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References

Aktuell

Bawaya 2014

Michael Bawaya, *A chocolate habit in ancient North America*. science **345** (2014), 991.

Residues on pottery suggest close ties between Mesoamerica and cultures to the north.

In their new paper, in the Journal of Archaeological Science, the Washburns and their colleagues report finding some contamination in the 123 vessels they analyzed, from sites in the Southwest, Southeast, and Midwest dating from 900 to 1400 C.E. They rinsed the ancient ceramics and analyzed the solution for three alkaloids from T. cacao—theobromine, caffeine, and theophylline. As controls, they tested pots from times and places where prehistoric cacao usage was extremely unlikely and also sampled dust from the museum shelves where the vessels were stored. Most vessels had at least a low level of theobromine, which the Washburns attribute to airborne contamination: People today consume so much chocolate and coffee (which contains the same alkaloids) that traces of this molecule are everywhere.

Others are doubtful. There are just too many vessels with purported cacao, says archaeologist Timothy Pauketat of the University of Illinois, Urbana-Champaign. The drink is thought to have been reserved for the privileged, yet most of the North American vessels said to have cacao residue come from the hinterlands of Cahokia. He doesn't rule out contact, however: "I will not be surprised if we do find chocolate in a few pots from, say, Cahokia, at some point in the future," he says. But for now, "we have not one bean."

Carson 2014

John Francis Carson et al., *Dynamic human–vegetation–climate interactions at forest ecotones during the late-Holocene in lowland South America, Reply to Silva*. PNAS **111** (2014), E3833.

John Francis Carson, Bronwen S. Whitney, Francis E. Mayle, José Iriarte, Heiko Prümers, J. Daniel Soto & Jennifer Watling

Silva claims that the climate records discussed in our report are all located in the high Andes, and questions the degree to which they represent lowland precipitation. As we argue in our report, these regions receive the majority of their precipitation from the Amazonian lowlands in the Holocene, and are therefore broadly representative of lowland precipitation history.

Gunhold 2014

Tina Gunhold, Andrew Whiten & Thomas Bugnyar, *Video demonstrations seed alternative problem-solving techniques in wild common marmosets*. Biology Letters (2014), preprint, 1–5. DOI:10.1098/rsbl.2014.0439.

BiolLett2014-Gunhold-Supplement1.pdf, BiolLett2014-Gunhold-Supplement2.jpg, BiolLett2014-Gunhold-Supplement3.jpg, BiolLett2014-Gunhold-Supplement4.pdf, BiolLett2014-Gunhold-Supplement5.pdf, BiolLett2014-Gunhold-Supplement6.pdf, BiolLett2014-Gunhold-Supplement7.pdf

Studies of social learning and tradition formation under field conditions have recently gained momentum, but suffer from the limited control of socio-ecological factors thought to be responsible for transmission patterns. The use of artificial visual stimuli is a potentially powerful tool to overcome some of these problems. Here, in a field experiment, we used video images of unfamiliar conspecifics performing virtual demonstrations of foraging techniques. We tested 12 family groups of wild common marmosets. Six groups received video demonstrations (footage of conspecifics either pulling a drawer open or pushing a lid upwards, in an 'artificial fruit'); the other six groups served as controls (exposed to a static image of a conspecific next to the fruit). Subjects in video groups were more manipulative and successful in opening the fruit than controls; they were also more likely to use the technique they had witnessed and thus could serve as live models for other family members. To our knowledge, this is the first study that used video demonstrations in the wild and demonstrated the potent force of social learning, even from unfamiliar conspecifics, under field conditions.

Subject Areas: behaviour, cognition

Keywords: primates, field experiment, social learning, seeding information, video demonstration

Mervis 2014

Jeffrey Mervis, *Why null results rarely see the light of day*. science **345** (2014), 992.

"File drawer" study proposes registry for unpublished social science data.

Worse, if researchers publish significant results from similar experiments in the future, they could look stronger than they should because the earlier null studies are ignored. Even more troubling to Malhotra was the fact that two scientists whose initial studies "didn't work out" went on to publish results based on a smaller sample. "The non-TESS version of the same study, in which we used a student sample, did yield fruit," noted one investigator.

Mishra 2014

Jyoti Mishra, *Having it all*. science **345** (2014), 1090.

Challenging research projects can take 5 years or more to complete. Raising a child takes far longer. Our brains generate the same reward signals when we conquer any challenge, big or small, so I take on smaller challenges outside work.

I grew up in urban India in a middle-class family, the daughter of two hard-working professionals. They always encouraged me. They never objected when I did mostly what boys did, like be the only girl in astronomy camp. My closest friends were boys, and we formed study groups and competed for the best grades. When I pursued graduate school in the United States for computational neurobiology, I was the only woman in my international class. A decade later, I'm a happy academic at a time when many leave this field.

Sher 2014

Itai Sher, Melissa Koenig & Aldo Rustichini, *Children's strategic theory of mind*. PNAS **111** (2014), 13307–13312.

pnas111-13307-Supplement.bib

Human strategic interaction requires reasoning about other people's behavior and mental states, combined with an understanding of their incentives. However, the ontogenic development of strategic reasoning is not well understood: At what age do we show a capacity for sophisticated play in social interactions? Several lines of inquiry suggest an important role for recursive thinking (RT) and theory of mind (ToM), but these capacities leave out the strategic element. We posit a

strategic theory of mind (SToM) integrating ToM and RT with reasoning about incentives of all players. We investigated SToM in 3- to 9-y-old children and adults in two games that represent prevalent aspects of social interaction. Children anticipate deceptive and competitive moves from the other player and play both games in a strategically sophisticated manner by 7 y of age. One game has a pure strategy Nash equilibrium: In this game, children achieve equilibrium play by the age of 7 y on the first move. In the other game, with a single mixed-strategy equilibrium, children's behavior moved toward the equilibrium with experience. These two results also correspond to two ways in which children's behavior resembles adult behavior in the same games. In both games, children's behavior becomes more strategically sophisticated with age on the first move. Beyond the age of 7 y, children begin to think about strategic interaction not myopically, but in a farsighted way, possibly with a view to cooperating and capitalizing on mutual gains in long-run relationships.

practical reasoning | child development | game theory

Silva 2014

Lucas C. R. Silva, *Importance of climate-driven forest–savanna biome shifts in anthropological and ecological research*. PNAS **111** (2014), E3831–E3832.

Notably, changes in vegetation structure are typically accompanied by changes in floristic composition, soil fertility, and faunal distribution (2, 4, 5), which could have affected the ability of human populations to persist. There is, nonetheless, a key piece still missing from the puzzle: direct evidence for past changes in climate.

Amerika

Park 2014

Robert W. Park, *Stories of Arctic colonization*. science **345** (2014), 1004–1005.

Genetic data elucidate the population history of the North American Arctic.

Just over a thousand years ago, the arrival of Norse Vikings in the North American Arctic completed the expansion of humanity around Earth's circumference. Sutherland has argued that there was extensive interaction, including trade, between the Dorset and the Norse Vikings in Baffin Island. Yet, the lack of evidence for intermarriage documented by Raghavan et al. is almost impossible to explain if such interactions took place. The problem may lie in the radiocarbon dating, and the Dorset may have died out before the Norse arrived. In this and other cases, Raghavan et al.'s findings are likely to influence models of prehistoric migrations and cultural contacts in the North American Arctic for some time to come.

Raghavan 2014

Maanasa Raghavan et al., *The genetic prehistory of the New World Arctic*. science **345** (2014), 1020, 1–9.

s345-1020-Supplement.pdf

Maanasa Raghavan, Michael DeGiorgio, Anders Albrechtsen, Ida Moltke, Pontus Skoglund, Thorfinn S. Korneliussen, Bjarne Grønnow, Martin Appelt, Hans Christian Gulløv, T. Max Friesen, William Fitzhugh, Helena Malmström, Simon Rasmussen, Jesper Olsen, Linea Melchior, Benjamin T. Fuller, Simon M. Fahrni, Thomas Stafford Jr., Vaughan Grimes, M. A. Priscilla Renouf, Jerome Cybulski,

Niels Lynnerup, Marta Mirazon Lahr, Kate Britton, Rick Knecht, Jette Arneborg, Mait Metspalu, Omar E. Cornejo, Anna-Sapfo Malaspinas, Yong Wang, Morten Rasmussen, Vibha Raghavan, Thomas V. O. Hansen, Elza Khusnutdinova, Tracey Pierre, Kirill Dneprovsky, Claus Andreasen, Hans Lange, M. Geoffrey Hayes, Joan Coltrain, Victor A. Spitsyn, Anders Götherström, Ludovic Orlando, Toomas Kivisild, Richard Villems, Michael H. Crawford, Finn C. Nielsen, Jørgen Dissing, Jan Heinemeier, Morten Meldgaard, Carlos Bustamante, Dennis H. O'Rourke, Mattias Jakobsson, M. Thomas P. Gilbert, Rasmus Nielsen & Eske Willerslev

The New World Arctic, the last region of the Americas to be populated by humans, has a relatively well-researched archaeology, but an understanding of its genetic history is lacking.We present genome-wide sequence data from ancient and present-day humans from Greenland, Arctic Canada, Alaska, Aleutian Islands, and Siberia.We show that Paleo-Eskimos (≈3000 BCE to 1300 CE) represent a migration pulse into the Americas independent of both Native American and Inuit expansions. Furthermore, the genetic continuity characterizing the Paleo-Eskimo period was interrupted by the arrival of a new population, representing the ancestors of present-day Inuit, with evidence of past gene flow between these lineages. Despite periodic abandonment of major Arctic regions, a single Paleo-Eskimo metapopulation likely survived in near-isolation for more than 4000 years, only to vanish around 700 years ago.

Moreover, there is no evidence of matrilineal gene flow between Dorset or Thule groups with neighboring Norse (Vikings) populations settling in the Arctic around 1000 years ago. However, we do detect gene flow between the Paleo-Eskimo and Neo-Eskimo lineages, dating back to at least 4000 years.

Our study has a number of important implications: Paleo-Eskimos likely represent a single migration pulse into the Americas from Siberia, separate from the ones giving rise to the Inuit and other Native Americans, including Athabascan speakers. Paleo-Eskimos, despite showing cultural differences across time and space, constituted a single population displaying genetic continuity for more than 4000 years. On the contrary, the Thule people, ancestors of contemporary Inuit, represent a population replacement of the Paleo-Eskimos that occurred less than 700 years ago. The long-term genetic continuity of the Paleo-Eskimo gene pool and lack of evidence of Native American admixture suggest that the Saqqaq and Dorset people were largely living in genetic isolation after entering the New World. Thus, the Paleo-Eskimo technological innovations and changes through time, as evident from the archaeological record, seem to have occurred solely by movement of ideas within a single resident population. This suggests that cultural similarities and differences are not solid proxies for population movements and migrations into new and dramatically different environments, as is often assumed.

Anthropologie

Lawler 2014

Andrew Lawler, *In search of Green Arabia*. science **345** (2014), 994–997.

Researchers are scouring the now-barren Arabian Peninsula to uncover its hidden role in ancient human migration.

That idea got a shot of support from an 8 August paper published online in the Journal of Human Evolution by Eleanor Scerri of the University of Bordeaux in France and colleagues including Groucutt.

Other researchers say that until archaeologists find the bones of the toolmakers, their identity will remain wide open. Chris Stringer, a paleontologist at London's

Natural History Museum, suggests they could have been Neandertals, who survived in Europe until about 40,000 years ago. Although Neandertal remains have not been found south of Iraqi Kurdistan, more than 1500 kilometers north of Riyadh, the new climate data make it conceivable that our extinct cousins, too, were drawn to a green Arabia, Stringer says. "Why not?" Stony Brook University's Shea adds that the recently discovered Denisovans, archaic humans apparently once widespread in Asia, could also have fashioned the tools after reaching Arabia from the east. "Nobody knows who or what was running around South Asia back then," he says. "Why nobody thinks populations could disperse into Arabia from South Asia is a mystery to me."

A few skeptics adamantly reject the idea of an ancient Arabia bustling with modern humans. To archaeologist Paul Mellars of the University of Cambridge in the United Kingdom, it is inconceivable that modern humans successfully sojourned outside Africa before 55,000 years or so ago. Even then, he says, they did not meander through the Arabian Peninsula but hugged the coast in a quick sprint to Southeast Asia and Australia. "Colonizing the deserts in Arabia would be a suicidal act," he says. "You can say Green Arabia, but it was only green for brief periods." He suggests that any Arabian forays by modern humans were short and ineffectual.

Scerri 2014

Eleanor M. L. Scerri, Huw S. Groucutt, Richard P. Jennings & Michael D. Petraglia, *Unexpected technological heterogeneity in northern Arabia indicates complex Late Pleistocene demography at the gateway to Asia.* Journal of Human Evolution (2014), preprint, 1–18. DOI:10.1016/j.jhevol.2014.07.002.

The role and significance of the Arabian Peninsula in modern human dispersals out of Africa is currently contentious. While qualitative observations of similarities between Arabian Middle Palaeolithic and African Middle Stone Age (MSA) assemblages have been made, these inferences remain untested and often situated within overly broad dichotomies (e.g., 'Africa' versus the 'Levant'), which distort concepts of geographic scale and subsume local variability. Here, we quantitatively test the hypothesis that assemblages from Jubbah, in the Nefud Desert of northern Saudi Arabia are similar to MSA industries from northeast Africa. Based on the quantitative analysis of a suite of metric and morphological data describing lithic reduction sequences, our results show that early and late core reduction at Jubbah is distinct from equivalent northeast African strategies, perhaps as a result of raw material factors. However, specific techniques of core shaping, preparation and preferential flake production at Jubbah draw from a number of methods also present in the northeast African MSA. While two Jubbah lithic assemblages (JKF-1 and JKF-12) display both similarities and differences with the northeast African assemblages, a third locality (JSM-1) was significantly different to both the other Arabian and African assemblages, indicating an unexpected diversity of assemblages in the Jubbah basin during Marine Isotope Stage 5 (MIS 5, ≈125–70,000 years ago, or ka). Along with evidence from southern Arabia and the Levant, our results add quantitative support to arguments that MIS 5 hominin demography at the interface between Africa and Asia was complex.

Keywords: Middle Palaeolithic | Lithic technology | Middle Stone Age | Out of Africa

Biologie

Huldén 2005

Lena Huldén, Larry Huldén & Kari Heliövaara, *Endemic malaria: an 'indoor' disease in northern Europe, Historical data analysed.* Malaria Journal **4** (2005), 19.

Background: Endemic northern malaria reached 68°N latitude in Europe during the 19th century, where the summer mean temperature only irregularly exceeded 16°C, the lower limit needed for sporogony of Plasmodium vivax. Because of the available historical material and little use of quinine, Finland was suitable for an analysis of endemic malaria and temperature.

Methods: Annual malaria death frequencies during 1800–1870 extracted from parish records were analysed against long-term temperature records in Finland, Russia and Sweden. Supporting data from 1750–1799 were used in the interpretation of the results. The life cycle and behaviour of the anopheline mosquitoes were interpreted according to the literature.

Results: Malaria frequencies correlated strongly with the mean temperature of June and July of the preceding summer, corresponding to larval development of the vector. Hatching of imagoes peaks in the middle of August, when the temperature most years is too low for the sporogony of Plasmodium. After mating some of the females hibernate in human dwellings. If the female gets gametocytes from infective humans, the development of Plasmodium can only continue indoors, in heated buildings.

Conclusion: Northern malaria existed in a cold climate by means of summer dormancy of hypnozoites in humans and indoor transmission of sporozoites throughout the winter by semiactive hibernating mosquitoes. Variable climatic conditions did not affect this relationship. The epidemics, however, were regulated by the population size of the mosquitoes which, in turn, ultimately was controlled by the temperatures of the preceding summer.

Morell 2014

Virginia Morell, *Wolves cooperate but dogs submit, study suggests.* science **345** (2014), 864.

Breeding for dependence, not cooperation, may have driven initial dog domestication. The notion of "dog-human cooperation" needs to be reconsidered, Range said, as well as "the hypotheses that domestication enhanced dogs' cooperative abilities." Instead, our ancestors bred dogs for obedience and dependency. "It's not about having a common goal," Range said. "It's about being with us, but without conflict. We tell them something, and they obey."

Grabung

Killebrew 1988

Shlomit Nemlich & Ann Killebrew, *Rediscovering the Ancient Golan, The Golan Archaeological Museum.* Biblical Archaeology Review **14** (1988), vi, 54–64.

This remote, sparsely inhabited and sometimes desolate area might seem the last place in the world for a modern archaeological museum. But not to the 600 families who live in Qatzrin. What could be more logical than a museum to display the Golan's archaeological treasures, to foster pride in the area, to attract tourists and, not least, to encourage scholarly research into the Golan's fascinating and varied past.

So there it is, in all its glory, near the center of the settlement of Qatzrin, beside some recently constructed homes.

For the past 20 years, Dr. Epstein has been bringing to light an extraordinary civilization that flourished on the Golan in the fourth millennium B.C.— between 5,000 and 6,000 years ago—in the time frame known to archaeologists as the Chalcolithic period. Chalcolithic culture has been found all over Palestine, but it apparently had an unusual flowering on the Golan. And Claire Epstein, in surveys and excavations, is almost single-handedly responsible for bringing it to light.

Killebrew 1991

Ann Killebrew & Steven Fine, *Qatzrin*, *Reconstructing Village Life in Talmudic Times*. Biblical Archaeology Review **17** (1991), iii, 44–56.

As we excavated the stone walls and floors of the complex and fascinating Byzantine village houses, I realized that in their excavated state they would be incomprehensible to the general public. As we continued digging, I became increasingly concerned with how we could best present the excavated remains not just to scholars, but to lay people. The answer was to recreate the atmosphere of a traditional Jewish house by reconstructing one of the excavated household units to its second story and to restore the interior as well.

In deciding precisely how to reconstruct the building, we used not only the archaeological information from our own site, but parallels from other sites as well.6 For example, no building at Qatzrin was preserved to the second story, but in other archaeological sites, especially in southern Syria and elsewhere in the Golan, Byzantine structures still stand to the second story, so we used them as models.

A second source of guidance was Jewish literature from this period, particularly rabbinic literature. In the sidebar "Entry into Rabbinic Literature," we briefly describe each of the works that we cite in this article and explain some of the terms used in describing this literature.

While the late antique Jewish literature is a gold mine of information, it is extremely difficult for anyone not expertly trained in its special literary conventions to mine and place it in historical context. I therefore decided to team up with a historian of Judaism during late antiquity, Steven Fine, also of the Hebrew University of Jerusalem, who is the co-author of this article.

Killebrew 2003

Ann E. Killebrew, Billy J. Grantham & Steven Fine, *A "Talmudic" House at Qasrin*, *On the Use of Domestic Space and Daily Life During the Byzantine Period*. Near Eastern Archaeology **66** (2003), 59–72.

Once we completed the process of excavation and general reconstruction based upon archaeological and ethnographic parallels, we sought to put the site in its broader context using literary sources. We turned to Rabbinic literature as the natural "context" for the house as part of our attempt to integrate architectural and textual data as it relates to our academic and popular interpretation of the Qasrin house and its presentation to the public. The naturalness of this decision was occasioned by a number of factors. The first was the proximity of the house to the nearby synagogue. We assumed that if the inhabitants of Qasrin were Jews, and if they prayed in a synagogue, then the obvious literature to which to turn was that of the Talmudic Rabbis. This connection to Rabbinic literature was intensified by the grave marker of "Rabbi Abun" written in Jewish Palestinian Aramaic with its typically square script. House B was even named after this "Rabbi Abun" in order to drive home the Talmudic connection between the "Talmud" and the "Talmudic House." The reconstructed house was not "merely" that of a Jewish peasant, but

the fiction was created that the “Talmudic house” belonged to one steeped in Rabbinic literature.

Maʿoz 1988
Zvi Uri Maʿoz & Ann Killebrew, *Ancient Qasrin, Synagogue and Village*. Biblical Archaeologist **51** (1988), 5–19.

Judentum

Maʿoz 1988
Zvi Uri Maʿoz, *Ancient Synagogues of the Golan*. Biblical Archaeologist **51** (1988), 116–128.

The finds from the synagogues of the Golan are of exceptional quantity and artistic richness. We therefore have before us a situation in which diversified artistic currents, colored with spiritual and religious notions, occurred within a very limited region. This will make it possible for a stylistic analysis to be carried out that has, in addition to its value to art history, important implications for the study of the history and culture of the Jews in the Holy Land. These observations will be especially worthwhile in the absence of literary sources. Thus, we might ask such questions as: Does the art and architectural style of the synagogues reflect the origin of the Jewish communities that came to settle in the Golan in the fourth century C.E.? Does their style show a continuous source of influence? What sort of cultural and spiritual background is indicated by the choice of symbols? Do the differences among various buildings suggest ties with neighboring communities? Do the synagogues reveal a chronological change or only a social and economic difference? These and other questions await further work, both new research and continued assessments of presently known material.

One thing, however, is clear already from the wealth of materials we now have at hand. The geographical position of the Golan, between the Galilee and the Hauran, gave the artisans of the region the opportunity to draw on influences and traditions of decoration from both areas, and in doing this they left us a distinct creation. The synagogues of the Golan thus speak to us as nothing else from their time can.

Klima

Carré 2014
Matthieu Carré et al., *Holocene history of ENSO variance and asymmetry in the eastern tropical Pacific*. science **345** (2014), 1045–1048.

s345-1045-Supplement.pdf

Matthieu Carré, Julian P. Sachs, Sara Purca, Andrew J. Schauer, Pascale Braconnot, Rommel Angeles Falcón, Michèle Julien & Danièle Lavallée

Understanding the response of the El Niño–Southern Oscillation (ENSO) to global warming requires quantitative data on ENSO under different climate regimes. Here, we present a reconstruction of ENSO in the eastern tropical Pacific spanning the past 10,000 years derived from oxygen isotopes in fossil mollusk shells from Peru.We found that ENSO variance was close to the modern level in the early Holocene and severely damped ≈4000 to 5000 years ago. In addition, ENSO variability was skewed toward cold events along coastal Peru 6700 to 7500 years ago owing to a shift of warm anomalies toward the Central Pacific. The modern ENSO regime was established ≈3000 to 4500 years ago. We conclude that ENSO

was sensitive to changes in climate boundary conditions during the Holocene, including but not limited to insolation.

Kultur

Lamba 2014

Shakti Lamba & Vivek Nityananda, *Self-Deceived Individuals Are Better at Deceiving Others*. PLoS ONE **9** (2014), e104562. DOI:10.1371/journal.pone.0104562.

pone09-e104562-Supplement1.tif, pone09-e104562-Supplement2.tif, pone09-e104562-Supplement3.xlsx, pone09-e104562-Supplement4.docx

Self-deception is widespread in humans even though it can lead to disastrous consequences such as airplane crashes and financial meltdowns. Why is this potentially harmful trait so common? A controversial theory proposes that self-deception evolved to facilitate the deception of others. We test this hypothesis in the real world and find support for it: Overconfident individuals are overrated by observers and underconfident individuals are judged by observers to be worse than they actually are. Our findings suggest that people may not always reward the more accomplished individual but rather the more self-deceived. Moreover, if overconfident individuals are more likely to be risk-prone then by promoting them we may be creating institutions, including banks and armies, which are more vulnerable to risk. Our results reveal practical solutions for assessing individuals that circumvent the influence of self-deception and can be implemented in a range of organizations including educational institutions.

Markowitz 2014

David M. Markowitz & Jeffrey T. Hancock, *Linguistic Traces of a Scientific Fraud, The Case of Diederik Stapel*. PLoS ONE **9** (2014), e105937. DOI:10.1371/journal.pone.0105937.

pone09-e105937-Supplement.xlsx

When scientists report false data, does their writing style reflect their deception? In this study, we investigated the linguistic patterns of fraudulent (N = 24; 170,008 words) and genuine publications (N = 25; 189,705 words) first-authored by social psychologist Diederik Stapel. The analysis revealed that Stapel's fraudulent papers contained linguistic changes in sciencerelated discourse dimensions, including more terms pertaining to methods, investigation, and certainty than his genuine papers. His writing style also matched patterns in other deceptive language, including fewer adjectives in fraudulent publications relative to genuine publications. Using differences in language dimensions we were able to classify Stapel's publications with above chance accuracy. Beyond these discourse dimensions, Stapel included fewer co-authors when reporting fake data than genuine data, although other evidentiary claims (e.g., number of references and experiments) did not differ across the two article types. This research supports recent findings that language cues vary systematically with deception, and that deception can be revealed in fraudulent scientific discourse.

Mittelpaläolithikum

Rodríguez-Vidal 2014

Joaquín Rodríguez-Vidal et al., *A rock engraving made by Neanderthals in Gibraltar*. PNAS **111** (2014), 13301–13306.

pnas111-13301-Supplement1.pdf, pnas111-13301-Supplement2.mp4

Joaquín Rodríguez-Vidal, Francesco d'Errico, Francisco Giles Pacheco, Ruth Blasco, Jordi Rosell, Richard P. Jennings, Alain Queffelec, Geraldine Finlayson, Darren A. Fa, José María Gutiérrez López, José S. Carrión, Juan José Negro, Stewart Finlayson, Luís M. Cáceres, Marco A. Bernal, Santiago Fernández Jiménez & Clive Finlayson

The production of purposely made painted or engraved designs on cave walls—a means of recording and transmitting symbolic codes in a durable manner—is recognized as a major cognitive step in human evolution. Considered exclusive to modern humans, this behavior has been used to argue in favor of significant cognitive differences between our direct ancestors and contemporary archaic hominins, including the Neanderthals. Here we present the first known example of an abstract pattern engraved by Neanderthals, from Gorham's Cave in Gibraltar. It consists of a deeply impressed cross-hatching carved into the bedrock of the cave that has remained covered by an undisturbed archaeological level containing Mousterian artifacts made by Neanderthals and is older than 39 cal kyr BP. Geochemical analysis of the epigenetic coating over the engravings and experimental replication show that the engraving was made before accumulation of the archaeological layers, and that most of the lines composing the design were made by repeatedly and carefully passing a pointed lithic tool into the grooves, excluding the possibility of an unintentional or utilitarian origin (e.g., food or fur processing). This discovery demonstrates the capacity of the Neanderthals for abstract thought and expression through the use of geometric forms.

Middle Paleolithic | symbolism | art | Iberia | cognition

Neolithikum

Dai 2014

Fei Dai, Zhong-Hua Chen, Xiaolei Wang, Zefeng Li, Gulei Jin, Dezhi Wu, Shengguan Cai, Ning Wang, Feibo Wu, Eviatar Nevo & Guo, *Transcriptome profiling reveals mosaic genomic origins of modern cultivated barley*. PNAS **111** (2014), 13403–13408.

pnas111-13403-Supplement.xlsx

The domestication of cultivated barley has been used as a model system for studying the origins and early spread of agrarian culture. Our previous results indicated that the Tibetan Plateau and its vicinity is one of the centers of domestication of cultivated barley. Here we reveal multiple origins of domesticated barley using transcriptome profiling of cultivated and wild-barley genotypes. Approximately 48-Gb of clean transcript sequences in 12 Hordeum spontaneum and 9 Hordeum vulgare accessions were generated. We reported 12,530 de novo assembled transcripts in all of the 21 samples. Population structure analysis showed that Tibetan hulless barley (qingke) might have existed in the early stage of domestication. Based on the large number of unique genomic regions showing the similarity between cultivated and wildbarley groups, we propose that the genomic origin of modern cultivated barley is derived from wild-barley genotypes in the Fertile Crescent (mainly in chromosomes 1H, 2H, and 3H) and Tibet (mainly in chromosomes 4H, 5H, 6H, and 7H). This study indicates that the domestication of barley may have occurred over time in geographically distinct regions.

evolution | genetic diversity | genomic similarity | RNA-Seq | single nucleotide variants

Story or Book

DeWoody 2014

J. Andrew DeWoody, *Heirloom genomes and bison conservation*. science **345** (2014), 1009.

American Plains Bison. Rewilding an Icon. James A. Bailey. Farcountry, 2013. 258 pp.

Bailey convincingly argues that traits necessary for the survival of wild animals are ill-adapted for captivity and vice versa. Animal production (i.e., farming or ranching) is insufficient to maintain the historical and biological integrity of wild animals. Many attributes of wild bison populations (e.g., dominance hierarchies) simply do not exist in most captive populations because artificial breeding schemes selectively avoid them.

Our society should instead retain elements of bison wildness by challenging them in a natural manner. This means with competitors, predators (wolves, bears, and humans), pathogens, and the environment itself. Wild plains bison evolved historically in the presence of pathogens and predators, and they remain the best means to control population sizes.