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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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## NEWS

### SAPIENS – The Human Genome Project and Neanderthals

The Human Genome Project first published the modern human genome 20 years ago, and the Neanderthal genome was sequenced a little more than a decade ago. What do these maps mean for our understanding of humanity?

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=83133f16f6&e=dc0eff6180>

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### SCIENCE DAILY – Neanderthals and Homo sapiens used identical Nubian technology

New analysis of a fossil tooth and stone tools from Shukbah Cave reveals Neanderthals used stone tool technologies thought to have been unique to modern humans.

<https://www.sciencedaily.com/releases/2021/02/210215092436.htm>

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### SCIENCE DAILY – Ancient relic points to a turning point in Earth's history 42,000 years ago

The temporary breakdown of Earth's magnetic field 42,000 years ago sparked major climate shifts that led to global environmental change and mass extinctions, a new international study shows.

<https://www.sciencedaily.com/releases/2021/02/210218142729.htm>

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## SCIENCE DAILY – Real-time dialogue with a dreaming person is possible

Dreams take us to what feels like a different reality. They also happen while we're fast asleep. So, you might not expect that a person in the midst of a vivid dream would be able to perceive questions and provide answers to them. But a new study shows that, in fact, they can.

<https://www.sciencedaily.com/releases/2021/02/210218114018.htm>

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## SCIENCE DAILY – How the brain processes sign language

Over 70 million deaf people use sign languages as their preferred communication form. Although they access similar brain structures as spoken languages, it hasn't been identified the brain regions that process both forms of language equally. Scientists have now discovered that Broca's area in the left hemisphere, central for spoken languages, is also crucial for sign languages. This is where the grammar and meaning are processed, regardless of whether it is spoken or signed language.

<https://www.sciencedaily.com/releases/2021/02/210219124236.htm>

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## SCIENCE NEWS – England's Stonehenge was erected in Wales first

Around 3200 B.C.E., Stone Age farmers in Wales's Preseli Hills built a great monument: They carved columns of unspotted dolerite, or bluestone, from a nearby quarry, then thrust them upright in a great circle aligned with the Sun. Exactly what the circle meant to them remains a mystery. But new research reveals that several centuries later, their descendants took down many of the giant stones and hauled them 200 kilometers to the Salisbury Plain, where they created what is still the world's most iconic prehistoric stone monument: Stonehenge.

<https://www.sciencemag.org/news/2021/02/england-s-stonehenge-was-erected-wales-first>

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## SCIENCE NEWS – Ancient kauri trees capture last collapse of Earth's magnetic field

Several years ago, workers breaking ground for a power plant in New Zealand unearthed a record of a lost time: a 60-ton trunk from a kauri tree, the largest tree species in New Zealand. The tree, which grew 42,000 years ago, was preserved in a bog and its rings spanned 1700 years, capturing a tumultuous time when the world was turned upside down—at least magnetically speaking.

<https://www.sciencemag.org/news/2021/02/ancient-kauri-trees-capture-last-collapse-earth-s-magnetic-field>

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## SOCIETY FOR SCIENCE – Stonehenge may have had roots in a Welsh stone circle

Ancient migrants to southern England brought the makings of the iconic monument with them, researchers suspect. {Hence the myth of Merlin transporting the stones from Ireland?}

<http://click.societyforscience->

[email.com/?qs=c7d9daciaa0f8441301b1807ccb6c7410c0714e0b5c178d204b15a6c89c648a79277ecad59023ce1b3d142fc454c5b0d2e92e5c8ec841c8f](mailto:email.com/?qs=c7d9daciaa0f8441301b1807ccb6c7410c0714e0b5c178d204b15a6c89c648a79277ecad59023ce1b3d142fc454c5b0d2e92e5c8ec841c8f)

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## THE CONVERSATION – Stonehenge first stood in Wales

A remarkable set of discoveries has confirmed that parts of Stonehenge first stood 140 miles away at Waun Mawn, west Wales.

<https://theconversation.com/stonehenge-first-stood-in-wales-how-archaeologists-proved-parts-of-the-5-000-year-old-stone-circle-were-imported-155315>

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## THE CONVERSATION – The science of 'mind-reading': our new test shows how well we understand others

Scientists have not properly distinguished mind-reading from empathy - until now.

<https://theconversationuk.cmail20.com/t/r-l-tlljtyld-khhilillah-c/>

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## THE CONVERSATION – Earth's magnetic field reset 42ky ago and caused massive sudden climate change

Scientists have uncovered evidence of a global paleoapocalypse.

<https://theconversationuk.cmail20.com/t/r-l-tlltiuy-khhilillah-m/>

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## OTHER NEWS – GUARDIAN – Another part of the Stonehenge mystery has been unearthed

If archaeology is a metaphor for the excavation of the psyche, a documentary about the 5,000-year-old enigma feels timely.

<https://www.theguardian.com/commentisfree/2021/feb/16/stonehenge-archaeology-documentary>

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## PUBLICATIONS

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### Current Biology

#### PAPERS

##### **AXEL BARLOW et al – Middle Pleistocene genome calibrates a revised evolutionary history of extinct cave bears**

Palaeogenomes provide the potential to study evolutionary processes in real time, but this potential is limited by our ability to recover genetic data over extended timescales. As a consequence, most studies so far have focused on samples of Late Pleistocene or Holocene age, which covers only a small part of the history of many clades and species. Here, we report the recovery of a low coverage palaeogenome from the petrous bone of a ~360,000 year old cave bear from Kudaro 1 cave in the Caucasus Mountains. Analysis of this genome alongside those of several Late Pleistocene cave bears reveals widespread mito-nuclear discordance in this group. Using the time interval between Middle and Late Pleistocene cave bear genomes, we directly estimate ursid nuclear and mitochondrial substitution rates to calibrate their respective phylogenies. This reveals post-divergence mitochondrial transfer as the dominant factor explaining their mito-nuclear discordance. Interestingly, these transfer events were not accompanied by large-scale nuclear introgression. However, we do detect additional instances of nuclear admixture among other cave bear lineages, and between cave bears and brown bears, which are not associated with mitochondrial exchange. Genomic data obtained from the Middle Pleistocene cave bear petrous bone has thus facilitated a revised evolutionary history of this extinct megafaunal group. Moreover, it suggests that petrous bones may provide a means of extending both the magnitude and time depth of palaeogenome retrieval over substantial portions of the evolutionary histories of many mammalian clades.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00138-X](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00138-X)

##### **KAREN R. KONKOLY et al – Real-time dialogue between experimenters and dreamers during REM sleep**

Dreams take us to a different reality, a hallucinatory world that feels as real as any waking experience. These often-bizarre episodes are emblematic of human sleep but have yet to be adequately explained. Retrospective dream reports are subject to distortion and forgetting, presenting a fundamental challenge for neuroscientific studies of dreaming. Here we show that individuals who are asleep and in the midst of a lucid dream (aware of the fact that they are currently dreaming) can perceive questions from an experimenter and provide answers using electrophysiological signals. We implemented our procedures for two-way communication during polysomnographically verified rapid-eye-movement (REM) sleep in 36 individuals. Some had minimal prior experience with lucid dreaming, others were frequent lucid dreamers, and one was a patient with narcolepsy who had frequent lucid dreams. During REM sleep, these individuals exhibited various capabilities, including performing veridical perceptual analysis of novel information, maintaining information in working memory, computing simple answers, and expressing volitional replies. Their responses included distinctive eye movements and selective facial muscle contractions, constituting correctly answered questions on 29 occasions across 6 of the individuals tested. These repeated observations of interactive dreaming, documented by four independent laboratory groups, demonstrate that phenomenological and cognitive characteristics of dreaming can be interrogated in real time. This relatively unexplored communication channel can enable a variety of practical applications and a new strategy for the empirical exploration of dreams.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00059-2](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00059-2)

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### Evolutionary Anthropology

#### PAPERS

##### **ELSPETH READY & MICHAEL HOLTON PRICE – Human behavioral ecology and niche construction**

We examine the relationship between niche construction theory (NCT) and human behavioral ecology (HBE), two branches of evolutionary science that are important sources of theory in archeology. We distinguish between formal models of niche construction as an evolutionary process, and uses of niche construction to refer to a kind of human behavior. Formal models from NCT examine how environmental modification can change the selection pressures that organisms face. In contrast, formal models from HBE predict behavior assuming people behave adaptively in their local setting, and can be used to predict when and why people engage in niche construction. We emphasize that HBE as a field is much broader than foraging theory and can incorporate social and cultural influences on decision-making. We demonstrate how these approaches can be formally incorporated in a multi-inheritance framework for evolutionary research, and argue that archeologists can best contribute to evolutionary theory by building and testing models that flexibly incorporate HBE and NCT elements.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21885>

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### Frontiers in Psychology

#### PAPERS

##### **ANNA M. BORGHI et al – Abstract Words as Social Tools: Which Necessary Evidence?**

Recent theories on abstract concepts and words (ACs), such as Words As social Tools (WAT) (Borghi et al., 2019b) and Language is an Embodied Neuroenhancement and Scaffold (LENS) (Dove, 2019) have underlined the crucial role of both sensorimotor experience and language for ACs representation and use [see Dove et al. (2020), for a comparison]. Here we focus on the WAT view. WAT highlights the role of language, sociality, and inner grounding (interoception, metacognition) for

ACs. Furthermore, WAT seeks to integrate a developmental perspective with approaches focusing on conceptual use and brain representation. We briefly illustrate evidence coming from both clinical and non-clinical populations and identify areas where additional evidence that ACs evoke linguistic, social, and interoceptive experience is still needed.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2020.613026/full>

### **BARBARA KAUP, NINA SCHERER & ROLF ULRICH – Associations Between Abstract Concepts: Investigating the Relationship Between Deictic Time and Valence**

The present study examines whether deictic time and valence are mentally associated, with a link between future and positive valence and a link between past and negative valence. We employed a novel paradigm, the two-choice-sentence-completion paradigm, to address this issue. Participants were presented with an initial sentence fragment that referred to an event that was either located in time (future or past) or of different valence (positive or negative). Participants chose between two completion phrases. When the given dimension in the initial fragment was time, the two completion phrase alternatives differed in valence (positive vs. negative). However, when the given dimension in the initial fragment was valence, the two completion phrase alternatives differed in time (future vs. past). As expected, participants chose completion phrases consistent with the proposed association between time and valence. Additional analyses involving individual differences concerning optimism/pessimism revealed that this association is particularly pronounced for people with an optimistic attitude.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.612720/full>

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## Human Nature

### PAPERS

### **KURT M. WILSON & BRIAN F. CODDING – The Marginal Utility of Inequality: A Global Examination across Ethnographic Societies**

Despite decades of research, we still lack a clear explanation for the emergence and persistence of inequality. Here we propose and evaluate a marginal utility of inequality hypothesis that nominates circumscription and environmental heterogeneity as independent, necessary conditions for the emergence of intragroup material inequality. After coupling the Standard Cross-Cultural Sample (SCCS) with newly generated data from remote sensing, we test predictions derived from this hypothesis using a multivariate generalized additive model that accounts for spatial and historical dependence as well as subsistence mode. Our analyses show that the probability a society will be stratified increases significantly as a function of proxies of environmental heterogeneity and environmental circumscription. This supports the hypothesis that increasing environmental heterogeneity and circumscription drives the emergence and persistence of inequality among documented societies across the globe. We demonstrate how environmental heterogeneity and circumscription produce situations that limit individuals' options so that some may find it in their best interest to give up some autonomy for material gain, while others may find it in their best interest to give up some material resources for another individual's time or deference. These results support the marginal utility of inequality framework and enable future explorations of the ecological conditions that facilitate the emergence of intragroup inequality through time and across the globe.

<https://link.springer.com/article/10.1007/s12110-020-09383-4>

### **KEVIN SMITH & PETER K. HATEMI – Are Moral Intuitions Heritable?**

Two prominent theoretical frameworks in moral psychology, Moral Foundations and Dual Process Theory, share a broad foundational assumption that individual differences in human morality are dispositional and in part due to genetic variation. The only published direct test of heritability, however, found little evidence of genetic influences on moral judgments using instrumentation approaches associated with Moral Foundations Theory. This raised questions about one of the core assumptions underpinning intuitionist theories of moral psychology. Here we examine the heritability of moral psychology using the moral dilemmas approach commonly used in Dual Process Theory research. Using such measures, we find consistent and significant evidence of heritability. These findings have important implications not only for understanding which measures do, or do not, tap into the genetically influenced aspects of moral decision-making, but in better establishing the utility and validity of different intuitionist theoretical frameworks and the source of why people differ in those frameworks.

<https://link.springer.com/article/10.1007/s12110-020-09380-7>

### **PHILIP H. CROWLEY – Self-Deception about Fecundity in Women: Modeling the Burley Hypothesis**

Concealed fecundity and extended female sexual receptivity have evolved in some primates, including humans, conferring advantages both within primarily monogamous relationships (e.g., benefits from paternity assurance) and from extrapair liaisons (e.g., better access to good genes). As humans evolved the intellectual capacity for decision-making, women became capable of altering their own fertility. In some circumstances, they may choose to ameliorate risks and responsibilities associated with pregnancy by reducing sexual motivation near the perceived most fecund time of their menstrual cycle. But three findings—a general inability of women to accurately recognize their own intervals of fecundity, high variability in ovulation timing, and unconscious transmission and reception of cues associated with fecundity—constitute a physiological and behavioral syndrome that can be considered self-deception. In this study, I develop a descriptive model to determine implications of the hypothesis that these features of female and male physiology and behavior have been shaped by natural

selection in response to female decision-making. My analysis shows that consensus motivation for coitus between partners influences both the importance of variable ovulation date and the probability of conception, under the influence of self-deception. It also identifies priorities for future empirical work.

<https://link.springer.com/article/10.1007/s12110-020-09384-3>

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## Language and Cognition

### PAPERS

#### **NIKLAS JOHANSSON, ANDREY ANIKIN & NIKOLAY ASEYEV – Color sound symbolism in natural languages**

This paper investigates the underlying cognitive processes of sound–color associations by connecting perceptual evidence from research on cross-modal correspondences to sound symbolic patterns in the words for colors in natural languages. Building upon earlier perceptual experiments, we hypothesized that sonorous and bright phonemes would be over-represented in the words for bright and saturated colors. This hypothesis was tested on eleven color words and related concepts (red–green, yellow–blue, black–white, gray, night–day, dark–light) from 245 language families. Textual data was transcribed into the International Phonetic Alphabet (IPA), and each phoneme was described acoustically using high-quality IPA recordings. These acoustic measurements were then correlated with the luminance and saturation of each color obtained from cross-linguistic color-naming data in the World Color Survey. As expected, vowels with high brightness and sonority ratings were over-represented in the words for colors with high luminance, while sonorous consonants were more common in the words for saturated colors. We discuss these results in relation to lexicalization patterns and the links between iconicity and perceptual cross-modal associations.

<https://www.cambridge.org/core/journals/language-and-cognition/article/color-sound-symbolism-in-natural-languages/537E325E594CFC227056D4FEA6BCD8E3>

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## Nature

### NEWS

#### **Neanderthal-like ‘mini-brains’ created in lab with CRISPR**

Organoids that contain an ancient version of a gene that influences brain development are smaller and bumpier than those with human genes.

<https://www.nature.com/articles/d41586-021-00388-2>

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### ARTICLES

#### **ANDREW F. G. BOURKE – The role and rule of relatedness in altruism**

Inclusive fitness theory shows that social partners must be related for altruism to evolve, yet some models suggest that relatedness is not needed. An analysis concludes that assumptions in those models build in a role for relatedness, after all.

<https://www.nature.com/articles/d41586-021-00210-z>

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## Nature Communications

### PAPERS

#### **MATHEW STEWART, W. CHRISTOPHER CARLETON & HUW S. GROUCUTT – Climate change, not human population growth, correlates with Late Quaternary megafauna declines in North America**

The disappearance of many North American megafauna at the end of the Pleistocene is a contentious topic. While the proposed causes for megafaunal extinction are varied, most researchers fall into three broad camps emphasizing human overhunting, climate change, or some combination of the two. Understanding the cause of megafaunal extinctions requires the analysis of through-time relationships between climate change and megafauna and human population dynamics. To do so, many researchers have used summed probability density functions (SPDFs) as a proxy for through-time fluctuations in human and megafauna population sizes. SPDFs, however, conflate process variation with the chronological uncertainty inherent in radiocarbon dates. Recently, a new Bayesian regression technique was developed that overcomes this problem—Radiocarbon-dated Event-Count (REC) Modelling. Here we employ REC models to test whether declines in North American megafauna species could be best explained by climate changes, increases in human population densities, or both, using the largest available database of megafauna and human radiocarbon dates. Our results suggest that there is currently no evidence for a persistent through-time relationship between human and megafauna population levels in North America. There is, however, evidence that decreases in global temperature correlated with megafauna population declines.

<https://www.nature.com/articles/s41467-021-21201-8>

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#### **YUANNING LI et al – Human cortical encoding of pitch in tonal and non-tonal languages**

Languages can use a common repertoire of vocal sounds to signify distinct meanings. In tonal languages, such as Mandarin Chinese, pitch contours of syllables distinguish one word from another, whereas in non-tonal languages, such as English, pitch is used to convey intonation. The neural computations underlying language specialization in speech perception are unknown. Here, we use a cross-linguistic approach to address this. Native Mandarin- and English- speaking participants each listened to both Mandarin and English speech, while neural activity was directly recorded from the non-primary auditory cortex. Both groups show language-general coding of speaker-invariant pitch at the single electrode level. At the electrode

population level, we find language-specific distribution of cortical tuning parameters in Mandarin speakers only, with enhanced sensitivity to Mandarin tone categories. Our results show that speech perception relies upon a shared cortical auditory feature processing mechanism, which may be tuned to the statistics of a given language.

<https://www.nature.com/articles/s41467-021-21430-x>

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## Nature Ecology & Evolution

### PAPERS

#### **P. KENNEDY et al with A. N. RADFORD – Diminishing returns drive altruists to help extended family**

Altruism between close relatives can be easily explained. However, paradoxes arise when organisms divert altruism towards more distantly related recipients. In some social insects, workers drift extensively between colonies and help raise less related foreign brood, seemingly reducing inclusive fitness. Since being highlighted by W. D. Hamilton, three hypotheses (bet hedging, indirect reciprocity and diminishing returns to cooperation) have been proposed for this surprising behaviour. Here, using inclusive fitness theory, we show that bet hedging and indirect reciprocity could only drive cooperative drifting under improbable conditions. However, diminishing returns to cooperation create a simple context in which sharing workers is adaptive. Using a longitudinal dataset comprising over a quarter of a million nest cell observations, we quantify cooperative payoffs in the Neotropical wasp *Polistes canadensis*, for which drifting occurs at high levels. As the worker-to-brood ratio rises in a worker's home colony, the predicted marginal benefit of a worker for expected colony productivity diminishes. Helping related colonies can allow effort to be focused on related brood that are more in need of care. Finally, we use simulations to show that cooperative drifting evolves under diminishing returns when dispersal is local, allowing altruists to focus their efforts on related recipients. Our results indicate the power of nonlinear fitness effects to shape social organization, and suggest that models of eusocial evolution should be extended to include neglected social interactions within colony networks.

<https://www.nature.com/articles/s41559-020-01382-z>

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## Nature Human Behaviour

### PAPERS

#### **AVIAD AGAM et al – Estimating temperatures of heated Lower Palaeolithic flint artefacts**

Production of stone artefacts using pyro-technology is known from the Middle and Upper Palaeolithic of Europe and the Levant, and the Middle Stone Age in Africa. However, determination of temperatures to which flint artefacts were exposed is impeded by the chemical and structural variability of flint. Here we combine Raman spectroscopy and machine learning to build temperature-estimation models to infer the degree of pyro-technological control effected by inhabitants of the late Lower Palaeolithic (Acheulo-Yabrudian) site of Qesem Cave, Israel. Temperature estimation shows that blades were heated at lower median temperatures (259 °C) compared to flakes (413 °C), whereas heat-induced structural flint damage (for example, pot-lids and microcracks) appears at 447 °C. These results are consistent with a differential behaviour for selective tool production that can be viewed as part of a plethora of innovative and adaptive behaviours of Levantine hominins >300,000 years ago.

<https://www.nature.com/articles/s41562-020-00955-z>

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## Nature Scientific Reports

### PAPERS

#### **ALESSIA NAVA et al – Multipronged dental analyses reveal dietary differences in last foragers and first farmers at Grotta Continenza, central Italy (15,500–7000 BP)**

This paper provides results from a suite of analyses made on human dental material from the Late Palaeolithic to Neolithic strata of the cave site of Grotta Continenza situated in the Fucino Basin of the Abruzzo region of central Italy. The available human remains from this site provide a unique possibility to study ways in which forager versus farmer lifeways affected human odonto-skeletal remains. The main aim of our study is to understand palaeodietary patterns and their changes over time as reflected in teeth. These analyses involve a review of metrics and oral pathologies, micro-fossils preserved in the mineralized dental plaque, macrowear, and buccal microwear. Our results suggest that these complementary approaches support the assumption about a critical change in dental conditions and status with the introduction of Neolithic foodstuff and habits. However, we warn that different methodologies applied here provide data at different scales of resolution for detecting such changes and a multipronged approach to the study of dental collections is needed for a more comprehensive and nuanced understanding of diachronic changes.

<https://www.nature.com/articles/s41598-021-82401-2>

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#### **JAMES BLINKHORN et al – Nubian Levallois technology associated with southernmost Neanderthals**

Neanderthals occurred widely across north Eurasian landscapes, but between ~ 70 and 50 thousand years ago (ka) they expanded southwards into the Levant, which had previously been inhabited by *Homo sapiens*. Palaeoanthropological research in the first half of the twentieth century demonstrated alternate occupations of the Levant by Neanderthal and *Homo sapiens* populations, yet key early findings have largely been overlooked in later studies. Here, we present the results of new examinations of both the fossil and archaeological collections from Shukbah Cave, located in the Palestinian West

Bank, presenting new quantitative analyses of a hominin lower first molar and associated stone tool assemblage. The hominin tooth shows clear Neanderthal affinities, making it the southernmost known fossil specimen of this population/species. The associated Middle Palaeolithic stone tool assemblage is dominated by Levallois reduction methods, including the presence of Nubian Levallois points and cores. This is the first direct association between Neanderthals and Nubian Levallois technology, demonstrating that this stone tool technology should not be considered an exclusive marker of *Homo sapiens*.

<https://www.nature.com/articles/s41598-021-82257-6>

### **JAMES P. HIGHAM et al – Female fertile phase synchrony, and male mating and reproductive skew, in the crested macaque**

High social status is the primary determinant of reproductive success among group-living male mammals. Primates living in multimale–multifemale groups show the greatest variation in the strength of this link, with marked variation in reproductive skew by male dominance among species, dependent on the degree of female fertile phase synchrony, and the number of competing males. Here, we present data on two groups of wild crested macaques (*Macaca nigra*), living in the Tangkoko Reserve, Sulawesi, Indonesia. We investigated male monopolization of fertile females in 31 cycles of 19 females, and genetic paternity of 14 offspring conceived during the study period. We show that female fertile phase synchrony was low, that females had few mating partners in their fertile phase, and that dominant males monopolized a high proportion of consortships and matings, resulting in marked and steep mating and reproductive skew. We conclude that female cycle asynchrony provides the opportunity for strong direct male–male competition in crested macaques, resulting in monopolization of females by dominant males, consistent with their marked sexual dimorphism. Our study provides a test of the underlying factors that determine the relative occurrence and strength of different mechanisms of sexual selection, and the phenotypes that evolve as a result.

<https://www.nature.com/articles/s41598-021-81163-1>

### **DANIEL GARCÍA-MARTÍNEZ, DAVID J. GREEN & JOSÉ MARÍA BERMÚDEZ DE CASTRO – Evolutionary development of the *Homo antecessor* scapulae (Gran Dolina site, Atapuerca) suggests a modern-like development for Lower Pleistocene *Homo***

Two well-preserved, subadult 800 ky scapulae from Gran Dolina belonging to *Homo antecessor*, provide a unique opportunity to investigate the ontogeny of shoulder morphology in Lower Pleistocene humans. We compared the *H. antecessor* scapulae with a sample of 98 *P. troglodytes* and 108 *H. sapiens* representatives covering seven growth stages, as well as with the DIK-1-1 (Dikika; *Australopithecus afarensis*), KNM-WT 15000 (Nariokotome; *H. ergaster*), and MH2 (Malapa; *A. sediba*) specimens. We quantified 15 landmarks on each scapula and performed geometric morphometric analyses. *H. sapiens* scapulae are mediolaterally broader with laterally oriented glenoid fossae relative to *Pan* and Dikika shoulder blades. Accordingly, *H. antecessor* scapulae shared more morphological affinities with modern humans, KNM-WT 15000, and even MH2. Both *H. antecessor* and modern *Homo* showed significantly more positive scapular growth trajectories than *Pan* (slopes: *P. troglodytes* = 0.0012; *H. sapiens* = 0.0018; *H. antecessor* = 0.0020). Similarities in ontogenetic trajectories between the *H. antecessor* and modern human data suggest that Lower Pleistocene hominin scapular development was already modern human-like. At the same time, several morphological features distinguish *H. antecessor* scapulae from modern humans along the entire trajectory. Future studies should include additional *Australopithecus* specimens for further comparative assessment of scapular growth trends.

<https://www.nature.com/articles/s41598-021-83039-w>

### **LISON MARTINET et al – New indices to characterize drawing behavior in humans (*Homo sapiens*) and chimpanzees (*Pan troglodytes*)**

Techniques used in cave art suggest that drawing skills emerged long before the oldest known representative human productions (44,000 years BC). This study seeks to improve our knowledge of the evolutionary origins and the ontogenetic development of drawing behavior by studying drawings of humans ( $N = 178$ , 3- to 10-year-old children and adults) and chimpanzees ( $N = 5$ ). Drawings were characterized with an innovative index based on spatial measures which provides the degree of efficiency for the lines that are drawn. Results showed that this index was lowest in chimpanzees, increased and reached its maximum between 5-year-old and 10-year-old children and decreased in adults, whose drawing efficiency was reduced by the addition of details. Drawings of chimpanzees are not random suggesting that their movements are constrained by cognitive or locomotor aspect and we cannot conclude to the absence of representativeness. We also used indices based on colors and time and asked children about what they drew. These indices can be considered relevant tools to improve our understanding of drawing development and evolution in hominids.

<https://www.nature.com/articles/s41598-021-83043-0>

### **KATHLEEN WERMKE, MICHAEL P. ROBB & PHILIP J. SCHLUTER – Melody complexity of infants' cry and non-cry vocalisations increases across the first six months**

In early infancy, melody provides the most salient prosodic element for language acquisition and there is huge evidence for infants' precocious aptitudes for musical and speech melody perception. Yet, a lack of knowledge remains with respect to melody patterns of infants' vocalisations. In a search for developmental regularities of cry and non-cry vocalisations and for

building blocks of prosody (intonation) over the first 6 months of life, more than 67,500 melodies (fundamental frequency contours) of 277 healthy infants from monolingual German families were quantitatively analysed. Based on objective criteria, vocalisations with well-identifiable melodies were grouped into those exhibiting a simple (single-arc) or complex (multiple-arc) melody pattern. Longitudinal analysis using fractional polynomial multi-level mixed effects logistic regression models were applied to these patterns. A significant age (but not sex) dependent developmental pattern towards more complexity was demonstrated in both vocalisation types over the observation period. The theoretical concept of melody development (MD-Model) contends that melody complexification is an important building block on the path towards language. Recognition of this developmental process will considerably improve not only our understanding of early preparatory processes for language acquisition, but most importantly also allow for the creation of clinically robust risk markers for developmental language disorders.

<https://www.nature.com/articles/s41598-021-83564-8>

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## New Scientist

### NEWS

#### **Chimpanzees seem to 'speak' in sentences of three or more calls**

Chimpanzees regularly string many different calls together into sequences, which are often three calls long and sometimes even longer. The finding suggests that the apes are more creative with their vocalisations than previously thought.

<https://www.newscientist.com/article/2267734-chimpanzees-seem-to-speak-in-sentences-of-three-or-more-calls/#ixzz6ms3Pyh9x>

#### **Stonehenge was built with bits of an older Welsh Stone Age monument**

The origins of Stonehenge have long been a mystery. Now new discoveries show that the iconic monument may have started as a stone circle in Wales that was then dismantled and rebuilt 280 kilometres away at its current location on Salisbury plain. This is the conclusion of a team of archaeologists who uncovered the remains of what appears to be Britain's third-largest stone circle, in the Preseli hills of west Wales.

<https://www.newscientist.com/article/2267537-stonehenge-was-built-with-bits-of-an-older-welsh-stone-age-monument/#ixzz6ms3jTDOr>

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## Research on Language and Social Interaction

### PAPERS

#### **TANYA STIVERS – Is Conversation Built for Two? The Partitioning of Social Interaction**

Conversation is flexible enough to be conducted with varying numbers of individuals, but most conversation is dyadic. Is the prevalence of dyadic focal participation frameworks facilitated by structures of conversation? Using video recordings of spontaneous naturally occurring conversations, I explore multiperson interactions focusing on how structures of turn taking, sequence organization, storytelling, and speaker gaze facilitate or inhibit the inclusion of multiple individuals in conversation. As I show, because our system favors dyadic participation through turn allocation and sequence organization, sustaining focal triadic or multiparty participation frameworks requires more interactional work than sustaining a dyadic focal participation framework. However, serially dyadic participation, which keeps dyads shifting, and story- and joke telling facilitate the participation of multiple individuals. Although conversational structures can be adapted to partition focal participation as dyadic or multiparty on a moment-by-moment basis, the structures generally facilitate dyadic focal participation. Data are in American English.

<https://www.tandfonline.com/doi/abs/10.1080/08351813.2020.1864158>

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## Science

### NEWS

#### **England's Stonehenge was erected in Wales first**

Around 3200 B.C.E., Stone Age farmers in Wales's Preseli Hills built a great monument: They carved columns of unspotted dolerite, or bluestone, from a nearby quarry, then thrust them upright in a great circle aligned with the Sun. Exactly what the circle meant to them remains a mystery. But new research reveals that several centuries later, their descendants took down many of the giant stones and hauled them 200 kilometers to the Salisbury Plain, where they created what is still the world's most iconic prehistoric stone monument: Stonehenge.

<https://www.sciencemag.org/news/2021/02/england-s-stonehenge-was-erected-wales-first>

#### **Kauri trees mark magnetic flip 42,000 years ago**

Several years ago, workers breaking ground for a power plant in New Zealand unearthed a record of a lost time: a 60-ton trunk from a kauri tree, the largest tree species in New Zealand. The tree, which grew 42,000 years ago, was preserved in a bog and its rings spanned 1700 years, capturing a tumultuous time when the world was turned upside down—at least magnetically speaking.

<https://science.sciencemag.org/content/371/6531/766>

## ARTICLES

### H. JESSE SMITH – Reversing the field

Do terrestrial geomagnetic field reversals have an effect on Earth's climate? Cooper et al. created a precisely dated radiocarbon record around the time of the Laschamps geomagnetic reversal about 41,000 years ago from the rings of New Zealand swamp kauri trees. This record reveals a substantial increase in the carbon-14 content of the atmosphere culminating during the period of weakening magnetic field strength preceding the polarity switch. The authors modeled the consequences of this event and concluded that the geomagnetic field minimum caused substantial changes in atmospheric ozone concentration that drove synchronous global climate and environmental shifts.

<https://science.sciencemag.org/content/371/6531/793.8>

## PAPERS

### ALAN COOPER et al – A global environmental crisis 42,000 years ago

Geological archives record multiple reversals of Earth's magnetic poles, but the global impacts of these events, if any, remain unclear. Uncertain radiocarbon calibration has limited investigation of the potential effects of the last major magnetic inversion, known as the Laschamps Excursion [41 to 42 thousand years ago (ka)]. We use ancient New Zealand kauri trees (*Agathis australis*) to develop a detailed record of atmospheric radiocarbon levels across the Laschamps excursion. We precisely characterize the geomagnetic reversal and perform global chemistry-climate modeling and detailed radiocarbon dating of paleoenvironmental records to investigate impacts. We find that geomagnetic field minima ~42 ka, in combination with grand solar minima, caused substantial changes in atmospheric ozone concentration and circulation, driving synchronous global climate shifts that caused major environmental changes, extinction events, and transformations in the archaeological record.

<https://science.sciencemag.org/content/371/6531/811>

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## Trends in Neurosciences

### PAPERS

#### GINA F. HUMPHREYS, MATTHEW A. LAMBON RALPH & JON S. SIMONS – A Unifying Account of Angular Gyrus Contributions to Episodic and Semantic Cognition

The angular gyrus (AG) region of lateral parietal cortex has been implicated in a wide variety of tasks and functions, generating numerous influential theories. However, these theories largely fail to explain why so many apparently distinct cognitive activities implicate common parietal structures. We propose a unifying model, based on a set of central principles, to account for coalescences of cognitive task activations across AG. To illustrate the proposed framework, we show how these principles account for findings from studies of episodic and semantic memory that have independently implicated the same AG regions but thus far been considered from largely domain-specific perspectives. We conclude that AG computations, as part of a wider lateral parietal system, enable the online dynamic buffering of multisensory spatiotemporally extended representations.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(21\)00019-9?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(21)00019-9?dgcid=raven_jbs_aip_email)

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