Liste erstellt am 2011-09-01

Literatur

Aktuell

Arvola 1961

Alpo Arvola & Olof Forsander, *Comparison between Water and Alcohol Consumption in Six Animal Species in Free-choice Experiments*. nature **191** (1961), 819–820.

The hedgehogs preferred water to alcohol solution. Sometimes, however, the animals drank considerable amounts of alcohol, and it could at times be judged from their movements that they were slightly drunk. The hamsters preferred alcohol. They seldom tasted the water and, when they did so, only until they found out that they were drinking from the wrong bottle. The guinea pigs preferred water. The comparatively large consumption of fluid and the wide variations in consumption showed that the animals spilled out some of the fluid; but it could be seen that they visited the water bottle more often and only seldom the alcohol vessel. The rabbits drank about as much alcohol as water. Individual rats differ in their choice between alcohol and water. Most of them prefer water to alcohol, but some prefer alcohol. In some individuals there was a change in preference while the experiments were in progress. What is said about rats is also true of mice.

Kolber 2011

Adam Kolber, *Give memory-altering drugs a chance*. nature **476** (2011), 275–276.

The ethical challenges of memory-dampening drugs are likely to be manageable and the pay-offs considerable, says Adam Kolber.

Libkind 2011

Diego Libkind et al., *Microbe domestication and the identification of the wild genetic stock of lager-brewing yeast*. PNAS **108** (2011), 14539–14544.

pnas108-14539-Supplement1.xls, pnas108-14539-Supplement2.xls, pnas108-14539-Supplement3.xls, pnas108-14539-Supplement4.xls, pnas108-14539-Supplement5.xls, pnas108-14539-Supplement6.xlsx

Diego Libkind, Chris Todd Hittinger, Elisabete Valério, Carla Gonçalves, Jim Dover, Mark Johnston, Paula Gonçalves and José Paulo Sampaio

Domestication of plants and animals promoted humanity's transition from nomadic to sedentary lifestyles, demographic expansion, and the emergence of civilizations. In contrast to the well-documented successes of crop and livestock breeding, processes of microbe domestication remain obscure, despite the importance of microbes to the production of food, beverages, and biofuels. Lagerbeer, first brewed in the 15th century, employs an allotetraploid hybrid yeast, Saccharomyces pastorianus (syn. Saccharomyces carlsbergensis), a domesticated species created by the fusion of a Saccharomyces cerevisiae ale-yeast with an unknown cryotolerant Saccharomyces species. We report the isolation of that species and designate it Saccharomyces eubayanus sp. nov. because of its resemblance to Saccharomyces bayanus (a complex hybrid of S. eubayanus, Saccharomyces uvarum, and S. cerevisiae found only in the brewing environment). Individuals from populations of S. eubayanus and its sister species, S. uvarum, exist in apparent sympatry in Nothofagus (Southern beech) forests in Patagonia, but are isolated genetically through intrinsic postzygotic barriers, and ecologically through host-preference. The draft genome sequence of S. eubayanus is 99.5 % identical to the non-S. cerevisiae portion of the S. pastorianus

genome sequence and suggests specific changes in sugar and sulfite metabolism that were crucial for domestication in the lager-brewing environment. This study shows that combining microbial ecology with comparative genomics facilitates the discovery and preservation of wild genetic stocks of domesticated microbes to trace their history, identify genetic changes, and suggest paths to further industrial improvement.
beer yeast | next-generation sequencing | yeast ecology | yeast taxonomy

McCook 2011

Alison McCook, *Shelved*. nature **476** (2011), 270–272.

For decades, the Armed Forces Institute of Pathology has been a leader in disease diagnosis. Now it is closing, and its legacy is in jeopardy.
In its long history, the AFIP has become a stalwart of the international biomedical community. With its vast library of tissue samples and expertise at analysing tissues for the diagnosis of disease, it has been a valuable resource for researchers and clinicians alike. Every year, the AFIP received at least 50,000 requests for second opinions on difficult cases from external pathologists. The nearly 800 employees—including experts in many areas of human and animal pathology—made major or minor changes to roughly half of the cases they acted on.
The AFIP was in trouble during the first US war with Iraq in the early 1990s, when the Department of Defense began to take a closer look at its budget. Suddenly, research projects that would have been approved and encouraged in the past were being questioned. Abbondanzo and her colleagues had submitted a proposal to study follicular lymphoma, a type of cancer that is rare in children. The AFIP repository contained at least 20 childhood cases, providing an unprecedented opportunity to characterize the condition. But the board that approved proposals rejected the project, saying it had "no military relevancy", Abbondanzo says. During this same period, she attended a meeting at which someone from the department referred to the AFIP as an "obscure little agency".

Marchant 2011

Jo Marchant, *'Flawed' infant death papers not retracted, Authors, institutions and editors did not act on findings of inquiry into organ harvesting.* nature **476** (2011), 263–264.

The Redfern report concluded that because van Velzen did not carry out proper post-mortems, it was impossible to be sure how any of the infants—in either the SIDS group or the control group—had actually died. Most of the papers have not been highly cited, but one—which shows that growth-retarded fetuses have poor kidney development—receives a steady stream of PubMed citations, and has been cited six times since 2010. Howard says that he and his co-authors considered whether to retract their papers after the Redfern report was published, but ultimately decided that all of their research remains valid. "We think we've made a contribution there," he says. "The outcome of that research has affected clinical practice," Howard says, in that growthretarded fetuses are now delivered as soon as possible to improve their chances of survival.
He complains of "tremendous variation" in the attitudes of journal editors, but cites as a positive example Steven Shafer, editor-in-chief of Anesthesia & Analgesia, who led a group of editors of 11 affected journals after the German anaesthesiologist Joachim Boldt was found to have published research that had been conducted without proper ethical approval. Working together, the editors have since retracted around 90 of Boldt's papers. He argues that follow-up experiments already provide a mechanism to check the validity of studies. "Replication of experiments is usually what highlights anomalies, not retraction," he says.

O'Connell 2011

Bree A. O'Connell, Karen M. Moritz, Claire T. Roberts, David W. Walker & Hayley Dickinson, *The Placental Response to Excess Maternal*

Glucocorticoid Exposure Differs Between the Male and Female Conceptus in Spiny Mice. Biology of Reproduction (2011) preprint, 1–16. <http://dx.doi.org/10.1095/biolreprod.111.093369>.

Maternal stress during pregnancy can have deleterious and long-lasting effects on the fetus and newborn. A striking example comes from the 2001 terrorist attacks on the World Trade Centre in New York. For pregnant women in the New York area at this time, there was a higher incidence of low birth weight babies, with the greatest proportion arising from mothers who were in the first two trimesters of their pregnancy at the time of the attack. There was also an increased incidence of male fetal death in New York after September 2001.

The placenta is the intermediary between the mother and fetus and its primary role is to provide for the appropriate growth of the fetus. A suboptimal in utero environment has been shown to differentially affect the health of offspring, depending on their sex. Here we show that excess maternal glucocorticoids administered in midgestation (Day 20, 0.5 gestation in the spiny mouse) for 60 h, have persisting effects on the placenta that differ by fetal sex, placental region, and time after glucocorticoid exposure. Dexamethasone (DEX) exposure altered placental structure and mRNA expression from male and female fetuses both immediately (Day 23) and two weeks posttreatment (Day 37). The immediate consequences (Day 23) of DEX were similar between males and females with reductions in the expression of IGF1, IGF1R and SLC2A1 in the placenta. However by Day 37, the transcriptional and structural response of the placenta was dependent on the sex of the fetus with placentas of male fetuses having an increase in GCM1 expression, a decrease in SLC2A1 expression and an increase in the amount of maternal blood sinusoids in the DEX exposed placenta. Female placentas on the other hand showed increased SLC2A1 and MAP2K1 expression and a decrease in the amount of maternal blood sinusoids in response to DEX exposure. We have shown that the effect of a brief glucocorticoid exposure at midgestation has persisting effects on the placenta, and this is likely to have ongoing and dynamic effects on fetal development, that differ for a male and female fetus.

Priyadarshi 2011

Antra Priyadarshi, Gerardo Dominguez & Mark H. Thiemens, *Evidence of neutron leakage at the Fukushima nuclear plant from measurements of radioactive ^{35}S in California.* PNAS **108** (2011), 14422–14425.

A recent earthquake and the subsequent tsunami have extensively damaged the Fukushima nuclear power plant, releasing harmful radiation into the environment. Despite the obvious implication for human health and the surrounding ecology, there are no quantitative estimates of the neutron flux leakage during the weeks following the earthquake. Here, using measurements of radioactive 35S contained in sulfate aerosols and SO2 gas at a coastal site in La Jolla, California, we show that nearly 4E11 neutrons per m2 leaked at the Fukushima nuclear power plant before March 20, 2011. A significantly higher 35SO4,2- activity as measured on March 28 is in accord with neutrons escaping the reactor core and being absorbed by the coolant seawater 35Cl to produce 35S by a (n, p) reaction. Once produced, 35S oxidizes to 35SO2 and 35SO4,2- and was then transported to Southern California due to the presence of strong prevailing westerly winds at this time. Based on a moving box model, we show that the observed activity enhancement in 35SO4,2- is compatible with long-range transport of the radiation plume from Fukushima. Our model predicts that 35SO4,2-, the concentration in the marine boundary layer at Fukushima, was approximately 2E5 atoms per m3, which is approximately 365 times above expected natural concentrations. These measurements and model calculations imply that approximately 0.7 % of the total radioactive sulfate present at the marine boundary layer at Fukushima reached Southern California as a result of the trans-Pacific transport.

gas to particle conversion | radioactive sulfur-35

Veerman 2011

J. Lennert Veerman, Genevieve N. Healy, Linda J. Cobiac, Theo Vos, Elisabeth A. H. Winkler, Neville Owen & David W. Dunstan, *Television viewing time and reduced life expectancy: a life table analysis*. British Journal of Sports Medicine (2011) preprint, 1–4. <http://dx.doi.org/10.1136/bjsm.2011.085662>.

Background Prolonged television (TV) viewing time is unfavourably associated with mortality outcomes, particularly for cardiovascular disease, but the impact on life expectancy has not been quantified. The authors estimate the extent to which TV viewing time reduces life expectancy in Australia, 2008.

Methods The authors constructed a life table model that incorporates a previously reported mortality risk associated with TV time. Data were from the Australian Bureau of Statistics and the Australian Diabetes, Obesity and Lifestyle Study, a national population-based observational survey that started in 1999-2000. The authors modelled impacts of changes in population average TV viewing time on life expectancy at birth.

Results The amount of TV viewed in Australia in 2008 reduced life expectancy at birth by 1.8 years (95 % uncertainty interval (UI): 8.4 days to 3.7 years) for men and 1.5 years (95 % UI: 6.8 days to 3.1 years) for women. Compared with persons who watch no TV, those who spend a lifetime average of 6 h/day watching TV can expect to live 4.8 years (95 % UI: 11 days to 10.4 years) less. On average, every single hour of TV viewed after the age of 25 reduces the viewer's life expectancy by 21.8 (95 % UI: 0.3-44.7) min. This study is limited by the low precision with which the relationship between TV viewing time and mortality is currently known.

Conclusions TV viewing time may be associated with a loss of life that is comparable to other major chronic disease risk factors such as physical inactivity and obesity.

Anthropologie

Hamann 2011

Katharina Hamann, Felix Warneken, Julia R. Greenberg & Michael Tomasello, *Collaboration encourages equal sharing in children but not in chimpanzees*. nature **476** (2011), 328–331.

n476-0328-Supplement.pdf

Humans actively share resources with one another to amuch greater degree than do other great apes, and much human sharing is governed by social norms of fairness and equity1-3. When in receipt of a windfall of resources, human children begin showing tendencies towards equitable distribution with others at five to seven years of age4-7. Arguably, however, the primordial situation for human sharing of resources is that which follows cooperative activities such as collaborative foraging,when several individualsmust share the spoils of their joint efforts8-10. Here we show that children of around three years of age share with others much more equitably in collaborative activities than they do in either windfall or parallel-work situations. By contrast, one of humans' two nearest primate relatives, chimpanzees (Pan troglodytes), 'share' (make food available to another individual) just as often whether they have collaborated with them or not. This species difference raises the possibility that humans' tendency to distribute resources equitably may have its evolutionary roots in the sharing of spoils after collaborative efforts.

Horner 2011

Victoria Horner, J. Devyn Carter, Malini Suchak & Frans B. M. de Waal, *Spontaneous prosocial choice by chimpanzees*. PNAS **108** (2011), 13847–13851.

The study of human and primate altruism faces an evolutionary anomaly: There is ample evidence for altruistic preferences in our own species and growing evidence in monkeys, but one of our closest relatives, the chimpanzee (Pan troglodytes), is viewed as a reluctant altruist, acting only in response to pressure and solicitation. Although chimpanzee prosocial behavior has been reported both in observational captive studies and in the wild, thus far Prosocial Choice Tests have failed to produce evidence. However, methodologies of previous Prosocial Choice Tests may have handicapped the apes unintentionally. Here we present findings of a paradigm in which chimpanzees chose between two differently colored tokens: one "selfish" token resulting in a reward for the actor only (1/0), and the other "prosocial" token rewarding both the actor and a partner (1/1). Seven female chimpanzees, each tested with three different partners, showed a significant bias for the prosocial option. Prosocial choices occurred both in response to solicitation by the partner and spontaneously without solicitation. However, directed requests and pressure by the partner reduced the actor's prosocial tendency. These results draw into question previous conclusions indicating that chimpanzees have a limited sensitivity to the needs of others and behave prosocially only in response to significant prompting.
other-regarding | fairness | great ape

Organ 2011

Chris Organ, Charles L. Nunn, Zarin Machanda & Richard W. Wrangham, *Phylogenetic rate shifts in feeding time during the evolution of Homo*. PNAS **108** (2011), 14555–14559.
pnas108-14555-Supplement.pdf, pnas108-14555-Supplement1.doc, pnas108-14555-Supplement2.doc, pnas108-14555-Supplement3.doc, pnas108-14555-Supplement4.doc
Unique among animals, humans eat a diet rich in cooked and nonthermally processed food. The ancestors of modern humans who invented food processing (including cooking) gained critical advantages in survival and fitness through increased caloric intake. However, the time and manner in which food processing became biologically significant are uncertain. Here, we assess the inferred evolutionary consequences of food processing in the human lineage by applying a Bayesian phylogenetic outlier test to a comparative dataset of feeding time in humans and nonhuman primates. We find that modern humans spend an order of magnitude less time feeding than predicted by phylogeny and body mass (4.7 % vs. predicted 48 % of daily activity). This result suggests that a substantial evolutionary rate change in feeding time occurred along the human branch after the human-chimpanzee split. Along this same branch, Homo erectus shows a marked reduction in molar size that is followed by a gradual, although erratic, decline in H. sapiens.We show that reduction in molar size in early Homo (H. habilis and H. rudolfensis) is explicable by phylogeny and body size alone. By contrast, the change in molar size to H. erectus, H. neanderthalensis, and H. sapiens cannot be explained by the rate of craniodental and body size evolution. Together, our results indicate that the behaviorally driven adaptations of food processing (reduced feeding time and molar size) originated after the evolution of Homo but before or concurrent with the evolution of H. erectus, which was around 1.9 Mya.
hominin | phylogenetic comparative methods | anthropology

Klima

Martínez-Garcia 2011

Alfredo Martínez-Garcia, Antoni Rosell-Melé, Samuel L. Jaccard, Walter Geibert, Daniel M. Sigman & Gerald H. Haug, *Southern Ocean dust-climate coupling over the past four million years*. nature **476** (2011), 312–315.
n476-0312-Supplement1.pdf, n476-0312-Supplement2.xls

Dust has the potential to modify global climate by influencing the radiative balance of the atmosphere and by supplying iron and other essential limiting micronutrients to the ocean1,2. Indeed, dust supply to the Southern Ocean increases during ice ages, and 'iron fertilization' of the subantarctic zone may have contributed up to 40 parts per million by volume (p.p.m.v.) of the decrease (80-100 p.p.m.v.) in atmospheric carbon dioxide observed during late Pleistocene glacial cycles3-7. So far, however, the magnitude of Southern Ocean dust deposition in earlier times and its role in the development and evolution of Pleistocene glacial cycles have remained unclear. Here we report a high-resolution record of dust and iron supply to the Southern Ocean over the past four million years, derived from the analysis of marine sediments from ODP Site 1090, located in the Atlantic sector of the subantarctic zone. The close correspondence of our dust and iron deposition records with Antarctic ice core reconstructions of dust flux covering the past 800,000 years (refs 8, 9) indicates that both of these archives record large-scale deposition changes that should apply to most of the Southern Ocean, validating previous interpretations of the ice core data. The extension of the record beyond the interval covered by the Antarctic ice cores reveals that, in contrast to the relatively gradual intensification of glacial cycles over the past three million years, Southern Ocean dust and iron flux rose sharply at the MidPleistocene climatic transition around 1.25 million years ago. This finding complements previous observations over late Pleistocene glacial cycles5,8,9, providing new evidence of a tight connection between high dust input to the Southern Ocean and the emergence of the deep glaciations that characterize the past one million years of Earth history.

Kultur

Diamond 2011

Jared Diamond, *Deep relationships between languages*. nature **476** (2011), 291–292.

Tracing a common ancestry between languages becomes harder as the connection goes further back in time. A new test has revealed a surprisingly ancient relationship between a central Siberian and a North American language family.

The reported Yeniseian-Na-Dene link raises many questions. Where was the common ancestral language spoken (Siberia or North America), and did Yeniseians move west or Na-Denes move east across the Bering Strait? Are there archaeological correlates of such a movement? (The only plausible candidates are archaeological horizons at around 12,000 and 5,000 years ago.) Do Yeniseian and Na-Dene form a superfamily by themselves, or do they belong to a larger superfamily that includes Sino-Tibetan and Basque? Are Yeniseian and Na-Dene people more closely related genetically to each other than to other Siberians and Native Americans? (Apparently not, possibly because of millennia of intermarriage with surrounding peoples.) Why did Yeniseian speakers have such a tiny geographical range in modern times?

But there are two questions that most trouble linguists. Why do Yeniseian and Na-Dene languages still show such a strong relationship if they diverged 12,000 years ago, when other languages diverge beyond recognition after 5,000-10,000 years ago? Either Yeniseian and Na-Dene languages really diverged only 5,000 years ago, or they are unusually conservative and evolve especially slowly. And how did Yeniseians and Na-Denes get separated by 5,200 km in only 5,000 or 12,000 years, making their overland migration the longest and fastest recorded by hunter-gatherers?

Stika 2011

Hans-Peter Stika, *Früheisenzeitliche Met- und Biernachweise aus Süddeutschland*. Archäologische Informationen **33** (2011), 113–121.

Bei späthallstattzeitlichen Ausgrabungen (7.–5. Jh. v. Chr.) in Süddeutschland wurden mehrfach Hinweise auf Met ermittelt. Aus den Großgrabhügeln von Eberdingen-Hochdorf, der Heuneburg bei Herbrechtingen-Hundersingen und dem Glauberg sowie aus einem Frauengrab aus Niedererlbach bei Landshut wurden Rückstände in Bronzegefäßen untersucht, die hohe Pollenkonzentrationen sowie Bienenwachs enthielten und auf eine rituelle Verwendung von Met bei Bestattungen hinweisen.
In ungewöhnlichen, geraden Grabenstrukturen der frühlatènezeitlichen Siedlung von Eberdingen-Hochdorf, Gewann Reps, wurde eine große Menge angekeimter Gerstenkörner gefunden. Wegen der großen Reinheit und des gleichmäßig schwachen Ankeimgrades kann das Malz nur von einer beabsichtigten Keimung stammen. Die archäologischen Strukturen, in denen die verkohlten Körner gefunden wurden, konnten sowohl zum Ankeimen als auch zum Darren des Malzes verwendet worden sein. Seine Herstellung hängt höchstwahrscheinlich mit dem Brauen von Bier zusammen. Ausgehend von den ausgegrabenen Bodenfunden und theoretischen Überlegungen zum Bierbrauen in der frühen Eisenzeit wird der Versuch unternommen, den Geschmack des Keltenbieres zu rekonstruieren.
Schlüsselwörter: Frühkeltischer Met, Malzfunde, Früheisenzeitliche Brauerei von Hochdorf, Geschmack von Keltenbier, Späthallstatt-/ Frühlatenezeit, Archäologische Ausgrabungen
Abstract: Evidence of mead is given by pollen analysis from late Hallstatt period (7th–5th cen. BC) in southern Germany. At the nobles burial sites of Eberdingen-Hochdorf, Heuneburg, Glauberg, and Niedererlbach among other outstanding grave gifts residues in bronze vessels were analysed to consist of a large amount of pollen and wax indicating the ritual use of mead.
In special straight ditch structures from the early Iron Age settlement of Eberdingen-Hochdorf (early La Tène Period), a large number of evenly germinated hulled barley grains were found, This malt seems to have been the result of deliberate germination, due to the purity of the finds and the unusual archaeological structure which could have been used both for the germination and also as a drying-kiln for producing roasted malt. The Hochdorf malt most probably was produced for the purpose of beer brewing. Based on the finds as well as theoretical reflections on the early Iron Age brewing process, attempts at reconstructing the possible taste of early .Celtic beer are presented.
Keywords: Early Celtic mead, Malt finds, Early Iron Age Hochdorf brewery, Taste of early Celtic beer, Late Hallstatt / early La Tène, Archaeological excavations

Story or Book

Gusterson 2011

Hugh Gusterson, *Quantum outsiders*. nature **476** (2011), 278–279.
Hugh Gusterson enjoys a history of the quirky group that pursued quantum physics when it was unfashionable.
How the Hippies Saved Physics: Science, Counterculture, and the Quantum Revival. David Kaiser. W. W. Norton: 2011. 372 pp. $ 26.95, £ 19.99
The book makes important observations about the social dynamics of physics in the United States during the cold war. Kaiser argues that, even as military patronage pumped massive financial resources into physics, the discipline's horizons shrank. University physicists disdained the philosophical questions that had enlivened pre-war European physics and developed a narrowly instrumentalist pedagogy that sometimes became a straitjacket.
Kaiser describes some students holding secret meetings to discuss quantum mechanics behind their advisers' backs, having been warned that "thinking seriously about foundations was a waste of time and a detriment to one's career". He also notes that the editor of Physical Review banned articles discussing interpretations of quantum mechanics; a brilliant experiment on Bell's theorem by John Clauser was scarcely cited because of the

prevailing orthodoxy. Clauser was told that his experiment was not “real physics”, and he had a terrible time on the job market.

Ho 2011

Joses Ho, *Her name was Jane, Remembrance day.* nature **476** (2011), 366.