

## Literatur

### Afrika

#### MCMMASTER 2005

Mary McMaster, *Language Shift and its Reflection in African Archaeology: Cord rouletting in the Uele and Interlacustrine regions*. *Azania* **40** (2005), 43–72.

Keywords: Historical linguistics, rouletted ceramics, interlacustrine history, Uele, spirantization.

#### MERCADER 2000

Julio Mercader, Salvador Rovira & Pablo Gómez-Ramos, *Shared Technologies, Forager-farmer interaction and ancient iron metallurgy in the Ituri rainforest, Democratic Republic of Congo*. *Azania* **35** (2000), 107–122.

The archaeological evidence from the Ituri rainforest supports the first scenario and is an interesting addition to central African archaeology, where there was previously no direct proof of smelting or forging from cave contexts (cf. Lavachery et al 1996; Emphoux cited in Lanfranchi 1991). Ceramic- and metal-using groups of the African rainforest may not correspond with the founding settlement of all of the Congo's rainforests. In the Northeast basin, archaeological evidence shows a long-term sustained Stone Age settlement considerably prior to the first appearance of ceramics and metal. Workers such as Eggert believe that 'it still appears to be valid that wherever pottery is produced and used in a primary prehistoric context, we are dealing with settled people' (Eggert 1993, 299) and that neither ceramics nor metal in early central African sites should be interpreted as proof of material exchanges between foragers and farmers. As limited and inconclusive as the archaeological evidence from the Ituri rock shelters may be, the preliminary data from this region indicate that neither ceramics nor metals are direct indicators of settled life or farming (especially in rock shelter sites of very likely LSA affiliation), rather than proof of interaction between LSA foragers and ceramic-metal using groups. If ceramics and metals derived from trade, it is possible to argue that exchange relationships between LSA foragers and ceramic groups existed. By itself, demonstration of trade constitutes no demonstration of domination or encapsulation of LSA foragers by ceramic groups during the 'Iron Age', but simply trade.

During the second millennium AD the Ituri groups used three technological repertoires, including lithics, ceramics, and metal. It is possible that these three technologies co-existed for several centuries and that, in the most recent past, the widespread consolidation of iron metallurgy may have caused a decreasing reliance on stone tools and eventual extinction of lithic reduction among local foragers.

Lastly, it is unclear whether the second millennium AD dates documented in the Ituri rainforest for the inception of ceramic and iron production indeed correspond to the earliest manifestations of pottery and iron technology in this region. They could be arbitrary chronological estimates derived from differential and limited archaeological research. In any case, the available data cannot explain how central and western regions of the Congo Basin could have received iron metallurgy from the interlacustrine area (Digombe et al 1988, 183; Childs and Killick 1993, 322; Eggert 1993, 304; Miller and Van der Merwe 1994, 10-11) when intermediate regions between the Western Rift and the central basin such as Ituri yield later chronologies than those available in west-Central Africa.

## Aktuell

ALEXANDER 2011

Marcus Alexander & Fotini Christia, *Context Modularity of Human Altruism*. [science](#) **334** (2011), 1392–1394.

[s334-1392-Supplement.pdf](#)

Whereas altruism drives the evolution of human cooperation, ethno-religious diversity has been considered to obstruct it, leading to poverty, corruption, and war. We argue that current research has failed to properly account for the institutional environment and how it affects the role diversity plays. The emergence of thriving, diverse communities throughout human history suggests that diversity does not always lead to cooperation breakdown. We conducted experiments in Mostar, Bosnia-Herzegovina with Catholic Croats and Muslim Bosniaks at a critical historic moment in the city's postwar history. Using a public goods game, we found that the ability to sanction is key to achieving cooperation in ethno-religiously diverse groups, but that sanctions succeed only in integrated institutional environments and fail in segregated ones. Hence, we show experimentally for the first time in a real-life setting that institutions of integration can unleash human altruism and restore cooperation in the presence of diversity.

GARCIA-CASTELLANOS 2011

D. Garcia-Castellanos & A. Villaseñor, *Messinian salinity crisis regulated by competing tectonics and erosion at the Gibraltar arc*. [nature](#) **480** (2011), 359–363.

[n480-0359-Supplement.pdf](#)

The Messinian salinity crisis<sup>1,2</sup> (5.96 to 5.33 million years ago) was caused by reduced water inflow from the Atlantic Ocean to the Mediterranean Sea resulting in widespread salt precipitation and a decrease in Mediterranean sea level of about 1.5 kilometres due to evaporation<sup>3</sup>. The reduced connectivity between the Atlantic and the Mediterranean at the time of the salinity crisis is thought to have resulted from tectonic uplift of the Gibraltar arc seaway and global sea-level changes, both of which control the inflow of water required to compensate for the hydrological deficit of the Mediterranean<sup>1,4</sup>. However, the different timescales on which tectonic uplift and changes in sea level occur are difficult to reconcile with the long duration of the shallow connection between the Mediterranean and the Atlantic<sup>5</sup> needed to explain the large amount of salt precipitated. Here we use numerical modelling to show that seaway erosion caused by the Atlantic inflow could sustain such a shallow connection between the Atlantic and the Mediterranean by counteracting tectonic uplift. The erosion and uplift rates required are consistent with previous mountain erosion studies, with the present altitude of marine sediments in the Gibraltar arc<sup>6,7</sup> and with geodynamic models suggesting a lithospheric slab tear underneath the region<sup>8-10</sup>. The moderate Mediterranean sea-level drawdown during the early stages of the Messinian salinity crisis<sup>3,5</sup> can be explained by an uplift of a few millimetres per year counteracted by similar rates of erosion due to Atlantic inflow. Our findings suggest that the competition between uplift and erosion can result in harmonic coupling between erosion and the Mediterranean sea level, providing an alternative mechanism for the cyclicity observed in early salt precipitation deposits and calling into question previous ideas regarding the timing of the events that occurred during the Messinian salinity crisis<sup>1</sup>.

GOETTE 2011

Lorenz Goette & Stephan Meier, *Can Integration Tame Conflicts?* [science](#) **334** (2011), 1356–1357.

Integration efforts can increase cooperation between ethnic or religious groups if competition is avoided.

Thus, competition between groups can lead to conflicts along group lines even in integrated environments. Integration efforts thus have to tread a fine line of bringing different groups together without creating a sense of competition between them. Alexander and Christia make a valuable contribution to a better understanding of this phenomenon, but more research is needed to understand what other contextual factors can mitigate group conflicts.

#### GRAVES 2011

Jennifer Graves, *Effects of year-round schooling on disadvantaged students and the distribution of standardized test performance*. [Economics of Education Review](#) **30** (2011), 1281–1305.

Using detailed longitudinal data for the state of California, this paper estimates the effect of year-round school calendars on nationally standardized test performance of traditionally disadvantaged students. The student subgroups studied in this paper are: low socioeconomic status, limited English proficiency, Hispanic and Latino, and African American students. I find significant negative effects of multi-track year-round calendars on academic achievement for all subgroups examined, with only the limited English proficiency student subgroup producing unreliable estimates. Negative and significant results for another type of year-round calendar, single-track, are also found for the full sample of students and low socioeconomic status students.

Keywords: Year-round schools | Academic achievement | Minority students

Commentary in science's editor's choice:

Does the organization of the school calendar affect student learning? Year-round schooling, which distributes school days with short, frequent breaks, is becoming more popular because it is thought to prevent the summer learning loss that occurs under a more traditional school calendar. Using longitudinal data from California public schools over a 9-year period, Graves examined the effect of year-round school calendars on nationally standardized test performance of traditionally disadvantaged students. Analysis showed that year-round calendars, especially multitrack year-round calendars in which the student body is never all in attendance at the same time, have a larger negative impact on the lower end of the distribution of scores, with Hispanics/Latinos and low socioeconomic status students experiencing a larger fall in performance than the overall population. African American students are more negatively affected than the overall student population with respect to reading. Policy-makers take note: These results present an additional cost of implementing year-round calendars.

#### HEADLAND 2011

Thomas N. Headland & Harry W. Greene, *Hunter-gatherers and other primates as prey, predators, and competitors of snakes*. [PNAS](#) **108** (2011), 20865–20866.

[pnas108-20865-Fulltext.pdf](#)

Relationships between primates and snakes are of widespread interest from anthropological, psychological, and evolutionary perspectives, but surprisingly, little is known about the dangers that serpents have posed to people with prehistoric lifestyles and nonhuman primates. Here, we report ethnographic observations of 120 Philippine Agta Negritos when they were still preliterate hunter-gatherers, among whom 26% of adult males had survived predation attempts by reticulated pythons. Six fatal attacks occurred between 1934 and 1973. Agta ate pythons as well as deer, wild pigs, and monkeys, which are also eaten by pythons, and therefore, the two species were reciprocally prey, predators, and potential competitors. Natural history data document snake predation on tree shrews and 26 species of nonhuman primates as well as many species of primates approaching, mobbing, killing, and sometimes eating snakes. These findings, interpreted within the context

of snake and primate phylogenies, corroborate the hypothesis that complex ecological interactions have long characterized our shared evolutionary history.

#### JIRKOVSKÝ 2011

Jakub S. Jirkovský, Itai Panas, Elisabet Ahlberg, Matej Halasa, Simon Romani & David J. Schiffrin, *Single Atom Hot-Spots at Au-Pd Nanoalloys for Electrocatalytic H<sub>2</sub>O<sub>2</sub> Production*. [Journal of the American Chemical Society](#) **133** (2011), 19432–19441.

JAmChemSoc133-19432-Supplement.pdf

A novel strategy to direct the oxygen reduction reaction to preferentially produce H<sub>2</sub>O<sub>2</sub> is formulated and evaluated. The approach combines the inertness of Au nanoparticles toward oxidation, with the improved O<sub>2</sub> sticking probability of isolated transition metal “guest” atoms embedded in the Au “host”. DFT modeling was employed to screen for the best alloy candidates. Modeling indicates that isolated alloying atoms of Pd, Pt, or Rh placed within the Au surface should enhance the H<sub>2</sub>O<sub>2</sub> production relative to pure Au. Consequently, Au<sub>1-x</sub>Pd<sub>x</sub> nanoalloys with variable Pd content supported on Vulcan XC-72 were prepared to investigate the predicted selectivity toward H<sub>2</sub>O<sub>2</sub> production for Au alloyed with Pd. It is demonstrated that increasing the Pd concentration to 8% leads to an increase of the electrocatalytic H<sub>2</sub>O<sub>2</sub> production selectivity up to nearly 95%, when the nanoparticles are placed in an environment compatible with that of a proton exchange membrane. Further increase of Pd content leads to a drop in H<sub>2</sub>O<sub>2</sub> selectivity, to below 10% for x = 0.5. It is proposed that the enhancement in H<sub>2</sub>O<sub>2</sub> selectivity is caused by the presence of individual surface Pd atoms surrounded by gold, whereas surface ensembles of contiguous Pd atoms support H<sub>2</sub>O formation. The results are discussed in the context of exergonic electrocatalytic H<sub>2</sub>O<sub>2</sub> synthesis in Polymer Electrolyte Fuel Cells for the simultaneous cogeneration of chemicals and electricity, the latter a credit to production costs.

Commentary in science’s editor’s choice:

Traditionally, the purpose of a fuel cell has been to channel chemical energy into electrical energy, and research has focused on optimizing the design to maximize the efficiency of this transformation. In this context, reducing oxygen all the way to water, rather than stopping halfway at hydrogen peroxide, is a central feature. On the other hand, there’s a market for hydrogen peroxide, and the current production route is frustratingly indirect (featuring the intermediacy of an organic quinone compound). Jirkovsky et al. consider the prospect of using polymer electrolyte fuel cells to cogenerate electricity and hydrogen peroxide. Beginning with the knowledge that certain gold surfaces manifest relatively high selectivity toward the partial reduction reaction, they performed density functional theory calculations to guide optimization. The calculations suggested that isolated Pd or Pt sites on the gold surface should enhance O<sub>2</sub> binding while suppressing scission of the O-O bond, but that adjacent centers of the second metal would promote further reduction to water. These predictions were then borne out in rotating ring-disc electrode measurements: Peroxide selectivity peaked near 95% at a Pd alloying concentration of 8%, but then plummeted as the Pd abundance passed 15% (the threshold for aggregation).

#### MERVIS 2011

Jeffrey Mervis, *Weed-Out Courses Hamper Diversity*. [science](#) **334** (2011), 1333.

And he believes that the combination of additional tutoring, faculty mentorship, summer research experiences, and internships at Bayer’s Pittsburgh materials research center will prove to be a winning formula for producing a more diverse STEM workforce.

## Anthropologie

RUXTON 2011

Graeme D. Ruxton & David M. Wilkinson, *Avoidance of overheating and selection for both hair loss and bipedality in hominins*. *PNAS* **108** (2011), 20965–20969.

Two frequently debated aspects of hominin evolution are the development of upright bipedal stance and reduction in body hair. It has long been argued, on the basis of heat-balance models, that thermoregulation might have been important in the evolution of both of these traits. Previous models were based on a stationary individual standing in direct sunlight; here we extend this approach to consider a walking hominin, having argued that walking is more thermally challenging than remaining still. Further, stationary activities may be more compatible with shade seeking than activities (such as foraging) involving travel across the landscape. Our model predictions suggest that upright stance probably evolved for nonthermoregulatory reasons. However, the thermoregulatory explanation for hair loss was supported. Specifically, we postulate progressive hair loss being selected and this allowing individuals to be active in hot, open environments initially around dusk and dawn without overheating. Then, as our ancestors' hair loss increased and sweating ability improved over evolutionary time, the fraction of the day when they could remain active in such environments extended. Our model suggests that only when hair loss and sweating ability reach near-modern human levels could hominins have been active in the heat of the day in hot, open environments.

WADLEY 2011

Lyn Wadley, Christine Sievers, Marion Bamford, Paul Goldberg, Francesco Berna & Christopher Miller, *Middle Stone Age Bedding Construction and Settlement Patterns at Sibudu, South Africa*. *science* **334** (2011), 1388–1391. [s334-1388-Supplement.pdf](#)

The Middle Stone Age (MSA) is associated with early behavioral innovations, expansions of modern humans within and out of Africa, and occasional population bottlenecks. Several innovations in the MSA are seen in an archaeological sequence in the rock shelter Sibudu (South Africa). At  $\approx 77,000$  years ago, people constructed plant bedding from sedges and other monocotyledons topped with aromatic leaves containing insecticidal and larvicidal chemicals. Beginning at  $\approx 73,000$  years ago, bedding was burned, presumably for site maintenance. By  $\approx 58,000$  years ago, bedding construction, burning, and other forms of site use and maintenance intensified, suggesting that settlement strategies changed. Behavioral differences between  $\approx 77,000$  and  $58,000$  years ago may coincide with population fluctuations in Africa.

## Klima

MCINTYRE 2003

Stephen McIntyre & Ross McKittrick, *Corrections to the Mann et al. (1998) Proxy Data Base and Northern Hemispheric Average Temperature Series*. *Energy & Environment* **14** (2003), 751–771.

The data set of proxies of past climate used in Mann, Bradley and Hughes (1998, “MBH98” hereafter) for the estimation of temperatures from 1400 to 1980 contains collation errors, unjustifiable truncation or extrapolation of source data, obsolete data, geographical location errors, incorrect calculation of principal components and other quality control defects. We detail these errors and defects. We then apply MBH98 methodology to the construction of a Northern Hemisphere average temperature index for

the 1400-1980 period, using corrected and updated source data. The major finding is that the values in the early 15th century exceed any values in the 20th century. The particular “hockey stick” shape derived in the MBH98 proxy construction – a temperature index that decreases slightly between the early 15th century and early 20th century and then increases dramatically up to 1980 – is primarily an artefact of poor data handling, obsolete data and incorrect calculation of principal components.

Key words: hockey stick, multiproxy method, global temperature history, IPCC, climate change, data quality.

#### MANN 1998

Michael E. Mann, Raymond S. Bradley & Malcolm K. Hughes, *Global-scale temperature patterns and climate forcing over the past six centuries*. [nature 392 \(1998\), 779–787](#).

[n392-0779-Supplement1.html](#), [n392-0779-Supplement2.html](#), [n392-0779-Supplement3.htm](#), [n392-0779-Supplement4.doc](#)

Spatially resolved global reconstructions of annual surface temperature patterns over the past six centuries are based on the multivariate calibration of widely distributed high-resolution proxy climate indicators. Time-dependent correlations of the reconstructions with time-series records representing changes in greenhouse-gas concentrations, solar irradiance, and volcanic aerosols suggest that each of these factors has contributed to the climate variability of the past 400 years, with greenhouse gases emerging as the dominant forcing during the twentieth century. Northern Hemisphere mean annual temperatures for three of the past eight years are warmer than any other year since (at least) AD 1400.

#### SCHMITTNER 2011

Andreas Schmittner et al., *Climate Sensitivity Estimated from Temperature Reconstructions of the Last Glacial Maximum*. [science 334 \(2011\), 1385–1388](#).

[s334-1385-Supplement.pdf](#)

Andreas Schmittner, Nathan M. Urban, Jeremy D. Shakun, Natalie M. Mahowald, Peter U. Clark, Patrick J. Bartlein, Alan C. Mix & Antoni Rosell-Melé

Assessing the impact of future anthropogenic carbon emissions is currently impeded by uncertainties in our knowledge of equilibrium climate sensitivity to atmospheric carbon dioxide doubling. Previous studies suggest 3 kelvin (K) as the best estimate, 2 to 4.5 K as the 66 % probability range, and nonzero probabilities for much higher values, the latter implying a small chance of high-impact climate changes that would be difficult to avoid. Here, combining extensive sea and land surface temperature reconstructions from the Last Glacial Maximum with climate model simulations, we estimate a lower median (2.3 K) and reduced uncertainty (1.7 to 2.6 K as the 66 % probability range, which can be widened using alternate assumptions or data subsets). Assuming that paleoclimatic constraints apply to the future, as predicted by our model, these results imply a lower probability of imminent extreme climatic change than previously thought.