

## Literatur

### Aktuell

CHU 2013

Chia-Ching Chu, Joseph L. Spencer, Matías J. Curzi, Jorge A. Zavala & Manfredo J. Seufferheld, *Gut bacteria facilitate adaptation to crop rotation in the western corn rootworm*. [PNAS 110 \(2013\), 11917–11922](#).

Insects are constantly adapting to human-driven landscape changes; however, the roles of their gut microbiota in these processes remain largely unknown. The western corn rootworm (WCR, *Diabrotica virgifera virgifera* LeConte) (Coleoptera: Chrysomelidae) is a major corn pest that has been controlled via annual rotation between corn (*Zea mays*) and nonhost soybean (*Glycine max*) in the United States. This practice selected for a “rotation-resistant” variant (RR-WCR) with reduced ovipositional fidelity to cornfields. When in soybean fields, RRWCRs also exhibit an elevated tolerance of antiherbivory defenses (i.e., cysteine protease inhibitors) expressed in soybean foliage. Here we show that gut bacterial microbiota is an important factor facilitating this corn specialist’s (WCR’s) physiological adaptation to brief soybean herbivory. Comparisons of gut microbiota between RR- and wild-type WCR (WT-WCR) revealed concomitant shifts in bacterial community structure with host adaptation to soybean diets. Antibiotic suppression of gut bacteria significantly reduced RR-WCR tolerance of soybean herbivory to the level of WT-WCR, whereas WTWCR were unaffected. Our findings demonstrate that gut bacteria help to facilitate rapid adaptation of insects in managed ecosystems. anthropogenic disturbance | host–microbe interaction | contemporary evolution | digestive enzymes | dietary stress

COELHO 2008

Carlos M. Coelho, Jorge A. Santos, Carlos Silva, Guy Wallis, Jennifer Tichon & Trevor J. Hine, *The Role of Self-Motion in Acrophobia Treatment*. [CyberPsychology & Behavior 11 \(2008\), 723–725](#).

Acrophobia is a chronic, highly debilitating disorder preventing sufferers from engaging with high places. Its etiology is linked to the development of mobility during infancy. We evaluated the efficacy of various types of movement in the treatment of this disorder within a virtual reality (VR) environment. Four men and four women who were diagnosed with acrophobia were tested in a virtual environment reproducing the balcony of a hotel. Anxiety and behavioral avoidance measures were taken as participants climbed outdoor stairs, moved sideways on balconies, or stood still. This took place in both real and virtual environments as part of a treatment evaluation study. Participants experienced an elevated level of anxiety not only to increases in height but also when required to move laterally at a fixed height. These anxiety levels were significantly higher than those elicited by viewing the fear-invoking scene without movement. We have demonstrated a direct link between any type of movement at a height and the triggering of acrophobia in line with earlier developmental studies. We suggest that recalibration of the action-perception system, aided by VR, can be an important adjunct to standard psychotherapy.

## DAHL 2013

Audun Dahl et al., *The Epigenesis of Wariness of Heights*. [Psychological Science](#) **24** (2013), 1361–1367.

[PsychSci24-1361-Supplement.mp4](#)

Audun Dahl, Joseph J. Campos, David I. Anderson, Ichiro Uchiyama, David C. Witherington, Mika Ueno, Laure Poutrain-Lejeune & Marianne Barbu-Roth

Human infants with little or no crawling experience surprisingly show no wariness of heights, but such wariness becomes exceptionally strong over the life span. Neither depth perception nor falling experiences explain this extraordinary developmental shift; however, something about locomotor experience does. The crucial component of locomotor experience in this emotional change is developments in visual proprioception—the optically based perception of self-movement. Precrawling infants randomly assigned to drive a powered mobility device showed significantly greater visual proprioception, and significantly greater wariness of heights, than did controls. More important, visual proprioception mediated the relation between wariness of heights and locomotor experience. In a separate study, crawling infants' visual proprioception predicted whether they would descend onto the deep side of a visual cliff, a finding that confirms the importance of visual proprioception in the development of wariness of heights.

Keywords: emotional development, motor processes

## HOLME 2013

R. Holme & O. de Viron, *Characterization and implications of intradecadal variations in length of day*. [nature](#) **499** (2013), 202–204.

[n499-0202-Supplement.pdf](#)

Variations in Earth's rotation (defined in terms of length of day) arise from external tidal torques, or from an exchange of angular momentum between the solid Earth and its fluid components<sup>1</sup>. On short timescales (annual or shorter) the non-tidal component is dominated by the atmosphere, with small contributions from the ocean and hydrological system. On decadal timescales, the dominant contribution is from angular momentum exchange between the solid mantle and fluid outer core. Intradecadal periods have been less clear and have been characterized by signals with a wide range of periods and varying amplitudes, including a peak at about 6 years (refs 2–4). Here, by working in the time domain rather than the frequency domain, we show a clear partition of the non-atmospheric component into only three components: a decadal varying trend, a 5.9-year period oscillation, and jumps at times contemporaneous with geomagnetic jerks. The nature of the jumps in length of day leads to a fundamental change in what class of phenomena may give rise to the jerks, and provides a strong constraint on electrical conductivity of the lower mantle, which can in turn constrain its structure and composition.

## NEVILLE 2013

Helen J. Neville, Courtney Stevens, Eric Pakulak, Theodore A. Bell, Jessica Fanning, Scott Klein & Elif Isbell, *Family-based training program improves brain function, cognition, and behavior in lower socioeconomic status preschoolers*. [PNAS](#) **110** (2013), 12138–12143.

Using information from research on the neuroplasticity of selective attention and on the central role of successful parenting in child development, we developed and rigorously assessed a familybased training program designed to improve brain systems for selective attention in preschool children. One hundred forty-one lower socioeconomic status preschoolers enrolled in a Head Start program were randomly

assigned to the training program, Head Start alone, or an active control group. Electrophysiological measures of children's brain functions supporting selective attention, standardized measures of cognition, and parent-reported child behaviors all favored children in the treatment program relative to both control groups. Positive changes were also observed in the parents themselves. Effect sizes ranged from one-quarter to half of a standard deviation. These results lend impetus to the further development and broader implementation of evidence-based education programs that target at-risk families.

### SONNEMANN 2013

Ulrich Sonnemann, Colin F. Camerer, Craig R. Fox & Thomas Langer, *How psychological framing affects economic market prices in the lab and field*. [PNAS 110 \(2013\), 11779–11784](#).

A fundamental debate in social sciences concerns how individual judgments and choices, resulting from psychological mechanisms, are manifested in collective economic behavior. Economists emphasize the capacity of markets to aggregate information distributed among traders into rational equilibrium prices. However, psychologists have identified pervasive and systematic biases in individual judgment that they generally assume will affect collective behavior. In particular, recent studies have found that judged likelihoods of possible events vary systematically with the way the entire event space is partitioned, with probabilities of each of  $N$  partitioned events biased toward  $1/N$ . Thus, combining events into a common partition lowers perceived probability, and unpacking events into separate partitions increases their perceived probability. We look for evidence of such bias in various prediction markets, in which prices can be interpreted as probabilities of upcoming events. In two highly controlled experimental studies, we find clear evidence of partition dependence in a 2-h laboratory experiment and a field experiment on National Basketball Association (NBA) and Federation Internationale de Football Association (FIFA World Cup) sports events spanning several weeks. We also find evidence consistent with partition dependence in nonexperimental field data from prediction markets for economic derivatives (guessing the values of important macroeconomic statistics) and horse races. Results in any one of the studies might be explained by a specialized alternative theory, but no alternative theories can explain the results of all four studies. We conclude that psychological biases in individual judgment can affect market prices, and understanding those effects requires combining a variety of methods from psychology and economics.

behavioral economics | judgment bias

### UNO 2013

Kevin T. Uno et al., *Bomb-curve radiocarbon measurement of recent biologic tissues and applications to wildlife forensics and stable isotope (paleo)ecology*. [PNAS 110 \(2013\), 11736–11741](#).

[pnas110-11736-Supplement.xlsx](#)

Kevin T. Uno, Jay Quade, Daniel C. Fisher, George Wittemyer, Iain Douglas-Hamilton, Samuel Andanje, Patrick Omondi, Moses Litoroh & Thure E. Cerling  
Above-ground thermonuclear weapons testing from 1952 through 1962 nearly doubled the concentration of radiocarbon ( $^{14}\text{C}$ ) in the atmosphere. As a result, organic material formed during or after this period may be radiocarbon-dated using the abrupt rise and steady fall of the atmospheric  $^{14}\text{C}$  concentration known as the bomb-curve. We test the accuracy of accelerator mass spectrometry radiocarbon dating of 29 herbivore and plant tissues collected on known dates between 1905 and 2008 in East Africa. Herbivore samples include teeth, tusks, soft tissue, hair, and horn. Tissues formed after 1955 are dated to within 0.3–1.3 y of formation,

depending on the tissue type, whereas tissues older than ca. 1955 have high age uncertainties (>17 y) due to the Suess effect.  $^{14}\text{C}$  dating of tissues has applications to stable isotope (paleo)ecology and wildlife forensics. We use data from 41 additional samples to determine growth rates of tusks, molars, and hair, which improve interpretations of serial stable isotope data for (paleo)ecological studies.  $^{14}\text{C}$  dating can also be used to calculate the time interval represented in periodic histological structures in dental tissues (i.e., perikymata), which in turn may be used as chronometers in fossil teeth. Bomb-curve  $^{14}\text{C}$  dating of confiscated animal tissues (e.g., ivory statues) can be used to determine whether trade of the item is legal, because many Convention of International Trade of Endangered Species restrictions are based on the age of the tissue, and thus can serve as a powerful forensic tool to combat illegal trade in animal parts.

carbon-14 | growth increments | growth rate | elephant | poaching

YAN 2013

Aibin Yan, Jun Zhao, Qingsong An, Yulong Zhao, Hailong Li & Yrjö Jun Huang, *Hydraulic performance of a new district heating systems with distributed variable speed pumps*. *Applied Energy* (2013), preprint, 1–10. DOI:10.1016/j.apenergy.2013.06.031.

The application of distributed variable speed pumps (DVSP) in the district heating (DH) network has been considered as a technology improvement that has a potential of saving energy, compared to the conventional central circulating pump (CCCP) DH system. A hydraulic model was developed to simulate the hydraulic performance of such a DVSP DH system, based on Kirchhoff's laws. It was applied to a real DH network in Kuerle, China. In order to improve the model accuracy, a new parameter called resistance ratio was proposed by comparing the measured data and the simulated result. The validation result shows that the model has the ability to predict the hydraulic behavior of the DVSP system. The results show that when the rotational speeds of all substation pumps are synchronously decreased by the same percentage, the pump heads and the flow rates are also reduced synchronously and almost in the same degree in all loops. In addition, two operation cases of DH were investigated, including (I) the flow rate varies in all of the loops simultaneously, and (II) the flow rate varies only in one of the loops. For both cases, the DVSP system has a better performance of saving energy at least 30 % than the CCCP system. Compared to the CCCP system, the installed pump capacities can be smaller in the DVSP system. Hence, applying DSVP, especially at a low flow rate, can save quite much electricity. Based on the example network in Kuerle, the DVSP system consumes electricity 71 % and 31 % less than the CCCP system for Cases I and II respectively.

Keywords: District heating | Central circulating pump | Distributed variable speed pump | Hydraulic performance | Energy saving

## Anthropologie

BOTIGUÉ 2013

Laura R. Botigué et al., *Gene flow from North Africa contributes to differential human genetic diversity in southern Europe*. *PNAS* **110** (2013), 11791–11796.

Laura R. Botigué, Brenna M. Henn, Simon Gravel, Brian K. Maples, Christopher R. Gignoux, Erik Corona, Gil Atzmon, Edward Burns, Harry Ostrer, Carlos Flores, Jaume Bertranpetit, David Comas & Carlos D. Bustamante

Human genetic diversity in southern Europe is higher than in other regions of the continent. This difference has been attributed to postglacial expansions, the demic diffusion of agriculture from the Near East, and gene flow from Africa. Using SNP data from 2,099 individuals in 43 populations, we show that estimates of recent shared ancestry between Europe and Africa are substantially increased when gene flow from North Africans, rather than Sub-Saharan Africans, is considered. The gradient of North African ancestry accounts for previous observations of low levels of sharing with Sub-Saharan Africa and is independent of recent gene flow from the Near East. The source of genetic diversity in southern Europe has important biomedical implications; we find that most disease risk alleles from genome-wide association studies follow expected patterns of divergence between Europe and North Africa, with the principal exception of multiple sclerosis.  
admixture | IBD segments | Maghreb | population genetics | Iberia

#### HUBLIN 2009

JEAN-JACQUES HUBLIN & MICHAEL P. RICHARDS (Hrsg.), *The Evolution of Hominin Diets, Integrating Approaches to the Study of Palaeolithic Subsistence*. Vertebrate Paleobiology and Paleoanthropology (Dordrecht 2009).

This volume brings together new and important research from the top experts in hominid diets across multiple fields. The objective of the volume is to explore if there is a consensus between the different methods, allowing us to better understand the nature of hominin dietary strategies through time. Contributions focus on modern studies, faunal studies, physical anthropology, archaeological studies, and isotopic studies, all aimed at answering the major questions of the evolution of hominid diets, such as: meat-eating emergence, hunting vs. scavenging, hunting technologies, and resource intensification in later humans.

#### SKORECKI 2013

Karl Skorecki & Doron M. Behar, *North Africans traveling north*. *PNAS* **110** (2013), 11668–11669.

Botigué et al. (3) motivate further studies to unravel the complexity of trans-Mediterranean gene flow. First, it is important to clarify whether the strong North African signal results from multiple waves or continuous gene flow to Europe or rather can be mostly attributed to the strong hold of North African Moors in Iberia lasting for almost a millennium. Moreover, multiple complex scenarios distinguish direct gene flow from North Africa to Europe from indirect gene flow via a third region such as the Levant and/or by the combined movements of groups such as Jews and Phoenicians. Levant and Near Eastern gene flow to southern Europe could also have been either direct or via a North Africa route, much as that for the Arabian introgression first to North Africa and then to Iberia. Sorting this out is required as a next necessary step with careful comparison of adequately representative Near East with North African population sample sets.

## Biologie

#### SCHMIDT 2010

Dominic Schmidt et al., *Five-Vertebrate ChIP-seq Reveals the Evolutionary Dynamics of Transcription Factor Binding*. *science* **328** (2010), 1036–1040.

s328-1036-Supplement.pdf

Dominic Schmidt, Michael D. Wilson, Benoit Ballester, Petra C. Schwalie, Gordon D. Brown, Aileen Marshall, Claudia Kutter, Stephen Watt, Celia P. Martinez-Jimenez, Sarah Mackay, Iannis Talianidis, Paul Flicek & Duncan T. Odom  
Transcription factors (TFs) direct gene expression by binding to DNA regulatory regions. To explore the evolution of gene regulation, we used chromatin immunoprecipitation with high-throughput sequencing (ChIP-seq) to determine experimentally the genome-wide occupancy of two TFs, CCAAT/enhancer-binding protein alpha and hepatocyte nuclear factor 4 alpha, in the livers of five vertebrates. Although each TF displays highly conserved DNA binding preferences, most binding is species-specific, and aligned binding events present in all five species are rare. Regions near genes with expression levels that are dependent on a TF are often bound by the TF in multiple species yet show no enhanced DNA sequence constraint. Binding divergence between species can be largely explained by sequence changes to the bound motifs. Among the binding events lost in one lineage, only half are recovered by another binding event within 10 kilobases. Our results reveal large interspecies differences in transcriptional regulation and provide insight into regulatory evolution.

### SEYMOUR 2013

Roger S. Seymour, *Maximal Aerobic and Anaerobic Power Generation in Large Crocodiles versus Mammals, Implications for Dinosaur Gigantothermy.* *PLoS ONE* **8** (2013), e69361.  
[DOI:10.1371/journal.pone.0069361](https://doi.org/10.1371/journal.pone.0069361).

Inertial homeothermy, the maintenance of a relatively constant body temperature that occurs simply because of large size, is often applied to large dinosaurs. Moreover, biophysical modelling and actual measurements show that large crocodiles can behaviourally achieve body temperatures above 30°C. Therefore it is possible that some dinosaurs could achieve high and stable body temperatures without the high energy cost of typical endotherms. However it is not known whether an ectothermic dinosaur could produce the equivalent amount of muscular power as an endothermic one. To address this question, this study analyses maximal power output from measured aerobic and anaerobic metabolism in burst exercising estuarine crocodiles, *Crocodylus porosus*, weighing up to 200 kg. These results are compared with similar data from endothermic mammals. A 1 kg crocodile at 30°C produces about 16 watts from aerobic and anaerobic energy sources during the first 10% of exhaustive activity, which is 57% of that expected for a similarly sized mammal. A 200 kg crocodile produces about 400 watts, or only 14% of that for a mammal. Phosphocreatine is a minor energy source, used only in the first seconds of exercise and of similar concentrations in reptiles and mammals. Ectothermic crocodiles lack not only the absolute power for exercise, but also the endurance, that are evident in endothermic mammals. Despite the ability to achieve high and fairly constant body temperatures, therefore, large, ectothermic, crocodile-like dinosaurs would have been competitively inferior to endothermic, mammal-like dinosaurs with high aerobic power. Endothermy in dinosaurs is likely to explain their dominance over mammals in terrestrial ecosystems throughout the Mesozoic.

## Klima

### CAROLIN 2013

Stacy A. Carolin et al., *Varied Response of Western Pacific Hydrology to Climate Forcings over the Last Glacial Period.* *science* **340** (2013), 1564–1566.

s340-1564-Supplement.pdf

Stacy A. Carolin, Kim M. Cobb, Jess F. Adkins, Brian Clark, Jessica L. Conroy, Syria Lejau, Jenny Malang & Andrew A. Tuen

Atmospheric deep convection in the west Pacific plays a key role in the global heat and moisture budgets, yet its response to orbital and abrupt climate change events is poorly resolved. Here, we present four absolutely dated, overlapping stalagmite oxygen isotopic records from northern Borneo that span most of the last glacial cycle. The records suggest that northern Borneo's hydroclimate shifted in phase with precessional forcing but was only weakly affected by glacial-interglacial changes in global climate boundary conditions. Regional convection likely decreased during Heinrich events, but other Northern Hemisphere abrupt climate change events are notably absent. The new records suggest that the deep tropical Pacific hydroclimate variability may have played an important role in shaping the global response to the largest abrupt climate change events.

## TRUC 2013

Loïc Truc et al., *Quantification of climate change for the last 20,000 years from Wonderkrater, South Africa, Implications for the long-term dynamics of the Intertropical Convergence Zone*. *Palaeo* (2013), preprint, 1–13. DOI:10.1016/j.palaeo.2013.06.024.

Loïc Truc, Manuel Chevalier, Charly Favier, Rachid Cheddadi, Michael E. Meadows, Louis Scott, Andrew S. Carr, Gideon F. Smith & Brian M. Chase

In southeast Africa – a region for which few palaeoenvironmental records are available – the fossil pollen record from the Wonderkrater spring mound has contributed substantially to our understanding of past vegetation change since the Last Glacial Maximum (LGM; 21 ka). Multivariate analysis of the pollen data by Scott and Thackeray (1987) provided environmental reconstructions suggesting relatively mesic LGM conditions, with warm and dry conditions during the early Holocene (11–6 cal kBP). This conforms to predicted patterns of precipitation change in the southern African tropics in response to Northern Hemisphere cooling and orbital forcing. Subsequent data from the Cold Air Cave speleothems and a sea-surface temperature record from the Mozambique Channel, however, indicate that conditions during the early to mid-Holocene may have been wetter than present in the Wonderkrater region. To explore this question further, we have created a series of botanical–climatological transfer functions based on a combination of modern climate and plant distribution data from southern Africa. Applying these to the Wonderkrater fossil pollen sequence, we have derived quantitative estimates for temperatures during the cold and warm quarters, as well as precipitation during the wet and dry quarters. In addition, a species-selection method based on Bayesian statistics is outlined, which provided a parsimonious choice of likely plant species from what are otherwise taxonomically broad pollen-types.

We do not propose that our findings invalidate the previous principal component analyses, but they do have the advantage of being based more clearly on the relationship between modern plant distributions and individual climatic variables. Results indicate that temperatures during both the warm and cold seasons were  $6 \pm 2$  °C colder during the LGM and Younger Dryas, and that rainy season precipitation during the Last Glacial Maximum was  $\approx 50\%$  of that during the mid-Holocene. Our results also imply that changes in precipitation at Wonderkrater generally track changes in Mozambique Channel sea-surface temperatures, with a steady increase following the Younger Dryas to a period of maximum water availability at Wonderkrater  $\approx 3$ –7 ka. These findings argue against a dominant role of a shifting Intertropical Convergence Zone in determining long-term environmental

trends, and indicate that the northern and southern tropics experienced similar climatic trends during the last 20 kyr.

Keywords: Quaternary | Southern Africa | Pollen analysis | Transfer function | Probability density function | Quantitative climate reconstruction | African Humid Period | Intertropical Convergence Zone

## Kultur

NADEL 2013

Dani Nadel et al., *Earliest floral grave lining from 13,700–11,700-y-old Natufian burials at Raqefet Cave, Mt. Carmel, Israel*. [PNAS](#) **110** (2013), 11774–11778.

Dani Nadel, Avinoam Danin, Robert C. Power, Arlene M. Rosen, Fanny Bocquentin, Alexander Tsatskin, Danny Rosenberg, Reuven Yeshurun, Lior Weissbrod, Noemi R. Rebollo, Omry Barzilai & Elisabetta Boaretto

Flowering plants possess mechanisms that stimulate positive emotional and social responses in humans. It is difficult to establish when people started to use flowers in public and ceremonial events because of the scarcity of relevant evidence in the archaeological record. We report on uniquely preserved 13,700–11,700-y-old grave linings made of flowers, suggesting that such use began much earlier than previously thought. The only potentially older instance is the questionable use of flowers in the Shanidar IV Neanderthal grave. The earliest cemeteries (ca. 15,000–11,500 y ago) in the Levant are known from Natufian sites in northern Israel, where dozens of burials reflect a wide range of inhumation practices. The newly discovered flower linings were found in four Natufian graves at the burial site of Raqefet Cave, Mt. Carmel, Israel. Large identified plant impressions in the graves include stems of sage and other Lamiaceae (Labiatae; mint family) or Scrophulariaceae (figwort family) species; accompanied by a plethora of phytoliths, they provide the earliest direct evidence now known for such preparation and decoration of graves. Some of the plant species attest to spring burials with a strong emphasis on colorful and aromatic flowers. Cave floor chiseling to accommodate the desired grave location and depth is also evident at the site. Thus, grave preparation was a sophisticated planned process, embedded with social and spiritual meanings reflecting a complex preagricultural society undergoing profound changes at the end of the Pleistocene.   
burial customs | preburial preparation | radiocarbon dates

## Religion

CZACHESZ 2009

István Czachesz, *Why Body Matters in the Afterlife, Mind Reading and Body Imagery in Synoptic Tradition and the Apocalypse of Peter*. In: T. NICKLAS, F. V. REITERER & J. VERHEYDEN (Hrsg.), *The Human Body in Death and Resurrection*. (Berlin 2009), 391–411.

What happens to the human body after death was an important concern for many early Christians. The answers that different Christian groups gave to this question at different times, however, varied considerably, as also the essays in the present volume demonstrate. Yet in the long run, one particular view became very influential and dominated Western culture almost exclusively throughout history. This particular idea about the human body is best preserved in the Apocalypse of Peter among the earliest sources. According to this view, people in the afterlife have bodies that are identical with, or at least very closely resembling, their bodies in this

world. Why did some Christians develop such a concept? Whereas intuitions about psychological states after death can be regarded as universal in human thought, people do not seem to have an intuitive, cross culturally shared, expectation of the continued existence of the body. In this article, I will argue that the concept of the human body in the Apocalypse of Peter is based on its system of sins and punishments, which, in turn, is rooted in a particular anthropological explanation of immoral behavior.

#### CZACHESZ 2009

István Czachesz, *The Gospel of the Acts Of John, Its relation to the fourth gospel*. In: T. RASIMUS (Hrsg.), *Legacy of John, Second Century Reception of the Fourth Gospel*. (Leiden 2009), 49–72.

We can explain the similarities and differences between the GAJ and the Fourth Gospel if we hypothesize the existence of common tradition used by both authors. This tradition was probably accessible to the authors in the form of an oral gospel narrative. This gospel, which I will call Proto-John, was much closer to the present form of the GAJ than to the present form of the Fourth Gospel. We can now attempt a tentative reconstruction of the content of Proto-John.

#### CZACHESZ 2011

István Czachesz, *Explaining Magic, Earliest Christianity as a Test Case*. In: L. H. MARTIN & J. SØRENSEN (Hrsg.), *Past Minds, Studies in Cognitive Historiography*. (London 2011), 141–165.

In this article, I will propose a new cognitive explanation of magic and apply it to early Christian evidence from the first and second centuries AD. I will argue that magic emerges and survives due to three factors. (1) Subconscious learning mechanisms create false links between our actions and events in our environment. (2) Miracle stories that are transmitted for a variety of reasons give support to magical belief and performance (and vice versa). (3) A set of explanatory techniques make such false connections plausible. The article elaborates on the results of a former study on magic in the canonical and in apocryphal Acts of the Apostles (Czachesz 2007).

#### CZACHESZ 2012

István Czachesz, *Filled with New Wine? Religious Experience and Social Dynamics in the Corinthian Church*. In: C. SHANTZ & R. A. WERLINE (Hrsg.), *Experientia, II. Linking Text and Experience*. (Atlanta 2012), 71–90.

The purpose of this essay is to present a new interpretation of the religious dynamics of the Corinthian church as known from the Pauline epistles. This new interpretation draws on recent neuroimaging research on religious experience, connecting such insights with social and theological factors. Neuroimaging uses noninvasive brain-scanning technology to observe which parts of the brain are active as people perform some task. To be more precise, neuroscientists compare the activation of different brain areas in a series of conditions: some group of neurons will work harder than others in some conditions and vice versa; the same group of neurons will be less or more active in another condition. Looking at people's experience in this way is quite different from asking them questions. When we ask people to report their experience explicitly, we only scratch the surface of their mental lives. People can only report what they experience consciously; reporting that conscious experience will be further constrained by the medium of human language. When we speak about religious experience, we often mean precisely this

kind of verbally expressed, conscious mental content. Neuroimaging is not limited to the description of human language—even if what we see on the brain scan is most often compared to and correlated with what people actually report.