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Literatur

Aktuell

Carrier 2011

David R. Carrier, *The Advantage of Standing Up to Fight and the Evolution of Habitual Bipedalism in Hominins*. PLoS ONE **6** (2011), e19630. <http://dx.doi.org/10.1371/journal.pone.0019630>.

Background: Many quadrupedal species stand bipedally on their hindlimbs to fight. This posture may provide a performance advantage by allowing the forelimbs to strike an opponent with the range of motion that is intrinsic to highspeed running, jumping, rapid braking and turning; the range of motion over which peak force and power can be produced.

Methodology/Principal Findings: To test the hypothesis that bipedal (i.e., orthograde) posture provides a performance advantage when striking with the forelimbs, I measured the force and energy produced when human subjects struck from "quadrupedal" (i.e., pronograde) and bipedal postures. Downward and upward directed striking energy was measured with a custom designed pendulum transducer. Side and forward strikes were measured with a punching bag instrumented with an accelerometer. When subjects struck downward from a bipedal posture the work was 43.70±12.59 % (mean ± S.E.) greater than when they struck from a quadrupedal posture. Similarly, 47.49±17.95 % more work was produced when subjects struck upward from a bipedal stance compared to a quadrupedal stance. Importantly, subjects did 229.69±44.19 % more work in downward than upward directed strikes. During side and forward strikes the force impulses were 30.12±3.68 and 43.04±9.00 % greater from a bipedal posture than a quadrupedal posture, respectively.

Conclusions/Significance: These results indicate that bipedal posture does provide a performance advantage for striking with the forelimbs. The mating systems of great apes are characterized by intense male-male competition in which conflict is resolved through force or the threat of force. Great apes often fight from bipedal posture, striking with both the fore- and hindlimbs. These observations, plus the findings of this study, suggest that sexual selection contributed to the evolution of habitual bipedalism in hominins.

Ceci 2011

Stephen J. Ceci & Wendy M. Williams, *Understanding current causes of women's underrepresentation in science*. PNAS **108** (2011), 3157–3162.

pnas108-03157-Comment.pdf, pnas108-03157-Reply.pdf, pnas108-03157-Supplement.pdf

Explanations for women's underrepresentation in math-intensive fields of science often focus on sex discrimination in grant and manuscript reviewing, interviewing, and hiring. Claims that women scientists suffer discrimination in these arenas rest on a set of studies undergirding policies and programs aimed at remediation. More recent and robust empiricism, however, fails to support assertions of discrimination in these domains. To better understand women's underrepresentation in math-intensive fields and its causes, we reprise claims of discrimination and their evidentiary bases. Based on a review of the past 20 y of data, we suggest that some of these claims are no longer valid and, if uncritically accepted as current causes of women's lack of progress, can delay or prevent understanding of contemporary determinants of women's underrepresentation. We conclude that differential gendered outcomes in the real world result from differences in resources attributable to choices, whether free or constrained, and that such choices could be influenced and

better informed through education if resources were so directed. Thus, the ongoing focus on sex discrimination in reviewing, interviewing, and hiring represents costly, misplaced effort: Society is engaged in the present in solving problems of the past, rather than in addressing meaningful limitations deterring women's participation in science, technology, engineering, and mathematics careers today. Addressing today's causes of underrepresentation requires focusing on education and policy changes that will make institutions responsive to differing biological realities of the sexes. Finally, we suggest potential avenues of intervention to increase gender fairness that accord with current, as opposed to historical, findings.
women in science | gender bias | child penalty | peer review

Dragu 2011

Tiberiu Dragu & Jonathan Rodden, *Representation and redistribution in federations*. PNAS **108** (2011), 8601–8604.
pnas108-08601-Supplement.pdf, pnas108-08601-Supplement1.xls
Many of the world's most populous democracies are political unions composed of states or provinces that are unequally represented in the national legislature. Scattered empirical studies, most of them focusing on the United States, have discovered that overrepresented states appear to receive larger shares of the national budget. Although this relationship is typically attributed to bargaining advantages associated with greater legislative representation, an important threat to empirical identification stems from the fact that the representation scheme was chosen by the provinces. Thus, it is possible that representation and fiscal transfers are both determined by other characteristics of the provinces in a specific country. To obtain an improved estimate of the relationship between representation and redistribution, we collect and analyze provincial-level data from nine federations over several decades, taking advantage of the historical process through which federations formed and expanded. Controlling for a variety of country- and province-level factors and using a variety of estimation techniques, we show that overrepresented provinces in political unions around the world are rather dramatically favored in the distribution of resources.

Parsch 2011

John Parsch, *The Cost of Being Male*. science **332** (2011), 798–799.
Mitochondrial mutations influence nuclear gene expression more in male Drosophila than in females.
Viewed from the mitochondrial genome's perspective, males are an evolutionary dead end: Regardless of the mitochondria's effect on a male's survival or reproductive success, they have no chance to contribute their genetic information to the next generation.
The results were striking: In females, exchanging mitochondrial genomes altered the expression of only a handful of nuclear genes; in contrast, in males, more than a thousand genes showed a significant change in expression. Assuming that most changes in gene expression are deleterious (4), this indicates a much greater mutational load in males than females.
The effect in females is a critical parameter that determines the rate at which these mutations will spread in a population. It is also important for extrapolating the Drosophila results to other species that have much smaller effective population sizes, such as mammals. For example, if most of the mutations have slightly deleterious effects on female fitness, one would predict a greater male mutational load in humans than in Drosophila, because natural selection is expected to be less efficient in humans.

Robock 2011

Alan Robock, *Nuclear winter is a real and present danger*. nature **473** (2011), 275–276.

Models show that even a ‘small’ nuclear war would cause catastrophic climate change. Such findings must inform policy, says Alan Robock.
A ‘small’ nuclear war between India and Pakistan, with each using 50 Hiroshima-size bombs (far less than 1 % of the current arsenal), if dropped on megacity targets in each country would produce climate change unprecedented in recorded human history. Five million tonnes of black carbon smoke would be emitted into the upper troposphere from the burning cities, and then be lofted into the stratosphere by the heat of the Sun. Temperatures would be lower than during the ‘Little Ice Age’ (1400-1850), during which famine killed millions. For several years, growing seasons would be shortened by weeks in the mid-latitudes.

Amerika

Powis 2011

Terry G. Powis, Ann Cyphers, Nilesh W. Gaikwad, Louis Grivetti & Kong Cheong, *Cacao use and the San Lorenzo Olmec*. PNAS **108** (2011), 8595–8600.

pnas108-08595-Supplement.pdf

Mesoamerican peoples had a long history of cacao use—spanning more than 34 centuries—as confirmed by previous identification of cacao residues on archaeological pottery from Paso de la Amada on the Pacific Coast and the Olmec site of El Manatí on the Gulf Coast. Until now, comparable evidence from San Lorenzo, the premier Olmec capital, was lacking. The present study of theobromine residues confirms the continuous presence and use of cacao products at San Lorenzo between 1800 and 1000 BCE, and documents assorted vessels forms used in its preparation and consumption. One elite context reveals cacao use as part of a mortuary ritual for sacrificial victims, an event that occurred during the height of San Lorenzo’s power.

chemistry | Mexico | tandem mass spectrometry | residue analysis | chocolate

Anthropologie

Fiorenza 2011

Luca Fiorenza, Stefano Benazzi, Bence Viola, Ottmar Kullmer & Friedemann Schrenk, *Relationship Between Cusp Size and Occlusal Wear Pattern in Neanderthal and Homo sapiens First Maxillary Molars*. The Anatomical Record **294** (2011), 453–461.

Tooth wear studies in mammals have highlighted the relationship between wear facets (attritional areas produced during occlusion by the contact between opposing teeth) and physical properties of the ingested food. However, little is known about the influence of tooth morphology on the formation of occlusal wear facets. We analyzed the occlusal wear patterns of first maxillary molars (M1s) in Neanderthals, early Homo sapiens, and contemporary modern humans. We applied a virtual method to analyze wear facets on the crown surface of three-dimensional digital models. Absolute and relative wear facet areas are compared with cusp area and cusp height. Although the development of wear facets partially follows the cusp pattern, the results obtained from the between-group comparisons do not reflect the cusp size differences characterizing these groups. In particular, the wear facets developed along the slopes of the most discriminate cusp between Neanderthals and Homo sapiens (hypocone) do not display any significant difference. Moreover, no correlations have been found between cusp size and wear facet areas (with the exception of the modern sample) and between cusp height and wear facet areas. Our results suggest that cusp size is only weakly related to the formation of the occlusal wear

facets. Other factors, such as, diet, food processing, environmental abrasiveness, and non-dietary habits are probably more important for the development and enlargement of wear facets, corroborating the hypotheses suggested from previous dental wear studies.
Keywords: Neanderthal; wear facets; cusp morphology; maxillary first molar

Biologie

HARE 2005

Brian Hare, Irene Plyusnina, Natalie Ignacio, Olesya Schepina, Anna Stepika, Richard Wrangham & Lyudmila Trut, *Social Cognitive Evolution in Captive Foxes Is a Correlated By-Product of Experimental Domestication*. Current Biology **15** (2005), 226–230.

CurrBiol15-0226-Supplement.pdf

Dogs have an unusual ability for reading human communicative gestures (e.g., pointing) in comparison to either nonhuman primates (including chimpanzees) or wolves. Although this unusual communicative ability seems to have evolved during domestication, it is unclear whether this evolution occurred as a result of direct selection for this ability, as previously hypothesized, or as a correlated by-product of selection against fear and aggression toward humans—as is the case with a number of morphological and physiological changes associated with domestication. We show here that fox kits from an experimental population selectively bred over 45 years to approach humans fearlessly and nonaggressively (i.e., experimentally domesticated) are not only as skillful as dog puppies in using human gestures but are also more skilled than fox kits from a second, control population not bred for tame behavior (critically, neither population of foxes was ever bred or tested for their ability to use human gestures). These results suggest that sociocognitive evolution has occurred in the experimental foxes, and possibly domestic dogs, as a correlated by-product of selection on systems mediating fear and aggression, and it is likely the observed social cognitive evolution did not require direct selection for improved social cognitive ability.

LINDBERG 2005

Julia Lindberg, Susanne Björnerfeldt, Peter Saetre, Kenth Svartberg, Birgitte Seehuus, Morten Bakken, Carles Vilà & Elena Jaz, *Selection for tameness has changed brain gene expression in silver foxes*. Current Biology **15** (2005), R915–R916.

CurrBiol15-R915-Supplement.pdf

TRUT 1999

Lyudmila N. Trut, *Early Canid Domestication: The Farm-Fox Experiment*. American Scientist **87** (1999), 160–169.

Foxes bred for tamability in a 40-year experiment exhibit remarkable transformations that suggest an interplay between behavioral genetics and development.

Datierung

PINHASI 2011

Ron Pinhasi, Thomas F. G. Higham, Liubov V. Golovanova & Vladimir B. Doronichev, *Revised age of late Neanderthal occupation and the end of the Middle Paleolithic in the northern Caucasus*. PNAS **108** (2011), 8611–8616.

pnas108-08611-Supplement.pdf
Advances in direct radiocarbon dating of Neanderthal and anatomically modern human (AMH) fossils and the development of archaeostratigraphic chronologies now allow refined regional models for Neanderthal-AMH coexistence. In addition, they allow us to explore the issue of late Neanderthal survival in regions of Western Eurasia located within early routes of AMH expansion such as the Caucasus. Here we report the direct radiocarbon (14C) dating of a late Neanderthal specimen from a Late Middle Paleolithic (LMP) layer in Mezmaiskaya Cave, northern Caucasus. Additionally, we provide a more accurate chronology for the timing of Neanderthal extinction in the region through a robust series of 16 ultrafiltered bone collagen radiocarbon dates from LMP layers and using Bayesian modeling to produce a boundary probability distribution function corresponding to the end of the LMP at Mezmaiskaya. The direct date of the fossil (39,700 ± 1,100 14C BP) is in good agreement with the probability distribution function, indicating at a high level of probability that Neanderthals did not survive at Mezmaiskaya Cave after 39 ka cal BP ("calendrical" age in kiloannum before present, based on IntCal09 calibration curve). This challenges previous claims for late Neanderthal survival in the northern Caucasus. We see striking and largely synchronous chronometric similarities between the Bayesian age modeling for the end of the LMP at Mezmaiskaya and chronometric data from Ortvale Klde for the end of the LMP in the southern Caucasus. Our results confirm the lack of reliably dated Neanderthal fossils younger than ≈40 ka cal BP in any other region of Western Eurasia, including the Caucasus.
ultrafiltration | admixture

Grabung

Slimak 2011

Ludovic Slimak et al., *Late Mousterian Persistence near the Arctic Circle.* science **332** (2011), 841–845.
s332-0841-Supplement.pdf
Ludovic Slimak, John Inge Svendsen, Jan Mangerud, Hugues Plisson, Herbjørn Presthus Heggen, Alexis Brugère & Pavel Yurievich Pavlov
Palaeolithic sites in Russian high latitudes have been considered as Upper Palaeolithic and thus representing an Arctic expansion of modern humans. Here we show that at Byzovaya, in the western foothills of the Polar Urals, the technological structure of the lithic assemblage makes it directly comparable with Mousterian Middle Palaeolithic industries that so far have been exclusively attributed to the Neandertal populations in Europe. Radiocarbon and optical-stimulated luminescence dates on bones and sand grains indicate that the site was occupied during a short period around 28,500 carbon-14 years before the present (about 31,000 to 34,000 calendar years ago), at the time when only Upper Palaeolithic cultures occupied lower latitudes of Eurasia. Byzovaya may thus represent a late northern refuge for Neandertals, about 1000 km north of earlier known Mousterian sites.

Klima

Bird 2011

Broxton W. Bird, Mark B. Abbott, Mathias Vuille, Donald T. Rodbell, Nathan D. Stansell & Michael F. Rosenmeier, *A 2,300-year-long annually resolved record of the South American summer monsoon from the Peruvian Andes.* PNAS **108** (2011), 8583–8588.
pnas108-08583-Supplement.pdf

Decadal and centennial mean state changes in South Americansummer monsoon (SASM) precipitation during the last 2,300 years are detailed using an annually resolved authigenic calcite record of precipitation d18O from a varved lake in the Central Peruvian Andes. This unique sediment record shows that d18O peaked during the Medieval Climate Anomaly (MCA) from A.D. 900 to 1100, providing evidence that the SASM weakened considerably during this period. Minimum d18O values occurred during the Little Ice Age(LIA) between A.D. 1400 and 1820, reflecting a prolonged intensification of the SASM that was regionally synchronous. After theLIA, d18O increased rapidly, particularly during the current warm period (CWP; A.D. 1900 to present), indicating a return to reduced SASM precipitation that was more abrupt and sustained than the onset of the MCA. Diminished SASM precipitation during the MCA and CWP tracks reconstructed Northern Hemisphere and North Atlantic warming and a northward displacement of the Intertropical Convergence Zone (ITCZ) over the Atlantic, and likely the Pacific. Intensified SASM precipitation during the LIA follows reconstructed Northern Hemisphere and North Atlantic cooling, El Niño-like warming in the Pacific, and a southward displacement of the ITCZ over both oceans. These results suggest that SASM mean state changes are sensitive to ITCZ variability as mediated by Western Hemisphere tropical sea surface temperatures, particularly in the Atlantic. Continued Northern Hemisphere and North Atlantic warming may therefore help perpetuate the recent reductions in SASM precipitation that characterize the last 100 years,which would negatively impact Andean water resources.
oxygen isotopes | varves | tropical hydroclimate

Mittelpaläolithikum

Balter 2011

Michael Balter, *Did Neandertals Linger in Russia's Far North?* science **332** (2011), 778.

If Neandertals did make the tools, it would be a "very big thing," says archaeologist Wil Roebroeks of Leiden University in the Netherlands. Byzovaya would push Neandertals' range northward by 1000 kilometers, and the site would be one of the youngest claimed for Neandertals, especially since recent redating has moved many Neandertal sites earlier in time (http://scim.ag/Neandertals). It would also show that the cold-adapted Neandertals could survive the rigors of the Arctic.
Artifacts similar to those found at Byzovaya were used by both Neandertals and modern humans throughout western Asia, including the Near East, where both species lived about 100,000 years ago, argues archaeologist John Shea of Stony Brook University in New York. Shea adds that "Mousterian-like" tools are also found in Africa. "They are no more uniquely associated with Neandertals than is a big brain or an opposable thumb," he says.

Fiorenza 2011

Luca Fiorenza, Stefano Benazzi, Jeremy Tausch, Ottmar Kullmer, Timothy G. Bromage, Friedemann Schrenk, *Molar Macrowear Reveals Neanderthal Eco-Geographic Dietary Variation.* PLoS ONE **6** (2011), e14769. <http://dx.doi.org/10.1371/journal.pone.0014769>.

Neanderthal diets are reported to be based mainly on the consumption of large and medium sized herbivores, while the exploitation of other food types including plants has also been demonstrated. Though some studies conclude that early Homo sapiens were active hunters, the analyses of faunal assemblages, stone tool technologies and stable isotopic studies indicate that they exploited broader dietary resources than Neanderthals. Whereas previous studies assume taxon-specific dietary specializations, we suggest here that

the diet of both Neanderthals and early Homo sapiens is determined by ecological conditions. We analyzed molar wear patterns using occlusal fingerprint analysis derived from optical 3D topometry. Molar macrowear accumulates during the lifespan of an individual and thus reflects diet over long periods. Neanderthal and early Homo sapiens maxillary molar macrowear indicates strong eco-geographic dietary variation independent of taxonomic affinities. Based on comparisons with modern hunter-gatherer populations with known diets, Neanderthals as well as early Homo sapiens show high dietary variability in Mediterranean evergreen habitats but a more restricted diet in upper latitude steppe/coniferous forest environments, suggesting a significant consumption of high protein meat resources.

Neolithikum

Bower 1991

John Bower, *The Pastoral Neolithic of East Africa*. Journal of World Prehistory **5** (1991), 49–82.

In East Africa, as in man)' other regions, the initial shift ft'om hunting and gathering to food production was a secondary process involving the introduction of species domesticated elsewhere. Specifically, the East African Neolithic, or Pastoral Neolithic, centered on herding livestock, some of which may have been domesticated in the Sahara and all of which were almost cel;tainly imported from areas to the north. The development of the Pastoral Neolithic was lengthy and complex, having begun before 4000 B.P. and lasted until about 1300 B.P. Although detailed information on this segment of African prehistory is not abundant, data so far available reveal a succession of cultural transformations within the Pastoral Neolithic, such that it can be divided into early, evolved, and late stages, each exhibiting distinctive combinations of ceramic wares, lithic industries, and subsistence regimes. The transformations seem to have been fostered by both environmental change and population movements.

KEY WORDS: East Africa; Neolithic; pastoralism.

Denham 2003

T. P. Denham, S. G. Haberle, C. Lentfer, R. Fullagar, J. Field, M. Therin, N. Porch & B. Winsborough, *Origins of Agriculture at Kuk Swamp in the Highlands of New Guinea*. science **301** (2003), 189–193.

s301-0189-Supplement.pdf

Multidisciplinary investigations at Kuk Swamp in the Highlands of Papua New Guinea show that agriculture arose independently in New Guinea by at least 6950 to 6440 calibrated years before the present (cal yr B.P.). Plant exploitation and some cultivation occurred on the wetland margin at 10,220 to 9910 cal yr B.P. (phase 1), mounding cultivation began by 6950 to 6440 cal yr B.P. (phase 2), and ditched cultivation began by 4350 to 3980 cal yr B.P. (phase 3). Clearance of lower montane rainforests began in the early Holocene, with modification to grassland at 6950 to 6440 cal yr B.P. Taro (Colocasia esculenta) was utilized in the early Holocene, and bananas (Musa spp.) were intensively cultivated by at least 6950 to 6440 cal yr B.P.

Neumann 2003

Katharina Neumann, *New Guinea: A Cradle of Agriculture*. science **301** (2003), 180–181.

Until recently, the opinion was widespread that remains of root crops (which may have been domesticated before seed crops) are easily destroyed in tropical soils, leaving no traces. The analyses presented by Denham et al. contradict this view. The authors found tiny plant remains that help to reconstruct former environmental conditions and plant

exploitation (10). In addition to wood and seeds, they recovered pollen and phytoliths (plant crystals) from sediments and starch grains from stone tools. The large number of banana phytoliths confirms that this crop was planted 7000 years ago.
Denham et al. show that the transition from foraging to farming in Kuk took several thousand years. The evidence attests to cultivation, but not necessarily domestication, of banana and taro.