

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
ACADEMIA.EDU – Structural continuity and technological change in Lower Pleistocene toolkits.....	2
EUDALD CARBONELL et al – Structural continuity and technological change in Lower Pleistocene toolkits.....	2
ACADEMIA.EDU – Hominin occupations at the Dmanisi site, Georgia, Southern Caucasus.....	2
ANA MGELADZE et al with DAVID LORDKIPANIDZE – Hominin occupations at the Dmanisi site, Georgia, Southern Caucasus: Raw materials and technical behaviours of Europe’s first hominins.....	2
NEWS	3
SCIENCE DAILY – Denisovans or Homo sapiens: Who were the first to permanently settle Tibetan Plateau?.....	3
SCIENCE DAILY – New phenomenon: Forest mammals eavesdrop on messy monkeys.....	3
SCIENCE DAILY – Speaking 'baby talk' to infants could help them learn to make words.....	3
PUBLICATIONS	3
American Scientist.....	3
ARTICLES	3
DANIEL T. KSEPKA – Bird Brain Evolution.....	3
eLife.....	3
PAPERS	3
EMANUELA CRISTIANI et al – Wild cereal grain consumption among Early Holocene foragers of the Balkans predates the arrival of agriculture.....	3
Frontiers in Communication.....	3
PAPERS	3
DIETER JAEGER & LOBSANG GONPO – Self, Free Will and Compassion: Shared Constructs in Neuroscience and Buddhism.....	3
Frontiers in Ecology and Evolution.....	4
PAPERS	4
PETER SCHAUSBERGER, SHUICHI YANO & YUKIE SATO – Cooperative Behaviors in Group-Living Spider Mites.....	4
Language Sciences.....	4
PAPERS	4
CARLOS I. ECHEVERRÍA – On the inertia of linguistic ideas: Revisiting the dichotomy between closed and open classes.....	4
Nature Africa.....	4
NEWS	4
Ancient human relative walked like a human, but climbed like an ape.....	4
Nature Scientific Reports.....	4
PAPERS	4
MOHAMMAD SALAHSHOUR – Evolution of cooperation and consistent personalities in public goods games.....	4
New Scientist.....	5
NEWS	5
Fossil footprints hint at mystery hominin with unusual walking style.....	5
Humans have been relatively short for thousands of years.....	5
Risso’s dolphins have invented rapid spin-dive technique for hunting.....	5
ARTICLES	5
STEVEN PINKER – Why humans aren’t as irrational as they seem.....	5
NPJ Science of Learning.....	5
PAPERS	5
SOLANGE DENERVAUD et al – Education shapes the structure of semantic memory and impacts creative thinking.....	5
PNAS.....	5
PAPERS	5
FRANCIS MOLLICA et al – The forms and meanings of grammatical markers support efficient communication.....	5
GEN SUWA et al – Canine sexual dimorphism in <i>Ardipithecus ramidus</i> was nearly human-like.....	5
Proceedings of the Royal Society B.....	6
PAPERS	6
BRIAN A. LERCH et al – Better baboon break-ups: collective decision theory of complex social network fissions.....	6
Scientific American special edition – The Age of Humans.....	6
ARTICLES	6
KATE WONG – The Origin of Us.....	6

CHET C. SHERWOOD – Are We Wired Differently?.....	6
BRIAN HARE & VANESSA WOODS – Survival of the friendliest.....	6
JOHN HAWKS – Still Evolving (after all these years).....	6
The Innovation.....	6
PAPERS.....	6
XIJUN NI et al with CHRIS STRINGER – Massive cranium from Harbin in northeastern China establishes a new Middle Pleistocene human lineage	6
SUBSCRIBE to the EAORC Bulletin	7
UNSUBSCRIBE from the EAORC Bulletin	7
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	7

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.

ACADEMIA.EDU – Structural continuity and technological change in Lower Pleistocene toolkits

In Quaternary International 393, 6-18 (2016).

EUDALD CARBONELL et al – Structural continuity and technological change in Lower Pleistocene toolkits

A structural foundation has recently been laid down to describe early stone industries using a four-phase evolutionary sequence: Homogeneity, Variability, Diversity, and Multiplicity. Homogeneity refers to a hypothetical phase predating the earliest recognizable industries (>2.6 Ma) during which stones could have been used for pounding or throwing but controlled knapping was not practiced. The Variability phase, already explored in previous publications, refers to a subsequent stage wherein simple knapping strategies were discovered and tested. It precedes the innovation of shaped tools in Africa and Eurasia within largely divergent timeframes. This paper explores the Diversity phase, during which standardized shaped tools and relatively complex flake production strategies occurred. Presently, flake-core assemblages lacking configured tools are referred to as ‘Oldowan’ or ‘Mode 1’ and those with handaxes and/or cleavers are named ‘Acheulian’ or ‘Mode 2’. The model described here does not propose to replace existing terminology, but presents an alternative approach to the ways in which we perceive of technological change and explores why analogous techno-typological changes occurred diachronically in different areas of the globe where contact between populations was unlikely. The Diversity phase, characterized by techno-typological expansion in stone toolkit components, translates improved hominin capacities to access resources, compete with other carnivores and widen their range of activities. This process intensified exchange between an increasingly complex lifestyles and growing cognitive capacities, leading to Multiplicity; the final phase of this conceptual model for understanding change in early human technologies.

[https://www.academia.edu/12662908/Structural continuity and technological change in Lower Pleistocene toolkits](https://www.academia.edu/12662908/Structural_continuity_and_technological_change_in_Lower_Pleistocene_toolkits)

ACADEMIA.EDU – Hominin occupations at the Dmanisi site, Georgia, Southern Caucasus

In Journal of Human Evolution 60:5, 571-596 (2011).

ANA MGELADZE et al with DAVID LORDKIPANIDZE – Hominin occupations at the Dmanisi site, Georgia, Southern Caucasus: Raw materials and technical behaviours of Europe’s first hominins

Dmanisi is the oldest site outside of Africa that records unquestioned hominin occupations as well as the dispersal of hominins in Europe and Asia. The site has yielded large numbers of artefacts from several periods of hominin occupation. This analysis of Dmanisi stone tool technology includes a review of all the pieces recovered during the last 15 years of excavations. This lithic assemblage gives insights into the hominin behaviour at 1.7-1.8 Ma in Eurasia. Dmanisi hominins exploited local rocks derived from either nearby riverbeds or outcrops, and petrographic study provides data on patterns of stone procurement. Recent geological surveys and technological studies of the artefacts illustrate the roles of hominins in composing the assemblage. Dmanisi hominins selected two types of blanks, including cobbles and angular blocks, of basalt, andesite, and tuffs. Many complete cobbles, pebbles, and rolled blocks in basalt were unmodified, and geological analyses and surveys indicate that hominins brought manuports back to the site, suggesting a complex procurement strategy. Cores, flakes and debris show that all stages of flaking activity took place at the site. Numerous unifacial cores suggest that knapping was not very elaborate. Centripetal knapping is observed on some flake-cores. Knapping was influenced by the blank shape and natural angles. Most flaked objects were either cores or chopper-cores. Flakes predominate while flake tools are rare. The Dmanisi lithic assemblage is comparable to Oldowan sites in Africa in terms of reduction sequence, organisation of the removals, platform types, and the lack of retouched flakes. Dmanisi artefacts and may have been produced by the original hominins in Europe and Asia.

<https://www.sciencedirect.com/science/article/abs/pii/S0047248410002411>

NEWS

SCIENCE DAILY – Denisovans or Homo sapiens: Who were the first to permanently settle Tibetan Plateau?

A new paper by archaeologists at the University of California, Davis, highlights that our extinct cousins, the Denisovans, reached the "roof of the world" about 160,000 years ago -- 120,000 years earlier than previous estimates for our species -- and even contributed to our adaptation to high altitude.

<https://www.sciencedaily.com/releases/2021/12/211207152519.htm>

SCIENCE DAILY – New phenomenon: Forest mammals eavesdrop on messy monkeys

Researchers have discovered a unique phenomenon among forest mammals -- eavesdropping. Their study demonstrates that various animal species depend on one another in more ways than ever imagined when it comes to finding food.

Consequently, one species' disappearance from a habitat can have major consequences.

<https://www.sciencedaily.com/releases/2021/12/211210103118.htm>

SCIENCE DAILY – Speaking 'baby talk' to infants could help them learn to make words

By mimicking the sound of a smaller vocal tract, adults may be cluing babies in to how the words should sound coming out of their own mouths.

<https://www.sciencedaily.com/releases/2021/12/211210121848.htm>

PUBLICATIONS

American Scientist

ARTICLES

DANIEL T. KSEPKA – Bird Brain Evolution

Avian smarts run the gamut from ostriches to crows. Why do large brains and high intelligence emerge in some lineages?

<https://www.americanscientist.org/article/bird-brain-evolution>

eLife

PAPERS

EMANUELA CRISTIANI et al – Wild cereal grain consumption among Early Holocene foragers of the Balkans predates the arrival of agriculture

Forager focus on wild cereal plants has been documented in the core zone of domestication in southwestern Asia, while evidence for forager use of wild grass grains remains sporadic elsewhere. In this paper, we present starch grain and phytolith analyses of dental calculus from 60 Mesolithic and Early Neolithic individuals from five sites in the Danube Gorges of the central Balkans. This zone was inhabited by likely complex Holocene foragers for several millennia before the appearance of the first farmers ~6200 cal BC. We also analyzed forager ground stone tools for evidence of plant processing. Our results based on the study of dental calculus show that certain species of Poaceae (species of the genus *Aegilops*) were used since the Early Mesolithic, while ground stone tools exhibit traces of a developed grass grain processing technology. The adoption of domesticated plants in this region after ~6500 cal BC might have been eased by the existing familiarity with wild cereals.

<https://elifesciences.org/articles/72976>

Frontiers in Communication

PAPERS

DIETER JAEGER & LOBSANG GONPO – Self, Free Will and Compassion: Shared Constructs in Neuroscience and Buddhism

The authors, a neuroscientist and a Buddhist monastic who met through the Emory Tibet Science Initiative, highlight similarities in the understanding of mental activities found in both traditions. An important principle discovered is the parallel processing of multiple mental activities, which reveals the existence of a unitary self and free will as illusions. These insights provide the rationale in Buddhism to develop a culture of compassion. Meanwhile western psychology and neuroscience have found brain circuits that have evolved to support social and even altruistic behaviors, giving compassion a physical basis in our brains as well. These insights then set the stage for a shared interest in an altruistic compassionate society.

{And yet there remains an important divide between Buddhism and Neuroscience: Neuroscience is, at most, agnostic about evidence for the existence of selfhood without physical instantiation.}

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.727860/full>

Frontiers in Ecology and Evolution

PAPERS

PETER SCHAUSBERGER, SHUICHI YANO & YUKIE SATO – Cooperative Behaviors In Group-Living Spider Mites

Cooperative behaviors are evolutionary stable if the direct and/or indirect fitness benefits exceed the costs of helping. Here we discuss cooperation and behaviors akin to cooperation in subsocial group-living species of two genera of herbivorous spider mites (Tetranychidae), i.e., the largely polyphagous *Tetranychus* spp. and the nest-building *Stigmaeopsis* spp., which are specialized on grasses, such as bamboo. These spider mites are distributed in patches on various spatial scales, that is, within and among leaves of individual host plants and among individual hosts of single or multiple plant species. Group-living of spider mites is brought about by plant-colonizing foundresses ovipositing at local feeding sites and natal site fidelity, and by multiple individuals aggregating in the same site in response to direct and/or indirect cues, many of which are associated with webbing. In the case of the former, emerging patches are often composed of genetically closely related individuals, while in the case of the latter, local patches may consist of kin of various degrees and/or non-kin and even heterospecific spider mites. We describe and discuss ultimate and proximate aspects of cooperation by spider mites in host plant colonization and exploitation, dispersal, anti-predator behavior, and nesting-associated behaviors and conclude with theoretical and practical considerations of future research on cooperation in these highly rewarding model animals.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.745036/full>

Language Sciences

PAPERS

CARLOS I. ECHEVERRÍA – On the inertia of linguistic ideas: Revisiting the dichotomy between closed and open classes

This article revisits the long-standing linguistic dichotomy between closed and open classes. It is shown that the dichotomy is related to a number of difficulties and problems and must be reformulated in light of several distinctions, though even in its coherent formulation it remains of little scientific value. Specifically, three main points are made in this regard. First, a sharp distinction between closed and open linguistic classes can be drawn only on the basis of whether class expansion is possible without altering the basic structure of the functional language system, even if changes would necessarily occur at the level of the language norm. Second, even so understood, the distinction becomes irrelevant once a functional and structural point of view is adopted, since such a point of view can only lead to closed classes. Third, despite claims to the contrary, the distinction is of no use for differentiating lexis from the other structural levels of a language, as a strictly functional and structural treatment of this domain leads to closed paradigmatic structures analogous to those found in morphosyntax and phonology.

<https://www.sciencedirect.com/science/article/pii/S0388000121000929>

Nature Africa

NEWS

Ancient human relative walked like a human, but climbed like an ape

New South African fossil find completes hominid spine of *Australopithecus sediba*.

<https://www.nature.com/articles/d44148-021-00117-x>

Nature Scientific Reports

PAPERS

MOHAMMAD SALAHSHOUR – Evolution of cooperation and consistent personalities in public goods games

The evolution of cooperation has remained an important problem in evolutionary theory and social sciences. In this regard, a curious question is why consistent cooperative and defective personalities exist and if they serve a role in the evolution of cooperation? To shed light on these questions, here, I consider a population of individuals who possibly play two consecutive rounds of public goods game, with different enhancement factors. Importantly, individuals have independent strategies in the two rounds. However, their strategy in the first round affects the game they play in the second round. I consider two different scenarios where either only first-round cooperators play a second public goods game, or both first-round cooperators and first-round defectors play a second public goods game, but in different groups. The first scenario can be considered a reward dilemma, and the second can be considered an assortative public goods game but with independent strategies of the individuals in the two rounds. Both models show cooperators can survive either in a fixed point or through different periodic orbits. Interestingly, due to the emergence of a correlation between the strategies of the individuals in the two rounds, individuals develop consistent personalities during the evolution. This, in turn, helps cooperation to flourish. These findings shed new light on the evolution of cooperation and show how consistent cooperative and defective personalities can evolve and play a positive role in solving social dilemmas.

<https://www.nature.com/articles/s41598-021-03045-w>

New Scientist

NEWS

Fossil footprints hint at mystery hominin with unusual walking style

A set of 3.7-million-year-old footprints were initially thought to have been left by a bear walking upright, but have now been reinterpreted as the prints of an unidentified hominin that walked a little bit like a modern catwalk fashion model.

<https://www.newscientist.com/article/2299611-fossil-footprints-hint-at-mystery-hominin-with-unusual-walking-style/#ixzz7Ee98rEwo>

Humans have been relatively short for thousands of years

Until around 150 years ago, humans were relatively short – but our recent growth spurt may have more to do with social factors than dietary ones.

<https://www.newscientist.com/article/2299658-humans-have-been-relatively-short-for-thousands-of-years/#ixzz7Ee9l7bSR>

Risso's dolphins have invented rapid spin-dive technique for hunting

A species of dolphin that hunts prey living 600 metres below the surface spins its body as it dives so it can drill down through the water rapidly.

<https://www.newscientist.com/article/2299407-rissos-dolphins-have-invented-rapid-spin-dive-technique-for-hunting/#ixzz7Ee9qG4Wg>

ARTICLES

STEVEN PINKER – Why humans aren't as irrational as they seem

To explain the paradox of a smart species that embraces fake news, conspiracy theories and paranormal woo, we need to rethink rationality, says psychologist Steven Pinker.

<https://www.newscientist.com/article/mg25233643-600-steven-pinker-interview-why-humans-arent-as-irrational-as-they-seem/#ixzz7EeAEyCkI>

NPJ Science of Learning

PAPERS

SOLANGE DENERVAUD et al – Education shapes the structure of semantic memory and impacts creative thinking

Education is central to the acquisition of knowledge, such as when children learn new concepts. It is unknown, however, whether educational differences impact not only what concepts children learn, but how those concepts come to be represented in semantic memory—a system that supports higher cognitive functions, such as creative thinking. Here we leverage computational network science tools to study hidden knowledge structures of 67 Swiss schoolchildren from two distinct educational backgrounds—Montessori and traditional, matched on socioeconomic factors and nonverbal intelligence—to examine how educational experience shape semantic memory and creative thinking. We find that children experiencing Montessori education show a more flexible semantic network structure (high connectivity/short paths between concepts, less modularity) alongside higher scores on creative thinking tests. The findings indicate that education impacts how children represent concepts in semantic memory and suggest that different educational experiences can affect higher cognitive functions, including creative thinking.

<https://www.nature.com/articles/s41539-021-00113-8>

PNAS

PAPERS

FRANCIS MOLLICA et al – The forms and meanings of grammatical markers support efficient communication

Functionalist accounts of language suggest that forms are paired with meanings in ways that support efficient communication. Previous work on grammatical marking suggests that word forms have lengths that enable efficient production, and work on the semantic typology of the lexicon suggests that word meanings represent efficient partitions of semantic space. Here we establish a theoretical link between these two lines of work and present an information-theoretic analysis that captures how communicative pressures influence both form and meaning. We apply our approach to the grammatical features of number, tense, and evidentiality and show that the approach explains both which systems of feature values are attested across languages and the relative lengths of the forms for those feature values. Our approach shows that general information-theoretic principles can capture variation in both form and meaning across languages.

<https://www.pnas.org/content/118/49/e2025993118.abstract>

GEN SUWA et al – Canine sexual dimorphism in *Ardipithecus ramidus* was nearly human-like

Body and canine size dimorphism in fossils inform sociobehavioral hypotheses on human evolution and have been of interest since Darwin's famous reflections on the subject. Here, we assemble a large dataset of fossil canines of the human clade, including all available *Ardipithecus ramidus* fossils recovered from the Middle Awash and Gona research areas in Ethiopia, and systematically examine canine dimorphism through evolutionary time. In particular, we apply a Bayesian probabilistic

method that reduces bias when estimating weak and moderate levels of dimorphism. Our results show that *Ar. ramidus* canine dimorphism was significantly weaker than in the bonobo, the least dimorphic and behaviorally least aggressive among extant great apes. Average male-to-female size ratios of the canine in *Ar. ramidus* are estimated as 1.06 and 1.13 in the upper and lower canines, respectively, within modern human population ranges of variation. The slightly greater magnitude of canine size dimorphism in the lower than in the upper canines of *Ar. ramidus* appears to be shared with early *Australopithecus*, suggesting that male canine reduction was initially more advanced in the behaviorally important upper canine. The available fossil evidence suggests a drastic size reduction of the male canine prior to *Ar. ramidus* and the earliest known members of the human clade, with little change in canine dimorphism levels thereafter. This evolutionary pattern indicates a profound behavioral shift associated with comparatively weak levels of male aggression early in human evolution, a pattern that was subsequently shared by *Australopithecus* and *Homo*.

<https://www.pnas.org/content/118/49/e2116630118.abstract>

Proceedings of the Royal Society B

PAPERS

BRIAN A. LERCH et al – Better baboon break-ups: collective decision theory of complex social network fissions

Many social groups are made up of complex social networks in which each individual associates with a distinct subset of its groupmates. If social groups become larger over time, competition often leads to a permanent group fission. During such fissions, complex social networks present a collective decision problem and a multidimensional optimization problem: it is advantageous for each individual to remain with their closest allies after a fission, but impossible for every individual to do so. Here, we develop computational algorithms designed to simulate group fissions in a network-theoretic framework. We focus on three fission algorithms (democracy, community and despotism) that fall on a spectrum from a democratic to a dictatorial collective decision. We parameterize our social networks with data from wild baboons (*Papio cynocephalus*) and compare our simulated fissions with actual baboon fission events. We find that the democracy and community algorithms (egalitarian decisions where each individual influences the outcome) better maintain social networks during simulated fissions than despotic decisions (driven primarily by a single individual). We also find that egalitarian decisions are better at predicting the observed individual-level outcomes of observed fissions, although the observed fissions often disturbed their social networks more than the simulated egalitarian fissions.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.2060>

Scientific American special edition – The Age of Humans

ARTICLES

KATE WONG – The Origin of Us

Fossils and DNA have revealed the complexity of human evolution. Darwin would be delighted.

CHET C. SHERWOOD – Are We Wired Differently?

Parts of the brain involved in language and cognition have enlarged greatly over an evolutionary timescale.

BRIAN HARE & VANESSA WOODS – Survival of the friendliest

Natural selection for hypersocial traits enables Earth's apex species to best Neandertals and other competitors.

JOHN HAWKS – Still Evolving (after all these years)

For 30,000 years our species has been changing remarkably quickly, and we're not done yet.

<https://www.scientificamerican.com/magazine/special-editions/2021/special-editions-volume-30-issue-4s/>

The Innovation

PAPERS

XIJUN NI et al with CHRIS STRINGER – Massive cranium from Harbin in northeastern China establishes a new Middle Pleistocene human lineage

It has recently become clear that several human lineages coexisted with *Homo sapiens* during the late Middle and Late Pleistocene. Here, we report an archaic human fossil that throws new light on debates concerning the diversification of the *Homo* genus and the origin of *H. sapiens*. The fossil was recovered in Harbin city in northeastern China, with a minimum uranium-series age of 146 ka. This cranium is one of the best preserved Middle Pleistocene human fossils. Its massive size, with a large cranial capacity (~1,420 mL) falling in the range of modern humans, is combined with a mosaic of primitive and derived characters. It differs from all the other named *Homo* species by presenting a combination of features, such as long and low cranial vault, a wide and low face, large and almost square orbits, gently curved but massively developed supraorbital torus, flat and low cheekbones with a shallow canine fossa, and a shallow palate with thick alveolar bone supporting very large molars. The excellent preservation of the Harbin cranium advances our understanding of several less-complete late Middle Pleistocene fossils from China, which have been interpreted as local evolutionary intermediates between the earlier species *Homo erectus* and later *H. sapiens*. Phylogenetic analyses based on parsimony criteria and

Bayesian tip-dating suggest that the Harbin cranium and some other Middle Pleistocene human fossils from China, such as those from Dali and Xiahe, form a third East Asian lineage, which is a part of the sister group of the H. sapiens lineage. Our analyses of such morphologically distinctive archaic human lineages from Asia, Europe, and Africa suggest that the diversification of the Homo genus may have had a much deeper timescale than previously presumed. Sympatric isolation of small populations combined with stochastic long-distance dispersals is the best fitting biogeographical model for interpreting the evolution of the Homo genus.

[https://www.cell.com/the-innovation/fulltext/S2666-6758\(21\)00055-2](https://www.cell.com/the-innovation/fulltext/S2666-6758(21)00055-2)

SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

UNSUBSCRIBE from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.

EAORC website information is at <http://martinedwardes.me.uk/eaorc/>

If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.