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References

Aktuell

Bergquist 2017

Bridget A. Bergquist, *Mercury, volcanism, and mass extinctions*. PNAS **114** (2017), 8675–8677.

Curtis 2017

David S. Curtis, Thomas E. Fuller-Rowell, Mona El-Sheikh, Mercedes R. Carnethon & Carol D. Ryff, *Habitual sleep as a contributor to racial differences in cardiometabolic risk*. PNAS **114** (2017), 8889–8894.

Insufficient and disrupted sleep is linked with cardiovascular and metabolic dysregulation and morbidity. The current study examines the degree to which differences in sleep between black/ African American (AA) and white/European American (EA) adults explain racial differences in cardiometabolic (CMB) disease risk. Total sleep time and sleep efficiency (percent of time in bed asleep) were assessed via seven nights of wrist actigraphy among 426 participants in the Midlife in the United States Study (31 % AA; 69 % EA; 61 % female; mean age = 56.8 y). CMB risk was indexed as a composite of seven biomarkers [blood pressure, waist circumference, hemoglobin A1c (HbA1c), insulin resistance, triglycerides, HDL cholesterol (HDL-C), and C-reactive protein]. Covariates included sociodemographic characteristics and relevant health behaviors. Results indicated that AAs relative to EAs obtained less sleep (341 vs. 381 min) and had lower sleep efficiency (72.3 vs. 82.2 %) (P values < 0.001). Further, 41 % and 58 % of the racial difference in CMB risk was explained by sleep time and sleep efficiency, respectively. In models stratified by sex, race was indirectly associated with CMB risk via sleep time and efficiency only among females (explaining 33 % and 65 % of the race difference, respectively). Indirect effects were robust to alternative model specifications that excluded participants with diabetes or heart disease. Consideration of sleep determinants and sleep health is therefore needed in efforts to reduce racial differences in CMB disease.

Keywords: health disparities | race | sleep | cardiometabolic disease | health behaviors

Significance: Large differences in cardiovascular disease and diabetes prevalence exist between African American and European American adults. The US federal government has committed to reducing racial disparities in health; however, the precise mechanisms are not well understood. Sleep is one potential behavioral explanation for current racial differences in cardiometabolic conditions. We show that more than one-half of racial differences in cardiometabolic risk can be explained by sleep patterns—namely, less total sleep and lower sleep efficiency among African American than European American adults. Sleep is a malleable health behavior that is linked with characteristics of the social and physical environment and could be an effective target in national efforts to reduce racial health disparities.

Eloy de Amorim 2017

Mariana Eloy de Amorim et al., *Lizards on newly created islands independently and rapidly adapt in morphology and diet*. PNAS **114** (2017), 8812–8816.

Mariana Eloy de Amorim, Thomas W. Schoener, Guilherme Ramalho Chagas Cataldi Santoro, Anna Carolina Ramalho Lins, Jonah Piovia-Scott & Reuber Albuquerque Brandão

Rapid adaptive changes can result from the drastic alterations humans impose on ecosystems. For example, flooding large areas for hydroelectric dams converts mountaintops into islands and leaves surviving populations in a new environment. We report differences in morphology and diet of the termite-eating gecko Gymnodactylus amarali between five such newly created islands and five nearby mainland sites located in the Brazilian Cerrado, a biodiversity hotspot. Mean prey size and dietary prey-size breadth were larger on islands than mainlands, expected because four larger lizard species that also consume termites, but presumably prefer larger prey, went extinct on the islands. In addition, island populations had larger heads relative to their body length than mainland populations; larger heads are more suited to the larger prey taken, and disproportionately larger heads allow that functional advantage without an increase in energetic requirements resulting from larger body size. Parallel morphological evolution is strongly suggested, because there are indications that, before flooding, relative head size did not differ between future island and future mainland sites. Females and males showed the same trend of relatively larger heads on islands, so the difference between island and mainland sites is unlikely to be due to greater male–male competition for mates on islands. We thus discovered a very fast (at most 15 y) case of independent parallel adaptive change in response to catastrophic human disturbance.

Keywords: rapid character change | islands | dietary shift | Brazilian Cerrado | lizards

Significance: We report for island populations of the termite-eating common gecko species Gymnodactylus amarali rapid parallel morphological and ecological change in response to human-caused environmental disturbance. The islands were formerly part of an extensive terrestrial ecosystem; in 1997, the area was flooded to construct a reservoir, fragmenting the higher portions into separate islands. Populations on all five islands studied have proportionally larger heads than populations at five nearby mainland sites. The new island morphology is accompanied by an increase in dietary niche breadth, mainly via expansion toward larger prey. This expansion is likely due to the greater availability of such prey on the newly formed islands after the extinction there of four larger lizard species that typically also included termites in their diets.

Farr 2013

Rachel H. Farr & Charlotte J. Patterson, *Coparenting Among Lesbian, Gay, and Heterosexual Couples, Associations With Adopted Children's Outcomes*. Child Development **84** (2013), 1226–1240.

Coparenting is associated with child behavior in families with heterosexual parents, but less is known about coparenting among lesbian- and gay-parent families. Associations were studied among self-reported divisions of labor, coparenting observations, and child adjustment (Mage = 3 years) among 104 adoptive families headed by lesbian, gay, or heterosexual couples. Lesbian and gay couples reported sharing child care, whereas heterosexual couples reported specialization (i.e., mothers did more child care than fathers). Observations confirmed this pattern—lesbian and gay parents participated more equally than heterosexual parents during family interaction. Lesbian couples showed the most supportive and least undermining behavior, whereas gay couples showed the least supportive behavior, and heterosexual couples the most undermining behavior. Overall, supportive coparenting was associated with better child adjustment.

Farr 2017

Rachel H. Farr, Samuel T. Bruun, Kathleen M. Doss & Charlotte J. Patterson, *Children's Gender-Typed Behavior from Early to Middle Childhood in Adoptive Families with Lesbian, Gay, and Heterosexual Parents*. Sex Roles (2017), preprint, 1–14. DOI:10.1007/s11199-017-0812-5.

Gender-typed behaviors—both genderconforming and nonconforming—were investigated longitudinally among children in 106 adoptive U.S. families with lesbian, gay, and heterosexual parents at two times (Wave 1, preschool-age; Wave 2, school-age) over 5 years. At Wave 1 (W1), parents reported on children's gender-typed behavior using the Pre-School Activities Inventory (PSAI; Golombok and Rust 1993), and children's gender-typed toy play was evaluated using observational methods. At Wave 2 (W2), children reported on their own gender-typed behavior using the Children's Occupations, Activities, and Traits Personal Measure (COAT-PM; Liben and Bigler 2002). Observations of children's gender-conforming toy play and parents' reports of children's gender nonconformity (PSAI) in early childhood (W1) were associated with children's selfreports of gender nonconformity (COAT-PM) in middle childhood (W2); toy play was most strongly predictive of gender nonconformity 5 years later. Children's gender-typed behavior also varied by age and gender at both time points, but no significant differences were found as a function of parental sexual orientation across time. Informative to ongoing debates about same-sex parenting, our findings indicate that among children reared by lesbian, gay, and heterosexual parents, gender-typing appears to be similar, and predominantly gender-conforming, across early to middle childhood.

Keywords: Adoptive parents | Early childhood development | Gender nonconformity | Gender roles | Sexual orientation | Toy selection

Gilligan 2017

Ian Gilligan, *Clothing and Hypothermia as Limitations for Midlatitude Hominin Settlement during the Pleistocene, A Comment on Hosfield 2016*. Current Anthropology **58** (2017), 534–535.

Hosfield justifies his prioritizing fire and shelter at the expense of clothes by saying (as many do) that archaeological evidence for Pleistocene clothing is "absent" (Hosfield 2016: 669). It is true that direct evidence for clothing is lacking (as is direct evidence for many other aspects of hominin prehistory of interest to us). However, we can utilize indirect evidence to make reasonable inferences (Gilligan 2010).

At Schöningen, for instance, use-wear and residue analyses on flake tools (including a retouched sidescraper) are suggestive of hide processing (Rots et al. 2015:300–303). Collectively these methodologies can render paleolithic clothes virtually visible, throwing light on climate-related trends in Paleolithic technological innovation and settlement patterns, not to mention the enigma of Neanderthal extinction (Collard et al. 2016; Gilligan 2007b).

Hosfield 2017

Robert Hosfield, *A Reply to Gilligan*. Current Anthropology **58** (2017), 536.

With regard to Gilligan's "safe naked limits" (around -5°C), these estimates are intriguing in light of the site-specific winter temperature estimates currently known for the European Lower Paleolithic, and Gilligan rightly highlights Happisburgh III (Bed E) and Schöningen (level II-4), where the minimum winter temperatures hover just above -5°C (see also table 1 in Hosfield 2016).

If there were limitations to the insulation qualities of Lower Paleolithic clothing rather than a complete absence of clothing, then those limitations, combined with the temperature challenges emphasized by Gilligan, might well partly explain the sporadic presence of hominins above 45°N prior to the later Middle Pleistocene.

Ren 2017

Haojia Ren et al., *Impact of glacial/interglacial sea level change on the ocean nitrogen cycle*. PNAS **114** (2017), E6759–E6766.

Haojia Ren, Daniel M. Sigman, Alfredo Martínez-García, Robert F. Anderson, Min-Te Chen, Ana Christina Ravelo, Marietta Straub, George T. F. Wong & Gerald H. Haug

The continental shelves are themost biologically dynamic regions of the ocean, and they are extensive worldwide, especially in the western North Pacific. Their area has varied dramatically over the glacial/interglacial cycles of the last million years, but the effects of this variation on ocean biological and chemical processes remain poorly understood. Conversion of nitrate to N2 by denitrification in sediments accounts for half or more of the removal of biologically available nitrogen ("fixed N") from the ocean. The emergence of continental shelves during ice ages and their flooding during interglacials have been hypothesized to drive changes in sedimentary denitrification. Denitrification leads to the occurrence of phosphorus-bearing, N-depleted surface waters, which encourages N2 fixation, the dominant N input to the ocean. An 860,000-y record of foraminifera shell-bound N isotopes from the South China Sea indicates that N2 fixation covaried with sea level. The N2 fixation changes are best explained as a response to changes in regional excess phosphorus supply due to sea level-driven variations in shallow sediment denitrification associated with the cyclic drowning and emergence of the continental shelves. This hypothesis is consistent with a glacial ocean that hosted globally lower rates of fixed N input and loss and a longer residence time for oceanic fixed N—a "sluggish" ocean N budget during ice ages. In addition, this work provides a clear sign of sea level-driven glacial/interglacial oscillations in biogeochemical fluxes at and near the ocean margins, with implications for coastal organisms and ecosystems.

Keywords: denitrification | nitrogen fixation | nitrogen isotopes | glacial cycles

Significance: Biologically available nitrogen (fixed N) limits the fertility of much of the ocean. Of the processes that remove fixed N from the ocean, conversion to N2 in coastal sediments appears to dominate. This work provides the strongest data-based support for the long-standing hypothesis of changes in N loss along the ocean margin due to the cyclic drowning and emergence of the continental shelves. The data also imply strong local coupling of N loss to N2 fixation, the dominant N input to the ocean, thus suggesting a stable oceanic fixed N reservoir over glacial cycles. Finally, this work points to glacial/interglacial oscillations in the biogeochemical fluxes at and near the ocean margins that would have influenced the evolution of coastal species.

Archäologie

Kaszab-Olschewski 2017

Tünde Kaszab-Olschewski & Ingrid Tamerl (Hrsg.), *Wald- und Holznutzung in der römischen Antike, Festgabe für Jutta Meurers-Balke zum 65. Geburtstag*. Archäologische Berichte 27 (Kerpen-Loogh 2017).

Bibel

Ponomariov 2015

Alexander Ponomariov, *The Lord's Prayer in a Wider Setting, A New Hebrew Reconstruction.* Journal of Northwest Semitic Languages **41** (2015), 71–100.

This contribution introduces a critical translingual approach to the Hebrew reconstruction of the Lord's Prayer, based on the knowledge accumulated on the subject to date. The author attempts to demonstrate that, despite the established dominant usage of Aramaic in 1st-century Palestine, the text of the Prayer in Matthew reflects linguistic peculiarities of the broader setting of the Sermon on the Mount and the presumed Hebrew background of Mt. Besides, the paper uncovers the existence of the Hebrew and Aramaic diglossia in the New Testament, arguing that both languages were used, each in its own context.

Energie

Lehar 2017

Hannes Lehar, *Römische Heizsysteme und ihr Verbrauch, Wie viel Wald frisst die Heizung einer römischen Stadt?* In: Tünde Kaszab-Olschewski & Ingrid Tamerl (Hrsg.), *Wald- und Holznutzung in der römischen Antike, Festgabe für Jutta Meurers-Balke zum 65. Geburtstag.* Archäologische Berichte 27 (Kerpen-Loogh 2017), 203–214.

Holz als Brennmaterial war in der Antike der kalorische Energieträger Nummer eins und deshalb diente es auch für Heizzwecke. Während eines Forschungsprojekts über römische Hypokaustheizungen erfolgte unter anderem die Berechnung des Wärmebedarfs verschiedener römischer Gebäudetypen (Wohnhäuser, Villen oder Thermen). Basierend auf dieser Kalkulation ist der jeweilige Heizmaterialverbrauch für eine Heizperiode ermittelt worden. Dieser Bedarf konnte je nach Möglichkeit mit Holz oder Holzkohle gedeckt werden.

Interessanterweise tendierte die archäologische Forschung bis 1950/60 vor allem bei Hypokaustheizungen zur Annahme der Verwendung von Holzkohle zur Wärmeerzeugung, danach jedoch wurde zu diesem Zweck überwiegend die Verwendung von Holz favorisiert. Auch deshalb ist eine Beurteilung und Überprüfung beider Materialien notwendig geworden.

Anhand des ermittelten Verbrauchs, der oben genannten einzelnen Haustypen, wurde der Gesamtverbrauch für die Hypokaustheizungen der Zivilstadt von Carnuntum (Österreich) hochgerechnet. Daraus ergab sich nicht nur eine Waldfläche, die (unterschiedlich) bei einer Verbrennung von Holz oder Holzkohle geschlägert werden musste, sondern auch die Zahl der benötigten Transportmittel sowie der in der Stadt beanspruchten Lagerfläche. Abschließend ist der Bedarf für andere Heizungsarten und für das Kochen geschätzt worden. Obwohl die Energie, die für technische Prozesse benötigt wurde, hier nicht berücksichtigt werden konnte, wird nachvollziehbar, warum z. B. der Waldbestand Baden-Württembergs nach nur rund 200 Jahren römischer "Bewirtschaftung" von 100 % wohl auf etwa 40 % zurückging.

Keywords: Römerzeit | Österreich | Carnuntum | Römische Heizungen | Holz versus Holzkohle | Wärmeerzeugung | Energiebedarf

Isotope

Frei 2017

Karin Margarita Frei et al., *A matter of months, High precision migration chronology of a Bronze Age female*. PLoS ONE **12** (2017), e178834. DOI:10.1371/journal.pone.0178834.

Karin Margarita Frei, Chiara Villa, Marie Louise Jørkov, Morten E. Allentoft, Flemming Kaul, Per Ethelberg, Samantha S. Reiter, Andrew S. Wilson, Michelle Taube, Jesper Olsen, Niels Lynnerup, Eske Willerslev, Kristian Kristiansen & Robert Frei

Establishing the age at which prehistoric individuals move away from their childhood residential location holds crucial information about the socio dynamics and mobility patterns in ancient societies. We present a novel combination of strontium isotope analyses performed on the over 3000 year old "Skrydstrup Woman" from Denmark, for whom we compiled a highly detailed month-scale model of her migration timeline. When combined with physical anthropological analyses this timeline can be related to the chronological age at which the residential location changed. We conducted a series of high-resolution strontium isotope analyses of hard and soft human tissues and combined these with anthropological investigations including CT-scanning and 3D visualizations. The Skrydstrup Woman lived during a pan-European period characterized by technical innovation and great social transformations stimulated by long-distance connections; consequently she represents an important part of both Danish and European prehistory. Our multidisciplinary study involves complementary biochemical, biomolecular and microscopy analyses of her scalp hair. Our results reveal that the Skrydstrup Woman was between 17–18 years old when she died, and that she moved from her place of origin -outside present day Denmark- to the Skrydstrup area in Denmark 47 to 42 months before she died. Hence, she was between 13 to 14 years old when she migrated to and resided in the area around Skrydstrup for the rest of her life. From an archaeological standpoint, this one-time and one-way movement of an elite female during the possible "age of marriageability" might suggest that she migrated with the aim of establishing an alliance between chiefdoms. Consequently, this detailed multidisciplinary investigation provides a novel tool to reconstruct high resolution chronology of individual mobility with the perspective of studying complex patterns of social and economic interaction in prehistory.

Gron 2017

Kurt J. Gron, Darren R. Gröcke, Mikael Larsson, Lasse Sørensen, Lars Larsson, Peter Rowley-Conwy & Mike J. Church, *Nitrogen isotope evidence for manuring of early Neolithic Funnel Beaker Culture cereals from Stensborg, Sweden*. Journal of Archaeological Science: Reports **14** (2017), 575–579.

Little is known about arable agriculture in the Early Neolithic (4000–3300 cal BC, Funnel Beaker Culture) of Southern Scandinavia. Archaeobotanical material is rare and few archaeological sites have yielded more than a small number of charred cereal grains. In this short communication, we present single-entity carbon and nitrogen isotope analyses of charred cereals from Stensborg, an early Funnel Beaker Culture site near Stockholm, Sweden. This cereal assemblage is important as it is large, well-preserved and consists of multiple crop species. Our isotopic results indicate that many of the Stensborg cereal crops had been manured and that there is intraand inter-species variation in manuring. We interpret these data as evidence of an integrated regime of stockkeeping and small-scale agriculture in the early Funnel Beaker Culture near its northernmost limit.

Keywords: Carbon and nitrogen isotopes | Funnel Beaker Culture | Neolithic | Cereal agriculture | Scandinavia | Manuring

Jungpaläolithikum

Bello 2017

Silvia M. Bello, Rosalind Wallduck, Simon A. Parfitt & Chris B. Stringer, *An Upper Palaeolithic engraved human bone associated with ritualistic cannibalism*. PLoS ONE **12** (2017), e182127. DOI:10.1371/journal.pone.0182127.

Cut-marked and broken human bones are a recurrent feature of Magdalenian (≈17–12,000 years BP, uncalibrated dates) European sites. Human remains at Gough's Cave (UK) have been modified as part of a Magdalenian mortuary ritual that combined the intensive processing of entire corpses to extract edible tissues and the modification of skulls to produce skull-cups. A human radius from Gough's Cave shows evidence of cut marks, percussion damage and human tooth marks, indicative of cannibalism, as well as a set of unusual zigzagging incisions on the lateral side of the diaphysis. These latter incisions cannot be unambiguously associated with filleting of muscles. We compared the macro- and micro-morphological characteristics of these marks to over 300 filleting marks on human and non-human remains and to approximately 120 engraved incisions observed on two artefacts from Gough's Cave. The new macro- and micro-morphometric analyses of the marks, as well as further comparisons with French Middle Magdalenian engraved artefacts, suggest that these modifications are the result of intentional engraving. The engraved motif comfortably fits within a Magdalenian pattern of design; what is exceptional in this case, however, is the choice of raw material (human bone) and the cannibalistic context in which it was produced. The sequence of the manipulations suggests that the engraving was a purposeful component of the cannibalistic practice, implying a complex ritualistic funerary behaviour that has never before been recognized for the Palaeolithic period.

Methoden

Brouwer Burg 2017

Marieka Brouwer Burg, *It must be right, GIS told me so! Questioning the infallibility of GIS as a methodological tool*. Journal of Archaeological Science **84** (2017), 115–120.

While the benefits of GIS are widely touted among archaeologists today, less attention has been paid to the potential pitfalls and drawbacks of this undeniably important methodological tool. One of the greatest challenges of geospatial modeling is unbalanced data: due to the nature of the archaeological record, we can never assume that the remnants of past behavioral processes we are working with constitute a fully representative sample. Rather, our datasets are reflective of differential social and natural preservation conditions, as well as research biases. Most regional geospatial studies must collate diverse data collected over decades by researchers with varying backgrounds and goals, using assorted spatial scales and levels of technological sophistication. Such factors contribute substantial uncertainty to our models, uncertainty that should be recognized, quantified, and mitigated. If GIS techniques are to continue shifting the waywe conduct archaeology and improve our abilities to answer questions regarding past behavior, then we must question the infallibility of GIS as a methodological tool and direct more

attention toward developing robust geospatial applications that can meet the idiosyncratic needs of archaeological analysis. This paper explores one example of how such uncertainty investigation can be conducted.

Keywords: GIS | Issues of methodology and application | Data | Data validation and verification | Uncertainty | Error

Colonese 2017

Andre Carlo Colonese et al., *New criteria for the molecular identification of cereal grains associated with archaeological artefacts*. Scientific Reports **6** (2017), 6633. DOI:10.1038/s41598-017-06390-x.

Andre Carlo Colonese, Jessica Hendy, Alexandre Lucquin, Camilla F. Speller, Matthew J. Collins, Francesco Carrer, Regula Gubler, Marlu Kühn, Roman Fischer & Oliver E. Craig

The domestication and transmission of cereals is one of the most fundamental components of early farming, but direct evidence of their use in early culinary practices and economies has remained frustratingly elusive. Using analysis of a well-preserved Early Bronze Age wooden container from Switzerland, we propose novel criteria for the identification of cereal residues. Using gas chromatography mass spectrometry (GC-MS), we identified compounds typically associated with plant products, including a series of phenolic lipids (alkylresorcinols) found only at appreciable concentration in wheat and rye bran. The value of these lipids as cereal grain biomarkers were independently corroborated by the presence of macrobotanical remains embedded in the deposit, and wheat and rye endosperm peptides extracted from residue. These findings demonstrate the utility of a lipid-based biomarker for wheat and rye bran and offer a methodological template for future investigations of wider range of archaeological contexts. Alkylresorcinols provide a new tool for residue analysis which can help explore the spread and exploitation of cereal grains, a fundamental component of the advent and spread of farming.

Neolithikum

Toffolo 2017

Michael B. Toffolo, Micka Ullman, Valentina Caracuta, Steve Weiner & Elisabetta Boaretto, *A 10,400-year-old sunken lime kiln from the Early Pre-Pottery Neolithic B at the Nesher-Ramla quarry (el-Khirbe), Israel*. Journal of Archaeological Science: Reports **14** (2017), 353–364.

The Pre-Pottery Neolithic B (PPNB) is the first period in human cultural evolution that is characterized by the extensive production of lime plaster for architectural, decorative and ritual purposes. The production of large quantities of lime plaster requires the operation of a lime kiln, a structure where limestone cobbles are heated to high temperatures (> 600 °C) to obtain quicklime, which is then mixed with water to form a moldable lime putty. However, little is known about lime kilns and plaster production processes during the PPNB. This may be because the technology used at that time was simple and left few traces that are unique to lime plaster production. These include combustion features rich in lime plaster and heat-altered sediments, which are difficult to identify through only a visual inspection of the archaeological context. Here we report the study of a small sinkhole at the Nesher-Ramla quarry in Israel, which yielded Early PPNB artifacts. Using infrared spectrometry and micromorphology of sediments, we identified in-situ deposits of heat-altered sediments rich in fragments of burnt limestone, lime plaster, and wood ash in the form of charcoal, phytoliths and siliceous aggregates,

which are features consistent with the operation of a lime kiln. Charred botanical remains were characterized and used for radiocarbon dating, which determined the age of the site at 10,400 cal BP. We therefore conclude, based on the examination of the microscopic archaeological record, that this sinkhole was used as a lime kiln during the Early PPNB.

Keywords: Lime plaster | Lime kiln | Pyrotechnology | PPNB | FTIR | Micromorphology | Radiocarbon

Ostasien

Westaway 2017

K. E. Westaway et al., *An early modern human presence in Sumatra 73,000–63,000 years ago.* nature **548** (2017), 322–325.

n548-0322-Supplement.pdf

K. E. Westaway, J. Louys, R. Due Awe, M. J. Morwood, G. J. Price, J.-X. Zhao, M. Aubert, R. Joannes-Boyau, T. M. Smith, M. M. Skinner, T. Compton, R. M. Bailey, G. D. Van Den Bergh, J. De Vos, A. W. G. Pike, C. Stringer, E. W. Saptomo, Y. Rizal, J. Zaim, W. D. Santoso, A. Trihascaryo, L. Kinsley & B. Sulistyanto

Genetic evidence for anatomically modern humans (AMH) out of Africa before 75 thousand years ago (ka)1 and in island southeast Asia (ISEA) before 60 ka (93–61 ka)2 predates accepted archaeological records of occupation in the region3. Claims that AMH arrived in ISEA before 60 ka (ref. 4) have been supported only by equivocal5 or nonskeletal evidence6. AMH evidence from this period is rare and lacks robust chronologies owing to a lack of direct dating applications7, poor preservation and/or excavation strategies8 and questionable taxonomic identifications9. Lida Ajer is a Sumatran Pleistocene cave with a rich rainforest fauna associated with fossil human teeth7,10. The importance of the site is unclear owing to unsupported taxonomic identification of these fossils and uncertainties regarding the age of the deposit, therefore it is rarely considered in models of human dispersal. Here we reinvestigate Lida Ajer to identify the teeth confidently and establish a robust chronology using an integrated dating approach. Using enamel–dentine junction morphology, enamel thickness and comparative morphology, we show that the teeth are unequivocally AMH. Luminescence and uranium-series techniques applied to bone-bearing sediments and speleothems, and coupled uranium-series and electron spin resonance dating of mammalian teeth, place modern humans in Sumatra between 73 and 63 ka. This age is consistent with biostratigraphic estimations7, palaeoclimate and sea-level reconstructions, and genetic evidence for a pre-60 ka arrival of AMH into ISEA2. Lida Ajer represents, to our knowledge, the earliest evidence of rainforest occupation by AMH, and underscores the importance of reassessing the timing and environmental context of the dispersal of modern humans out of Africa.