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References

Aktuell

Berkowitz 2016

Talia Berkowitz, Marjorie W. Schaeffer, Christopher S. Rozek, Erin A. Maloney, Susan C. Levine & Sian L. Beilock, *"Math at home adds up to achievement in school", Response to Comment.* science **351** (2016), 1161.

Frank presents an alternative interpretation of our data, yet reports largely similar results to those in our original Report. A critical difference centers on how to interpret and test interaction effects. Frank finds no mistakes in our analyses. We stand by our original conclusions of meaningful effects of the Bedtime Learning Together (BLT) math app on children's math achievement.

Frank 2016

Michael C. Frank, *Comment on "Math at home adds up to achievement in school".* science **351** (2016), 1161.

Berkowitz et al. (Reports, 9 October 2015, p. 196) described a randomized field experiment testing whether a math app designed to increase parent-child interaction could also bring academic benefits. A reanalysis of the data suggests that this well-designed trial failed to find strong evidence for the efficacy of the intervention. In particular, there was no significant effect of the intervention on math performance.

Grunspan 2016

Daniel Z. Grunspan, Sarah L. Eddy, Sara E. Brownell, Benjamin L. Wiggins, Alison J. Crowe & Steven M. Goodreau, *Males Underestimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms.* PLoS ONE **11** (2016), e148405. DOI:10.1371/journal.pone.0148405.

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Women who start college in one of the natural or physical sciences leave in greater proportions than their male peers. The reasons for this difference are complex, and one possible contributing factor is the social environment women experience in the classroom. Using social network analysis, we explore how gender influences the confidence that collegelevel biology students have in each other's mastery of biology. Results reveal that males are more likely than females to be named by peers as being knowledgeable about the course content. This effect increases as the term progresses, and persists even after controlling for class performance and outspokenness. The bias in nominations is specifically due to males over-nominating their male peers relative to their performance. The over-nomination of male peers is commensurate with an overestimation of male grades by 0.57 points on a 4 point grade scale, indicating a strong male bias among males when assessing their classmates. Females, in contrast, nominated equitably based on student performance rather than gender, suggesting they lacked gender biases in filling out these surveys. These trends persist across eleven surveys taken in three different iterations of the same Biology course. In every class, the most renowned students are always

male. This favoring of males by peers could influence student self-confidence, and thus persistence in this STEM discipline.

Starr 2016

Douglas Starr, *When DNA is lying*. science **351** (2016), 1133–1136.

DNA analysis has helped free thousands of wrongly convicted people. But sometimes DNA lands innocent people in prison, Greg Hampikian warns.

Coble asked 108 labs across the country to determine whether a separate DNA sample, which he posited had come from a suspect in the robberies, was also part of the mix. Seventy-three of the labs got it wrong, saying the suspect's DNA was part of the mix when, in fact, it was not. "It's the Wild West out there," Coble says. "Too much is left to the analysts' discretion."

Stevenson 2016

Alice Stevenson, *Conflict antiquities and conflicted antiquities, Addressing commercial sales of legally excavated artefacts*. Antiquity **90** (2016), 229–236.

The antiquities market thrives on attaining the highest possible price for objects. It is simply not an appropriate conduit for transferring archaeological heritage, and auction houses should not be the middlemen for the disposal of material that was to remain in public trust. Private, discrete sales between museums or institutions are not being condemned here. Of concern is the public circus of commercialisation that is performed in the auction room, in which legally acquired antiquities are paraded as assets for the elite that can disappear into unregulated private territory. The price is not only high for the public profile of the archaeological profession and the trust held in museums but, more importantly, it is too high for source communities and archaeological sites around the world. Licit and illicit antiquities cannot be decoupled, as the commercial sale of the former still creates demand for the latter (cf. Brodie 2014). For these reasons, museums and archaeological institutions must take a stand.

Anthropologie

Gibbons 2016

Ann Gibbons, *Five matings for moderns, Neandertals*. science **351** (2016), 1250–1251.

Powerful genetic studies pin down multiple trysts on different continents.

Datierung

Protsch 1973

Reiner Protsch & Rainer Berger, *Earliest Radiocarbon Dates for Domesticated Animals, Europe is added to the Near East as another early center of domestication*. science **179** (1973), 235–239.

Our dates show that cattle and pigs were first domesticated in Europe. Sheep, which were thought to have become extinct in Europe during the terminal Pleistocene, also appear first in Europe. However, there remains little doubt that sheep were first domesticated in the Near East or Turkey, since no wild sheep appear to have existed in Europe at the beginning of the Holocene. Dogs were domesticated in both the Near East and Europe at virtually the same time. In the Near East,

Asiab, at around 8000 B.C., qualifies as the first center of goat domestication. It is also the earliest center of domestication for all animals we have dated here. Horses were first domesticated in the steppes of the Ukraine, perhaps even earlier than our dates indicate, since all of the samples found at Polling are virtually contemporaneous.

Undoubtedly, future research will alter the details of our overall impressions, especially after bones at earlier sites such as Nea Nikomedeia have been dated directly. But, on balance, there can be no doubt that southeastern Europe was as much an early center of domestication as the Near East was.

Regev 2014

Johanna Regev, Israel Finkelstein, Matthew J. Adams & Elisabetta Boaretto, *Wiggle-Matched ^{14}C Chronology of Early Bronze Megiddo and the Synchronization of Egyptian and Levantine Chronologies.* Ägypten und Levante **24** (2014), 241–264.

The microstratigraphic excavation of the EB at Megiddo produced a group of radiocarbon samples from the EB I and EB III periods which could be dated and then wiggle matched according to the calibration curve to produce a high-resolution chronology of the period. Overall, the results from Megiddo support the new dating of the EB developed from other sites in the Southern Levant. What both studies have highlighted is that there is much need for an audit of the synchronisms between Egyptian and Levantine chronologies and a revision of our understanding of the interrelations between the two regions for the 3rd Millennium. On this front, it can now be said that the Southern Levantine EB III comes to an end in the era of the 4th Dynasty. This absolute chronological synchronism provides new explanations for the presence of Egyptian artifacts in the Levant during the EB III and of the Levantine pottery in Egyptian tombs. Based on these observations, a new outline of Egyptian/Levantine interactions was put forth to lay the groundwork for a reappraisal of the voluminous data on the subject.

Isotope

Asam 2006

Tanja Asam, Gisela Grupe & Joris Peters, *Menschliche Subsistenzstrategien im Neolithikum, Eine Isotopenanalyse bayerischer Skelettfunde.* Anthropologischer Anzeiger **64** (2006), 1–23.

Originating from the Near East, the Neolithic lifestyle will reach Southeast Europe in its fully developed form in the course of the 7th millennium cal. BC. In the region of today's Bavaria this lifestyle can be evidenced from the middle of the 6th millennium cal. BC onwards. Stable isotope analyses of carbon and nitrogen in bone collagen, and of carbon and oxygen in the bone's structural carbonate of human skeletons from burial sites dated to the Linear Pottery Culture, the middle Neolithic, the Corded Ware and the Bell Beaker Culture revealed differences in the dietary behaviour between 5500 until 3000 BC, and between 3000 until 2000 BC, respectively. In late Neolithic times, meat procurement appears improved and the dietary spectrum as such broadened, evidencing a more secured and increasingly flexible subsistence strategy. Oxygen isotope ratios of the structural carbonate proved to be reliable climatic indicators and may be helpful in the dating of archaeological sites.

Keywords: Stable isotopes | neolithisation | Bavaria | subsistence strategy | food web.

Ausgehend vom Vorderen Orient wird die neolithische Lebensweise Südosteuropa in ihrer voll entwickelten Form im 7. vorchristlichen Jahrtausend erreichen und sich in (nord)westliche Richtung ausbreiten. Um die Mitte des 6. vorchristlichen Jahrtausends wird sie im heutigen bayerischen Raum nachweisbar. Eine Analyse menschlicher Skelettfunde aus bayerischen Fundplätzen der Linearbandkeramik, des mittleren Neolithikums, der Schnurkeramik und der Glockenbecherkultur in Bezug auf stabile Kohlenstoffund Stickstoffisotope des Knochenkollagens sowie stabiler Kohlenstoff- und Sauerstoffisotope des strukturellen Karbonates zeigte einen deutlichen Unterschied in der Ernährungsweise zwischen den Zeitspannen 5500 – 3000 v. Chr. und 3000 – 2000 v. Chr. Im jüngeren Zeitabschnitt deutet sich eine Verbesserung der Fleischversorgung bei insgesamt verbreitertem Nahrungsspektrum an, was gleichermaßen als Zeichen einer gesicherteren und flexibleren Subsistenz gedeutet werden kann. Die Sauerstoff-Isotopensignatur der Karbonatfraktion erwies sich als zuverlässiger Klimaindikator und kann bei der zeitlichen Einordnung von Fundplätzen hilfreich sein.

Keywords: Stabile Isotope | Neolithisierung | Bayern | Subsistenzstrategie | Nahrungsnetz.

le Bras-Goude 2013

Gwenaëlle le Bras-Goude, Estelle Herrscher & Jean Vaquer, *Funeral practices and foodstuff behaviour: What does eat meat mean? Stable isotope analysis of Middle Neolithic populations in the Languedoc region (France).* Journal of Anthropological Archaeology **32** (2013), 280–287.

The aim of this study is to reconstruct the dietary patterns and economic behaviours of Neolithic populations in the Northwestern Mediterranean using isotopic and archaeological data. Burials come from four sites located in Languedoc–Roussillon region in French Mediterranean area. These sites are dated from the Middle Neolithic period (ca. 4500–3500 BC). They represent the Chasséen culture, characterized by regional features, such as economy management, resulting from territorial control. For this investigation, a stable isotopes (d13C and d15N) method has been used on 50 human bone collagens and 28 associated animal bones. This method provides direct dietary information on the protein consumed including the relative amounts of marine vs. terrestrial and animal vs. plant proteins in diets. Isotopic results are mainly compared to archaeological data to understand economic distinctions and potential social status variations between different groups using specific funeral practices, i.e. lithic chamber graves vs. domestic/funeral pits. Results show that individuals buried in lithic chamber graves and those buried in pits did not have the same dietary pattern. This result suggests a possible differentiation between two socio-economic groups, i.e. consumers of resources from herding and from farming. No aquatic food appeared to be routinely consumed by these individuals despite a relative close proximity to sea and freshwater sources. Moreover, these outcomes lead us to hypothesize that: (1) funeral practices could be linked to specific economies and/or (2) to different social status and that (3) burial type and foodstuff could be an expression of religious worship. Further research could include data from other areas, such as Spanish Catalonia where there are funeral structures similar to Languedoc lithic chamber graves.

Keywords: Neolithic | Languedoc | Mediterranean | Funeral practices | Diet | Isotope | Nitrogen | Carbon

Giblin 2009

Julia Irene Giblin, *Strontium isotope analysis of Neolithic and Copper*

Age populations on the Great Hungarian Plain. Journal of Archaeological Science **36** (2009), 491–497.

The strontium isotope ratio (87Sr/86Sr) is used in archaeological studies to identify major events of population movement in prehistory such as migration, conquest, and inter-marriage. This study shows that the strontium isotope method can be expanded to identify more subtle shifts in prehistoric human mobility. 87Sr/86Sr isotope ratios were analyzed in dental enamel from human and faunal specimens from the Late Neolithic and Copper Age on the Great Hungarian Plain. The archaeological record indicates that several aspects of life changed during the transition from the Late Neolithic to the Copper Age (ca. 4500 BC) in Hungary; evidence for increased interaction over a wide geographical area, less resource pooling and the use of secondary products has been used to support the idea that local populations became more mobile, perhaps due to the adoption of an agro-pastoral economy. Results from this study identify a change in the range of strontium isotope values from the Late Neolithic to the Copper Age from a very narrow range of values to a much broader range of values, which suggests that changes in how land and resources were utilized on the Great Hungarian Plain affected incorporation of strontium into the skeletal system. This study indicates that the strontium isotope ratio is a valuable tool for identifying more subtle changes in prehistoric behavior such as a shift to a more pastoral economy.

Keywords: Neolithic | Copper Age | Hungary | Isotopes | 87SR/86SR | Human mobility | Diet

Giblin 2013

Julia I. Giblin, Kelly J. Knudson, Zsolt Bereczki, György Pálfi & Ildikó Pap, *Strontium isotope analysis and human mobility during the Neolithic and Copper Age, A case study from the Great Hungarian Plain.* Journal of Archaeological Science **40** (2013), 227–239.

From the Late Neolithic to the Early Copper Age on the Great Hungarian Plain (4500 BC, calibrated) a transformation in many aspects of life has been inferred from the archaeological record. This transition is characterized by changes in settlements, subsistence, cultural assemblages, mortuary customs, and trade networks. Some researchers suggest that changes in material culture, particularly the replacement of long-occupied tells with smaller, more dispersed hamlets, indicates a shift from sedentary farming villages to a more mobile, agropastoral society that emphasized animal husbandry and perhaps secondary products of domestication. In a previous study (Giblin, 2009), preliminary radiogenic strontium (87Sr/86Sr) isotope data from human dental enamel showed that Copper Age individuals expressed more variable isotope values than their Neolithic predecessors. These data provided support for the idea that Copper Age inhabitants of the Plain were acquiring resources from a greater geographic area, findings that seemed consistent with a more mobile lifestyle. In this article a larger sample from human and animal skeletal material is used to re-evaluate earlier work and shed new light on the transition from the Neolithic to the Copper Age in eastern Hungary. The expanded sample of strontium isotopes from human dental enamel shows that 87Sr/86Sr values are more variable during the Copper Age, but the change is more pronounced in the Middle Copper Age than in the Early Copper Age. These results, along with recently published complementary research, indicate that the transition from the Late Neolithic tell cultures of the Plain to the more dispersed Copper Age hamlets was more gradual than previously thought, and that the emergence of an agropastoral economy does not explain changes in settlement and material culture.

Keywords: Neolithic | Copper Age | Hungary | Isotope | Strontium | Mobility

Giblin 2016

Julia I. Giblin & Richard W. Yerkes, *Diet, dispersal and social differentiation during the Copper Age in eastern Hungary*. Antiquity **90** (2016), 81–94.

Why did the early farming societies of southeast Europe 'collapse' and become apparently less complex at the end of the Neolithic? Stable isotope analysis of human bone collagen from Late Neolithic and Copper Age cemeteries in eastern Hungary provides new insights into this question by exploring dietary changes during this key transitional period. Results show that diet did not change significantly over time, and there was no evidence that individuals of different sex or social status were consuming privileged diets. The changes of this period appear to indicate a reorganisation of society, perhaps based around extended families, with greater dispersal across the landscape, but without reliance on dairying or the emergence of powerful leaders.

Keywords: Hungary | Neolithic | Copper Age | diet | stable isotope analysis | carbon | nitrogen

Gron 2016

Kurt J. Gron, Janet Montgomery, Poul Otto Nielsen, Geoff Nowell, Joanne Peterkin, Lasse Sørensen & Peter Rowley-Conwy, *Strontium isotope evidence of early Funnel Beaker Culture movement of cattle*. Journal of Archaeological Science: Reports **6** (2016), 248–251.

The movement of livestock across and within landscapes is increasingly being recognized as common in northern European prehistoric contexts, and was performed for various purposes. However, almost nothing is known about the movement of livestock in the earliest phase of the southern Scandinavian Neolithic Funnel Beaker Culture (ENI, TRB, 4000–3500 cal BC), or even if such movement is indicated. In this study, domestic cattle (Bos taurus) teeth from the early Neolithic sites Almhov, Sweden (N = 6) and Havnelev, Denmark (N = 7) were analyzed in order to determine the presence and character of potential livestock movement in this period. Tooth enamel strontium isotope analyses indicated a range of variation in local origin of the animals: some probably local and some non-local. Importantly, both sites yielded an individual exhibiting strontium isotope ratios indicating movement from elsewhere and over a body of water via boat. Although based on a small number of cattle, the movement of livestock is indicated in the earliest Neolithic in the region and provides evidence of social, economic, or other connections over substantial distances.

Keywords: Strontium isotopes | Funnel Beaker Culture | Neolithic | Cattle | Scandinavia

Guiry 2012

Eric J. Guiry, *Dogs as Analogs in Stable Isotope-Based Human Paleodietary Reconstructions, A Review and Considerations for Future Use*. Journal of Archaeological Method and Theory **19** (2012), 351–376.

In contexts where human remains are scarce, poorly preserved, or otherwise unavailable for stable isotope-based paleodietary reconstruction, dog bone collagen as well as other tissues may provide a suitable proxy material for addressing questions relating to human dietary practices. Inferences drawn from applications of this "canine surrogacy approach" (CSA) must be made with caution to ensure the accuracy and transparency of conclusions. This paper shows that CSA applications are essentially analogical inferences which can be divided into two groups that

provide specific types of information and may require different levels of substantiation. A framework of three categories of factors is outlined to aid in establishing positive, negative, and neutral elements of comparison of dog and human diets. CSA applications may benefit from explicitly detailing the type and nature of the analogical reasoning employed and from providing a systematic assessment of the degree to which stable isotope values of dogs and humans under comparison are thought to be like, unlike, or of unknown likeness.

Keywords: Dogs | Paleodiet | Human proxy | Stable isotopes

Harbeck 2006

Michaela Harbeck, Reimer Dobberstein, Stefanie Ritz-Timme, Inge Schröder & Gisela Grupe, *Degradation von Biomolekülen in Knochen, Auswirkung auf die biologische Spurenkunde am Beispiel stabiler Isotopenverhältnisse im Kollagen.* Anthropologischer Anzeiger **64** (2006), 273–282.

Modern bone samples were experimentally degraded by incubation into water at increased temperature and examined in terms of their collagen content, the stable C and N isotopie ratios, and the molar C/N ratio. The same analyses were carried out with archaeological human bone of varying age (300 up to 8000 years). The experimentally degraded samples exhibited changes of the collagen' s integrity, which influence the stable isotope ratios. In the case of the archaeological material, a correlation between stable d13C- and d15N-values and collagen content could be demonstrated. The molar C:N ratio was no suitable criterion for the assessment of the state of preservation of extractable collagen.

Keywords: Collagen | d13C | d15 N | molar C:N ratio | degradation.

Knochenproben wurden durch Inkubation in destilliertem Wasser bei erhöhter Temperatur experimentell degradiert und auf ihren prozentualen Kollagengehalt, die stabilen Isotopenverhältnisse von Kohlenstoff und Stickstoff sowie das molare Verhältnis von Kohlenstoff zu Stickstoff im verbliebenen Kollagen untersucht. Entsprechende Analysen wurden an archäologischem Knochenmaterial unterschiedlicher Zeitstellung (300 bis 8000 Jahre Liegezeit) durchgeführt. Es konnten durch experimentelle physiko-chemische Degradation hervorgerufene Veränderungen des Kollagens nachgewiesen werden, welche Einfluss auf die stabilen Isotopenverhältnisse von Kohlenstoff und Stickstoff haben. In dem archäologischen Material weisen Korrelationen zwischen stabilen Isotopenverhältniswerten und Kollagengehalt auf diagenetisch veränderte Verhältnisse hin. Das molare C:N-Verhältnis erwies sich als kein zuverlässiges Kriterium für die Abschätzung des Erhaltungsgrades von Kollagen.

Keywords: Kollagen | d13C | d15N | molares C:N-Verhältnis | Degradation.

Howcroft 2014

Rachel Howcroft, Gunilla Eriksson & Kerstin Lidén, *Infant feeding practices at the Pitted Ware Culture site of Ajvide, Gotland.* Journal of Anthropological Archaeology **34** (2014), 42–53.

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The infant feeding practices used at the Middle Neolithic Pitted Ware Culture (PWC) site of Ajvide on the Baltic island of Gotland were investigated using carbon and nitrogen stable isotope ratio analysis. The PWC were marine hunters with a seal-based economy, but were contemporary with the farming Funnel Beaker and Boat Axe Cultures. The carbon and nitrogen stable isotope ratios of bone collagen from adult females (14 individuals) and bone and dentine collagen from subadult individuals (23 individuals, 55 samples) from Ajvide were analysed. The results (mean ± 1s.d.) were d13C = .15.2 ± 0.4 ‰, d15N = 15.6 ±

0.5 ‰ for the adult females, and d13C = .15.3 ± 0.6 ‰, d15N = 16.5 ± 1.1 ‰ for the subadults. The majority of infants continued breastfeeding into the third or fourth year of life. There was some variation in the types of supplementary foods used and the timing of their introduction, perhaps due to seasonal variation in the availability of different resources. The isotope ratios from one infant, a neonate, were indicative of a much more terrestrial diet than usually consumed by the PWC, suggesting contact with the contemporary farming populations. Comparison of the results from Ajvide to those from other PWC sites in the Baltic region reveals that both adult and subadult dietary practices differed slightly between sites.

Keywords: Breastfeeding | Weaning | Seasonality | Neolithic | Sweden | Baltic | Stable isotope | Carbon | Nitrogen | Paleodiet

Lidén 1995

Kerstin Lidén, *Megaliths, Agriculture, and Social Complexity*, *A Diet Study of Two Swedish Megalith Populations*. Journal of Anthropological Archaeology **14** (1995), 404–417.

This paper tests the relationship between the erection of megaliths and agriculture in Neolithic Scandinavia. A dietary change in two Swedish megalith populations was tested by analyses of stable carbon and nitrogen isotopes extracted from human bone collagen. Carbon isotopes show that marine resources still were utilized in the coastal area and nitrogen isotope indicates that the major part of the protein came from a high trophic level, i.e., animals. It is concluded that a change in diet, and hence subsistence, took place from a hunter-gatherer-based subsistence toward one based on pastoralism, not horticulturalism. The prerequisite for social complexity is discussed and the author favors sedentism as the major determinant.

Phillips 2012

Donald L. Phillips, *Converting isotope values to diet composition*, *The use of mixing models*. Journal of Mammalogy **93** (2012), 342–352.

A common use of stable isotope analysis in mammalogy is to make inferences about diet from isotope values (typically d13C and d15N) measured in tissues and food sources of a consumer. Mathematical mixing models are used to estimate the proportional contributions of food sources to the isotopie composition of the tissues of a consumer, which reflect the assimilated diet. This paper reviews basic mixing models and how they work; additional refinements also are described that include addressing uncertainty, larger numbers of sources, combining sources, concentration effects, and Bayesian statistical frameworks. Information is provided on where to access software for the various models. Numerous examples are cited to show application of these models in the mammal research literature.

Keywords: diet | mixing model | stable isotopes

Sjögren 2013

K.-G. Sjögren & T. Douglas Price, *A complex Neolithic economy*, *Isotope evidence for the circulation of cattle and sheep in the TRB of western Sweden*. Journal of Archaeological Science **40** (2013), 690–704.

We report here the results of strontium, oxygen and carbon isotope analysis of teeth from domestic animals at two Neolithic settlement sites in Falbygden, Sweden. The main result is the high mobility of domestic animals, particularly of cattle but also of sheep. More than half of the analysed cattle teeth show strontium isotope signals indicating that they were raised in an area of Precambrian rock, outside the sedimentary Cambro-Silurian rocks found in Falbygden. This is

in marked contrast to pigs, which were mostly local to Falbygden. The mobility of cattle is much higher than that of humans, for which the frequency of immigrants is about 25 %.

We suggest that West Sweden in the Neolithic was not a local but a regional economy, where not only prestige items and humans were circulating but also basic components of subsistence. Such a regional economy would have drawn together the megalithic-building population in Falbygden with its nonmegalithic neighbours. In addition, it seems that cattle had a particular place in the Neolithic symbolic system, beyond their economic and practical value.

Keywords: Neolithic | Sweden | Falbygden | Economy | Mobility | Cattle | Strontium isotopes | Oxygen isotopes | Carbon isotopes

Stevens 2006

Rhiannon E. Stevens, Adrian M. Lister & Robert E. M. Hedges, *Predicting diet, trophic level and palaeoecology from bone stable isotope analysis, A comparative study of five red deer populations.* Oecologia **149** (2006), 12–21.

C and N stable isotope ratios of red deer (Cervus elaphus) bone collagen (154 individuals) from five modern populations occupying geographically different habitats are reported. No significant difference was observed between deer occupying forested and non forested environments subject to similar climatic conditions suggesting a simple "canopy effect" is not observed. Mean population d13C is negatively correlated with temperature whereas mean population d15N is positively correlated with temperature. A weak but significant positive correlation was observed between deer age and collagen d13C values from the Isle of Rum population (Scotland). The amount of intra-population isotope variability is not consistent among populations; thus significant numbers of individuals from each species are required for modern food web studies, for palaeodietary baseline data, and for palaeoecological studies.

Keywords: Carbon | Canopy effect | Collagen | Nitrogen | Temperature

Styring 2016

Amy Styring, Ursula Maier, Elisabeth Stephan, Helmut Schlichtherle & Amy Bogaard, *Cultivation of choice: new insights into farming practices at Neolithic lakeshore sites.* Antiquity **90** (2016), 95–110.

The high-quality organic preservation at Alpine lakeshore settlement sites allows us to go beyond simplistic reconstructions of farming in the Neolithic. The rich archaeological datasets from these sites may be further complemented by methods such as nitrogen isotope (d15N) analysis of charred crop remains. At Hornstaad-Hörnle IA and Sipplingen, on the shore of Lake Constance in south-west Germany, this method has been used to provide a unique insight into strategies of cultivation such as manuring on both a spatial and temporal scale.

Keywords: south-west Germany | Neolithic | Alpine foreland | agriculture | nitrogen isotopes | archaeobotany

Viner 2010

Sarah Viner, Jane Evans, Umberto Albarella & Mike Parker Pearson, *Cattle mobility in prehistoric Britain, Strontium isotope analysis of cattle teeth from Durrington Walls (Wiltshire, Britain).* Journal of Archaeological Science **37** (2010), 2812–2820.

An important role has been envisaged for cattle during the Neolithic period in Britain based on their prominence within the faunal assemblages of the period

as a whole. The relative ease with which cattle can be moved over long distances and the requirement to provide ample pastureland leads almost inescapably to the consideration of prehistoric cattle movement. This paper presents the results of an investigation into the mobility of Late Neolithic cattle at the well-known site of Durrington Walls, Wiltshire. 87Sr/86Sr values from cattle (Bos taurus) teeth were compared to local vegetation samples, well established values from archaeological material and to known geological conditions in order to determine whether individual animals were raised in areas with similar geological conditions as those found at the site (i.e. chalkland), and therefore whether the animals were of allochthonous or autochthonous origin. In total, 13 mandibular molars from DurringtonWalls were analysed. Two of the animals included in the study were certainly raised under conditions similar to those found in the vicinity of Durrington Walls, but the other 11 provided signatures so distinct from that found locally that they could not have been raised on chalkland. From the results it is suggested that cattle were brought to the site from a variety of grazing areas in different parts of Britain. The implication of these findings is that the movement of cattle was undertaken during the Late Neolithic, and that in a number of cases substantial distances must have been traversed in order for animals to reach the site. In addition, the study provided valuable information for the interpretation of the site, which attracted people from a variety of regions, probably for ceremonial reasons.

Keywords: Britain | Neolithic | Durrington Walls | Cattle | Strontium | Mobility

Jungpaläolithikum

Hoffecker 2016

John F. Hoffecker et al., *Kostenki 1 and the early Upper Paleolithic of Eastern Europe*. Journal of Archaeological Science: Reports **5** (2016), 307–326.

John F. Hoffecker, Vance T. Holliday, M. V. Anikovich, A. E. Dudin, N. I. Platonova, V. V. Popov, G. M. Levkovskaya, I. E. Kuz'mina, E. V. Syromyatnikova, N. D. Burova, Paul Goldberg, Richard I. Macphail, Steven L. Forman, Brian J. Carter & Laura J. Crawford

Although best known for its spectacular Gravettian features and art, the open-air site of Kostenki 1 (located near Voronezh on the Don River [Russian Federation]) also has played an important role in the study of the early Upper Paleolithic (EUP) of Eastern Europe. New excavations at Kostenki 1 were undertaken in 2004–2012 with a focus on the EUP layers (Layers III–V), which represent temporal zones of recurring occupation, buried in low-energy slope deposits (5 % slope). Soils formed during periods of increased surface stability. A new set of radiocarbon estimates on wood charcoal indicates that Layer III dates between 33,000 and 38,000 cal BP. Layer V underlies the CI tephra (≈40,000 cal BP), which is redeposited and identified only by microscopic analysis of sediment samples in most of the (downslope) areas of the site excavated during 2004–2012. Large and medium mammal remains recovered from the EUP layers include mammoth, horse, reindeer, arctic fox, and wolf, and taphonomic analyses indicate that carcasses were processed at the site. All EUP layers yielded artifacts typical of the East European Strelets industry (e.g., bifaces, side-scrapers), but earlier excavation (1948–1953) of Layer III also produced diagnostic Aurignacian artifacts (e.g., carinated scrapers, retouched bladelets). The newchronology for Layer III suggests an association between the Aurignacian of the central East European Plain and the warm intervals (GI 8–GI 7) following the HE4 cold period (≈38,000–40,000 cal BP).

Keywords: Eastern Europe | Early Upper Paleolithic | Geoarchaeology | Zooarchaeology

Klima

Aurenche 2013

O. Aurenche, J. K. Kozłowski & S. K. Kozłowski, *To Be Or Not To Be ... Neolithic: "Failed attempts" at Neolithization in Central and Eastern Europe and in The Near East, and Their Final Success (35,000–7000 BP)*. Paléorient **39** (2013), ii, 5–45.

After a brief parallel presentation of the development of the Upper Paleolithic cultures in Central and Eastern Europe as well as in the Near East we propose a new paradigm for the issue of the process, that is to say, the birth of Neolithization. Instead of a sudden appareance within a few centuries around 9000 BP, we think that the phenomenon is the result of a long and chaotic story which began independently in both continents more than 35,000 years ago. After many attempts which failed one after the other due to the severe and repeated climatic fluctuations at the end of the Pleistocene and/or due to the lack of 'understanding' vegetal and animal species which were 'ready' to 'accept' domestication, the success arrived in very precise environmental and climatic conditions at the beginning of the Holocene in only one of the two regions, the Near East. If Neolithization doesn't appear earlier it's not because 'culture' was not ready, but because 'nature' was not able to give a favourable answer to the request of man.

Keywords: Upper Paleolithic | Neolithic | Eastern Europe | Near East | Sedentism | Habitat | Plant and animal Domestication | Lithic | industry | Artistic production.

Kerr 2007

Richard A. Kerr, *Support Is Drying Up for Noah's Flood Filling the Black Sea*. science **317** (2007), 886.

Moeller 2005

Nadine Moeller, *The First Intermediate Period, A time of famine and climate change?* Ägypten und Levante **15** (2005), 153–167.

The critical review of the available data relating to climate change in Egypt shows that there is currently no evidence for a short term, abrupt anomaly, which would have led to the collapse of the Old Kingdom state in Egypt. So far, the evidence of Nile flood trends suggests a long-term, gradual development towards generally drier conditions. Therefore the cultural, economic and political changes, which characterise the First Intermediate Period does not seem to have been triggered by a natural catastrophe as has often been implied. Furthermore the ability of people to adapt must not be underestimated, Evidence from Syria and Pakistan shows that a rather dry climate period affected parts of the Near East, which might have led to changes in agricultural practices and settlement patterns but not necessarily to the collapse of civilisations, However, further studies are needed to correlate this evidence with data from Egypt as well as the evaluation of possible global effects of such short-term climate changes.

de Pablo 2010

Javier Fernández-López de Pablo & Michael A. Jochim, *The impact of the 8,200 cal BP climatic event on human mobility strategies during*

the Iberian late Mesolithic. Journal of Anthropological Research **66** (2010), 39–68.

Recent marine and lake core studies in the Western Mediterranean Basin and Iberia have changed the traditional perception of Holocene climate change. Particularly important in this region, the 8,200 cal bp event is marked by colder and more arid conditions. During this episode, we identify a pattern of abandonment episodes at five Late Mesolithic sites. We suggest that such desertion episodes are correlated with adjustments in the logistic mobility system undertaken in the context of broader stmctural changes in regional settlement organization.

Keywords: Climate change | Holocene | Late Mesolithic | Mobility | Radiocarbon dating | Settlement | Spain

Kultur

Mithen 2010

Steven Mithen, *The domestication of water, Water management in the ancient world and its prehistoric origins in the Jordan Valley.* Phil. Trans. Royal Society A **368** (2010), 5249–5274.

The ancient civilizations were dependent upon sophisticated systems of water management. The hydraulic engineering works found in ancient Angkor (ninth to thirteenth century AD), the Aztec city of Tenochtitlan (thirteenth to fifteenth century AD), Byzantine Constantinople (fourth to sixth century AD) and Nabatean Petra (sixth century BC to AD 106) are particularly striking because each of these is in localities of the world that are once again facing a water crisis. Without water management, such ancient cities would never have emerged, nor would the urban communities and towns from which they developed. Indeed, the 'domestication' of water marked a key turning point in the cultural trajectory of each region of the world where state societies developed. This is illustrated by examining the prehistory of water management in the Jordan Valley, identifying the later Neolithic (approx. 8300-6500 years ago) as a key period when significant investment in water management occurred, laying the foundation for the development of the first urban communities of the Early Bronze Age.

Keywords: water management | Jordon Valley | Neolithic | urban | domestication of water | water crisis

Müller 2000

Johannes Müller, *Soziale Grenzen—Ein Exkurs zur Frage räumlicher Identitätsgruppen in der Prähistorie, Identitäten und Grenzen in der prähistorischen Archäologie.* In: Sławomir Kadrow (Hrsg.), *A Turning of Ages – Im Wandel der Zeiten, Jubilee Book Dedicated to Professor Jan Machnik on His 70th Anniversary.* (Kraków 2000), 415–427.

Der Versuch, Kommunikationsintensitäten für prähistorische Gesellschaften zu rekonstruieren, führt zur Frage von "Identitätsgruppen" und "Grenzen". Die Vielfältigkeit der Organisationsformen von Austauschsystemen und Identitätsbezügen verbietet eine simplifizierende Interpretation, insbesondere bei der Auflösung des traditionellen "EthnosBegriffes in der anthroplogischen Forschung. Immerhin bieten die technischen Möglichkeiten der GIS-Programme einen Weg, archäologische Verbreitungskarten gezielter auf Parameter der Kommunikationsintensität zu untersuchen. Am Fallbeispiel einiger Karten aus dem Spät- und Endneolithikum des Mittelelbe-Saale-Gebietes konnte angedeutet werden, daß sich durchaus "Grenzen" rekonstruieren lassen.

Pitts 2008

Mike Pitts, *The Henge Builders*. Archaeology **61** (2008), i, 48–55.

New discoveries inspire archaeologists to re-envision the culture that created Stonehenge.

Darvill, like many scholars, has focused on the Welsh bluestones, but the really big stones are sarsen“ The largest are 22 feet high, and weigh more than 50 tons each. Nowhere in ancient Europe can there have been a project as challenging—and dangerous—as moving a large sarsen to Stonehenge“ And unlike most of the bluestones, they were subjected to laborious dressing and surface finishing. To understand Stonehenge we need to know more about the sarsens, how they were moved and carved, and exactly where they came from.

Ideas about why Stonehenge was built need to account for Neolithic politics“ The authority to gather the resources and organize the labor to build the monument would have brought power and respect to whomever was responsible. The projects scale would have demanded a labor force greater than local communities could have provided. The route along which the bluestones traveled must have traversed several territories, and even the sarsens may have come from a neighboring realm. Unfortunately, archaeology gives us no clues as to whether these territories might have been controlled by tribes, chiefdoms, or other types of government. It is difficult to prove, but negotiations and alliances would surely have been needed, and may even have been a factor in the decision to use Welsh stone. The people at Stonehenge could have used the bluestones to extend their authority.

Toward the end of Durrington Walls' history, around 2300 b.c., a massive earthwork enclosure more than 500 yards across was built on the site—a “henge” distinguished by a ditch inside a bank. Three other earth henges of similar scale were dug in a line between Avebury in the north and the coast to the south. I have proposed these henges mark the centers of rival territories. Timber palisades and large numbers of flint arrowheads suggest localized warfare. (The new excavations at Durrington Walls have also yielded a human bone with arrow wounds.) Stonehenge may have been part of power games involving living people as much as the gods or ancestors to whom it was home.

Thomas 2006

Mark G. Thomas, Michael P. H. Stumpf & Heinrich Harke, *Evidence for an apartheid-like social structure in early Anglo-Saxon England*. Proc. Royal Society B **273** (2006), 2651–2657.

The role of migration in the Anglo-Saxon transition in England remains controversial. Archaeological and historical evidence is inconclusive, but current estimates of the contribution of migrants to the English population range from less than 10 000 to as many as 200 000. In contrast, recent studies based on Y-chromosome variation posit a considerably higher contribution to the modern English gene pool (50-100 %). Historical evidence suggests that following the Anglo-Saxon transition, people of indigenous ethnicity were at an economic and legal disadvantage compared to those having Anglo-Saxon ethnicity. It is likely that such a disadvantage would lead to differential reproductive success. We examine the effect of differential reproductive success, coupled with limited intermarriage between distinct ethnic groups, on the spread of genetic variants. Computer simulations indicate that a social structure limiting intermarriage between indigenous Britons and an initially small Anglo-Saxon immigrant population provide a plausible explanation of the high degree of Continental male-line ancestry in England.

Keywords: computer simulation | migration | population | ethnicity | Y-chromosome

Metallzeiten

Faust 2000

Avraham Faust, *Ethnic Complexity in Northern Israel During Iron Age II.* Palestine Exploration Quarterly **132** (2000), 2–27.

Much discussion has focused on the ability of archaeology (and archaeologists) to identify ethnic groups on the basis of material culture. According to Colin Renfrew 'the most problematic of all the concepts which we have tended to use is that of "a people" , (1993, 20). Much of the discussion of this subject in Syro-Palestinian archaeology has concentrated around the identification of the 'Israelites' (for example, Congress 1992, 5-17; Dever 1993, 1995a; Finkelstein 1995, 1996a, 1997; Kempinski 1995; Bunimovitz and Yasur-Landau 1996; Herzog 1997; Kletter 1995). Most of this discussion has focused on Iron Age I (the Settlement period), in an attempt to identify the similarities and differences between the various ethnic groups which existed in Palestine at this time (for'the various groups see Mazar 1981; Aharoni 1979).

The present article will discuss the ethnicity of the inhabitants of Northern Israel during Iron Age II. The departure point of this article is the rural sector, which has not received much attention from 'Tell-minded' archaeological research (Ahlstrom 1982a, 24-25), but, for reasons given below, seems to hold the key to the attempt to identify ethnic groups in ancient Israel (see also London 1989, 52).

The differences between the finds at villages in the Northern Valleys and the villages in other regions of the country, and even between these villages and urban settlements in northern Israel, demonstrate that the population was from a different social and ethnic background—the residents of these sites were, apparently, Canaanite-Phoenician. This inference was supported by the similarity exhibited in almost all aspects between the villages discussed here and Bronze Age villages. Special attention was given in this study to the analysis of the household, on which Emberling (1997, 325) wrote: 'In particular, we suggest that household structure might be methodologically valuable because of its close, meaningful relationship with daily life'. Also of importance is the apparent difference in religious practices, and perhaps in food consumption. The special settlement history of these sites seems to support this differentiation, especially in the light of the historical background. It seems as if the differences cannot be simply attributed to such factors as ecology, wealth or class, and setting (urban versus rural) (but see below).

It seems therefore, that the royal cities of the Northern Valleys were used as 'symbols of power' in order to suppress the indigenous population and legitimize the new state and the new social order (see also Whitelam 1986), and less in order to 'educate' ('Israelize') them (Ahlstrom 1982 b). The latter could be, perhaps, partially correct in relation to the local elite.

The above discussion reveals the complex reality of the plural society that existed within the political entity discussed here (the kingdom of Israel), in which several ethnic groups existed, and different dynamics influenced the relations between those groups in the urban and rural sectors (in the Northern Valleys, while taking into account the different nature of the settlements and society of the highlands). If the scenario presented here is correct, it reveals dialectical relations between social and ethnic aspects, in which the different social status of the population of the Northern Valleys influenced their ethnicity on the one hand, but was influenced by it on the other hand.

Faust 2006

Avraham Faust, *Farmsteads in the Foothills of Western Samaria, A Reexamination.* In: Aren M. Maeir & Pierre de

Miroschedji (Hrsg.), *"I Will Speak the Riddles of Ancient Times", Archaeological and Historical Studies in Honor of Amihai Mazar on the Occasion of His Sixtieth Birthday.* (Winona Lake 2006), 477–504.

A unique wave of settlement occurred in the foothills of western Samaria during the late Iron Age, with a large number of farmsteads built in an ecologically inferior region that had never been settled before. This phenomenon lasted a few hundred years, from the 8th to the 2nd century bce.

It is currently impossible to assess the suggestion regarding the Mesopotamian origins of the farmstead population and to estimate how many of the deportees may have settled in the region and whether they constituted all or part of this population. People of such origin, however, were obviously present in the area at the time, at least at Tel Hadid.

It is likely that at least some of the population, however, was local, probably comprising people from the Coastal Plain (mainly from the settlements located in or near the alluvial valley) and perhaps also refugees from the devastated (western?) Samaria, drawn to the region because of its relative prosperity. It is likely that the latter represent an addition to a settlement process that already began.

Nafplioti 2016

Argyro Nafplioti, *Eating in prosperity, First stable isotope evidence of diet from Palatial Knossos.* Journal of Archaeological Science: Reports **6** (2016), 42–52.

This paper discusses the first stable isotope evidence of diet fromProtopalatial to Neopalatial Knossos on Crete to reconstruct individual long-term dietary records for people from the site, spanning the period circa 1900 to 1600 BC. The aim is to shed light onto the lifeways and social organization of the respective communities, and to investigate people's everyday life for evidence of the site's politico-economic supremacy in the Neopalatial period.

Eighty-one human and 12 animal individuals from two Palatial cemeteries at Knossos were sampled for cortical bone and the extracted collagen was analyzed for stable carbon and nitrogen isotope ratios to trace relative proportions of (broad categories of) foodstuffs that they consumed on a day-to-day basis. The human collagen stable isotope signatures follow a broad distribution that reflects a range of diets, where animal protein, including marine in addition to terrestrial, was consumed at different levels. Faunal isotope values from the site are consistent with a terrestrial C3 trophic context with apparently no C4 protein input. The observed dietary variation in the human stable isotope ratios shows no clear sex-, tomb-, or cemeterypattern; it rather follows a temporal trend that is in tune with contemporary socio-economic and political developments and the increasing prosperity of Knossos in the period investigated.Moreover, the study yielded the first positive human palaeodietary evidence for marine food consumption in Prehistoric Crete.

Keywords: Stable isotopes | Carbon | Nitrogen | Diet | Social variation | Knossos | Aegean

Neolithikum

van der Linden 2007

Marc van der Linden, *What linked the Bell Beakers in third millennium BC Europe?* Antiquity **81** (2007), 343–352.

In this important new review the author shows that neither trade nor migration can account for the distribution of Bell Beakers and the associated artefacts and burial practices in Europe. The materials were generally local and rooted in local

know-how. However recent stable isotope results show small-scale population changes associated with the arrival of Beaker practice. The distribution of Bell Beakers could thus reect the movement of marriage partners.

Keywords: Europe | Neolithic | Bronze Age | Bell Beakers | population movement | stable isotope | analysis

Müller 2011

Johannes Müller, *Megaliths and Funnel Beakers, Societies in Change 4100–2700 BC*. Kroonvoordrachten 33 (Amsterdam 2011).

Religion

Kristiansen 2010

Kristian Kristiansen, *Rock Art and Religion, The sun journey in Indo-European mythology and Bronze Age rock art*. In: Asa C. Fredell, Kristian Kristiansen & Felipe Criado Boado (Hrsg.), *Representations and Communications, Creating an Archaeological Matrix of Late Prehistoric Rock Art*. (Oxford 2010), 93–115.

In this article I carry out an analysis of the sun journey in Bronze Age rock art in south Scandinavia. The story is based upon a widely shared Indo-European myth about the sun maiden and her twin brothers and helpers, the Divine or Heavenly Twins, who in disguise of ships and horses come to her help so that the sun can rise in the morning. This myth can be illustrated by combining Bronze Age iconography, bronze igurines, burials, hoards, and rock art (Kristiansen and Larsson 2005, ig. 139). Here I wish to explore if scenes referring to the sun journey can be identiied in rock art alone. I apply the method of identifying singular motifs that relate to the overall narrative of the journey of the sun. On igures 1.6 to 1.12 I have selected and combined episodes from various rock art panels that refer back to the original mythological narrative of the sun journey. Although there is some regional variation it can be demonstrated that Bronze Age rock art in Scandinavia contains scenes from the shared Indo-European myth about the sun journey.

Story or Book

Eichler 2007

Raanan Eichler, *Digging Themselves Deeper*. Azure **27** (2007), 148–156.

Israel Finkelstein and Neil Asher Silberman. David and Solomon: In Search of the Bible's Sacred Kings and the Roots of the Western Tradition. Free Press, 2006, 342 pages.

Overall, the claims presented in this book as compared with the mainstream view can be summarized thus: (i) Most of the David and Solomon narrative has been proven by archaeology to be fictitious; (ii) archaeology can point to later contexts within which the various strata of this narrative may have been composed; and (iii) even those elements with tenth-century-bce origins could not have been written down until the late eighth century bce, when literacy in the land of Israel became widespread. Let us evaluate each of these claims.

All this is not to say that David and Solomon has no redeeming value. Indeed, there are several instances of impressive and valuable scholarship. For example, in a section on the depiction of Goliath the Philistine, the authors ask whether

the description of his armor matches what we know about how Philistine warriors actually looked, based on ancient drawings of them. By way of reaching a negative conclusion, the authors use data on Greek culture to propose that this depiction of Goliath is actually based on Greek mercenaries who they claim began to appear within the Judahite sphere from the seventh century bce.

The book's most important contribution, however, is in demonstrating what archaeology can reveal about the process of the Bible's composition. Until now, most biblical archaeologists have tended to confine themselves to shedding light on the Bible's "finished product," and most biblical scholars have failed to avail themselves of all that archaeology has to offer.

Watkins 2013

Trevor Watkins, *The creation of inequality*. Antiquity **87** (2013), 600–601.

Kent Flannery & Joyce Marcus. The creation of inequality: how our prehistoric ancestors set the stage for monarchy, slavery, and empire. xiv+631 pages, 72 illustrations. 2012. Cambridge (MA): Harvard University Press; 978-0-674-06469-0 hardback $ 39.95 & £ 29.95.

What do the authors mean by 'egalitarian' societies and 'inequality'? By default, it becomes clear that they are interested in the inequality of personal prestige that can be converted into authority, because their end point is the development of political power and authority.

I am, however, uneasy about their labelling of certain buildings within a number of sites of the late Epipalaeolithic (Natufian) and early Neolithic as 'men's houses'. How did they come to such an understanding? Certainly not from any of the archaeologists who have excavated these buildings.

The theory and method on which the book's thesis is based is very simple: among ethnographically documented hunter-gatherers, they differentiate those societies that are egalitarian, and lacking social institutions beyond close kin relations, and those that recognise clans. Clans involve people thinking in terms of 'us' and 'them', and therefore, sometimes, of 'us' versus 'them', which can result in acts of violence. Their chosen examples of such societies are seen to have cosmological myths and ritual practices—and men's houses (are there really no women's houses?). Therefore, in prehistoric situations where there is evidence for violence amounting to acts of ambush or violent death, or protective walls around the settlement, and where there are also buildings that are large, central, non-domestic, or full of symbolic representations, those buildings can be said to be 'men's houses'. Methodologically, we are a long way from the scientific processualism of Flannery's youth.