

## References

### Aktuell

#### HOLMES 2015

N. G. Holmes, Carl E. Wieman & D. A. Bonn, *Teaching critical thinking*. *PNAS* **112** (2015), 11199–11204.

The ability to make decisions based on data, with its inherent uncertainties and variability, is a complex and vital skill in the modern world. The need for such quantitative critical thinking occurs in many different contexts, and although it is an important goal of education, that goal is seldom being achieved. We argue that the key element for developing this ability is repeated practice in making decisions based on data, with feedback on those decisions. We demonstrate a structure for providing suitable practice that can be applied in any instructional setting that involves the acquisition of data and relating that data to scientific models. This study reports the results of applying that structure in an introductory physics laboratory course. Students in an experimental condition were repeatedly instructed to make and act on quantitative comparisons between datasets, and between data and models, an approach that is common to all science disciplines. These instructions were slowly faded across the course. After the instructions had been removed, students in the experimental condition were 12 times more likely to spontaneously propose or make changes to improve their experimental methods than a control group, who performed traditional experimental activities. The students in the experimental condition were also four times more likely to identify and explain a limitation of a physical model using their data. Students in the experimental condition also showed much more sophisticated reasoning about their data. These differences between the groups were seen to persist into a subsequent course taken the following year.

**Keywords:** critical thinking | scientific reasoning | scientific teaching | teaching experimentation | undergraduate education

**Significance:** Understanding and thinking critically about scientific evidence is a crucial skill in the modern world. We present a simple learning framework that employs cycles of decisions about making and acting on quantitative comparisons between datasets or data and models. With opportunities to improve the data or models, this structure is appropriate for use in any data-driven science-learning setting. This structure led to significant and sustained improvement in students' critical thinking behaviors, compared with a control group, with effects far beyond that of statistical significance.

#### WANG 2015

Ping Wang, Dirk Scherler, Jing Liu-Zeng, Jürgen Mey, Jean-Philippe Avouac, Yunda Zhang & Dingguo Shi, “*Tectonic control of Yarlung Tsangpo Gorge revealed by a buried canyon in Southern Tibet*”, *Response to Comment*. *science* **349** (2015), 799.

In their Comment, Zeitler et al. do not challenge our results or interpretation. Our study does not disprove coupling between tectonic uplift and erosion but suggests that this coupling cannot be the sole explanation of rapid uplift in the Himalayan syntaxes.

## ZEITLER 2015

Peter K. Zeitler, Peter O. Koons, Bernard Hallet & Anne S. Meltzer, *Comment on “Tectonic control of Yarlung Tsangpo Gorge revealed by a buried canyon in Southern Tibet”*. *science* **349** (2015), 799.

Wang et al. (Reports, 21 November, 2014, p. 978) describe a buried canyon upstream of the Yarlung Tsangpo Gorge and argue that rapid erosion of the gorge was merely a passive response to rapid uplift at  $\approx 2.5$  million years ago (Ma). We view these data as an expected consequence emerging from feedbacks between erosion and crustal rheology active well before 2.5 Ma.

## Amerika

### RAGHAVAN 2015

Maanasa Raghavan et al., *Genomic evidence for the Pleistocene and recent population history of Native Americans*. *science* **349** (2015), 841. [s349-0841-Supplement.pdf](#)

Maanasa Raghavan, Matthias Steinrücken, Kelley Harris, Stephan Schiffels, Simon Rasmussen, Michael DeGiorgio, Anders Albrechtsen, Cristina Valdiosera, María C. Ávila-Arcos, Anna-Sapfo Malaspinas, Anders Eriksson, Ida Moltke, Mait Metspalu, Julian R. Homburger, Jeff Wall, Omar E. Cornejo, J. Víctor Moreno-Mayar, Thorfinn S. Korneliussen, Tracey Pierre, Morten Rasmussen, Paula F. Campos, Peter de Barros Damgaard, Morten E. Allentoft, John Lindo, Ene Metspalu, Ricardo Rodríguez-Varela, Josefina Mansilla, Celeste Henrickson, Andaine Seguin-Orlando, Helena Malmström, Thomas Stafford Jr., Suyash S. Shringarpure, Andrés Moreno-Estrada, Monika Karmin, Kristiina Tambets, Anders Bergström, Yali Xue, Vera Warmuth, Andrew D. Friend, Joy Singarayer, Paul Valdes, Francois Balloux, Ilán Lebreiro, Jose Luis Vera, Hector Rangel-Villalobos, Davide Pettener, Donata Luiselli, Loren G. Davis, Evelyne Heyer, Christoph P. E. Zollikofer, Marcia S. Ponce de León, Colin I. Smith, Vaughan Grimes, Kelly-Anne Pike, Michael Deal, Benjamin T. Fuller, Bernardo Arriaza, Vivien Standen, Maria F. Luz, Francois Ricaut, Niede Guidon, Ludmila Osipova, Mikhail I. Voevoda, Olga L. Posukh, Oleg Balanovsky, Maria Lavryashina, Yuri Bogunov, Elza Khusnutdinova, Marina Gubina, Elena Balanovska, Sardana Fedorova, Sergey Litvinov, Boris Malyarchuk, Miroslava Derenko, M. J. Mosher, David Archer, Jerome Cybulski, Barbara Petzelt, Joycelynn Mitchell, Rosita Worl, Paul J. Norman, Peter Parham, Brian M. Kemp, Toomas Kivisild, Chris Tyler-Smith, Manjinder S. Sandhu, Michael Crawford, Richard Villems, David Glenn Smith, Michael R. Waters, Ted Goebel, John R. Johnson, Ripan S. Malhi, Mattias Jakobsson, David J. Meltzer, Andrea Manica, Richard Durbin, Carlos D. Bustamante, Yun S. Song, Rasmus Nielsen & Eske Willerslev

How and when the Americas were populated remains contentious. Using ancient and modern genome-wide data, we found that the ancestors of all present-day Native Americans, including Athabascans and Amerindians, entered the Americas as a single migration wave from Siberia no earlier than 23 thousand years ago (ka) and after no more than an 8000-year isolation period in Beringia. After their arrival to the Americas, ancestral Native Americans diversified into two basal genetic branches around 13 ka, one that is now dispersed across North and South America and the other restricted to North America. Subsequent gene flow resulted in some Native Americans sharing ancestry with present-day East Asians (including Siberians) and, more distantly, Australo-Melanesians. Putative “Paleoamerican” relict populations, including the historical Mexican Pericúes and South American

Fuego-Patagonians, are not directly related to modern Australo-Melanesians as suggested by the Paleoamerican Model.

#### SKOGLUND 2015

Pontus Skoglund et al., *Genetic evidence for two founding populations of the Americas*. [nature 525 \(2015\), 104–108](#).

[n525-0104-Supplement.pdf](#)

Pontus Skoglund, Swapan Mallick, Maria Cátira Bortolini, Niru Chennagiri, Tábita Hünemeier, Maria Luiza Petzl-Erler, Francisco Mauro Salzano, Nick Patterson & David Reich

Genetic studies have consistently indicated a single common origin of Native American groups from Central and South America. However, some morphological studies have suggested a more complex picture, whereby the northeast Asian affinities of present-day Native Americans contrast with a distinctive morphology seen in some of the earliest American skeletons, which share traits with present-day Australasians (indigenous groups in Australia, Melanesia, and island Southeast Asia)<sup>5–8</sup>. Here we analyse genome-wide data to show that some Amazonian Native Americans descend partly from a Native American founding population that carried ancestry more closely related to indigenous Australians, New Guineans and Andaman Islanders than to any present-day Eurasians or Native Americans. This signature is not present to the same extent, or at all, in present-day Northern and Central Americans or in a 12,600-year-old Clovis-associated genome, suggesting a more diverse set of founding populations of the Americas than previously accepted.

## Bibel

#### KEMPINSKI 1986

Aharon Kempinski, *Joshua's Altar—An Iron Age I Watchtower*. [Biblical Archaeology Review 12 \(1986\), i, 42–49](#).

But Zertal's architectural evidence does not qualify as either steps or a ramp. His "ramp" is slightly over three feet wide. This would be a dangerous passageway whether a ramp or steps. Imagine climbing up to the altar by so narrow a passage, especially if one was taking a sheep, goat or cow up with him.

No doubt Zertal was led to his mistaken identification by an uncritical reading of the Bible. He accepted literally the passages in Deuteronomy 27 and Joshua 8 that supposedly describe an altar on Mt. Ebal. Actually, the earliest version of the text probably placed the altar on nearby Mt. Gerizim, which is where the Samaritan version of the Pentateuch places it.

On March 31, 1984, Israeli television aired Zertal's story, in a presentation very similar to his BAR article. But the program also included an interview with Mr. Binyamin Zedakah, one of the leaders of the Samaritan community. This interview was unfairly edited on television. So the next day, Mr. Zedakah wrote his complete argument for the newspaper Ha-Aretz, which published it on April 4, 1984. Zedakah reminded us that Zertal's site was first discovered by Victor Guérin in the 1860s. Even at that early date, Guérin identified it as Joshua's altar. In arguing that Joshua's altar was built on Mt. Gerizim, however, the Samaritan's holy mountain, Zedakah asks us this question: If Joshua's altar was built on Mt. Ebal, why was such an important cult place totally forgotten in the later Iron Age? Why is there no archaeological or historical tradition at Mt. Ebal from the period of the Israelite monarchy for the existence of such a site?

UZIEL 2007

Joe Uziel & Itzhaq Shai, *Iron Age Jerusalem: Temple-Palace, Capital City*. [Journal of the American Oriental Society](#) **127** (2007), 161–170.

Jerusalem under the United Monarchy was not a large capital city. David and Solomon's activities were intended to establish the city as the royal estate, the seat of the king, the royal cult center, and the location of administrative activity directly connected to the functioning of the monarchy. Therefore, the lack of finds in Jerusalem dating to the tenth-ninth centuries B.C.E. should not be explained by the "full" or "empty" glass. It is solely a result of the city's function until the eighth century, a function deliberately determined by the monarchs in order to exalt themselves. During the tenth-ninth and early eighth centuries it was called "the City of David," hinting that it was the city of the royal family.

During the eighth century this purpose changed as the city grew and began to function as a capital city in a manner more comparable to that of modern capitals, and similar to that of Samaria in the Northern Kingdom of Israel. This may have occurred as a result of the conquest of the Northern Kingdom and the migration of its elite population to Judah, where they served in key positions in the royal administration. Yet it is also probably related to the fact that the Davidic dynasty had already become the rightful, established, and divinely chosen line in the eyes of the Judean people. The ruin of the competitor kingdom was surely a catalyst for Jerusalem's development and a formative factor for a new way of thinking about the Judean monarchy.

ZERTAL 1985

Adam Zertal, *Has Joshua's Altar Been Found on Mt. Ebal?* [Biblical Archaeology Review](#) **11** (1985), i, 26–43.

The main problem, I suppose, is that archaeology has not always corroborated the Biblical stories of Joshua's time. At Jericho, Ai, Arad, and other sites, archaeology does not corroborate what the Bible tells us. No evidence from the period of Joshua has been found at these sites.

With respect to the Mt. Ebal altar, however, all the scientific evidence fits very well with the Biblical description. The three main factors that correlate precisely are the period, the nature of the site, and the location. True, no inscriptions have been found as yet. But apart from that one point, it may be said with all scientific restraint that there must be a connection between the strong, important and authentic Biblical tradition that identifies Mt. Ebal as a central Israelite cultic center and the gathering place of the Israelite tribes, on the one hand, and the site unearthed by us, on the other. There are still debates about most of the issues: Who was Joshua? When did the Israelite tribes enter the Land? Did they enter from the east, as the Bible states?

But this rare case, where Biblical tradition and concrete archaeological evidence coincide, cannot be ignored. We have on Mt. Ebal not only the complete prototype of an Israelite altar, but moreover, a site that might prove to be directly related to the Biblical traditions concerning Joshua's building of an altar on Mt. Ebal.

## **Biologie**

CVIJOVIĆ 2015

Ivana Cvijović, Benjamin H. Good, Elizabeth R. Jerison & Michael M. Desai, *Fate of a mutation in a fluctuating environment*. [PNAS](#) **112** (2015), E5021–E5028.

Natural environments are never truly constant, but the evolutionary implications of temporally varying selection pressures remain poorly understood. Here we investigate how the fate of a new mutation in a fluctuating environment depends on the dynamics of environmental variation and on the selective pressures in each condition. We find that even when a mutation experiences many environmental epochs before fixing or going extinct, its fate is not necessarily determined by its time-averaged selective effect. Instead, environmental variability reduces the efficiency of selection across a broad parameter regime, rendering selection unable to distinguish between mutations that are substantially beneficial and substantially deleterious on average. Temporal fluctuations can also dramatically increase fixation probabilities, often making the details of these fluctuations more important than the average selection pressures acting on each new mutation. For example, mutations that result in a trade-off between conditions but are strongly deleterious on average can nevertheless be more likely to fix than mutations that are always neutral or beneficial. These effects can have important implications for patterns of molecular evolution in variable environments, and they suggest that it may often be difficult for populations to maintain specialist traits, even when their loss leads to a decline in time-averaged fitness.

**Keywords:** population genetics | fixation probability | fluctuating environment | effective diffusion

**Significance:** Evolution in variable environments depends crucially on the fates of new mutations in the face of fluctuating selection pressures. In constant environments, the relationship between the selective effect of a mutation and the probability that it will eventually fix or go extinct is well understood. However, our understanding of fixation probabilities in fluctuating environmental conditions is limited. Here, we show that temporal fluctuations in environmental conditions can have dramatic effects on the fate of each new mutation, reducing the efficiency of natural selection and increasing the fixation probability of all mutations, including those that are strongly deleterious on average. This makes it difficult for a population to maintain specialist adaptations, even if their benefits outweigh their costs.

## Datierung

GADOT 2015

Yuval Gadot, Uri Davidovich, Gideon Avni, Yoav Avni & Naomi Porat, *The formation of terraced landscapes in the Judean Highlands, Israel*. *Antiquity* **89** (2015), gadot346. <<http://antiquity.ac.uk/projgall/gadot346>>.

The importance of reliable dating of terraces cannot be underestimated, as it holds the key for accurate reconstructions of landscape formation processes and their reciprocal relations with cultural trajectories in the Mediterranean highlands and elsewhere.

The emerging OSL age patterns, investigated vis-à-vis regional settlement patterns evolving from archaeological surveys and historical records, enable for the first time a complete assessment of the transformation of the Judean Highlands from a natural ‘wildscape’ to the cultural landscape they form today.

## Energie

MILLER 2015

Lee M. Miller et al., *Two methods for estimating limits to large-scale wind power generation*. [PNAS 112 \(2015\), 11169–11174](#).

Lee M. Miller, Nathaniel A. Brunsell, David B. Mechem, Fabian Gans, Andrew J. Monaghan, Robert Vautard, David W. Keith & Axel Kleidon

Wind turbines remove kinetic energy from the atmospheric flow, which reduces wind speeds and limits generation rates of large wind farms. These interactions can be approximated using a vertical kinetic energy (VKE) flux method, which predicts that the maximum power generation potential is 26 % of the instantaneous downward transport of kinetic energy using the preturbine climatology. We compare the energy flux method to the Weather Research and Forecasting (WRF) regional atmospheric model equipped with a wind turbine parameterization over a 105 km<sup>2</sup> region in the central United States. The WRF simulations yield a maximum generation of 1.1  $\text{W}\cdot\text{m}^{-2}$ , whereas the VKE method predicts the time series while underestimating the maximum generation rate by about 50 %. Because VKE derives the generation limit from the preturbine climatology, potential changes in the vertical kinetic energy flux from the free atmosphere are not considered. Such changes are important at night when WRF estimates are about twice the VKE value because wind turbines interact with the decoupled nocturnal low-level jet in this region. Daytime estimates agree better to 20 % because the wind turbines induce comparatively small changes to the downward kinetic energy flux. This combination of downward transport limits and wind speed reductions explains why large-scale wind power generation in windy regions is limited to about 1  $\text{W}\cdot\text{m}^{-2}$ , with VKE capturing this combination in a comparatively simple way.

**Keywords:** generation limits | turbine–atmosphere interactions | wind resource | kinetic energy flux | extraction limits

**Significance:** Wind turbines generate electricity by removing kinetic energy from the atmosphere. We show that the limited replenishment of kinetic energy from aloft limits wind power generation rates at scales sufficiently large that horizontal fluxes of kinetic energy can be ignored. We evaluate these factors with regional atmospheric model simulations and find that generation limits can be estimated from the preturbine climatology by comparatively simple means, working best when the atmosphere between the surface and hub height is naturally well-mixed during the day. Our results show that the reduction of wind speeds and limited downward fluxes determine the limits in large-scale wind power generation to less than 1  $\text{W}/\text{m}^2$ .

## Islam

STROUMSA 2015

Guy G. Stroumsa, *Jewish Christianity and Islamic Origins*. In: BEHNAM SADEGHI, ASAD Q. AHMED, ADAM SILVERSTEIN & ROBERT HOYLAND (Hrsg.), *Islamic Cultures, Islamic Contexts, Essays in Honor of Professor Patricia Crone*. (Leiden 2015), 72–96.

The idea of a late antique Abrahamic religious movement, flourishing especially among the Negev Arabs, is certainly a plausible hypothesis, but not one that can be demonstrated in the present state of our knowledge. Such a movement would have been located on the margin of both Judaism and Christianity, just like Jewish Christianity. One might also point out the striking importance of Abraham in the

Pseudo-Clementine Recognitions, a text according to which Abraham was the first man to cross from ignorance to knowledge.

It is to its heuristic utility that the Jewish Christian track owes its strength. Its significance, however, disappears as soon as the metaphor of source rather than that of yeast is being used. Like any complex historical phenomenon, the birth of Islam is over-determined. Delimiting it too precisely risks over-simplifying reality, and freezes the essentially fluid interaction of ideas and sects. The mystery of the birth of a religion cannot be solved, and neither can the alchemical transformation of religious ideas, of their passage from fluid to solid state.

## Mittelpaläolithikum

RUEBENS 2015

Karen Ruebens, Shannon J. P. McPherron & Jean-Jacques Hublin, *On the local Mousterian origin of the Châtelperronian, Integrating typo-technological, chronostratigraphic and contextual data*. [Journal of Human Evolution 86 \(2015\), 55–91](#).

JHumEvo086-0055-Supplement1.xlsx, JHumEvo086-0055-Supplement2.pdf

Across Europe the period 45–40 ka (thousands of years ago) is associated with several technological changes, including the emergence of the Châtelperronian technocomplex in France and northern Spain. The Châtelperronian, stratigraphically located between the Mousterian and Aurignacian, is characterized by Upper Palaeolithic features, such as volumetric blade reduction, curved backed blades, end-scrapers, bladelets, bone tools and ornaments. Concurrently, repeated, though debated, associations with Neanderthal remains and Mousterian elements suggest a local technological development. Following recent critiques and cumulating technological studies, this paper provides data-driven contextualisations of the Châtelperronian and late Mousterian archaeological records and a primary comparative assessment of a major linking element, backed knives, to re-assess the origin of the Châtelperronian.

The results demonstrate the challenging nature of the 50–35 ka record, with many interpretive problems caused by poorly recorded excavations, resulting in only 25 well-contextualised assemblages from the claimed 143 Châtelperronian find spots. These 25 assemblages facilitate more detailed chronostratigraphic and typo-technological assessments and show that the Châtelperronian has a homogenous set of technologies and tools. A similar evaluation of the late Mousterian indicates a wide-ranging late Neanderthal skill set, commonly including laminar blank production and backing. Further, conceptual similarities were noted both in blank selection and edge modification between Mousterian and Châtelperronian backed knives, alongside their near-absence in other, contemporaneous technocomplexes.

A Europe-wide contextualisation shows that while the current coarse-grained record still allows for several potential scenarios, the data throughout this paper point towards a most parsimonious model of a Châtelperronian made by Neanderthals, with roots in the late Middle Palaeolithic technological skill set. However, this change seems triggered by early arrivals of modern humans either indirectly, through stimulus diffusion, or directly, after ca. 42 ka. Fully testing this model requires an ongoing focus on site formation and assemblage integrity, alongside in-depth analyses of recently excavated assemblages and existing collections.

**Keywords:** Middle-Upper Paleolithic transition | Lithic technology | Western Europe | Neanderthal | Population dynamics

## Neolithikum

HENDERSON 2014

Daniel A. Henderson, Andrew W. Baggaley, Anvar Shukurov, Richard J. Boys, Graeme R. Sarson & Andrew Golightly, *Regional variations in the European Neolithic dispersal: the role of the coastlines*. [Antiquity 88 \(2014\), 1291–1302](#).

[Antiquity088-1291-Supplement1.pdf](#), [Antiquity088-1291-Supplement2.xls](#)

The mechanisms by which agriculture spread across Europe in the Neolithic, and the speed at which it happened, have long been debated. Attempts to quantify the process by constructing spatio-temporal models have given a diversity of results. In this paper, a new approach to the problem of modelling is advanced. Data from over 300 Neolithic sites from Asia Minor and Europe are used to produce a global picture of the emergence of farming across Europe which also allows for variable local conditions. Particular attention is paid to coastal enhancement: the more rapid advance of the Neolithic along coasts and rivers, as compared with inland or terrestrial domains. The key outcome of this model is hence to confirm the importance of waterways and coastal mobilities in the spread of farming in the early Neolithic, and to establish the extent to which this importance varied regionally.

Keywords: Europe | Asia Minor | Neolithic dispersal | modelling | waterways | propagating | population front | wave of advance

MEYER 2015

Christian Meyer, Christian Lohr, Detlef Gronenborn & Kurt W. Alt, *The massacre mass grave of Schöneck-Kilianstädten reveals new insights into collective violence in Early Neolithic Central Europe*. [PNAS 112 \(2015\), 11217–11222](#).

Conflict and warfare are central but also disputed themes in discussions about the European Neolithic. Although a few recent population studies provide broad overviews, only a very limited number of currently known key sites provide precise insights into moments of extreme and mass violence and their impact on Neolithic societies. The massacre sites of Talheim, Germany, and Asparn/ Schletz, Austria, have long been the focal points around which hypotheses concerning a final lethal crisis of the first Central European farmers of the Early Neolithic Linearbandkeramik Culture (LBK) have concentrated. With the recently examined LBK mass grave site of Schöneck-Kilianstädten, Germany, we present new conclusive and indisputable evidence for another massacre, adding new data to the discussion of LBK violence patterns. At least 26 individuals were violently killed by blunt force and arrow injuries before being deposited in a commingled mass grave. Although the absence and possible abduction of younger females has been suggested for other sites previously, a new violence-related pattern was identified here: the intentional and systematic breaking of lower limbs. The abundance of the identified perimortem fractures clearly indicates torture and/or mutilation of the victims. The new evidence presented here for unequivocal lethal violence on a large scale is put into perspective for the Early Neolithic of Central Europe and, in conjunction with previous results, indicates that massacres of entire communities were not isolated occurrences but rather were frequent features of the last phases of the LBK.

Keywords: LBK | warfare | trauma | burial | osteoarchaeology

Significance: The Early Neolithic massacre-related mass grave of Schöneck-Kilianstädten presented here provides new data and insights for the ongoing discussions



of prehistoric warfare in Central Europe. Although several characteristics gleaned from the analysis of the human skeletal remains support and strengthen previous hypotheses based on the few known massacre sites of this time, a pattern of intentional mutilation of violence victims identified here is of special significance. Adding another key site to the evidence for Early Neolithic warfare generally allows more robust and reliable reconstructions of the possible reasons for the extent and frequency of outbreaks of lethal mass violence and the general impact these events had on shaping the further development of the Central European Neolithic.

#### OLALDE 2015

Iñigo Olalde et al., *A common genetic origin for early farmers from Mediterranean Cardial and Central European LBK cultures*. [Molecular Biology and Evolution \(2015\), preprint, 1–47](#). .

Iñigo Olalde, Hannes Schroeder, Marcela Sandoval-Velasco, Lasse Vinner, Irene Lobón, Oscar Ramirez, Sergi Civit, Pablo García Borja, Domingo C. Salazar-García, Sahra Talamo, Josep Maria Fullola, Francesc Xavier Oms, Mireia Pedro, Pablo Martínez, Montserrat Sanz, Joan Daura, João Zilhão, Tomàs Marquès-Bonet, M. Thomas P. Gilbert & Carles Lalueza-Fox

The spread of farming out of the Balkans and into the rest of Europe followed two distinct routes: an initial expansion represented by the Impressa and Cardial traditions, which followed the Northern Mediterranean coastline; and another expansion represented by the LBK tradition, which followed the Danube River into Central Europe. While genomic data now exist from samples representing the second migration, such data have yet to be successfully generated from the initial Mediterranean migration. To address this, we generated the complete genome of a 7,400 year-old Cardial individual (CB13) from Cova Bonica in Vallirana (Barcelona), as well as partial nuclear data from five others excavated from different sites in Spain and Portugal. CB13 clusters with all previously sequenced early European farmers and modern-day Sardinians. Furthermore, our analyses suggest that both Cardial and LBK peoples derived from a common ancient population located in or around the Balkan Peninsula. The Iberian Cardial genome also carries a discernible hunter-gatherer genetic signature that likely was not acquired by admixture with local Iberian foragers. Our results indicate that retrieving ancient genomes from similarly warm Mediterranean environments such as the Near East is technically feasible.

## Physik

#### BELL 1964

John S. Bell, *On the Einstein Podolsky Rosen Paradox*. [Physics 1 \(1964\), 195–200](#).

In a theory in which parameters are added to quantum mechanics to determine the results of individual measurements, without changing the statistical predictions, there must be a mechanism whereby the setting of one measuring device can influence the reading of another instrument, however remote. Moreover, the signal involved must propagate instantaneously, so that such a theory could not be Lorentz invariant. Of course, the situation is different if the quantum mechanical predictions are of limited validity. Conceivably they might apply only to experiments in which the settings of the instruments are made sufficiently in advance to allow them to reach some mutual rapport by exchange of signals with velocity less than or equal to that of light. In that connection, experiments of the type proposed by Bohm and Aharonov, in which the settings are changed during the flight of the particles, are crucial.

MERALI 2015

Zeeya Merali, *Toughest test yet for quantum ‘spookiness’*. [nature](#) **525** (2015), 14–15.

Experiment plugs loopholes in previous demonstrations of ‘action at a distance’ and could make data encryption safer.

This idea galled Einstein because it seemed that this ghostly influence would travel instantaneously—contravening the universal rule that nothing can travel faster than the speed of light. He proposed that quantum particles do have set properties, called hidden variables, before they are measured, and that even though those variables cannot be accessed they pre-program entangled particles to behave in correlated ways.

In the 1960s, physicist John Bell proposed a test that could discriminate between Einstein’s hidden variables and spooky action at a distance. He calculated that hidden variables can explain correlations only up to some maximum limit. If that level is exceeded, then Einstein’s model must be wrong.

## Politik

GORDON 2015

Evelyn Gordon, *The Two-State Solution Is in Stalemate, Here’s What Israel Can Do to Prevail*. [Mosaic Monthly Essays](#) **2015**, Sep. 1.

For two decades the Jewish state has sought, fruitlessly, to negotiate an end to the conflict. Needed is a new, viable strategy for coping with reality and winning out.

As it happens, Israel’s claim to the West Bank and Gaza is strong. The League of Nations assigned these territories to the Jewish national home in 1922, and the UN Charter preserved that decision in Article 80. The UN’s 1947 partition plan was a nonbinding recommendation that the Arabs rejected. The UN-brokered agreement that determined the 1949 armistice line, also known (wrongly) as the “pre-1967 border,” explicitly states that this was *not* a final border and did not prejudice any party’s territorial claims. Israel captured both the West Bank and Gaza in a defensive war in 1967, at a time when neither was under the rule of any recognized sovereign. UN Security Council Resolution 242, which ended the 1967 war, was explicitly worded to allow Israel to retain at least part of these territories.

I began this essay by suggesting that the current stalemate between Israel and the Palestinians might be thought of as a kind of cold war. The choice of terminology was deliberate: to my mind, not only are there certain clear similarities between this conflict and the decades-long cold war between the West, particularly the United States, and the Soviet Union, but I believe that the ultimately victorious strategy adopted by the U.S. provides a template for Israel’s own approach to its long struggle with the Palestinians.

All of these are doable. And by doing them, Israel can survive and thrive despite its cold war, and ultimately win it—just as America did.

## Religion

SCHWARTZ-BOSTUNITSCH 1930

Gregor Schwartz-Bostunitsch, *Doktor Steiner – ein Schwindler wie keiner, Ein Kapitel über Anthroposophie und die geistige Verwirrungssarbeit der „Falschen Propheten“*. (München 1930).

## Story or Book

FLEURBAEY 2015

Marc Fleurbaey, *Achieving equality*. [science](#) **349** (2015), 797.

Economist Anthony Atkinson proposes ambitious policies for combating inequality.

*Inequality. What Can Be Done?* Anthony B. Atkinson. Harvard University Press, 2015. 398 pp.

The reader will enjoy the passages in which Atkinson takes sides on classical debates about basic income (arguing that countries that choose to provide a regular, minimum sum of money to every citizen should require some contribution to society in return), the targeting of social aid (arguing that it is largely a mistake and that we should institute universal social insurance instead), and development aid (arguing that it is effective and should be increased). Written by an economist, this book focuses on income and wealth more than other aspects of inequality, but it does mention the key question of the balance of power among stakeholders, and indeed one of the 15 proposals centers around the idea of empowering consumers and workers.

GROVE 2015

Matt Grove, *Thin on the ground*. [Antiquity](#) **89** (2015), 994–995.

Steven E. Churchill. *Thin on the ground: Neanderthal biology, archeology, and ecology*. 2014. xvi+453 pages, numerous b&w illustrations and tables. Oxford:Wiley-Blackwell; 978-1-118-59087-4 hardback £ 100.

Churchill's central thesis is that Neanderthals existed at perpetually meagre population densities throughout their occupation of Europe: they were literally thin on the ground. Their energetically costly solutions to ecological problems led to relatively low rates of fertility; population increases were slow, bringing an attendant susceptibility to various stochastic forces.

The long-term effects of small and potentially fragmented populations would have included the inability to maintain cultural innovations such as the projectile technologies with which *Homo sapiens* entered Europe.

The sections on Neanderthal energetics are some of the most comprehensive I have read, and leave little doubt as to the nature of the Neanderthal adaptation. The energetically expensive Neanderthal strategy is set against a detailed picture of the climatic and environmental conditions in Europe during Marine Isotope Stages 6–3, demonstrating the costs of survival in very real terms.

It is also pleasing to note Churchill's contention, supported by increasingly abundant evidence, that Neanderthals were cognitively capable of producing essentially 'modern' material culture, but that their population densities prevented them from doing so for long periods of time.