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## NOTICES

### PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, do let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

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### SCIENCE NEWS – Were humans living in a Mexican cave during the last ice age?

At first glance, Chiquihuite Cave in Mexico’s Zacatecas state is an unlikely place to find signs of early humans, let alone evidence that might change the story of the peopling of the Americas. It sits a daunting 1000 meters above a valley, overlooking a desert landscape in the mountains north of Zacatecas. Getting there requires a 4- or 5-hour uphill scramble over a moonscape of jagged boulders.

[https://www.sciencemag.org/news/2020/07/were-humans-living-mexican-cave-during-last-ice-age?utm\\_campaign=news\\_daily\\_2020-07-22&et rid=17774313&et cid=3417255](https://www.sciencemag.org/news/2020/07/were-humans-living-mexican-cave-during-last-ice-age?utm_campaign=news_daily_2020-07-22&et rid=17774313&et cid=3417255)

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### SOCIETY FOR SCIENCE – Stone artifacts hint that humans reached the Americas surprisingly early

Finds uncovered in a Mexican cave suggest North America may have had human inhabitants more than 30,000 years ago - way before archaeologists thought.

<http://click.societyforscience-email.com/?qs=cedd09ed0696763797edba6162f87eff128e02cb067b01652b29749df9bcd519a710ec084bf5c16a2fec440d98b335713d2b56b2392755e6>

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### BREAKING SCIENCE – Archaeologists Find 30,000-Year-Old Stone Tools in Mexican Cave

Archaeologists have uncovered 1,900 stone artifacts in Chiquihuite Cave, a high-altitude site in the Astillero Mountains in northern Mexico. DNA analysis of the plant and animal remains from the sediment packed around the tools dates the human occupation of the site to 25,000-30,000 years ago. These findings challenge the commonly held theory that the Clovis people were the first human inhabitants of the Americas 15,000 years ago.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/2EGqROrszNk/stone-tools-chiquihuite-cave-mexico-08667.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/2EGqROrszNk/stone-tools-chiquihuite-cave-mexico-08667.html?utm_source=feedburner&utm_medium=email)

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### SCIENCE DAILY – Spider monkey groups as collective computers

New research shows that spider monkeys use collective computation to figure out the best way to find food.

<https://www.sciencedaily.com/releases/2020/07/200721160725.htm>

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### SCIENCE DAILY – Neanderthals of W. Mediterranean did not become extinct because of climate changes

According to paleoclimatic reconstructions analyzing stalagmites sampled in some caves in the Murge plateau (Apulia, Italy), Neanderthals might have become extinct because Homo sapiens employed more sophisticated hunting technologies.

<https://www.sciencedaily.com/releases/2020/07/200720101759.htm>

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### SCIENCE DAILY – Earliest humans stayed at the Americas 'oldest hotel' in Mexican cave

A cave in a remote part of Mexico was visited by humans around 30,000 years ago - 15,000 years earlier than people were previously thought to have reached the Americas. Excavations of Chiquihuite Cave, located in a mountainous area in northern Mexico controlled by drugs cartels, uncovered nearly 2000 stone tools from a small section of the high-altitude cave. Analysis of the sediment in the cave uncovered a new story of the colonisation of the Americas.

<https://www.sciencedaily.com/releases/2020/07/200722112726.htm>

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### SCIENCE DAILY – Brain builds and uses maps of social networks, physical space, in the same way

Even in these social-distanced days, we keep in our heads a map of our relationships with other people: family, friends, coworkers and how they relate to each other. New research shows that we put together this social map in much the same way that we assemble a map of physical places and things.

<https://www.sciencedaily.com/releases/2020/07/200722112657.htm>

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### SCIENCE DAILY – Young dolphins pick their friends wisely

Strategic networking is key to career success, and not just for humans. A study of bottlenose dolphins reveals that in early life, dolphins devote more time to building connections that could give them an edge later on. Analyzing nearly 30 years of records for some 1700 dolphins in Australia, researchers find that dolphins under age 10 seek out peers and activities that could help them forge bonds and build skills they'll need in adulthood.

<https://www.sciencedaily.com/releases/2020/07/200723172000.htm>

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### SCIENCE DAILY – Neanderthals may have had a lower threshold for pain

Nerve cells have a special ion channel that has a key role in starting the electrical impulse that signals pain and is sent to the brain. New research finds that people who inherited the Neanderthal variant of this ion channel experience more pain.

<https://www.sciencedaily.com/releases/2020/07/200723115900.htm>

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### SCIENCE DAILY – How does cooperation evolve?

In nature, organisms often support each other in order to gain an advantage. However, this kind of cooperation appears to contradict the theory of evolution proposed by Charles Darwin: Why would organisms invest valuable resources to help others? Instead, they should rather use them for themselves, in order to win the evolutionary competition with other species. A new study has now solved this puzzle.

<https://www.sciencedaily.com/releases/2020/07/200723115234.htm>

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### SCIENCE DAILY – Narcissists don't learn from their mistakes because they don't think they make any

When most people find that their actions have resulted in an undesirable outcome, they tend to rethink their decisions and ask, 'What should I have done differently to avoid this outcome?' When narcissists face the same situation, however, their refrain is, 'No one could have seen this coming!' In refusing to acknowledge that they have made a mistake, narcissists fail to learn from those mistakes, a recent study has found.

<https://www.sciencedaily.com/releases/2020/07/200722163223.htm>

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### NATURE BRIEFING – Stone tools hint Americans arrived earlier

A massive haul of stone tools discovered in a cave in Mexico is evidence that people occupied the area more than 30,000 years ago. The finding suggests that humans arrived in North America at least 15,000 years earlier than had been thought. The discovery is backed up by a separate statistical analysis incorporating data from sites in North America and Siberia. But some researchers are unconvinced. They question the age of the tools, and whether the artefacts are tools at all, rather than objects created by natural processes. Data from caves are "notoriously troublesome" to interpret, says archaeologist François Lanoë.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=98de9f065d&e=1db4b9a19b>

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## NATURE BRIEFING – Podcast: Ancient Americans

A massive haul of stone tools discovered in a cave in Mexico is evidence that people occupied the area more than 30,000 years ago. The finding suggests that humans arrived in North America at least 15,000 years earlier than had been thought — adding fuel to a debate that has raged among archeologists for ages. On this week's Nature Podcast, we hear from the researchers who uncovered the latest evidence. Plus, get the latest news on the COVID-19 pandemic in our weekly Coronapod segment.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=39809d1308&e=1db4b9a19b>

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## NATURE BRIEFING – Neanderthal gene linked to pain sensitivity

Neanderthals had a biological predisposition to a heightened sense of pain. A first-of-its kind genome study found that the ancient human relatives carried three mutations in a gene encoding the protein Nav1.7, which conveys painful sensations to the spinal cord and brain. They also showed that in a sample of British people, those who had inherited the Neanderthal version of Nav1.7 tend to experience more pain than others. "This is beautiful work", says neuroscientist Cedric Boeckx, because it shows how aspects of Neanderthal physiology can be reconstructed by studying modern humans.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=7a08d8a145&e=1db4b9a19b>

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## SAPIENS – When Deafness Is Not Considered a Deficit

In the Peruvian Amazon, the Maijuna peoples created their own sign language—which hints at the importance of community in the evolution of language.

[https://www.sapiens.org/language/maijuna/?utm\\_source=SAPIENS.org+Subscribers&utm\\_campaign=2fe79fe9c0-EMAIL\\_CAMPAIGN\\_2020\\_07\\_24&utm\\_medium=email&utm\\_term=0\\_18b7e41cd8-2fe79fe9c0-201933693&ct=t\(\)](https://www.sapiens.org/language/maijuna/?utm_source=SAPIENS.org+Subscribers&utm_campaign=2fe79fe9c0-EMAIL_CAMPAIGN_2020_07_24&utm_medium=email&utm_term=0_18b7e41cd8-2fe79fe9c0-201933693&ct=t())

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## PUBLICATIONS

### Current Biology

#### PAPERS

#### **HUGO ZEBERG et al with JANET KELSO & SVANTE PÄÄBO – A Neanderthal Sodium Channel Increases Pain Sensitivity in Present-Day Humans**

The sodium channel Nav1.7 is crucial for impulse generation and conduction in peripheral pain pathways [1]. In Neanderthals, the Nav1.7 protein carried three amino acid substitutions (M932L, V991L, and D1908G) relative to modern humans. We expressed Nav1.7 proteins carrying all combinations of these substitutions and studied their electrophysiological effects. Whereas the single amino acid substitutions do not affect the function of the ion channel, the full Neanderthal variant carrying all three substitutions, as well as the combination of V991L with D1908G, shows reduced inactivation, suggesting that peripheral nerves were more sensitive to painful stimuli in Neanderthals than in modern humans. We show that, due to gene flow from Neanderthals, the three Neanderthal substitutions are found in ~0.4% of present-day Britons, where they are associated with heightened pain sensitivity.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30861-7?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30861-7?dgcid=raven_jbs_aip_email)

#### **TINA C. ROESKE et al with DAVID POEPEL – Categorical Rhythms Are Shared between Songbirds and Humans**

Rhythm is a prominent feature of music. Of the infinite possible ways of organizing events in time, musical rhythms are almost always distributed categorically. Such categories can facilitate the transmission of culture—a feature that songbirds and humans share. We compared rhythms of live performances of music to rhythms of wild thrush nightingale and domestic zebra finch songs. In nightingales, but not in zebra finches, we found universal rhythm categories, with patterns that were surprisingly similar to those of music. Isochronous 1:1 rhythms were similarly common. Interestingly, a bias toward small ratios (around 1:2 to 1:3), which is highly abundant in music, was observed also in thrush nightingale songs. Within that range, however, there was no statistically significant bias toward exact integer ratios (1:2 or 1:3) in the birds. High-ratio rhythms were abundant in the nightingale song and are structurally similar to fusion rhythms (ornaments) in music. In both species, preferred rhythms remained invariant over extended ranges of tempos, indicating natural categories. The number of rhythm categories decreased at higher tempos, with a threshold above which rhythm became highly stereotyped. In thrush nightingales, this threshold occurred at a tempo twice faster than in humans, indicating weaker structural constraints and a remarkable motor proficiency. Together, the results suggest that categorical rhythms reflect similar constraints on learning motor skills across species. The saliency of categorical rhythms across humans and thrush nightingales suggests that they promote, or emerge from, the cultural transmission of learned vocalizations.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30924-6?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30924-6?dgcid=raven_jbs_aip_email)

#### **DANIEL PREUSSGER et al – Reciprocal Fitness Feedbacks Promote the Evolution of Mutualistic Cooperation**

Mutually beneficial interactions are ubiquitous in nature and have played a pivotal role for the evolution of life on earth. However, the factors facilitating their emergence remain poorly understood. Here, we address this issue both experimentally and by mathematical modeling using cocultures of auxotrophic strains of *Escherichia coli*, whose growth depends on a

reciprocal exchange of amino acids. Coevolving auxotrophic pairs in a spatially heterogeneous environment for less than 150 generations transformed the initial interaction that was merely based on an exchange of metabolic byproducts into a costly metabolic cooperation, in which both partners increased the amounts of metabolites they produced to benefit their corresponding partner. The observed changes were afforded by the formation of multicellular clusters, within which increased cooperative investments were favored by positive fitness feedbacks among interacting genotypes. Under these conditions, non-cooperative individuals were less fit than cooperative mutants. Together, our results highlight the ease with which mutualistic cooperation can evolve, suggesting similar mechanisms likely operate in natural communities.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30986-6?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30986-6?dgcid=raven_jbs_aip_email)

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## Frontiers in Psychology

### PAPERS

#### **AMALIA P. M. BASTOS & ALEX H. TAYLOR – Macphail's Null Hypothesis of Vertebrate Intelligence: Insights From Avian Cognition**

Macphail famously criticized two foundational assumptions that underlie the evolutionary approach to comparative psychology: that there are differences in intelligence across species, and that intelligent behavior in animals is based on more than associative learning. Here, we provide evidence from recent work in avian cognition that supports both these assumptions: intelligence across species varies, and animals can perform intelligent behaviors that are not guided solely by associative learning mechanisms. Finally, we reflect on the limitations of comparative psychology that led to Macphail's claims and suggest strategies researchers can use to make more advances in the field.

[https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01692/full?utm\\_source=F-AAE&utm\\_medium=EMLF&utm\\_campaign=MRK\\_1383094\\_69\\_Psycho\\_20200721\\_arts\\_A](https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01692/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1383094_69_Psycho_20200721_arts_A)

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## Human Nature

### PAPERS

#### **ZACHARY H. GARFIELD, ROBERT L. HUBBARD & EDWARD H. HAGEN – Evolutionary Models of Leadership**

This study tested four theoretical models of leadership with data from the ethnographic record. The first was a game-theoretical model of leadership in collective actions, in which followers prefer and reward a leader who monitors and sanctions free-riders as group size increases. The second was the dominance model, in which dominant leaders threaten followers with physical or social harm. The third, the prestige model, suggests leaders with valued skills and expertise are chosen by followers who strive to emulate them. The fourth proposes that in small-scale, kin-based societies, men with high neural capital are best able to achieve and maintain positions of social influence (e.g., as headmen) and thereby often become polygynous and have more offspring than other men, which positively selects for greater neural capital. Using multiple search strategies we identified more than 1000 texts relevant to leadership in the Probability Sample of 60 cultures from the Human Relations Area Files (HRAF). We operationalized the model with variables and then coded all retrieved text records on the presence or absence of evidence for each of these 24 variables. We found mixed support for the collective action model, broad support for components of the prestige leadership style and the importance of neural capital and polygyny among leaders, but more limited support for the dominance leadership style. We found little evidence, however, of emulation of, or prestige-biased learning toward, leaders. We found that improving collective actions, having expertise, providing counsel, and being respected, having high neural capital, and being polygynous are common properties of leaders, which warrants a synthesis of the collective action, prestige, and neural capital and reproductive skew models. We sketch one such synthesis involving high-quality decision-making and other computational services.

[https://link.springer.com/article/10.1007/s12110-019-09338-4?utm\\_source=hybris-campaign](https://link.springer.com/article/10.1007/s12110-019-09338-4?utm_source=hybris-campaign)

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#### **RAYMOND HAMES – Pacifying Hunter-Gatherers**

There is a well-entrenched schism on the frequency (how often), intensity (deaths per 100,000/year), and evolutionary significance of warfare among hunter-gatherers compared with large-scale societies. To simplify, Rousseauians argue that warfare among prehistoric and contemporary hunter-gatherers was nearly absent and, if present, was a late cultural invention. In contrast, so-called Hobbesians argue that violence was relatively common but variable among hunter-gatherers. To defend their views, Rousseauians resort to a variety of tactics to diminish the apparent frequency and intensity of hunter-gatherer warfare. These tactics include redefining war, censoring ethnographic accounts of warfare in comparative analyses, misconstruing archaeological evidence, and claiming that outside contact inflates the intensity of warfare among hunter-gatherers. These tactics are subject to critical analysis and are mostly found to be wanting. Furthermore, Hobbesians with empirical data have already established that the frequency and intensity of hunter-gatherer warfare is greater compared with large-scale societies even though horticultural societies engage in warfare more intensively than hunter-gatherers. In the end I argue that although war is a primitive trait we may share with chimpanzees and/or our last common ancestor, the ability of hunter-gatherer bands to live peaceably with their neighbors, even though war may occur, is a derived trait that fundamentally distinguishes us socially and politically from chimpanzee societies. It is a point often lost in these debates.

[https://link.springer.com/article/10.1007%2Fs12110-019-09340-w?utm\\_source=hybris-campaign&utm\\_medium=email&utm\\_content=internal&utm\\_campaign=BSSS\\_2\\_MD01\\_HSS\\_HP\\_Camp2\\_SPR&sap-outbound-id=FF82DEC068089B0E9241E95E40BE7EE4E0F462E3](https://link.springer.com/article/10.1007%2Fs12110-019-09340-w?utm_source=hybris-campaign&utm_medium=email&utm_content=internal&utm_campaign=BSSS_2_MD01_HSS_HP_Camp2_SPR&sap-outbound-id=FF82DEC068089B0E9241E95E40BE7EE4E0F462E3)

## **AZAR GAT – Is War in Our Nature? What Is Right and What Is Wrong about the Seville Statement on Violence**

The Seville Statement on Violence rejected the view that violence and war were in any way rooted in human nature and proclaimed that they were merely a cultural artifact. This paper points out both the valid and invalid parts of the statement. It concludes that the potential for both war and peace is embedded in us. The human behavioral toolkit comprises a number of major tools, respectively geared for violent conflict, peaceful competition, or cooperation, depending on people's assessment of what will serve them best in any given circumstance. Conflict is only one tool—the hammer—in our diverse behavioral toolkit. However, all three behavioral strategies are not purely learned cultural forms. This naive nature/nurture dichotomy overlooks the heavy and complex biological machinery that is necessary for the working of each of them and the interplay between them. They are all very close under our skin and readily activated because they have all been very handy during our long evolutionary past. At the same time, they are variably calibrated to particular conditions through social learning, which means that their relative use may fluctuate widely. Thus, state authority has tilted the menu of human choices in the direction of the peaceful options in the domestic arena, and changing economic, social, and political conditions may be generating a similar effect in the international arena.

[https://link.springer.com/article/10.1007%2Fs12110-019-09342-8?utm\\_source=hybris-campaign&utm\\_medium=email&utm\\_content=internal&utm\\_campaign=BSSS\\_2\\_MD01\\_HSS\\_HP\\_Camp2\\_SPR&sap-outbound-id=FF82DEC068089B0E9241E95E40BE7EE4E0F462E3](https://link.springer.com/article/10.1007%2Fs12110-019-09342-8?utm_source=hybris-campaign&utm_medium=email&utm_content=internal&utm_campaign=BSSS_2_MD01_HSS_HP_Camp2_SPR&sap-outbound-id=FF82DEC068089B0E9241E95E40BE7EE4E0F462E3)

## **SAGAR A. PANDIT, GAURI R. PRADHAN & CAREL P. VAN SCHAIK – Why Class Formation Occurs in Humans but Not among Other Primates: A Primate Coalitions Model**

Most human societies exhibit a distinct class structure, with an elite, middle classes, and a bottom class, whereas animals form simple dominance hierarchies in which individuals with higher fighting ability do not appear to form coalitions to “oppress” weaker individuals. Here, we extend our model of primate coalitions and find that a division into a bottom class and an upper class is inevitable whenever fitness-enhancing resources, such as food or real estate, are exploitable or tradable and the members of the bottom class cannot easily leave the group. The model predicts that the bottom class has a near flat, low payoff and always comprises at least half the society. The upper class may subdivide into one or more middle class(es), resulting in improved payoff for the topmost members (elite). The model predicts that the bottom class on its own is incapable of mounting effective counter-coalitions against the upper class, except when receiving support from dissatisfied members of the middle class(es). Such counter-coalitions can be prevented by keeping the payoff to the lowest-ranked members of the middle classes (through concessions) well above that of the bottom class. This simple model explains why classes are also absent in nomadic hunter-gatherers and predominate in (though are not limited to) societies that produce and store food. Its results also agree well with various other known features of societies with classes.

{Hmm. So to form a social class system in humans you need a pre-existing social class system. A good explanation of how a class system perpetuates, but not how it begins.}

[https://link.springer.com/article/10.1007/s12110-020-09370-9?utm\\_source=toc](https://link.springer.com/article/10.1007/s12110-020-09370-9?utm_source=toc)

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## **Journal of Archaeological Method & Theory**

### **PAPERS**

#### **MANUEL VAQUERO & FRANCESCA ROMAGNOLI – Searching for Lazy People: the Significance of Expedient Behavior in the Interpretation of Paleolithic Assemblages**

A quick glance at the evolution of lithic assemblages throughout prehistory highlights a great variability in the time and effort invested in technological activities. This variability has been related to differences in the technological organization of human groups, giving rise to the distinction proposed by Binford between curated and expedient technologies. Curation has been the subject of much discussion with regard to its definition and archaeological implications, but expediency has received comparatively less interest from researchers. Nevertheless, expedient technologies are ubiquitous in the archaeological record and represent a large proportion of prehistoric lithic assemblages, even becoming clearly dominant in certain chronological and/or regional contexts. The aim of this paper is to characterize expedient technologies as low-cost strategies that can be identified in all the stages of the lithic production sequence, from raw material provisioning to tool manufacture. However, we will focus our attention on core reduction technologies, emphasizing the consequences of distinguishing between expedient and formal reduction strategies. Finally, some implications of expediency in archaeological interpretation will be discussed, focusing on the significance of expedient technologies in the cultural ascription of lithic assemblages.

<https://link.springer.com/article/10.1007/s10816-017-9339-x?sap-outbound-id=846728541EDF12E61E91E1AA9BA8190513A83D73>

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## **Nature**

### **NEWS**

#### **When did people arrive in the Americas? New evidence stokes debate**

New evidence may push back the date on human arrival to the Americas, and an examination of science's flaws.

<https://www.nature.com/articles/d41586-020-02200-z>

## ARTICLES

### **RUTH GRUHN – Evidence grows that peopling of the Americas began more than 20,000 years ago**

The long-debated timing of the peopling of the Americas comes into focus, thanks to some archaeological findings. What are the implications of a revised timeline for our understanding of these earliest inhabitants?

<https://www.nature.com/articles/d41586-020-02137-3>

## PAPERS

### **LORENA BECERRA-VALDIVIA & THOMAS HIGHAM – The timing and effect of the earliest human arrivals in North America**

The peopling of the Americas marks a major expansion of humans across the planet. However, questions regarding the timing and mechanisms of this dispersal remain, and the previously accepted model (termed ‘Clovis-first’)—suggesting that the first inhabitants of the Americas were linked with the Clovis tradition, a complex marked by distinctive fluted lithic points—has been effectively refuted. Here we analyse chronometric data from 42 North American and Beringian archaeological sites using a Bayesian age modelling approach, and use the resulting chronological framework to elucidate spatiotemporal patterns of human dispersal. We then integrate these patterns with the available genetic and climatic evidence. The data obtained show that humans were probably present before, during and immediately after the Last Glacial Maximum (about 26.5–19 thousand years ago) but that more widespread occupation began during a period of abrupt warming, Greenland Interstadial 1 (about 14.7–12.9 thousand years before AD 2000). We also identify the near-synchronous commencement of Beringian, Clovis and Western Stemmed cultural traditions, and an overlap of each with the last dates for the appearance of 18 now-extinct faunal genera. Our analysis suggests that the widespread expansion of humans through North America was a key factor in the extinction of large terrestrial mammals.

<https://www.nature.com/articles/s41586-020-2491-6>

### **CIPRIAN F. ARDELEAN et al with ESKE WILLERSLEV – Evidence of human occupation in Mexico around the Last Glacial Maximum**

The initial colonization of the Americas remains a highly debated topic, and the exact timing of the first arrivals is unknown. The earliest archaeological record of Mexico—which holds a key geographical position in the Americas—is poorly known and understudied. Historically, the region has remained on the periphery of research focused on the first American populations. However, recent investigations provide reliable evidence of a human presence in the northwest region of Mexico, the Chiapas Highlands, Central Mexico and the Caribbean coast during the Late Pleistocene and Early Holocene epochs. Here we present results of recent excavations at Chiquihuite Cave—a high-altitude site in central-northern Mexico—that corroborate previous findings in the Americas of cultural evidence that dates to the Last Glacial Maximum (26,500–19,000 years ago), and which push back dates for human dispersal to the region possibly as early as 33,000–31,000 years ago. The site yielded about 1,900 stone artefacts within a 3-m-deep stratified sequence, revealing a previously unknown lithic industry that underwent only minor changes over millennia. More than 50 radiocarbon and luminescence dates provide chronological control, and genetic, palaeoenvironmental and chemical data document the changing environments in which the occupants lived. Our results provide new evidence for the antiquity of humans in the Americas, illustrate the cultural diversity of the earliest dispersal groups (which predate those of the Clovis culture) and open new directions of research.

<https://www.nature.com/articles/s41586-020-2509-0>

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## Nature Communications

### PAPERS

#### **JEREMY E. MARTIN et al – Calcium isotopic ecology of Turkana Basin hominins**

Diet is a major driver of hominin evolution, but most of the geochemical evidence relies on carbon isotopes ( $\delta^{13}\text{C}$ ). Here, we report enamel stable calcium isotope ( $\delta^{44}/^{42}\text{Ca}$ ) values against  $\delta^{13}\text{C}$  values for several hominins and co-existing primates in the Turkana Basin area, circa 4 to 2 Ma. *Australopithecus anamensis* clusters with mammal browsers, *Kenyanthropus platyops* is distinct from *A. anamensis* in foraging into more open environments and the coexisting *Theropithecus brumpti* encompasses both the grazer and omnivore/carnivore domains. Early *Homo* is remarkable for its wide distribution in  $\delta^{44}/^{42}\text{Ca}$  values, possibly reflecting omnivorous and opportunistic preferences. *Paranthropus boisei* is uniquely distributed in the  $\delta^{13}\text{C}$  versus  $\delta^{44}/^{42}\text{Ca}$  iso-space being distinct from all other hominins from the Turkana Basin area as well as from the co-existing *Theropithecus oswaldi*. Several hypotheses are explored to discuss the unique  $\delta^{44}/^{42}\text{Ca}$  values of *Paranthropus boisei* including significant differences observed with  $\delta^{44}/^{42}\text{Ca}$  values recently reported for *P. robustus* from South Africa, questioning the monophyly of this genus.

<https://www.nature.com/articles/s41467-020-17427-7>

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## Nature Scientific Reports

### PAPERS

#### **KELLY ROOKER & SERGEY GAVRILETS – On the evolution of sexual receptivity in female primates**

There has been much interest in the evolutionary forces responsible for, and underlying the diversity in, female primate reproductive cycles. While there has been limited research on sexual receptivity in primates, this has been one recurring

topic of interest. Some primate species are like humans, sexually receptive to mating throughout their entire estrus cycle, while other species are the opposite, receptive for mere hours out of their several-week cycles. Why is there such prominent variation in sexual receptivity length among primate species? Here we examine the evolutionary trade-offs associated with sexual receptivity length using mathematical modeling. We investigate how various factors, including having ovulation signs present versus concealed ovulation, female physiological costs, and group size, each influence the length of females' receptive periods. We find that both continuous receptivity and very short lengths of receptivity are able to evolve. Our model predicts that increasing the impacts of infanticide will increase the length of the female receptive period, emphasizing the possible importance of paternity confusion. Similar effects can also be achieved by increasing the non-genetic benefits provided by males. Overall, our work offers a theoretical framework for understanding the evolution and diversity of mating traits in female primates.

<https://www.nature.com/articles/s41598-020-68338-y>

### **C. O. BRAND et al with A. MESOUDI – The emergence and adaptive use of prestige in an online social learning task**

Prestige-biased social learning occurs when individuals preferentially learn from others who are highly respected, admired, copied, or attended to in their group. This form of social learning is argued to reflect novel forms of social hierarchy in human societies, and, by providing an efficient short-cut to acquiring adaptive information, underpin the cumulative cultural evolution that has contributed to our species' ecological success. Despite these potentially important consequences, little empirical work to date has tested the basic predictions of prestige-biased social learning. Here we provide evidence supporting the key predictions that prestige-biased social learning is used when it constitutes an indirect cue of success, and when success-biased social learning is unavailable. We ran an online experiment (n = 269) in which participants could copy each other in real-time to score points on a general-knowledge quiz. Our implementation of 'prestige' was the number of times someone had previously been copied by others. Importantly, prestige was an emergent property of participants' behaviour during the experiment; no deception or manipulation of prestige was employed at any time. We found that, as predicted, participants used prestige-biased social learning when the prestige cue was an indirect cue of success, and when direct success information was unavailable. This highlights how people flexibly and adaptively employ social learning strategies based on the reliability of the information that such strategies provide.

<https://www.nature.com/articles/s41598-020-68982-4>

### **MONTERRAT SANZ et al with JOÃO ZILHÃO – Early evidence of fire in south-western Europe: the Acheulean site of Gruta da Aroeira (Torres Novas, Portugal)**

The site of Gruta da Aroeira (Torres Novas, Portugal), with evidence of human occupancy dating to ca. 400 ka (Marine Isotope Stage 11), is one of the very few Middle Pleistocene localities to have provided a fossil hominin cranium associated with Acheulean bifaces in a cave context. The multi-analytic study reported here of the by-products of burning recorded in layer X suggests the presence of anthropogenic fires at the site, among the oldest such evidence in south-western Europe. The burnt material consists of bone, charcoal and, possibly, quartzite cobbles. These finds were made in a small area of the cave and in two separate occupation horizons. Our results add to our still-limited knowledge about the controlled use of fire in the Lower Palaeolithic and contribute to ongoing debates on the behavioural complexity of the Acheulean of Europe.

<https://www.nature.com/articles/s41598-020-68839-w>

### **RACHEL DALE, SARAH MARSHALL-PESCINI & FRIEDERIKE RANGE – What matters for cooperation? The importance of social relationship over cognition**

Cooperation is vital for the survival of many species and has been extensively researched at the ultimate level however, there is a considerable degree of variation within a given species in the extent of cooperative behaviours exhibited. Possible factors that have been discussed to contribute to this variation are the social relationship between the cooperating individuals, but also non-social factors such as inhibitory control. Investigating the performance of wolves, a highly cooperative species, in three experimental cooperative tasks; a coordination (string-pulling) task, a prosocial task and an inequity aversion task, we found that the social relationship between the partners had the largest effects on all tasks, while non-social factors (inhibition, learning speed, causal understanding and persistence) had rather unpredicted, or no effects. The results support the potential importance of relational factors, rather than motivation and cognitive abilities, in driving cooperative interactions.

<https://www.nature.com/articles/s41598-020-68734-4>

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## Neuron

### PAPERS

#### **SEONGMIN A. PARK et al – Map Making: Constructing, Combining, and Inferring on Abstract Cognitive Maps**

Cognitive maps enable efficient inferences from limited experience that can guide novel decisions. We tested whether the hippocampus (HC), entorhinal cortex (EC), and ventromedial prefrontal cortex (vmPFC)/medial orbitofrontal cortex (mOFC) organize abstract and discrete relational information into a cognitive map to guide novel inferences. Subjects learned the status of people in two unseen 2D social hierarchies, with each dimension learned on a separate day. Although one dimension was behaviorally relevant, multivariate activity patterns in HC, EC, and vmPFC/mOFC were linearly related to the Euclidean distance between people in the mentally reconstructed 2D space. Hubs created unique comparisons between the

hierarchies, enabling inferences between novel pairs. We found that both behavior and neural activity in EC and vmPFC/mOFC reflected the Euclidean distance to the retrieved hub, which was reinstated in HC. These findings reveal how abstract and discrete relational structures are represented, are combined, and enable novel inferences in the human brain.  
[https://www.cell.com/neuron/pdf/S0896-6273\(20\)30484-0.pdf?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627320304840%3Fshowall%3Dtrue](https://www.cell.com/neuron/pdf/S0896-6273(20)30484-0.pdf?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627320304840%3Fshowall%3Dtrue)

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## New Scientist

### NEWS

#### **Humans reached the Americas earlier than thought**

Humans seem to have been living in the Americas as early as 33,000 years ago – 15,000 years before the most widely accepted date.

<https://newscientist.us3.list-manage.com/track/click?u=6710b48697068ec8e08d69abf&id=cc7833351b&e=c07cfd7395>

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## PNAS

### PAPERS

#### **B. J. WEST et al with R. I. M. DUNBAR – Relating size and functionality in human social networks through complexity**

Extensive empirical evidence suggests that there is a maximal number of people with whom an individual can maintain stable social relationships (the Dunbar number). We argue that this arises as a consequence of a natural phase transition in the dynamic self-organization among  $N$  individuals within a social system. We present the calculated size dependence of the scaling properties of complex social network models to argue that this collective behavior is an enhanced form of collective intelligence. Direct calculation establishes that the complexity of social networks as measured by their scaling behavior is nonmonotonic, peaking around 150, thereby providing a theoretical basis for the value of the Dunbar number. Thus, we establish a theory-based bridge spanning the gap between sociology and psychology.

<https://www.pnas.org/content/early/2020/07/17/2006875117.abstract?etoc>

#### **HECTOR A. ORENGO et al – Automated detection of archaeological mounds using machine-learning classification of multisensor and multitemporal satellite data**

This paper presents an innovative multisensor, multitemporal machine-learning approach using remote sensing big data for the detection of archaeological mounds in Cholistan (Pakistan). The Cholistan Desert presents one of the largest concentrations of Indus Civilization sites (from ca. 3300 to 1500 BC). Cholistan has figured prominently in theories about changes in water availability, the rise and decline of the Indus Civilization, and the transformation of fertile monsoonal alluvial plains into an extremely arid margin. This paper implements a multisensor, multitemporal machine-learning approach for the remote detection of archaeological mounds. A classifier algorithm that employs a large-scale collection of synthetic-aperture radar and multispectral images has been implemented in Google Earth Engine, resulting in an accurate probability map for mound-like signatures across an area that covers ca. 36,000 km<sup>2</sup>. The results show that the area presents many more archaeological mounds than previously recorded, extending south and east into the desert, which has major implications for understanding the archaeological significance of the region. The detection of small (<5 ha) to large mounds (>30 ha) suggests that there were continuous shifts in settlement location. These shifts are likely to reflect responses to a dynamic and changing hydrological network and the influence of the progressive northward advance of the desert in a long-term process that culminated in the abandonment of much of the settled area during the Late Harappan period.

<https://www.pnas.org/content/early/2020/07/17/2005583117.abstract?etoc>

#### **JIA YANG et al – General learning ability in perceptual learning**

Developing expertise in any field usually requires acquisition of a wide range of skills. Most current studies on perceptual learning have focused on a single task and concluded that learning is quite specific to the trained task, and the ubiquitous individual differences reflect random fluctuations across subjects. Whether there exists a general learning ability that determines individual learning performance across multiple tasks remains largely unknown. In a large-scale perceptual learning study with a wide range of training tasks, we found that initial performance, task, and individual differences all contributed significantly to the learning rates across the tasks. Most importantly, we were able to extract both a task-specific but subject-invariant component of learning, that accounted for 38.6% of the variance, and a subject-specific but task-invariant perceptual learning ability, that accounted for 36.8% of the variance. The existence of a general perceptual learning ability across multiple tasks suggests that individual differences in perceptual learning are not “noise”; rather, they reflect the variability of learning ability across individuals. These results could have important implications for selecting potential trainees in occupations that require perceptual expertise and designing better training protocols to improve the efficiency of clinical rehabilitation.

<https://www.pnas.org/content/early/2020/07/22/2002903117.abstract?etoc>

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## Science

### ARTICLES

#### **ANDREW CURRY – Tools suggest people reached Americas early**

At first glance, Chiquihuite Cave in Mexico's Zacatecas state is an unlikely place to find signs of early humans, let alone evidence that might change the story of the peopling of the Americas. It sits a daunting 1000 meters above a valley, overlooking a desert landscape in the mountains north of Zacatecas. Getting there requires a 4- or 5-hour uphill scramble over a moonscape of jagged boulders. But in the soil below the cave's floor, a team led by Autonomous University of Zacatecas, University City Siglo XXI, archaeologist Ciprian Ardelean dug up almost 2000 stone objects they think are tools. By combining state-of-the-art dating methods, the team found that the oldest were deposited 26,000 years ago—more than 10,000 years before any other known human occupation in the region. That was the height of the last ice age, when ice covered much of North America, and long before researchers thought the Americas were settled. But some other researchers remain skeptical, in part because they aren't convinced the artifacts are tools.

<https://science.sciencemag.org/content/369/6502/355>

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## Science Advances

### PAPERS

#### **SANDRA A. HELDSTAB ET AL WITH CAREL P. VAN SCHAIK – When ontogeny recapitulates phylogeny: fixed neurodevelopmental sequence of manipulative skills among primates**

Neural development is highly conserved across distantly related species of different brain sizes. Here, we show that the development of manipulative complexity is equally cumulative across 36 primate species and also that its ontogeny recapitulates phylogeny. Furthermore, larger-brained species reach their adult skill levels later than smaller-brained ones, largely because they start later with the simplest techniques. These findings demonstrate that these motor behaviors are not modular and that their slow development may constrain their evolution. Complex foraging techniques therefore critically require a slow life history with low mortality, which explains the limited taxonomic distribution of flexible tool use and the unique elaboration of human technology.

[https://advances.sciencemag.org/content/6/30/eabb4685?utm\\_campaign=toc\\_advances\\_2020-07-24&et rid=17774313&et cid=3420894](https://advances.sciencemag.org/content/6/30/eabb4685?utm_campaign=toc_advances_2020-07-24&et rid=17774313&et cid=3420894)

#### **LAURIANNE CABRERA & JUDIT GERVAIN – Speech perception at birth: the brain encodes fast and slow temporal information**

Speech perception is constrained by auditory processing. Although at birth infants have an immature auditory system and limited language experience, they show remarkable speech perception skills. To assess neonates' ability to process the complex acoustic cues of speech, we combined near-infrared spectroscopy (NIRS) and electroencephalography (EEG) to measure brain responses to syllables differing in consonants. The syllables were presented in three conditions preserving (i) original temporal modulations of speech [both amplitude modulation (AM) and frequency modulation (FM)], (ii) both fast and slow AM, but not FM, or (iii) only the slowest AM (<8 Hz). EEG responses indicate that neonates can encode consonants in all conditions, even without the fast temporal modulations, similarly to adults. Yet, the fast and slow AM activate different neural areas, as shown by NIRS. Thus, the immature human brain is already able to decompose the acoustic components of speech, laying the foundations of language learning.

[https://advances.sciencemag.org/content/6/30/eaba7830?utm\\_campaign=toc\\_advances\\_2020-07-24&et rid=17774313&et cid=3420894](https://advances.sciencemag.org/content/6/30/eaba7830?utm_campaign=toc_advances_2020-07-24&et rid=17774313&et cid=3420894)

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## Trends in Neurosciences

### PAPERS

#### **LYLE KINGSBURY & WEIZHE HONG – A Multi-Brain Framework for Social Interaction**

Social interaction can be seen as a dynamic feedback loop that couples action, reaction, and internal cognitive processes across individual agents. A fuller understanding of the social brain requires a description of how the neural dynamics across coupled brains are linked and how they coevolve over time. We elaborate a multi-brain framework that considers social interaction as an integrated network of neural systems that dynamically shape behavior, shared cognitive states, and social relationships. We describe key findings from multi-brain experiments in humans and animal models that shed new light on the function of social circuits in health and disease. Finally, we discuss recent progress in elucidating the cellular-level mechanisms underlying inter-brain neural dynamics and outline key areas for future research.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(20\)30150-8?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(20)30150-8?dgcid=raven_jbs_aip_email)

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