

Human Bones, Burials and Cemeteries: New Sources - List 12



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Meiklejohn and Robson
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This is the twelfth list of new articles and theses covering Mesolithic burial, begun in 2015. With 63 articles this is the largest to date, and, for the first time, the list is from two of us. Harry Robson has been identifying articles of possible interest for some time and it is appropriate that he is recognised as a co-author. Formatting remains as before. The size of this list reflects that this is the first issue since March of last year. Material specific to 15 countries and two areas is included, with some papers focused on more than one country and/or area/region. Looking at regional focus/bias the highest numbers are from Britain (England & Scotland) and Italy (including Sicily and Sardinia) with seven each, while Sweden, the Baltic countries and Russia have six each, and Portugal, the Balkans and Europe as a whole have five each. Other countries included are France (including Corsica) (4 each), Spain, Holland (including the North Sea), Greece and Finland (3 each), Ireland, Denmark, Norway and Ukraine (2 each) and Germany (1). In some cases papers cover more than one of these. In terms of primary chronological focus, all cover Mesolithic material to some degree, but in terms of primary focus 36 papers are largely restricted to the Mesolithic, 15 each focus on either the Mesolithic-Neolithic transition or the Holocene *in toto*, while eight focus on the Neolithic.

Turning to topics covered, the largest number of papers, 18, cover aspects of genomics, 11 focus on ^{14}C dating and ten on stable isotopes. These often overlap, and as a group are found alone or in tandem in 34 papers. Turning to papers focused on skeletal material or their context, including grave goods, 12 focused on grave goods and overall grave context, 11 on burials as units, and five on the description of skeletal material. Again, given overlap, these topics involved a total of 23 papers. Finally, other topics singled out in papers were seven under diet, three under dental studies and two under environment.

As is perhaps a measure of the broader topic of Mesolithic studies this list shows that the studies of context and of chemical/biochemical analyses are dominant and few describe the actual skeletal material underlying the topic of bones and burials. Only five papers describe previously unreported material in any detail, while four provide new data on previously published burial sites. Previously unreported finds are from Arma Veirana in Liguria, northern Italy, though with the core focus on associated ornaments, Sima Hedionda IV in Andalucía in southern Spain, cranial remains from a sinkhole context, and two from Finland, very limited human remains in an ochre grave at Majoonsuo in eastern Finland, and a very late hunter-gatherer burial at Suutarinniemi in the northwest. There are also four papers on previously known sites, one each on Kanaljorden (Motala) in Sweden, one of the burials from Theopetra in inland Thessaly in Greece, one on Haute-Île in the Marne Valley in northern France, and one on the “multiple burial” at Groß Fredenwalde in eastern Germany.

- Arzelier, A., Rivollat, M., De Belvalet, H., Pemonge, M.-H., Binder, D., Convertini, F., Duday, H., Gandelin, M., Guilaine, J., Haak, W., Deguilloux, M.-F. & Pruvost M. (2022) Neolithic genomic data from Southern France showcase intensified interactions with hunter-gatherer communities. *iScience* 25, 105387. <https://doi.org/10.1016/j.isci.2022.105387>

Abstract: Archaeological research shows that the dispersal of the Neolithic took a more complex turn when reaching western Europe, painting a contrasted picture of interactions between autochthonous hunter-gatherers (HGs) and incoming farmers. In order to clarify the mode, the intensity, and the regional variability of biological exchanges implied in these processes, we report new palaeogenomic data from Occitanie, a key region in Southern France. Genomic data from 28 individuals originating from six sites spanning from c. 5,500 to c. 2,500 BCE allow us to characterize regional patterns of ancestries throughout the Neolithic period. Results highlight major differences between the Mediterranean and Continental Neolithic expansion routes regarding both migration and interaction processes. High proportions of HG ancestry in both Early and Late Neolithic groups in Southern France support multiple pulses of inter-group gene flow throughout time and space and confirm the need for regional studies to address the complexity of the processes involved.

Comment: Though focused on the Neolithic in southern France, a key subtext involves contact with Late Mesolithic groups and the dynamics of the transition. Linkage in Neolithic individuals was found to both the Late Upper Palaeolithic GoyetQ2 and Villabruna group of finds, with GoyetQ2 linkage found at the Early Mesolithic site of Les Perrats. A topic raised involved whether Early Neolithic groups tended to occur in areas uninhabited during the later Mesolithic. Sites with new data in the paper are all Early Neolithic in context. Recent cited sources with overlapping focus include Rivollat *et al.* (2020) and Perrin and Manen (2021).

- Augereau, A. (2022) In search of the origin of inequalities: Gender study and variability of social organization in the first farmers societies of western Europe (Linearbandkeramik culture). *Journal of Anthropological Archaeology* 66, 101413. <https://doi.org/10.1016/j.jaa.2022.101413>

Abstract: In this paper, a gender approach attempts to address social organization and its variability in the Western Linearbandkeramik (LBK). By comparing burial goods with the sex and age of the individuals, with data on origin, nutrition and health, and examining the sexual division of labor, we aim to determine the variability in social organization from 5500 to 4900 BCE in an extensive area that encompasses the Carpathian basin to the Paris basin. Four main cores emerge, central European core being the most cohesive. Human groups may have had different social and economic roles. In particular, a dominant group with the land rights and the responsibility for ensuring the social and territorial stability, was made up of local men with a higher intake of animal protein, who were buried in central places with adzes. This model collapses at the end of the LBK in the Paris basin where women in elaborate dress stand out and authority seems to be attributed to a social class. This would have led to inequalities based on the amount of material wealth and the capacity to produce and capitalize on it. This is perhaps one of the differences between hunter-gatherer societies and Early Farmers.

Comment: Though focused on the LBK, this article is included because of the extensive discussion of elements that separate the LBK from the Mesolithic societies they displaced, focused on gender and inequality. The interest here is that a considerable portion of the discussion involves data from burial contexts. Discussion of grave goods includes the issue of male/female similarities and differences. Of key interest to those interested in the Mesolithic-Neolithic transition, a key data source includes a listing, with numbers of individuals and references, of sites with human remains in LBK context; 61 are listed ranging from Hungary, Slovakia and the Czech Republic to France. A key finding, from

our perspective, lies in the apparent greater differentiation between burials in the LBK compared to Mesolithic cases. This paper clearly provides a base for further work.

- Behnamian, S., Esposito, U., Holland, G., Alshehab, G., Dobre, A.M., Pirooznia, M., Brimacombe, C.S. & Elhaik, E. (2022) Temporal population structure, a genetic dating method for ancient Eurasian genomes from the past 10,000 years. *Cell Reports Methods* 2(8), 100270. <https://doi.org/10.1016/j.crmeth.2022.100270>

Abstract: Radiocarbon dating is the gold standard in archeology to estimate the age of skeletons, a key to studying their origins. Many published ancient genomes lack reliable and direct dates, which results in obscure and contradictory reports. We developed the temporal population structure (TPS), a DNA-based dating method for genomes ranging from the Late Mesolithic to today, and applied it to 3,591 ancient and 1,307 modern Eurasians. TPS predictions aligned with the known dates and correctly accounted for kin relationships. TPS dating of poorly dated Eurasian samples resolved conflicting reports in the literature, as illustrated by one test case. We also demonstrated how TPS improved the ability to study phenotypic traits over time. TPS can be used when radiocarbon dating is unfeasible or uncertain or to develop alternative hypotheses for samples younger than 10,000 years ago, a limitation that may be resolved over time as ancient data accumulate.

Comment: This paper is included here for the approach rather than the specific data in use. Data from Mesolithic contexts is limited, but the method suggests new ways of approaching issues of chronology. Specific sites are not discussed in the primary text, but data and sources are given in the supplementary files.

- Bird, M.I., Haig, J., Ulm, S. & Wurster, C. (2022) A carbon and nitrogen isotope perspective on ancient human diet in the British Isles. *Journal of Archaeological Science* 137, 105516. <https://doi.org/10.1016/j.jas.2021.105516>

Abstract (lightly edited): The stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope composition of human bone collagen is increasingly used to investigate past mobility and subsistence strategies. This study presents a compilation of 1298 carbon and nitrogen isotope analyses of archaeological human bone collagen from the British Isles spanning much of the Holocene, along with a compilation of 4148 analyses of modern and ancient isotope analyses from the major marine and terrestrial dietary resources from the same region. We convert ancient human stable isotope data to modern diet equivalent (MDE) values for humans, and convert the isotope composition of ancient dietary items to modern tissue equivalent (MTE) isotope values. These conversions enable a direct comparison of ancient and modern datasets. Results for food groups (plants, grain, herbivores, omnivores, shellfish, freshwater fish and marine fish) show a remarkably broad range of $\delta^{13}\text{C}_{\text{MTE}}$ values from ~ -36 to -7‰ and $\delta^{15}\text{N}_{\text{MTE}}$ values from ~ -2 to $+21\text{‰}$ and we provide estimates for each food type that can be used in dietary reconstruction in the absence of site-specific data. We further show that there is no significant change in terrestrial stable isotope baseline values over the Holocene, with observed variability in baseline values due to local eco-physiological, edaphic and microclimatic factors. The range of values expressed in the human sample set from the beginning of the Iron Age is relatively tightly clustered with 50% of all human modern diet equivalent results falling within a $\sim 2\text{‰}$ range in $\delta^{13}\text{C}_{\text{MDE}}$ values (-25.5 to -27.5‰) and a $\sim 3.5\text{‰}$ range in $\delta^{15}\text{N}_{\text{MDE}}$ values from $+4\text{‰}$ to $+8\text{‰}$. From the Iron Age to post-medieval times there is a consistent progressive shift to higher $\delta^{13}\text{C}_{\text{MDE}}$ and $\delta^{15}\text{N}_{\text{MDE}}$ values at the population level. This shift likely reflects a combination of successive innovations associated with food production, preservation and transport that enabled a broader cross-section of the population of the British Isles to incorporate a higher proportion of animal, and particularly marine protein, into their diets.

Comment: Purporting to look at dietary patterns in Britain from the Mesolithic through post-Iron Age, anyone looking at this paper for insight into the Mesolithic and the Neolithic transition will find data from the two periods discussed as a single unit. Mesolithic samples used are identified as Scottish coastal midden sites and Doggerland, referencing Bownes (2018) and van der Plicht *et al.* (2016). Checking the sources, the primary Scottish Mesolithic site is Cnoc Coig. Most of the data used are available elsewhere and the primary interest relates to methodological issues relating to differences in reporting ancient and modern isotope values. One result is that $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values used in the discussion are not directly comparable to those reported in most archaeological sources. I would also caution that the pdf version examined contains typographic errors that make both reading and comprehension difficult in places.

- Boethius, A., Ahlström, T., Kielman-Schmitt, M., Kjällquist, M. & Larsson, L. (2022) Assessing laser ablation multi-collector inductively coupled plasma mass spectrometry as a tool to study archaeological and modern human mobility through strontium isotope analyses of tooth enamel. *Archaeological and Anthropological Sciences* 14, 97. <https://doi.org/10.1007/s12520-022-01556-9>

Abstract: To evaluate the possibility of obtaining detailed individual mobility data from archaeological teeth, the strontium isotope ratios on 28 human teeth from three separate Early-Mid Holocene, Swedish, foraging contexts (Norje Sunnansund, Skateholm and Västerbjers) were analysed through laser ablation. The teeth/individuals have previously been analysed using traditional bulk sampled thermal ionisation mass spectrometry. To validate the conclusions regarding the archaeological teeth, a tooth from a modern man with a known background was also analysed. The result shows that all of the teeth display less than 0.4% discrepancy between the mean values of the laser ablation profiles and the previously published bulk data and 25 (89%) of the teeth display less than a 0.2% discrepancy. By calculating linear and polynomial trendlines for each ablated tooth, it was possible to illustrate a strong correlation for the transition pattern between the measurements when following a chronological sequence from the tip to the cervix. Such correlations were not reproduced when the data sequence was randomized. The analyses show that the chronologically sequenced ablation data fit with a transition between local bioavailable strontium regions, that the measurements do not fluctuate between extremes and that their values are not caused by end-member mixing. This indicates an increasing data resolution when reducing strontium isotope ratio averaging time by minimizing the sampling area. The results suggest strontium incorporation in human teeth can be measured on an ordinal scale, with a traceable chronological order to enamel mineralization when sampled from tip to cervix at an equal distance from the surface. Micro-sampling enamel is considered a valid method to assess prehistoric, but not modern, human mobility; laser ablation technology increases the amount of information obtained from a single tooth while rendering minimal damage to the studied specimen.

Comment: This paper increases the breadth of studies using largely non-destructive approaches to dental analysis to archaeological problems, in this case to human mobility. It is included here because it uses data from three Swedish sites, Mesolithic Norje Sunnansund and Skateholm, and Neolithic Västerbjers. The extended abstract describes the approach. Of particular interest is the further use of data from Norje Sunnansund, a site only recently reported (see List 11 in *Mesolithic Miscellany* 29(2), Kjällquist 2021 and Kjällquist & Price 2019).

- Brami, M., Winkelbach, L., Schulz, I., Schreiber, M., Blöcher, J., Diekmann, Y. & Burger, J. (2022) Was the fishing village of Lepenski Vir built by Europe's first farmers? *Journal of World Prehistory* 35, 109-133. <https://doi.org/10.1007/s10963-022-09169-9>

Abstract: It is now widely accepted that agriculture and settled village life arrived in Europe as a cultural package, carried by people migrating from Anatolia and the Aegean Basin. The putative fisher-forager site of Lepenski Vir in Serbia has long been acknowledged as an exception to this model. Here, the Mesolithic–Neolithic transition—possibly inspired by interaction with the new arrivals—was thought to have taken place autochthonously on site. Our reinterpretation, based on ancient genomes, as well as archaeological and isotopic evidence, indicates that here, too, house construction, early village society and agriculture were primarily associated with Europe's first farmers, thus challenging the long-held view of Lepenski Vir as a Mesolithic community that adopted Neolithic practices. Although aspects of the site's occupation, such as the trapezoidal houses, were inspired by local Mesolithic traditions, it is far from certain that the village was founded by Iron Gates foragers. A detailed timeline of population changes at the site suggests that Aegean incomers did not simply integrate into an established Mesolithic society, but rather founded new lineages and households. Iron Gates foragers and their admixed descendants largely appear to have been buried separately, on the fringes of the settlement. The diet of those buried outside in pits shows no major shift from aquatic to terrestrial food resources.

Comment: This paper gives a critical overview of the population sequence at the Iron Gates site of Lepenski Vir, within a review of available aDNA, ^{14}C and $\delta^{15}\text{N}$ data. Information on data used is given in the supplementary files. Though there is evidence for some population continuity across the transition, the model presented suggests a clear break or hiatus between an Early Mesolithic and appearance of a Transformational or Early Neolithic population, between 7400 and 6200 cal BC. This suggests that the pattern of occupation at Lepenski Vir is much closer to European areas to the north and west than previously thought. It also suggests that the pattern seen at Lepenski Vir and Padina differs from Vlasac, suggesting a pattern where the latter continued a Mesolithic way of life for several hundred years after arrival of the Lepenski/Padina population from the Aegean.

- Calò, C.M., Vona, G., Robledo, R. & Francalacci, P. (2021) From old markers to next generation: reconstructing the history of the peopling of Sardinia. *Annals of Human Biology* 48(3), 203-212. <https://doi.org/10.1080/03014460.2021.1944312>

Abstract:

Context: For many years the Sardinian population has been the object of numerous studies because of its unique genetic structure. Despite the extreme abundance of papers, various aspects of the peopling and genetic structure of Sardinia still remain uncertain and sometimes controversial.

Objective: We reviewed what has emerged from different studies, focusing on some still open questions, such as the origin of Sardinians, their relationship with the Corsican population, and the intraregional genetic heterogeneity.

Methods: The various issues have been addressed through the analysis of classical markers, molecular markers and, finally, genomic data through next generation sequencing.

Results and conclusions: Although the most ancient human remains date back to the end of the Palaeolithic, Mesolithic populations brought founding lineages that left evident traces in the modern population. Then, with the Neolithic, the island underwent an important demographic expansion. Subsequently, isolation and genetic drift contributed to maintain a significant genetic heterogeneity, but preserving the overall homogeneity on a regional scale. At the same time, isolation and genetic drift contributed to differentiate Sardinia from Corsica, which saw an important gene flow from the mainland. However, the isolation did not prevent gene flow from the neighbouring populations whose contribution are still recognisable in the genome of Sardinians.

Comment: This is the first of four articles from *Annals of Human Biology* in this list, a journal not

previously cited in this series of articles (see also Feldman *et al.*, Modi *et al.* and Serrano *et al.* below). As noted in the abstract the review covers the biological history of Sardinia from the Late Palaeolithic to the present, included here for its coverage of the Mesolithic and the Mesolithic-Neolithic transition. Though generally an overview, it provides an introduction to the available literature and, from the perspective of this series of articles, on the debate/discussion on the degree to which the Sardinian population shows evidence of genetic continuity across the transition.

- Catalano, G., Modi, G., D'Amore, G., Lari, M., Caramelli, D. & Sineo, L. (2021) Analisi paleogenetica dei cacciatori-raccoglitori della Sicilia: nuovi dati sul primo popolamento dell'isola. In P. Militello, F. Nicoletti & R. Panvini (eds.) *La Sicilia preistorica: dinamiche interne e relazioni esterne: atti del Convegno internazionale di studi: Catania-Siracusa 7-9 ottobre 2021*. Regione Siciliana Assessorato dei Beni Culturali e dell'Identità Siciliana, Palermo, 61-69 (in Italian with English summary). <https://hdl.handle.net/10447/571465>

Summary in place of abstract (slightly edited): The first undisputed colonization of the island has been linked to Late or Final Epigravettian groups after the Last Glacial Maximum (LGM), as evidenced by the fossil record. Two significant sites to investigate this issue are the Grotta di San Teodoro (Acquedolci, Messina) and the Grotta d'Oriente (Favignana island). The Grotta di San Teodoro has yielded the oldest and largest human skeletal sample yet found in Sicily. Inside the cave, during field excavations carried out between 1937 and 1947, seven human adults were discovered (ST1-ST7). In the Grotta d'Oriente four prehistoric burials assigned to the Late Upper Paleolithic (Oriente A and C) and Mesolithic (Oriente B and X) were unearthed during work in 1972 and 2005. Thanks to the recent development of new methods for the analysis of ancient DNA (aDNA) coupled with Next Generation Sequencing technologies (NGS), it is nowadays possible to go deep into the migration movements of past human populations. In order to better understand the peopling of Sicily during the Late Upper Paleolithic and Mesolithic, we analyzed and compared three complete mitochondrial genome sequences for ST2, Oriente C and Oriente B. ST2 is an almost complete cranium attributed to a male, housed at the "G.G. Gemmellaro" Geological Museum of the University of Palermo. The ST2 individual was buried near ST1, which was radiocarbon dated to 15,232-14,126 cal. BP. The Oriente C individual was found in 2005. Two radiocarbon dates on charcoal are consistent with typical Late Epigravettian stone assemblages and refer Oriente C, a female represented by the upper half of the skeleton, to the period spanning 14,200-13,800 cal. BP. The Mesolithic Oriente B was unearthed in 1972. This individual, an almost complete adult female skeleton, has been directly dated to 10,683-10,544 cal. BP. Paleogenetic analysis reveals a significant homogeneity in Sicilian Paleo-Mesolithic hunter-gatherers, and our data suggest a strong genetic relationship with Upper Paleolithic hunter-gatherers from Southern Italy, supporting the hypothesis that the first humans to arrive in Sicily could have originated from Epigravettian groups that migrated from the Italian peninsula soon after the LGM.

Comment: The core of the paper is clearly outlined in the summary. Its inclusion here is because the discussion includes the material from the Oriente site, which spans that LUP-Mesolithic boundary. Also included is discussion of data from Grotta dell'Uzzo and a maximum parsimony table showing mtDNA linkage to a large range of published European Upper Palaeolithic and Mesolithic mtDNA results. Radiocarbon results reference work of Mannino *et al.* (2011, 2012). Coverage of this paper overlaps with Yu *et al.* (see below).

- Chapple, R.M., McLaughlin, R. & Warren, G. (2022) '...where they pass their unenterprising existence...': change over time in the Mesolithic of Ireland as shown in radiocarbon-dated activity. *Proceedings of the Royal Irish Academy: Archaeology, Culture, History, Literature* 122, 1-38. <https://doi.org/10.1353/ria.2022.0011>

Abstract: This paper presents the first detailed audit and analysis of radiocarbon-dated Mesolithic activity in Ireland. This provides a data set of 119 definite or possible sites and nearly 450 dates. This data set is reviewed to understand how changes in the character of archaeological activity and other biasing factors influence the distribution of radiocarbon dates across space and time. We present very different outcomes than previously published reviews, especially regarding the claimed impact of the 8200 cal BP climatic downturn. This is an outcome of the more reliable data set presented here. Some of the patterns identified are a product of sampling strategies, such as a peak in Earlier Mesolithic activity attributable to multiple dates from Mount Sandel. Others relate to restructuring of activity by hunter-gatherers leading to significant changes to the archaeological visibility of that activity at the change from Earlier to Later Mesolithic. Increasing numbers of radiocarbon dates at the end of the period, alongside the changing character of the archaeological evidence, may indicate low levels of population growth.

Comment: We include this article because of its interest to anyone exploring issues of chronology in Mesolithic Ireland, including Eire and Northern Ireland. Mention of human material is limited, but dates associated with human material are included in supplementary file 2, including material discussed in *Mesolithic Miscellany* in 2012 (Meiklejohn & Woodman 2012). The extended database is derived from an earlier online base developed by the lead author, Robert Chapple.

- Charlton, S., Brace, S., Hajdinjak, M., Kearney, R., Booth, T., Reade, T., Tripp, J.A., Sayle, K.L., Grimm, S.B., Bello, S.M., Walker, E.A., Gilardet, A., East, P., Glocke, I., Larson, G., Higham, T., Stringer, C., Skoglund, P., Barnes, I. & Stevens, R.E. (2022) Dual ancestries and ecologies of the Late Glacial Palaeolithic in Britain. *Nature Ecology & Evolution* 6, 1658-1668. <https://doi.org/10.1038/s41559-022-01883-z>

Abstract: Genetic investigations of Upper Palaeolithic Europe have revealed a complex and transformative history of human population movements and ancestries, with evidence of several instances of genetic change across the European continent in the period following the Last Glacial Maximum (LGM). Concurrent with these genetic shifts, the post-LGM period is characterized by a series of significant climatic changes, population expansions and cultural diversification. Britain lies at the extreme northwest corner of post-LGM expansion and its earliest Late Glacial human occupation remains unclear. Here we present genetic data from Palaeolithic human individuals in the United Kingdom and the oldest human DNA thus far obtained from Britain or Ireland. We determine that a Late Upper Palaeolithic individual from Gough's Cave probably traced all its ancestry to Magdalenian-associated individuals closely related to those from sites such as El Mirón Cave, Spain, and Troisième Caverne in Goyet, Belgium. However, an individual from Kendrick's Cave shows no evidence of having ancestry related to the Gough's Cave individual. Instead, the Kendrick's Cave individual traces its ancestry to groups who expanded across Europe during the Late Glacial and are represented at sites such as Villabruna, Italy. Furthermore, the individuals differ not only in their genetic ancestry profiles but also in their mortuary practices and their diets and ecologies, as evidenced through stable isotope analyses. This finding mirrors patterns of dual genetic ancestry and admixture previously detected in Iberia but may suggest a more drastic genetic turnover in northwestern Europe than in the southwest.

Comment: Though, as clearly indicated in the title and abstract, this paper focuses on the post-LGM Upper Palaeolithic, a quick search shows a secondary focus for understanding the ancestry of British Mesolithic groups and their interrelationships. As indicated above, the Kendrick's Cave and Late Upper Palaeolithic Gough's Cave individuals show different aDNA profiles, the former with the more southerly Villabruna group, the latter with the Goyet group, seen more clearly in France, Belgium and Germany. Both groups are also shown to be present in later British Mesolithic individuals that have

been tested, and the question of differing origins of Mesolithic groups in Britain is raised, with data provided for individuals from the sites of Aveline's Hole, Gough's Cave ("Cheddar Man") and Kent's Cavern in southwestern England, and Ogof-yr-Ychen in Wales.

- Clark G.A. & Barton C.M. (2022) The Mesolithic of Atlantic Coastal Spain – a comparison with the Middle Ebro Basin. *Comptes Rendus Palevol* 21(3), 39-114. <https://doi.org/10.5852/cr-palevol2022v21a3>

Abstract: This paper compares current evidence for Mesolithic adaptations along the north Spanish coast from Galicia in the west to the Basque Country in the east. Significant questions and issues pertinent to Mesolithic research are reviewed, followed by a brief discussion of advances in method and theory over the past 25 years. Cantabria, País Vasco, and Galicia are compared with each other and *en bloc* with evidence from the middle Ebro over the 12-6 ka BP interval considered to bracket the transition between foraging and domestication economies. Marked differences in the time-space grid, geology, and the resolution of the data hinder these comparisons. A radiocarbon database totaling 610 dates is compiled, cleaned, filtered and analyzed for each region individually using summed calibrated date probability distribution (SPD) curves as a proxy for population density fluctuations over time. Regional curves are then compared with each other and with a global model.

Comment: The importance of this article for this list involves the extensive radiocarbon database (pp. 95-114). Laboratory numbers are included though original date references are not. Reference in the paper to specific bioarchaeological issues is minor. We note that calibrations provided and analysed use the IntCal13 and Marine13 calibration curves, and therefore require recalibration using the IntCal20 and Marine20 curves before further work is done (see Heaton *et al.* 2020; Reimer *et al.* 2020).

- Costa, A.M., Freitas, M. da C., Jiménez-González, M.A., Jiménez-Morillo, N.T., Dias, C.B., Val-Péon, C., Reichert, K., Fatela, F., Araújo, A.C., Gabriel, S., Leira, M., Diniz, M. & Arias, P. (2022) A multidisciplinary approach to characterise the Early-Middle Holocene palaeoenvironmental evolution of the Sado Valley of Portugal: implications for late Mesolithic human communities. *Palaeogeography, Palaeoclimatology, Palaeoecology* 598, 111015. <https://doi.org/10.1016/j.palaeo.2022.111015>

Abstract: In this paper we present the results of a multidisciplinary study performed in the Carasqueira valley, a tributary of the River Sado (SW Portugal), aimed at characterising the Holocene environmental conditions during the late Mesolithic occupation of this valley. Our findings are based on a 13.5 m long sediment core (Arez3) collected on the alluvial plain close to a late Mesolithic shell midden, the Arapouco site. The results of the multiproxy analyses (texture, magnetic susceptibility, organic composition and chemistry, *n*-alkanes and palynology) point to a greater marine influence between ca. 8850 cal yrs. B.P. (at the core base) and ca. 7450 cal yrs. B.P. (at 750 cm below mean sea level (MSL)) and the existence of an environment similar to the present-day central estuarine basin. At this point in time, sedimentation rates were lower than the rate of sea-level rise, resulting in the formation of a drowned area with intertidal environments developing on the less incised margins. After 7040 cal yrs. B.P. the contribution of organic matter from terrestrial plants and freshwater phytoplankton to the sediment increased, reflecting a change in the sedimentary pattern, with the estuarine environments progressively giving way to freshwater environments. After the Middle Holocene (ca. 6530 cal yrs. B.P.), negative shifts of $\delta^{15}\text{N}$ to values $\sim 0\%$ point to hyper-eutrophication and cyanobacteria bloom episodes under backswamp conditions. According to these results, the estuarine environment prevailed in the area until 7040 cal yrs. B.P. (5090 cal yrs. B.C.; 390 cm below MSL), i.e., during the Mesolithic occupation of the valley, allowing for the occurrence and for the exploitation of marine

shellfish and fish by these hunter-gatherer communities at the proximity of the downstream occupation areas.

Comment: This paper focuses on the environment of the Late Mesolithic Sado Basin during its occupation, based on data collected from the vicinity of Arapouco, one of the Sado basin sites with dated Mesolithic human remains. Related to similar sites Arapouco is the closest to the mouth of the Sado estuary. Though not dealing specifically with the human remains, the paper focuses on the available diet for the Mesolithic population of the Sado basin. It also shows the continued access to marine food resources in the estuary until *ca.* 7000 cal BP, thereby providing new information related to the last occupation of the area by hunter-gatherers. There is also comparison to the contemporary situation in the Tagus estuary, and therefore into the debate over the nature of the Late Mesolithic Sado and Tagus enclaves, parallel to the first appearance of the Neolithic, *ca.* 7450 cal BP.

- Cristiani, E., Radini, A., Zupancich, A., Gismondi, A., D'Agostino, A., Ottoni, C., Carra, M., Vukojičić, S., Constantinescu, M., Antonović, D., Price, T.D. & Borić, D. (2021) Wild cereal grain consumption among Early Holocene foragers of the Balkans predates the arrival of agriculture. *eLife* 10, e72976. <https://doi.org/10.7554/eLife.72976>

Abstract: 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 (GSTs) 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 GSTs 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.

Comment: Though the focus of this paper is more archaeological than bioanthropological, the central methodology is framed within an area that has become increasingly important, the study of dental calculus for evidence of diet, with core results indicated in the abstract. Papers using dental calculus have appeared in the last four lists, and include material from Italy and Sweden (Cristiani *et al.* 2018; Jovanovic *et al.* 2021; Nava *et al.* 2021 and Norström *et al.* 2019). Mesolithic sites used are Lepenski Vir, Padina, Vlasac and Hajdučka Vodenica.

- Cummings, V., Hofmann, D., Bjørnevad-Ahlqvist, M. & Iversen, R. (2022) Muddying the waters: reconsidering migration in the Neolithic of Britain, Ireland and Denmark. *Danish Journal of Archaeology* 11, 1-25. <https://doi.org/10.7146/dja.v11i.129698>

Abstract: This paper explores the current narratives of migration for the start and spread of the Neolithic with a particular focus on the role that the new ancient DNA data have provided. While the genetic data are important and instructive, here it is argued that archaeologists should also consider other strands of evidence. More nuanced appreciations of migration as a long-term process can be created by exploring modern mobility studies alongside considerations of continued mobility throughout the Neolithic in Europe. We can also re-interpret the material evidence itself in the light of these approaches to help trace multiple possible links and migrations from multiple different origin points. This involves the investigation of complex, but connected, practices, such as monument construction and deposition across wider areas of northern Europe than are currently normally investigated. Such an approach will enable us to address long-term processes of movement, migration and interaction and

investigate how new, shared social experiences emerged in a setting in which mobility and migration may have been the norm.

Comment: Though focused on the Neolithic, this paper is included because the base for much of the argument lies in interpretation of the Mesolithic-Neolithic transition. Though specific reference to the Mesolithic is limited, the discussion arising from recent aDNA studies, including Mesolithic material, permeates the paper, as does recent publication on the nature of the transition. Sources mentioned include Elliott and Griffiths (2018), Garrow and Sturt (2011), Rivollat *et al.* (2020) and Thomas (1988).

- de Becdelièvre, C., Blagojević, T., Jovanović, J., Stefanović, S., Hofmanová, Z. & Porčić, M. (2021) Palaeodemography of the foraging to farming transition: insights from the Danube Gorges Mesolithic-Neolithic transformations. In A. Degioanni, E. Herrscher & S. Naji (eds.) *Journey of a committed paleodemographer: farewell to Jean-Pierre Bocquet-Appel*. Presses Universitaires de Provence, Aix-en-Provence, 113-131. <https://doi.org/10.4000/books.pup.54310>

Abstract: The diffusion of the farming way-of-life into environments occupied by Mesolithic hunter-gatherers in Europe has been associated with two major demographic events: the migrations of farmers originating from the Near-East and an unprecedented population increase, the "Neolithic Demographic Transition" (NDT). The Mesolithic-Neolithic transformations in the Danube Gorges provide a context of particular importance for tackling issues of Neolithization, due to its location, temporal depth, and highly contextualized osteo-anthropological record. This chapter compares complementary palaeodemographic proxies and bioarchaeological markers in order to assess the demographic response of local foragers to the Neolithic expansion. Interpreted together, these lines of evidence confirm the predictions of the NDT, and shed light on the relationships between subsistence intensification, sedentism and population growth, between migrations, cultural transmission and adaptations, and between dietary strategies, fertility and morbidity – i.e. on some mechanisms, benefits and costs of the farming transition – in the Central Balkans.

Comment: This article is from the tribute volume for the palaeodemographer J.-P. Bocquet-Appel, who died in 2018, focused on the Danube Gorge area. After looking at the Neolithic transition, it focuses on what it refers to as the "probability distribution of different radiocarbon dates (SCPD)". In looking at demographic markers, sites referred to are Lepenski Vir, Padina, Vlasac, Hajdučka Vodenica, Ajmana and Velesnica.

- Dreshaj, M., Dee, M., Brusgaard, N., Raemaekers, D. & Peeters, H. (2023) High-resolution Bayesian chronology of the earliest evidence of domesticated animals in the Dutch wetlands (Hardinxveld-Giessendam archaeological sites). *PLoS ONE* 18(1), e0280619. <https://doi.org/10.1371/journal.pone.0280619>

Abstract: The archaeological sites of Hardinxveld-Giessendam de Bruin and Polderweg, situated in the Rhine-Meuse delta, are the best-preserved Mesolithic sites in the Netherlands. Due to the early appearance of domesticated animals in their faunal assemblage, they are also integral to the research of the emergence of animal husbandry in the region. This study focuses on the precise chronology of the sites, using radiocarbon dating and Bayesian modelling of both newly acquired and legacy radiocarbon dates. To mitigate the risk of erroneous dates, we dated the bone collagen of 26 herbivorous and one aquatic mammal from clear archaeological contexts and discovered that the most recent occupational phases at both sites are several centuries younger than previously thought. This is consistent with material evidence of lifestyle changes in the final phase at Hardinxveld-Giessendam de Bruin, which is now, according to our chronology, contemporaneous with the similar patterns produced in the region.

Comment: While seemingly tangential to the focus of these lists on Mesolithic human skeletal material and its interpretation, the core topic is critical for understanding the Mesolithic-Neolithic transition in the Netherlands and the association of human remains with the transition. There has been extended discussion of whether sites identified as within the Swifterbant culture are Mesolithic or Neolithic, and this paper does much to clarify the chronology, centred in the two volumes published on the de Bruin and Polderweg sites (Louwe-Kooijmans 2001a, 2001b). Introduction of domestic animals is seen as a critical marker for the appearance of food production and the true Neolithic. The core of the paper involves new radiocarbon dates and their interpretation, showing the two key sites as ~200 year younger than previously believed and younger than the oldest identified Swifterbant sites, in the Scheldt Valley in Belgium. The transition in the two sites is now viewed as dating to ~4250-4450 cal BC, almost a millennium later than the first evidence of the LBK.

- Duijals, K., Foody, M.G.B., Justeau, P., Silva, M., Martiniano, R., Oteo-García, G., Fichera, A., Rodrigues, S., Gandini, F., Meynert, A., Donnelly, K., Aitman, T.J., The Scottish Genomes Partnership, Chamberlain, A., Lelong, O., Kozikowski, G., Powlesland, D., Waddington, C., Mattiangeli, V., Bradley, D.G., Bryk, J., Soares, P., Wilson, J.F., Wilson, G., Moore, H., Pala, M., Edwards, C.J. & Richards, M.B. (2022) Ancient DNA at the edge of the world: continental immigration and the persistence of Neolithic male lineages in Bronze Age Orkney. *Proceedings of the National Academy of Sciences* 119(8), e2108001119. <https://doi.org/10.1073/pnas.2108001119>

Abstract: Orkney was a major cultural center during the Neolithic, 3800 to 2500 BC. Farming flourished, permanent stone settlements and chambered tombs were constructed, and long-range contacts were sustained. From ~3200 BC, the number, density, and extravagance of settlements increased, and new ceremonial monuments and ceramic styles, possibly originating in Orkney, spread across Britain and Ireland. By ~2800 BC, this phenomenon was waning, although Neolithic traditions persisted to at least 2500 BC. Unlike elsewhere in Britain, there is little material evidence to suggest a Beaker presence, suggesting that Orkney may have developed along an insular trajectory during the second millennium BC. We tested this by comparing new genomic evidence from 22 Bronze Age and 3 Iron Age burials in northwest Orkney with Neolithic burials from across the archipelago. We identified signals of inward migration on a scale unsuspected from the archaeological record: As elsewhere in Bronze Age Britain, much of the population displayed significant genome-wide ancestry deriving ultimately from the Pontic-Caspian Steppe. However, uniquely in northern and central Europe, most of the male lineages were inherited from the local Neolithic. This suggests that some male descendants of Neolithic Orkney may have remained distinct well into the Bronze Age, although there are signs that this had dwindled by the Iron Age. Furthermore, although the majority of mitochondrial DNA lineages evidently arrived afresh with the Bronze Age, we also find evidence for continuity in the female line of descent from Mesolithic Britain into the Bronze Age and even to the present day.

Comment: Though focused on the Neolithic and centred on Bronze and Iron Age data, we have included this paper because of a theme raised in the last sentence of the abstract, continuity of female mtDNA with Mesolithic roots. Attention is especially paid to variants within the U5b2 lineage of mtDNA, also found in Neolithic Orkney and Mesolithic Ireland, and with similar linkages found in Y-chromosome markers.

- Feldman, M., Gnecci-Ruscione, G.A., Lamnidis, T.C. & Posth, C. (2021) Where Asia meets Europe – recent insights from ancient human genomics. *Annals of Human Biology* 48(3), 191-202. <https://doi.org/10.1080/03014460.2021.1949039>

Abstract:

Context: The peopling of Europe by modern humans is a widely debated topic in the field of modern and ancient genomics. While several recent syntheses have focussed on this topic, little has been discussed about the genetic history of populations in the continent's surrounding regions.

Objective: We explore genetic transformations in three key areas that played an essential role in the formation of the European genetic landscape through time, focusing on the periods spanning from the Epipalaeolithic/ Mesolithic and up until the Iron Age.

Methods: We review published ancient genomic studies and integrate the associated data to provide a quantification and visualisation of major trends in the population histories of the Near East, the western Eurasian Steppe and North East Europe.

Results: We describe cross-regional as well as localised prehistoric demographic shifts and discuss potential research directions while highlighting geo-temporal gaps in the data.

Conclusion: In recent years, archaeogenetic studies have contributed to the understanding of human genetic diversity through time in regions located at the doorstep of Europe. Further studies focusing on these areas will allow for a better characterisation of genetic shifts and regionally-specific patterns of admixture across western Eurasia.

Comment: As one of the articles from *Annals of Human Biology* (see also Calò *et al.* above and Modi *et al.* and Serrano *et al.* below) this paper focuses on the genetics rather than the skeletal record. It provides a useful review of both the genetics of the Mesolithic-Neolithic transition, and the broader study of the genetics of Mesolithic and Early Neolithic European groups.

- Fontanals-Coll, M., Soncin, S., Talbot, H.M., von Tersch, M., Gibaja, J.F., Colonese, A.C. & Craig, O.E. (2023) Stable isotope analyses of amino acids reveal the importance of aquatic resources to Mediterranean coastal hunter-gatherers. *Proceedings of the Royal Society B* 290(1993), 20211330. <https://doi.org/10.1098/rspb.2022.1330>

Abstract: Determining the degree to which humans relied on coastal resources in the past is key for understanding long-term social and economic development, as well as for assessing human health and anthropogenic impacts on the environment. Prehistoric hunter-gatherers are often assumed to have heavily exploited aquatic resources, especially those living in regions of high marine productivity. For the Mediterranean, this view has been challenged, partly by the application of stable isotope analysis of skeletal remains which has shown more varied coastal hunter-gatherer diets than in other regions, perhaps due to its lower productivity. By undertaking a more specific analysis of amino acids from bone collagen of 11 individuals from one of the oldest and best-known Mesolithic cemeteries in the Mediterranean, at El Collado, Valencia, we show that high levels of aquatic protein consumption were achieved. By measuring both carbon and nitrogen in amino acids, we conclude that some of the El Collado humans relied heavily on local lagoonal fish and possibly shellfish, rather than open marine species. By contrast to previous suggestions, this study demonstrates that the north-western coast of the Mediterranean basin could support maritime-oriented economies during the Early Holocene.

Comment: This paper examines two issues, the terrestrial to aquatic shift in Late Palaeolithic and Early Holocene groups, and interpretation of isotopic evidence for aquatic input into the diet of Mesolithic populations in the western Mediterranean. Underlying this is the discussion of why Mesolithic groups from the Mediterranean coast showed limited evidence for marine diet when compared to, for example, those in the estuarine Muge and Sado basins in Portugal. As indicated in the abstract, the focus is on data from the site of Collado on the Valencian coast, with the largest human burial collection from Mesolithic Spain. Subsidiary information is drawn from fish samples from Cueva de Nerja, near Malaga on the south coast. The core of the text focuses on methodology. Analysis of amino acids in carbon and nitrogen isotopes shows that lagoon living fish and, possibly, shellfish, saw considerable

use, providing a quite different view of the overall human diet on the Mediterranean coast than that interpreted from bulk $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ analyses alone. As well as providing a much more nuanced understanding of the human diet at Collado, the paper adds to the complexity in its interpretation. The idea that Mediterranean Mesolithic groups were not using coastal resources needs rethinking.

- Godinho, R.M., Umbelino, C. & Gonçalves, C. (2023) Mesolithic and Chalcolithic mandibular morphology: using geometric morphometrics to reconstruct incomplete specimens and analyse morphology. *Open Archaeology* 8(1), 536-549. <https://doi.org/10.1515/opar-2022-0247>

Abstract: Human skeletal remains are routinely used to examine cultural and biological aspects of past populations. Yet, archaeological specimens are frequently fragmented/incomplete and so excluded from analyses. This leads to decreased sample sizes and to potentially biased results. Digital methods are now frequently used to restore/estimate the original morphology of fragmented/incomplete specimens. Such methods include 3D digitisation and Geometric Morphometrics (GM). The latter is also a solidly established method now to examine morphology. In this study, we use GM-based methods to estimate the original morphology of incomplete Mesolithic and Chalcolithic mandibles originating from present Portugal and perform ensuing morphological analyses. Because mandibular morphology is known to relate to population history and diet, we hypothesised the two samples would differ. Thirty-seven specimens (12 complete and 25 incomplete) were CT-scanned and landmarked. Originally complete specimens were used as reference to estimate the location of absent anatomical landmarks in incomplete specimens. As predicted, our results show shape differences between the two samples which are likely due to the compounded effect of contrasting population histories and diets.

Comment: This paper deals with two areas of interest, approaches to analysis of fragmented and/or incomplete skeletal material, in this case mandibular, and work with Mesolithic material from Portugal, with data from the Muge and Sado sites. As well as the methodological focus, this paper overlaps in topic with the paper which follows, by the same research group and with data from the same sites.

- Godinho, R.M., Umbelino, C., Garcia, S. & Gonçalves, C. (2023) Changes in dental wear magnitude in the last ~8000 years in southwestern Iberia. *Archives of Oral Biology* 147(1), 105626. <https://doi.org/10.1016/j.archoralbio.2023.105626>

Abstract (minor edit):

Objective: This study examines changes in dental wear magnitude in the past ~8000 years, i.e., since the Mesolithic until the 19th century, in southwestern Iberia. Thus, it encompasses the transition from hunting-gathering to agro-pastoralism, and then to the industrialization of food production and pre-processing.

Design: Dental wear magnitude was scored in a total of 191 individuals and 1557 teeth from Mesolithic (individuals=56; teeth=643), Neolithic (individuals=35; teeth=169), Chalcolithic (individuals=35; teeth = 221), Modern Age (individuals=17; teeth=209), and Late Modern Age (individuals=48; teeth=315) samples originating in southwestern Iberia (i.e., present central and southern Portugal) and according to the 8 levels ordinal scale of Smith (1984).

Results: Results show a general trend for decreased wear magnitude in these two major transitions and during this time span (although the hunting-gathering - agro-pastoralism transition had larger impact). The only meaningful differences in wear rate were found between the Late Modern Age and all remaining samples.

Conclusion: Dental wear generally decreased during this time span (although wear magnitude was less impacted by the industrialization of food production and pre-processing). Our results are consistent with studies documenting skull morphological gracilization associated with reduced masticatory

demands due to the adoption of softer diets.

Comment: Dental wear provides critical information about human diet. Though this paper covers a much longer time period, over 40 percent of the sample is from Mesolithic sites. The region-specific study confirms work that suggested a relationship between dietary change and dental reduction. The included Mesolithic data comes from four Muge/Magos sites, Amoreira, Arruda, Moita and Cova da Onça, and three Sado sites, Arapouco, Cabeço de Pez and Vale de Romeiras. The dental wear methodology used is that of Smith (1984) and overlaps with work reported by Godinho and Gonçalves (2021).

- Gravel-Miguel, C., Cristiani, E., Hodgkins, J., Orr, C.M., Strait, D.S., Peresani, M., Benazzi, S., Pothier-Bouchard, G., Keller, H.M., Meyer, D., Drohobytsky, D., Talamo, S., Panetta, D., Zupancich, A., Miller, C.E., Negrino, F. & Riel-Salvatore, J. (2022) The ornaments of the Arma Veirana Early Mesolithic infant burial. *Journal of Archaeological Method and Theory*. <https://doi.org/10.1007/s10816-022-09573-7>

Abstract: Personal ornaments are widely viewed as indicators of social identity and personhood. Ornaments are ubiquitous from the Late Pleistocene to the Holocene, but they are most often found as isolated objects within archaeological assemblages without direct evidence on how they were displayed. This article presents a detailed record of the ornaments found in direct association with an Early Mesolithic buried female infant discovered in 2017 at the site of Arma Veirana (Liguria, Italy). It uses microscopic, 3D, and positional analyses of the ornaments as well as a preliminary perforation experiment to document how they were perforated, used, and what led to their deposit as part of the infant's grave goods. This study provides important information on the use of beads in the Early Mesolithic, in general, as well as the relationship between beads and young subadults, in particular. The results of the study suggest that the beads were worn by members of the infant's community for a considerable period before they were sewn onto a sling, possibly used to keep the infant close to the parents while allowing their mobility, as seen in some modern forager groups. The baby was then likely buried in this sling to avoid reusing the beads that had failed to protect her or simply to create a lasting connection between the deceased infant and her community.

Comment: This paper adds detail on the infant burial described by Hodgkins *et al.* (2021; see below), focusing on the ornaments, with detailed descriptions and discussion of use within the framework of ornaments associated with burials in Upper Palaeolithic and Mesolithic contexts. A total of 93 beads were recovered. Of particular interest is that ornaments recovered in association with infants were related to the way children were carried in, for example, baby carriers (see e.g. Vang Petersen 2016). Also included is detailed discussion of the positioning of the infant within the burial and extended discussion of the study of the burial with the perspective of archaeoethnology/"anthropologie de terrain". Finally, we emphasise that evidence exists from the wear patterns of the ornaments, showing them to have been in use for a considerable period of time before association with the child. A key point not explicitly raised in the paper is that this suggests linkage to the family rather than to the sex and/or gender of the child.

- Hallgren, F., Berggren, K., Arnberg, A., Hartzell, L. & Larsson, B. (2021) *Kanaljorden, Motala: rituella våtmarksdepositioner och boplatzlämningar från äldre stenålder, yngre stenålder och järnålder (Kanaljorden, Motala: ritual wetland deposits and settlement remains from the Old Stone Age, Late Stone Age and Iron Age)*. Västerås Stiftelsen Kulturmiljövård, Västerås (Sweden). (=Stiftelsen Kulturmiljövård Rapport 2021:12) (in Swedish).

Abstract/Summary (free translation): This report provides results from the excavation at Kanaljorden in Motala 2009-2013. The investigation was prompted by the construction of a new railway past

Motala and was carried out in accordance with a decision by the County Administrative Board of Östergötland. The Swedish Transport Administration paid for the work. This volume will be followed by a scientific publication with an in-depth discussion of the results in English, as well as a popular science publication aimed at interested public.

Comment: This extensive and well-illustrated report, in Swedish, consists of a primary volume and three major appendices. The four files can be found online. As clear from the title, the coverage extends from the Mesolithic through the Iron Age. The full range of excavated material is covered, including the human remains and ^{14}C results, with a full chapter on the chronology. From the perspective of this series of articles, key reports in the appendices are on the human skeletal material (Kjellström and Gummesson in Appendix 2) as well as the ^{14}C and isotope results (Eriksson as well as Hallgren in Appendix 3).

- Henderson, R.C., Zarina, G., Czermak, A., Schulting, R.J., Henderson, P.A., Legzdina, D., Zagorska, I. & Lee-Thorp, J. (2022) Life histories at stone age Zvejnieki based on stable isotope profiles of tooth dentine. *Journal of Archaeological Science: Reports* 44, 103496. <https://doi.org/10.1016/j.jasrep.2022.103496>

Abstract: The timing of infant weaning in the past is important for its implications for birth-spacing and infant survival, and hence for population maintenance or growth under different socio-economic regimes. Prior to the adoption of agriculture, breastfeeding is believed to have been more prolonged amongst hunter-gatherers due, at least partly, to the lack of suitable weaning foods that are available to agriculturalists. The introduction of pottery possibly also changed weaning patterns due to shifts in food preparation even prior to the adoption of domesticated foods. Here we apply stable carbon and nitrogen isotope sequential samples on dentine to explore differences in diet relating to weaning age, social roles and food sharing between children and adults in a well-preserved Mesolithic/Neolithic population from the cemetery of Zvejnieki, Latvia. We address whether there are differences in diet between the Mesolithic and the Neolithic periods, defined here by the appearance of pottery rather than the adoption of agriculture. Considerable variability in weaning patterns was observed, but in general individuals tended to be breastfed from birth, with the contribution of breast milk declining after the age of 6–12 months, and completely withdrawn by the age of 3 years. We note a difference in $\delta^{15}\text{N}$ dentine profiles between the Mesolithic and Neolithic, which may be linked to the introduction of pottery. We also assess differences in diets in relation to identities marked in death, specifically the presence or absence of animal tooth pendants. The carbon and nitrogen isotope profiles for sequentially sampled first molars show that adults who were buried without animal tooth pendants as grave goods consumed more freshwater resources during their childhoods than those buried with animal tooth pendants. We conclude that infant and childhood diet reflected different societal roles or identities within the population that continued into adulthood.

Comment: This paper, within the increasingly expanding area of bioarchaeology, focuses on stable isotopes in tooth dentine with data from the Mesolithic and ceramic Neolithic levels of Zvejnieki in Latvia. We note that the definition of the Mesolithic-Neolithic transition is defined by the presence of ceramics rather than the shift to food production, a topic covered in more detail in many articles. In this case a core issue centres on whether dietary changes altered cultural behaviours such as the age of weaning, a topic of considerable interest to the topic of population growth change at the Mesolithic-Neolithic transition. The paper reviews previous studies of isotope data from Zvejnieki, with the analysis here based on data from mandibular left first molars from 18 individuals, divided into Mesolithic, Early or ceramic Neolithic and later Neolithic groups, the last with evidence for food production. Data in the paper are shown by individual.

- Hodgkins, J., Orr, C.M., Gravel-Miguel, C., Riel-Salvatore, J., Miller, C.E., Bondioli, L., Nava, A., Lugli, F., Talamo, S., Hajdinjak, M., Cristiani, E., Romandini, M., Meyer, D., Drohobytsky, D., Kuester, F., Pothier-Bouchard, G., Buckley, M., Mancini, L., Baruffaldi, F., Silvestrini, S., Arrighi, S., Keller, H.M., Belén Griggs, R., Peresani, M., Strait, D.S., Benazzi, S. & Negrino, F. (2021) An infant burial from Arma Veirana in northwestern Italy provides insights into funerary practices and female personhood in early Mesolithic Europe. *Scientific Reports* 11, 23735. <https://doi.org/10.1038/s41598-021-02804-z>

Abstract: The evolution and development of human mortuary behaviors is of enormous cultural significance. Here we report a richly-decorated young infant burial (AVH-1) from Arma Veirana (Liguria, northwestern Italy) that is directly dated to 10,211–9910 cal BP (95.4% probability), placing it within the early Holocene and therefore attributable to the early Mesolithic, a cultural period from which well-documented burials are exceedingly rare. Virtual dental histology, proteomics, and aDNA indicate that the infant was a 40–50 days old female. Associated artifacts indicate significant material and emotional investment in the child's interment. The detailed biological profile of AVH-1 establishes the child as the earliest European near-neonate documented to be female. The Arma Veirana burial thus provides insight into sex/gender-based social status, funerary treatment, and the attribution of personhood to the youngest individuals among prehistoric hunter-gatherer groups and adds substantially to the scant data on mortuary practices from an important period in prehistory shortly following the end of the last Ice Age.

Comment: This paper reports the first burial recovered from Arma Veirana in western Liguria. Found in 2017/2018, the fragmentary remains of a female child were found. Associated shell beads (*Columbella rustica*) and pierced ornaments (*Glycymeris*) are described and there is an associated ¹⁴C date. Sex was determined by aDNA. The ornaments recovered have been published in a separate paper discussed above (Gravel-Miguel *et al.* 2022).

- Kozintsev, A.G. (2021) Patterns in the population history of Northern Eurasia from the Mesolithic to the Early Bronze Age, based on craniometry and genetics. *Archaeology, Ethnology & Anthropology of Eurasia* 49(4), 140-151. <https://doi.org/10.17746/1563-0110.2021.49.4.140-151>

Abstract: This study examines the craniometric differentiation of Northern Eurasian groups with reference to genetic and partly linguistic facts. Measurements of 66 series of male crania from that territory, dating to various periods from the Mesolithic to the Early Bronze Age, were subjected to statistical methods especially destined for detecting spatial patterns, specifically gradients. Using the nonmetric multidimensional scaling of the matrix of D2 distances corrected for sample size, a two-dimensional projection of group constellation was generated, and a minimum spanning tree, showing the shortest path between group centroids in the multivariate space, was constructed. East-west clines in Northern Eurasia, detected by both genetic and craniometric traits, likely indicate not so much gene flow as isolation by distance, resulting from an incomplete evolutionary divergence of various filial groups constituting the Boreal meta-population. The western filial component, which, in Siberia and Eastern Central Asia, is mostly represented by Afanasyevans, has evidently made little contribution to the genetic makeup of later populations. The eastern filial component, which had appeared in the Cis-Baikal region from across Lake Baikal no later than the Neolithic, admixed with the autochthonous Paleosiberian component. The latter's principal marker—the ANE autosomal component—had been present in Siberia since the Upper Paleolithic. Likewise autochthonous were both Eurasian formations—Northern and Southern; statistical analysis has made it possible to make these more inclusive, whereby the former has been expanded in the eastern direction to include the Kuznetsk Basin, and the latter westwards, to the Middle Irtysh. Nothing suggests that Eastern European groups had taken part in the origin of either the Northern Eurasian formation or the proto-Uralic

groups.

Comment: This paper is included for completeness. From a Russian perspective and a traditional paradigm, including linkage to racial types, it links craniometric data from over 60 sources and compares them to information from recent aDNA evidence. It does suggest that the craniometric data support aDNA centred conclusions. Four Mesolithic sites are included, Oleni Ostrov and Popovo in northeastern Russia, Zvejnieki in Latvia, with samples identified as Mesolithic, Early Neolithic and Middle/Late Neolithic, and a general Ukraine sample (using data from Konduktorova 1973; see also Konduktorova 1974).

- Kirkinen, T., López-Costas, O., Martínez Cortizas, A., Sanna P., Sihvo, S.P., Ruhanen, H., Käkälä, R., Nyman, J.E., Mikkola, E., Rantanen, J., Hertell, E., Ahola, M., Roiha, J. & Mannermaa, K. (2022) Preservation of microscopic fur, feather, and bast fibers in the Mesolithic ochre grave of Majoonsuo, Eastern Finland. *PLoS ONE* 17(9), e0274849. <https://doi.org/10.1371/journal.pone.0274849>

Abstract: The study of animal and plant fibers related to grave furnishing, garments, and grave goods in thousands-of-year-old burials provides new insights into these funerary practices. Their preservation presupposes favorable conditions, where bacterial and fungal activity is at a minimum, as in anaerobic, wet, salty, arid, or frozen environments. The extreme acidic-soil environments (i.e., podzols) of Finland pose a challenge when it comes to studying funerary deposits, as human remains are rarely found. However, its potential to preserve microparticles allows us to approach the funerary event from a totally different point of view. Here, we present the first multiproxy analyses of a Mesolithic deposit from Finland. A red-ochre burial of a child found in Majoonsuo is studied by analyzing 1) microscopic fibers, 2) fatty acids, and 3) physical-chemical (CIELab color, pH, grain size) properties of 60 soil samples and associated materials. The microscopic fibers evidenced the remains of waterfowl downy feathers, a falcon feather fragment, canid and small rodent hairs as well as bast fibers. These could have been used in furnishing the grave and as ornaments or clothes. Canid hairs could belong to a dog inhumation, or more likely to canid fur used as grave good/clothes. Samples with microparticles have more long-chain and unsaturated fatty acids, although animal species identification was not possible. Soil properties indicate that the burial was made in the local soil, adding homogeneous red ochre and removing the coarser material; no bioturbation was found. The highly acidic sandy soil, together with a slight increase in finer particles when ochre is abundant, probably resulted in micro-scale, anoxic conditions that prevented bacterial attack. This study reveals the first animal hairs and feathers from a Finnish Mesolithic funerary context, and provides clues about how their preservation was possible.

Comment: Within a broader European context, Mesolithic burials in Finland were largely unknown until about a decade ago when a paper and a poster were presented at the Mesolithic burials conference in Halle in 2013 about Vantaa Jönsas, also known as Jönsas (Ahola 2016). Others published since include Kukkarokosi and Rahakangas, and this paper adds the ochre associated Majoonsuo to the list, from near the town of Outokumpu in Finnish Karelia. As in a number of previously reported sites, there is only limited preservation of remains. As indicated in the title, this paper focuses on the grave context, associated grave goods and funerary practices. The grave was discovered accidentally in 1992 and rescue excavated in 2018, when seen as threatened; it was partially disturbed at the time of discovery. As well as the goods described and discussed in this paper, there is a brief summary of the human remains, restricted to tooth roots which retain some enamel. Burned bone fragments (non-human assumed) have been dated to 8354 ± 37 BP (Ua-64385). An excavation report, in Finnish, is also available and includes details of the ^{14}C date, in English (Nyman *et al.* 2018).

- Koptekin, D., Yüncü, E., Rodríguez-Varela, R., Altınısık, N.E., Psonis, N., Kashuba, N., Yorulmaz, S., George, R., Kazancı, D.D., Kaptan, D., Gürün, K., Vural, K.B., Gemici, H.C., Vassou, D., Daskalaki, E., Karamurat, C., Lagerholm, V.K., Erdal, O.D., Kırdök, E., Marangoni, A., Schachner, A., Üstündag, H., Shengelia, R., Bitadze, L., Elashvili, M. & Stravopodi, E. (2023) Spatial and temporal heterogeneity in human mobility patterns in Holocene Southwest Asia and the East Mediterranean. *Current Biology* 33(1), 41-57. <https://doi.org/10.1016/j.cub.2022.11.034>

Abstract: We present a spatiotemporal picture of human genetic diversity in Anatolia, Iran, Levant, South Caucasus, and the Aegean, a broad region that experienced the earliest Neolithic transition and the emergence of complex hierarchical societies. Combining 35 new ancient shotgun genomes with 382 ancient and 23 present-day published genomes, we found that genetic diversity within each region steadily increased through the Holocene. We further observed that the inferred sources of gene flow shifted in time. In the first half of the Holocene, Southwest Asian and the East Mediterranean populations homogenized among themselves. Starting with the Bronze Age, however, regional populations diverged from each other, most likely driven by gene flow from external sources, which we term "the expanding mobility model." Interestingly, this increase in interregional divergence can be captured by outgroup- f_3 -based genetic distances, but not by the commonly used F_{ST} statistic, due to the sensitivity of F_{ST} , but not outgroup- f_3 , to within-population diversity. Finally, we report a temporal trend of increasing male bias in admixture events through the Holocene.

Comment: This paper covers Early Holocene through Bronze Age genetic diversity in the Near East. Though interest to the European Mesolithic is recognised as marginal, it is included because of data from the Greek cave sites of Theopetra, Sarakenos and Perachora discussed in the appendices, with the dated material extending from the Upper Palaeolithic, through the Mesolithic to the Bronze Age.

- Kubiak-Martens, L. & van der Linden, M. (2022) *Neolithic human diet based on studies of coprolites from the Swifterbant Culture sites, the Netherlands*. Cultural Heritage Agency of the Netherlands, Amersfoort (=Nederlandse Archeologische Rapporten 077).

Summary (edited and shortened): The project 'Neolithic human diet based on studies of coprolites from the Swifterbant culture sites in the Netherlands' was one in a series of studies referred to as Pre-Malta projects. The aim was to assess the diet and health of Swifterbant culture populations through analysis of coprolites from sites excavated before 2007, with four sites selected, Hardinxveld-Giessendam De Bruin, dated to c. 5500 to 4450 cal BC, the Swifterbant-S3 and -S4 sites, dated to c. 4300-4000 cal BC, and Emmeloord-J78-91, dated to c. 2400-2100 cal BC. A group of seven specialists from universities and commercial companies worked together, each contributing distinct data sets to the project. Multiple proxies were combined, including faecal steroids, micro-CT scans, SEM images, animal bone remains, phytoliths, pollen, intestinal parasites and starch granules.

In this project the primary focus was on human coprolites. Human faecal remains, however, are often difficult to identify with certainty. The method which was used in this study to distinguish human from animal coprolites was gas chromatography-mass spectrometry (GC-MS). Unfortunately, the identification of the coprolitic source organisms was limited by low concentrations of faecal biomarkers, which either precluded source identification or presented multiple possible source organisms. Humans, pigs and carnivores (likely dogs) were the dominant producer organisms of the confirmed coprolites, accounting for at least eleven of the 25 GC-MS-examined coprolites.

Based on the results of the initial GC-MS faecal lipid biomarker assessment, 13 coprolites were initially subjected to micro-CT scan and Scanning Electron Microscope (SEM) analyses, including six coprolites of human origin (S3-2, S3-4, S3-10, S3-20, S3-28 and S4-1), two of likely-human origin (S3-15

and S4-4), three coprolites of animal origin, including two pigs (Hardinxveld-Giessendam 19952 and S3-18) and one ruminant (S3-5), as well as two coprolites of unknown source organism (S3-11 and S3-13). Additional three coprolites were added later to the micro-CT scan and SEM analyses.

Although this project aimed to reconstruct Neolithic human diet based on human coprolites, the fact that we were working with a mixed coprolite assemblage means that our contribution may be regarded as the reconstruction of the community diet. It seems that clarifying the diet on the level of individual species (humans in particular) might be challenging, if not impossible, particularly at sites such as Hardinxveld- Giessendam De Bruin and the Swifterbant-S3 and -S4 sites, where people were living with their dogs (and pigs, nearby), and likely all shared a similar diet. Although it seems like activity areas were kept clean, the hygienic conditions at the settlements must have been poor since the health of both humans and their animals was affected by multiple intestinal parasite infections.

Comment: This volume examines a core issue in bioarchaeology, means of studying diet other than through classical approaches largely limited to human teeth and bones. As indicated in the title and summary the focus is of sites from the Swifterbant culture, with data from three site groups, the Late Mesolithic Hardinxveld-Giessendam De Bruin, two Mesolithic-Neolithic interface sites from the Swifterbant Polder and Late Neolithic Emmeloord, from the Noord-Oost Polder. The basic findings are summarised above. Interest in this volume needs quick comment, including the interest of CM as one of the editors of this series, and one of the initial describers of the Swifterbant human skeletal material, focused on site S2 (Meiklejohn & Constandse-Westermann 1978; Constandse-Westermann & Meiklejohn 1979). In addition, we note that though the volume title suggests primary focus on the Neolithic, the Middle Swifterbant, dated to ~4300-3900 cal BC, and occupation of both Swifterbant S3 and S4, is seen by some if not all Dutch workers as transitional between an earlier full Mesolithic and later full Neolithic (see discussion in Meiklejohn *et al.* 2015). This is not the place to extend this debate, but is the reason for inclusion of this volume.

- Lahtinen, M., Hakamäki, V. & Kuusela, J.-M. (2022) The most recent Baltic Sea marine hunter-gatherers? The buried individual of grave IB3 in the Suutarinniemi cemetery, Finland. *PLoS ONE* 17(11), e0274953. <https://doi.org/10.1371/journal.pone.0274953>

Abstract: Most European hunter-gatherers slowly assimilated into farming communities during the Neolithic period. In the north these groups persisted far longer. In this paper, we present evidence from what may be one of the most recent non-agricultural sites in the region, where a marine hunter-gatherer lifestyle may have continued until as late as the 15th–16th centuries AD. The isotope composition of incremental dental analysis suggests a significant, long-term dependence on seals. This indicates that vestiges of this means of subsistence might have been present in Europe for much longer than previously thought.

Comment: This article focuses on subsistence patterns in Scandinavia and Russia north and east of the area settled by incoming Neolithic farmers ~4000 cal BP. The Suutarinniemi site lies on the island of Illinsaari near the extreme northeast of the Baltic. The burial described is not Mesolithic as defined to the south in Denmark and Sweden, but falls within the context of continuing hunter-gatherer groups. We have included it here as part of the broader discussion of subarctic hunter-gatherers and their continued existence until after 1000 AD.

- Lambert, M., Courtaud, P., Le Bourdonnec, F.-X. Lemasson, Q., Pichon, L., Leandri, F., Cesari, J., Bressy-Leandri, C. & Skeates, R. (2022) Characterising the pigment on a Mesolithic cranium from Corsica using ion beam analysis. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms* 529, 24-28. <https://doi.org/10.1016/j.nimb.2022.08.003>

Abstract: Characterising thin mineral layers on heterogeneous media is a significant challenge in archaeometry. Nevertheless, obtaining such geochemical and mineralogical data can, in many cases, provide valuable information about the original raw-material procurement strategies and document the chaîne opératoire leading to the finished object. In this contribution, we report on the geochemical analysis of a thin layer of red mineral pigment found on a skull from the Mesolithic burial of Campu Stefanu, Corsica. A proton ion beam analysis was conducted at the New AGLAE facilities (Palais du Louvre, Paris) to determine major, minor and trace element compositions. Contribution from the pigment's elemental composition is statistically differentiated from that of the bone and the sediment. Furthermore, the composition of the pigment is shown to be compatible with that of iron-oxide rich mineral blocks found within the mortuary deposits.

Comment: This primarily methodological paper focuses on the study of ochre remains recovered on one of the crania from Campu Stefanu, the site excavated in southwestern Corsica between 2005 and 2011 (Courtaud *et al.* 2016). It is noted in the conclusion that ochre has been recovered from one other Mesolithic cranium in Corsica, Bonifacio/Araguina-Sennola and one in Sardinia, S'Ormu e S'Orku.

- Larsson, L. & Price, T.D. (2022) Animal teeth and Mesolithic society. *Open Archaeology* 8(1), 55-61. <https://doi.org/10.1515/opar-2022-0229>

Abstract: In several graves from the Mesolithic sites of Skateholm, South Sweden, animal teeth were found. Some of these teeth were used as beads in clothing. The strontium isotope analysis of 11 animal teeth is reported and discussed in comparison with human values from burials at the sites and baseline values from South Sweden. Roughly half of the animal teeth are nonlocal and from different places of origin. The beads themselves appear to carry symbolic information that may be related to the physical or social attributes of the wearer. This study involved a detailed investigation of the use-wear around the perforation and its relation to the local and nonlocal origin of the teeth.

Comment: This paper derived from Meso'2020, held in Toulouse, focuses on the interpretation of mammal tooth beads recovered from human graves, with core focus on strontium isotope data, and material from the Skateholm I and II burial sites. The tooth beads studied were primarily from red deer and wild boar, with small numbers from elk, bear and aurochs, and isotope data show that some of the teeth are non-local. Attention to individual burials is limited, though there is specific mention of two female burials at Skateholm II, VIII and II as well as XXII, where over 100 beads from around the hips were recovered in both cases. It is noted that these numbers are high for the total series, but that beads found in the hip area were a regular feature and that few were recovered in association with male burials. Of further interest, though some of the tooth beads appear to have come from areas other than southern Scania, the same is not true for any of the human individuals analysed (see also Price *et al.* 2021).

- Lauria, G. & Sineo, L. (2023) Human peopling and population dynamics in Sicily: preliminary analysis of the craniofacial morphometric variation from the Paleolithic to the contemporary age. *Heritage* 6(2), 1187-1208. <https://doi.org/10.3390/heritage6020066>

Abstract: The geographic position, isolation, and the long and dynamic history of colonization created a human context in Sicily that allows for a particular anthropological study; information about "migratory flow" and "population influx" could be investigated in the cranial morphology of a localized geographical region. The research goals are the identification of temporal trends in facial morphology in order to assess the adaptations and the microevolutionary trends and to verify if the cranial morphology of humans was modified by the various genetic contributions and more or less related to the intense and significant migratory flows. This work includes a diachronic morphometrics study

of 3D models of 95 Sicilian skulls coming from 19 populations (from the Paleolithic to the Contemporary Age), providing an overview of human biodiversity and variability in Sicily. To achieve this, a geometric morphometrics analysis of the facial features of adult human skulls was performed. The approach used allows for the identification of the main micro-anatomical and micro-evolutionary features. Considering sample size/composition, it has been possible to discriminate between prehistorical and historical populations. The results highlight a series of morphological changes related to different migratory flows that have followed one another with different intensities and effectiveness starting from the Prehistory up to the Contemporary Age. The human peopling of Sicily is a subject of continuous debate; however, this study points to the coexistence of microevolutionary patterns and population dynamics, with the latter being one of the main causes of the morphological variations.

Comment: This broad-ranging study of available craniometric data from Sicily, focuses on changes over time from the Upper Palaeolithic through historic periods. The primary interest in this listing is to the earlier sites, with one from the Late Palaeolithic, San Teodoro, and two from the Mesolithic, Grotta dell'Uzzo and Molara. As might be expected, cluster analysis separates them from all later material. The primary interest here is the methodology and listing of available material from Sicily.

- Lillie, M.C. & Elton, S. (2022) Palaeoecology: considering proximate and ultimate influences on human diets and environmental responses in the early Holocene Dnieper River region of Ukraine. In K.A. Plomp, C.A. Roberts, S. Elton & G.R. Bentley (eds.) *Palaeopathology and Evolutionary Medicine*. Oxford University Press, Oxford, 120-137. <https://doi.org/10.1093/oso/9780198849711.003.0007>

Abstract (edited from Introduction): In this chapter, we bring together bioarchaeological data and evolutionary theory to give an overview of Early Holocene human palaeoecology in changing environments... (W)e necessarily focus on archaeological sites from one region and a restricted time period, Mesolithic and Early Neolithic assemblages from contemporary Ukraine.... (U)sing palaeopathological and isotopic studies of Ukrainian prehistoric populations, we examine dietary variation and health status in the context of Holocene warming and cooling, and discuss the impact that these might have had on cultural developments across the Mesolithic and Neolithic in Ukraine. We further use our case study of Ukraine to consider the relative importance of ultimate (evolutionary) and proximate (immediate) effects in determining the health of individuals and populations during the Early Holocene 'transition' period.

Comment: This book chapter examines diet and environment in the Dnieper Rapids region of Ukraine, within the work of Lillie and colleagues over the past 30 years. As well as an overview of studies covering the Late Pleistocene and Early Holocene, the chapter focuses on four Holocene sites with major burial grounds, Epipalaeolithic Vasilyevka III, Mesolithic Vasilyevka II, and Neolithic or Mariupol-type Yasinovatka and Dereivka I. The time period is indicated as from 10,400 to 5470 cal BP, contemporary with the Mesolithic and Early Neolithic as defined to the west. This paper overlaps with those in the recent volume by Lillie and Potekhina (2020; see Bones and Burials List in *Mesolithic Miscellany*, 29(1)).

- Macãne, A. (2022) *Stone Age companions. Humans and animals in hunter-gatherer burials in north-eastern Europe*. Ph.D. Thesis, University of Gothenburg. <https://gupea.ub.gu.se/handle/2077/71409>

Abstract (from Introduction paragraph 1, references removed): The cemeteries of hunter-gatherers dated to the Mesolithic and Neolithic (ca. 7500–2600 cal BC) around the Baltic Sea and in central Russia reveal complex, multispecies mortuary practices. Animal remains frequently occur alongside human bodies in hunter-gatherer burials. A wide range of unworked and modified bones, teeth (mainly

incisors and canines), antlers, jaws, phalanges, astragali, claws and other body parts from a variety of species have been identified. Through a detailed investigation of the animal remains deposited in the graves, in particular tooth pendants, this thesis aims to explore how relationships between humans, animals and their environment were expressed and given form in the burial practices of hunter-gatherers from a relational perspective. In this thesis, animals are considered not just as a source of food and raw materials. Humans were co-inhabiting a Stone Age landscape with an abundance of flora and fauna. Animals were part of the naturescape, they were companions and they embodied ideals, fear and respect. These relationships developed through continued interactions, which were inevitable in the close co-existence within this shared environment.

Comment: Aija Macâne's thesis greatly increases our knowledge of hunter-gatherer human burial dynamics in relation to associated animal remains, and is an important addition to earlier papers by Macâne (e.g. Macâne 2020, Macâne & Nordqvist 2021). The thesis centres on three sites, Skateholm in Sweden, Zvejnieki in Latvia, and Sakhtysh in the Upper Volga basin, the last with a literature primarily in Russian. Beyond initial chapters on structure of the thesis and the approach taken, the primary sections examine the three sites, including history of excavation, look in detail at the animal remains, and conclude with discussion of modified human remains at the three sites. The primary appendices are on cemeteries, including an extended listing of the human remains from the three sites with associated data, on the animal remains, and on new ^{14}C dates on animal remains.

Finally, some comment is needed on the Sakhtysh sites, occupied from the Mesolithic through Iron Age. A total of 149 burials have been recovered from five sites in the region, with the thesis concentrating on 90 burials from two of them, Sakhtysh II and IIa, published earlier by Macâne *et al.* (2019) and Piezonka *et al.* (2013). Though identified locally as Neolithic, given the presence of ceramics, this is a hunter-gather society with dated burials that are consistently over 3000 cal BP and association with the Lyalovo (Pit-Comb) and Volosovo Cultures.

- Mannermaa, K., Malyutina, A., Zubova, A. & Gerasimov D. (2022) First evidence of human bone pendants from Late Mesolithic Northeast Europe. *Journal of Archaeological Science: Reports* 43, 103488. <https://doi.org/10.1016/j.jasrep.2022.103488>

Abstract: In this paper, we introduce the first evidence of the use of human bone for making pendants in Northeast Europe. Twelve of the 37 studied pendants made of long bone splinters turned out to be human bone. Here, we present the ZooMS (Zooarchaeology by Mass Spectrometry) identifications of artefacts and their traceological analysis, and we discuss their implications for the archaeology of Mesolithic burial practices. Our results indicate that the raw material for some of the items was in a fresh or semi-fresh state before making pendants. They were used before they were placed into the graves, and most likely in the same ways as animal bone pendants. This is the first study that has found the use of human bone as raw material in Russian Karelia and the first time that the ZooMS method has been applied to archaeological materials from this region. Together with previous human bone artefact finds from the European Mesolithic period, the bone pendants from Yuzhniy Oleniy Ostrov indicate that the tradition of using human bone as raw material may have been widespread.

Comment: This paper extends those by Kristiina Mannermaa and colleagues on materials associated with human burial in Northeastern Europe, including Yuzhniy Oleniy Ostrov in Russian Karelia (e.g. Mannermaa & Kirkinen 2020; Mannermaa *et al.* 2021). The abstract clearly summarises the information within the paper. There is discussion of the whole issue of use of both human teeth and bone recovered both within burials and in broader contexts within sites. The paper also looks at the use of human bone for adornments and construction of bone points, the latter reported for the North Sea area in a paper reported in *Mesolithic Miscellany* issue 28(2) (Dekker *et al.* 2020).

- Marchi, N., Winkelbach, L., Schulz, I., Brami, M., Hofmanová, Z., Blöcher, J., Reyna-Blanco, C., Diekmann, Y., Thiéry, A., Kapopoulou, A., Link, V., Piuz, V., Kreutzer, S., Figarska, S.M., Ganiatsou, E., Pukaj, A., Struck, T.J., Gutenkinst, R.N., Karul, N., Gerritsen, F., Pechtl, J., Peters, J., Zeeb-Lanz, A., Lenneis, E., Teschler-Nicola, M., Triantaphyllou, S., Stefanović, S., Papageorgopoulou, C., Wegmann, D., Burger, J. & Excoffier, L. (2022) The genomic origins of the world's first farmers. *Cell* 185(11), 1842-1859. <https://doi.org/10.1016/j.cell.2022.04.008>

Abstract: The precise genetic origins of the first Neolithic farming populations in Europe and Southwest Asia, as well as the processes and the timing of their differentiation, remain largely unknown. Demogenomic modeling of high-quality ancient genomes reveals that the early farmers of Anatolia and Europe emerged from a multiphase mixing of a Southwest Asian population with a strongly bottlenecked western hunter-gatherer population after the last glacial maximum. Moreover, the ancestors of the first farmers of Europe and Anatolia went through a period of extreme genetic drift during their westward range expansion, contributing highly to their genetic distinctiveness. This modeling elucidates the demographic processes at the root of the Neolithic transition and leads to a spatial interpretation of the population history of Southwest Asia and Europe during the late Pleistocene and early Holocene.

Comment: This paper is included for its focus on the Mesolithic-Neolithic transition. Though input from Mesolithic sources is minor, the paper gives an overview of both European and Southwest Asian data. New European "whole-genome sequences" are given for Mesolithic Vlasac and transitional and Neolithic Lepenski Vir, with an additional 11 from Neolithic Turkey, Greece, Serbia, Austria and Germany. Identified highlights, of interest from a Mesolithic perspective, are that genetic divergence of European and Near Eastern hunter-gatherers occurred during the Late Glacial Maximum (LGM), that at the same time a demographic bottleneck in European hunter-gatherers reduced genetic diversity, and that considerable post-LGM admixture is present in early European farming groups. Of considerable interest is the genetic bottleneck at LGM, which agrees with findings of possible population replacement in Europe at the same time (Brewster *et al.* 2014a, 2014b).

- Marciniak, S., Bergey, C.M., Silva, A.M., Hałuszko, A., Furmanek, M., Veselka, B., Velemínský, P., Vercellotti, G., Wahl, J., Zarina, G., Longhi, C., Kolár, J., Garrido-Pena, R., Flores-Fernández, R., Herrero-Corral, A.M., Simalcsik, A., Müller, W., Sheridan, A., Miliuskiene, Z., Jankauskas, R., Moiseyev, V., Köhler, K., Király, A., Gamarra, B., Cheronet, O., Szeverényi, V., Kiss, V., Szeniczey, T., Kiss, K., Zoffmann, Z.K., Koós, J., Hellebrandt, M., Maier, R.M., Domboróczki, L., Virag, V., Novak, M., Reich, D., Hajdu, T., von Cramon-Taubadel, N., Pinhasi, R. & Perry, G.H. (2022) An integrative skeletal and paleogenomic analysis of stature variation suggests relatively reduced health for early European farmers. *Proceedings of the National Academy of Sciences* 119(15), e2106743119. <https://doi.org/10.1073/pnas.2106743119>

Abstract: Human culture, biology, and health were shaped dramatically by the onset of agriculture ~12,000 y B.P. This shift is hypothesized to have resulted in increased individual fitness and population growth as evidenced by archaeological and population genomic data alongside a decline in physiological health as inferred from skeletal remains. Here, we consider osteological and ancient DNA data from the same prehistoric individuals to study human stature variation as a proxy for health across a transition to agriculture. Specifically, we compared "predicted" genetic contributions to height from paleogenomic data and "achieved" adult osteological height estimated from long bone measurements for 167 individuals across Europe spanning the Upper Paleolithic to Iron Age (~38,000 to 2,400 B.P.). We found that individuals from the Neolithic were shorter than expected (given their individual polygenic height scores) by an average of 23.82 cm relative to individuals from the Upper Paleolithic and

Mesolithic ($P = 0.040$) and 22.21 cm shorter relative to post-Neolithic individuals ($P = 0.068$), with osteological vs. expected stature steadily increasing across the Copper (+1.95 cm relative to the Neolithic), Bronze (+2.70 cm), and Iron (+3.27 cm) Ages. These results were attenuated when we additionally accounted for genome-wide genetic ancestry variation: for example, with Neolithic individuals 22.82 cm shorter than expected on average relative to pre-Neolithic individuals ($P = 0.120$). We also incorporated observations of paleopathological indicators of nonspecific stress that can persist from childhood to adulthood in skeletal remains into our model. Overall, our work highlights the potential of integrating disparate datasets to explore proxies of health in prehistory.

Comment: This paper can be described as lying within the biological core of data falling within the spheres of bioanthropology and bioarchaeology, providing a look at issues central to the dynamics of the Mesolithic-Neolithic transition. Of key interest is whether the shift to agriculture increases or decreases the average health status of populations at the transition. This study suggests that Neolithic populations were less healthy than their Mesolithic and Upper Palaeolithic predecessors. The paper is important within the framework of the overall question that underlies it. A key question for the compilers of this series involves the strength of the underlying dataset. A limiting factor in the data used is that samples taken were limited to individuals with existing long bone length and aDNA data. The total sample is 167 individuals spread over a little over 35,000 years, representing six time periods. The Mesolithic sample is 15 individuals from 12 sites, Gough's Cave (UK) (1), Zvejnieki (Latvia) (3), Donkalis (1) and Spiginas (1) (Lithuania), Padina (1) and Vlasac (1) (Serbia), Loschbour (1) (Luxembourg), La Brana (1), Los Canes (1) and Chan do Lindeiro (1) (Spain), Ostrovul Corbului (2) (Romania), and Bad Dürrenberg (1) (Germany) (from Supporting Information). With five from the Baltic States, four from the Balkans and three from northern Spain, this is a very unbalanced dataset. From the perspective of having written about stature and the transition (Meiklejohn and Babb 2011), the methodology in this paper is of more interest than the dataset and subsequent conclusions.

- Martínez-Sánchez, R.M., Bretones-García, M.D., Valdiosera, C., Vera-Rodríguez, J.C., López Flores, I., Simón-Vallejo, M.D., Ruiz Borrega, P., Martínez Fernández, M.J., Romo Villalba, J.L., Bermúdez Jiménez, F., Martín de los Santos, R., Pardo-Gordó, S. & Cortés Sánchez, M. (2022) Fallen and lost into the abyss? A Mesolithic human skull from Sima Hedionda IV (Casares, Málaga, Iberian Peninsula). *Open Archaeology* 8(1), 892-904. <https://doi.org/10.1515/opar-2022-0267>

Abstract: The presence of scattered prehistoric human bones in caves and sinkholes is common in many regions of Iberia. These are usually interpreted as erratic elements coming from burial contexts, usually collective associations. These burial contexts are very frequent in karst areas of the Iberian Peninsula since the Early Neolithic, mostly in the Late Neolithic, and Copper Age, while findings from earlier chronologies are much more unusual. In this work, we present partial remains of a human skull from the Mesolithic period, recovered from a cave in the Strait of Gibraltar area. Although there is no conclusive evidence pointing to a dismantled burial context, this constitutes an isolated find, where its final location appears to be consistent with gravitational fall followed by water transportation.

Comment: This is primarily a description and analysis of human remains in a sinkhole context in Andalucía, dated to the Mesolithic. Emphasis is placed on the limited number of Mesolithic finds from this part of Spain. This is a sinkhole find in karst topography, *ca.* 5 km from the current coastline. Sima Hedionda IV is one gallery in a complex discovered in the 1970s, with exploration of the specific gallery in 2014 and 2015. The human remains were in a deep fissure and involve five fragments, apparently from a single skull, a large fragment of frontal bone, plus two other vault fragments, a temporal fragment and a partial maxilla with two associated molar teeth. All are consistent with a robust adult

male. An AMS ^{14}C date comes from dentine from one of the molars (7600 ± 30 BP; Beta-424650), with two possible calibrations at 2 sigma of 8200-8370 and 8360-8460 cal BP (results in paper are cal BC), ca. 700-1000 years prior to the Neolithic transition in the area.

- Modi, A., Vai, S., Posth, C., Vergata, C., Zaro, V., Diroma, M.A., Boschin, F., Capecchi, G., Ricci, S., Ronchitelli, A., Catalano, G., Lauria, G., D'Amore, G., Sineo, L., Caramelli, D. & Lari, M. (2021) More data on ancient human mitogenome variability in Italy: new mitochondrial genome sequences from three Upper Palaeolithic burials. *Annals of Human Biology* 48(3), 213-222. <https://doi.org/10.1080/03014460.2021.1942549>

Abstract:

Background: Recently, the study of mitochondrial variability in ancient humans has allowed the definition of population dynamics that characterised Europe in the Late Pleistocene and Early Holocene. Despite the abundance of sites and skeletal remains few data are available for Italy.

Aim: We reconstructed the mitochondrial genomes of three Upper Palaeolithic individuals for some of the most important Italian archaeological contexts: Paglicci (South-Eastern Italy), San Teodoro (South-Western Italy) and Arene Candide (North-Western Italy) caves.

Subjects and methods: We explored the phylogenetic relationships of the three mitogenomes in the context of Western Eurasian ancient and modern variability.

Results: Paglicci 12 belongs to sub-haplogroup U8c, described in only two other Gravettian individuals; San Teodoro 2 harbours a U2'3'4'7'8'9 sequence, the only lineage found in Sicily during the Late Pleistocene and Early Holocene; Arene Candide 16 displays an ancestral U5b1 haplotype already detected in other Late Pleistocene hunter-gatherers from Central Europe.

Conclusion: Regional genetic continuity is highlighted in the Gravettian groups that succeeded in Paglicci. Data from one of the oldest human remains from Sicily reinforce the hypothesis that Epigravettian groups carrying U2'3'4'7'8'9 could be the first inhabitants of the island. The first pre-Neolithic mitogenome from North-Western Italy, sequenced here, shows more affinity with continental Europe than with the Italian peninsula.

Comment: This is the third of four articles from *Annals of Human Biology* (see also Calò *et al.* Feldman *et al.*, and Serrano *et al.*). Focused on mtDNA results from the Upper Palaeolithic, it also provides a comparison and discussion with available Mesolithic data. Upper Palaeolithic individuals are listed in the abstract above and have associated mtDNA results. The individual included from Arene Candide is dated at least a millennium prior to the currently accepted Pleistocene-Holocene boundary (11,650 cal BP). The paper provides a clear overview of currently available data from Italy.

- Nilsson Stutz, L. (2022) What can archaeoethanatology add? A case study of new knowledge and theoretical implications in the re-study of Mesolithic burials in Sweden and Denmark. In C. Knüsel & E.M.J. Schotsmans (eds.) *The Routledge handbook of archaeoethanatology: bioarchaeology of mortuary behaviour*. Routledge, London, 178-193.

Abstract: (None in volume; the following is from the Introduction) This chapter presents the study of two Late Mesolithic burial sites from Southern Scandinavia, sometimes referred to as 'cemeteries', referring to the fact that they contain a large number of inhumations that appear to relate to one another and have a connection to nearby occupation sites. The method used in this study is an application of archaeoethanological principles to archival documents. Several questions present themselves when taking on this kind of project. The first relates to the quality of the excavation records. Is the documentation appropriate and does it have enough detail to allow for the archaeoethanological analysis to be reliable? A second question relates to the degree to which archaeoethanatology can really add anything. Will archaeoethanatology really lead to new inferences that the original analysis did not? In

cases of what appears to be very straightforward, homogenous data, perhaps archaeoethanatology will only confirm what previous researchers observed. This chapter will show that document-based archaeoethanatology study of Mesolithic sites has provided significant new knowledge.

Comment: The volume with this paper was released in the spring of 2022 and provides an overview of archaeoethanatology, in 34 articles. The volume description on the publisher website gives the focus as on the "gap ... between francophone and anglophone funerary archaeological approaches to the remains of the dead and the understanding of societies, past and present." This paper is the only one explicitly focused on the Mesolithic. Briefly, the paper provides a useful entry to the field, centred on work on the Scandinavian sites of Skateholm and Vedbæk-Bøgebakken, both with multiple burials dated to the Ertebølle culture. The data discussed are derived from previously published papers including Nilsson Stutz (2003) focused on these sites.

- Papagrigrakis, M.J., Maravelakis, E., Kyparissi-Apostolika, N., Stravopodi, E., Konstantaras, A., Apostolikas, O., Toulas, P., Potagas, C., Papapolychroniou, T., Mastoris, M., Synodinos, P.N., Kousoulis, A.K., Tsilivakos, M.G., Tsakanikou, P. & Chrousos, G.P. (2022) An integrated study of the Mesolithic skeleton in Theopetra Cave, Greece: from the skeleton analysis to 3D face reconstruction. *Heritage* 5(2), 881-895. <https://doi.org/10.3390/heritage5020049>

Abstract: Skeletal evidence dating back to the Mesolithic period is scarce and should be studied under a multidisciplinary perspective. The primary objective of the study was to carefully assess the skeleton of a young woman from this era, named "Avgi," to compile its bioarchaeological profile, analyze its paleopathology and dental pathology, and deploy a 3D reconstruction and modeling method in order to reveal her face. Both demographic and pathological information were drawn from macroscopically observing the bones, long bone X-rays, skull CT and X-rays, 3D modeling and printing of the skull, and panoramic dental X-rays. The Manchester method was used for the 3D facial reconstruction. On analysis, we determined that Avgi was a female adolescent, aged around 17–19 years at death, and likely suffering from iron deficiency anemia and Class III dental malocclusion. Notably, Harris lines and a hair-on-end pattern were identified in the long bones and skull radiographs, respectively. Various less significant skeletal lesions reflected potential minor pathologies. Our findings suggest that multidisciplinary collaborative approaches should be followed in the modern study of lesser-known past eras. Multiple scientific perspectives, as well as social structures, geographical aspects, settlements, population movements, and social networks should all be taken into account when assessing lifestyle characteristics and paleopathological signs in skeletal remains.

Comment: The focus of this study is outlined in the abstract. Its importance to a broader audience is that Theopetra is one of only three or four Greek Mesolithic sites with known human remains, and the only one from an inland location, in Thessaly. Closest similarities of the described individual, one of three at Theopetra, is apparently to burials at Franchthi in the Argolid, excavated in the 1960s and 1970s, and both first found and best known (Cullen 1995). It is also the only other Mesolithic burial site from mainland Greece. Others are Maroulas, on the island of Kythnos in the Central Aegean and with only preliminary publication (Poulianos 2010; Sampson 2014), and possible material from Negros Cave on the island of Astypalaia, further to the southeast but not published yet. An earlier study of the Theopetra material is found in Manolis and Stavropodi (2003).

- Perrin, T., Dachy, T., López-Montalvo, E., Manen, C. & Marchand, G. (2022) What relations between North Africa and Europe in the Early Holocene? *Revista Tabona* 22, 261-281. <http://riull.ull.es/xmlui/handle/915/27448>

Abstract: Between the 8th and 5th millennium BCE, human societies in the Western Mediterranean underwent several major changes. One of them took place during the 7th millennium with a profound

change in material production, especially in their stone industries. It resulted in a fundamental change in production patterns, operating sequences and technical procedures. The precise origin of these changes is currently unknown, but it is possible that they initially occurred in North Africa before spreading rapidly along the shores of the Mediterranean and reaching Western Europe. This south-to-north expansion could reflect population shifts, at least in the early stages of the expansion of these new technical processes. However, possible contacts between Africa and Europe are not limited to this technical sphere, and exchanges can also be documented in both ceramic productions and graphic expressions. Several recent research programmes have brought new data to these hypotheses, the main results of which are presented here.

Comment: Though perhaps tangential to the main focus of these listings, this article touches on the intriguing shift from the first to the second Mesolithic. Though the core focus is on archaeological aspects of the shift, there is continuous reference to the question of whether it is entirely technological or involves population movement as well. Three of the key figures involved in developing the idea, including its initial suggestion, are authors here, Perrin, Manen and Marchand. This paper provides an important overview of the on-going discussion and debate.

- Peschaux, C., Deseine, A., Leduc, C., Lejeune, Y., Marquebielle, B., Valentin, B. & Valentin, F. (2020) Mesolithic settlement on la Haute-Île in Neuilly-sur-Marne (Seine-Saint-Denis, France): between funerary and domestic functions. *Bulletin de la Société préhistorique française* 117(4), 547-581. <https://www.jstor.org/stable/27089166>

Abstract: The site of la Haute-Île in Neuilly-sur-Marne (Seine-Saint-Denis) is located in a meander of the Marne where a Holocene paleosol is preserved over a surface of 3 400 m², on the paleobank of a former island. This paleo-soil contains the remains of several Mesolithic occupations (as well as some sparse remains from the Neolithic and Protohistoric periods). The site was partially excavated as part of preventive (2000-2004), then programmed operations (2011-2015), which revealed, for the Mesolithic: on one hand, a group of graves (four, for the moment), which represent the fourth known cemetery in France for this period; and, on the other hand, abundant remains (lithic industry, fauna, osseous industry) indicating the presence of several successive domestic occupations. Radiocarbon dates reveal that the necropolis is older than the domestic remains, indicating several phases of site use during the Mesolithic, with, first of all, a mainly funerary use towards the middle of the seventh millennium before our era (transition between the first and second Mesolithic), followed by several domestic occupations during the sixth millennium (second Mesolithic i.e., late and final Mesolithic).

Comment: This major report combines archaeological and bioanthropological data from the site of la Haute-Île, on the lower Marne river, 10-15 km east of Paris. Though a number of preliminary reports have included data from this site, this is the first easily accessible full report of both aspects of the site. The initial burial recovered at the site was briefly reported by Valentin *et al.* (2008; see also Confalonieri & Le Jeune 2013) and this is the only find from the site reported in the survey of French burials by Meiklejohn *et al.* (2010; *Mesolithic Miscellany* 21(1)). This paper pulls the currently available evidence together, including ¹⁴C dates from three of the four burials, all tightly flexed, plus one of the isolated human bone finds. The published dates from human material are all on teeth and therefore not currently corrected, though isotopic analysis of the bones is reported as currently underway.

- Peyroteo-Stjerna, R., Nilsson Stutz, L., Mickleburgh, H.L. & Cardoso, J.L. (2022) Mummification in the Mesolithic: new approaches to old photo documentation reveal previously unknown mortuary practices in the Sado Valley, Portugal. *European Journal of Archaeology* 25(3), 309-330. <https://doi.org/10.1017/eea.2022.3>

Abstract: Recently rediscovered photographs of the remains of thirteen individuals buried in the Sado Valley Mesolithic shell middens of Poças de S. Bento and Arapouco, excavated in 1960 and 1962, show the potential of revisiting excavation archives with new methods. The analysis, which applies the principles of archaeoanthatology and is enriched by experimental taphonomic research, confirmed details concerning the treatment of the dead body and provided new insights into the use of burial spaces. Some bodies may have been mummified prior to burial, a phenomenon possibly linked to their curation and transport, highlighting the significance of both the body and the burial place in Mesolithic south-western Portugal.

Comment: The core of this paper is well described above, centred on the use of photographs to reconstruct the series of burials from two sites in the Sado basin, in northern Alentejo, permitting application of techniques unavailable at the time of excavation in the 1960s. Very little was published at the time of burial. Central to the paper is the suggestion that two of the burials, one each from Arapouco and Poças de São Bento, were tightly bound and mummified during the burial process. The limited direct dates available suggest that the two may have been roughly contemporaneous within the period 7900 to 8150 cal BP.

- Peyroteo-Stjerna, R., Simões, L.G., Fernandes, R., Lopes, G., Günther, T. & Jakobsson, M. (2022) Multidisciplinary investigation reveals an individual of West African origin buried in a Portuguese Mesolithic shell midden four centuries ago. *Journal of Archaeological Science: Reports* 42, 103370. <https://doi.org/10.1016/j.jasrep.2022.103370>

Abstract: Cabeço da Amoreira is a well-studied shell midden with a robust chronology based on a large number of radiocarbon dates on Mesolithic human burials. Surprisingly, we discovered one individual that lived about 400 years ago buried in this site. We employed a multidisciplinary approach integrating archaeology, historical records, genetics, radiocarbon dating and stable isotope analysis to investigate the biogeographic origins of this individual and burial circumstances. We could determine that this was a man of West African origin, probably from Senegambia, arriving in Portugal via the Trans-Atlantic Slave Trade. Our study provides new insights into aspects of the life and death of a first-generation African individual in Portugal during the Trans-Atlantic Slave Trade period and highlights the power of multidisciplinary research to unravel unwritten history.

Comment: This paper is included for its methodological base. Much work on sites such as Cabeço da Amoreira, a classic shell midden site in the Muge river basin, has tended to accept, without question, early sources related to archaeological sequence and chronology. In this case the paper deals with a burial excavated in 1930 and accepted as Mesolithic in almost all sources. The recent summary of dates from the Muge sites by Peyroteo-Stjerna (2021), including Amoreira, shows all available dates as clearly Mesolithic in age. However, the issue over whether there were intrusive burials is long-standing. In this case, a burial from reasonably deep in the midden sequence at Amoreira has been shown to be a recent intrusion, the first known case.

- Pickard, J. & Bonsall, C. (2022) Reassessing Neolithic diets in Western Scotland. *Humans* 2(4), 226-250. <https://doi.org/10.3390/humans2040015>

Abstract: Although marine resources are known to have been exploited by both foragers and early farmers in Scotland, the importance of seafood to the diets of Neolithic groups has been widely debated. Here we present paired stable isotope ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) and radiocarbon measurements on Early Neolithic human remains from Raschoille Cave in Oban. These are compared with published data for other sites in western Scotland and used to re-evaluate the use of marine resources by the first farmers. The diets of Late Mesolithic foragers and Early Neolithic farmers were modelled from stable isotope

data using both Linear and Bayesian (FRUITS) mixing models. Our FRUITS dietary models indicate that Mesolithic foragers obtained much of their dietary protein and calories from marine resources, consistent with the predominance of shellfish, fish and sea mammal remains in their shell middens. Of note is the large proportion of dietary calories obtained from plant foods, which is like that of the early farming groups. The diets of Early Neolithic farmers appear relatively homogeneous across Scotland. Plant foods were the primary source of calories. Meat and/or dairy from terrestrial mammals were the most important source of dietary protein. Marine resources were, at most, a minor component of the 'lifetime' diet.

Comment: Though this article clearly focuses on the Early Neolithic, with new data largely from Raschoille, a site just to the south of Oban Bay, it also provides a major overview of the comparison with the Late Mesolithic sites such as those on Oronsay, the basis for its inclusion here.

- Piličiauskas, G., Kluczynska, G., Kisielienė, D., Skipitytė, R., Peseckas, K., Matuzevičiūtė, S., Lukešová, H., Lucquin, A., Craig, O.E. & Robson, H.K. (2020) Fishers of the Corded Ware culture in the Eastern Baltic. *Acta Archaeologica* 91(1), 95-120. <https://doi.org/10.1111/j.1600-0390.2020.12223.x>

Abstract: Between 2800 and 2400 cal BC pastoralists from Central Europe migrated into the eastern Baltic paving the way for the Corded Ware Culture (CWC), and a new type of economy, animal husbandry. Traditionally the CWC people were viewed as highly mobile due to the lack of substantial traces of dwellings and material culture at settlement sites; they were reliant on an economy based on animal husbandry as demonstrated by zooarchaeological and stable isotopic evidence. However, this paradigm is beginning to shift. Here, we present new AMS radiocarbon (^{14}C) measurements, pollen and macrobotanical data from sediment samples and a portable fish screen, as well as technological, molecular and isotopic data obtained from ceramic vessels from three CWC sites in the eastern Baltic. Overall, our results indicate a de-Neolithisation process undergone by some CWC groups, particularly in lacustrine and coastal ecotones, and a shift to hunting, gathering and fishing.

Comment: Centring on sites in Latvia and Lithuania, this paper provides important information relating to Corded Ware groups in the Eastern Baltic referred to as Neolithic, but retaining a broad-based hunter-gatherer-fisher economy. Sites central to the analysis are Abora 1 and Celmi in Latvia, and Šventoji 58 and Daktariškė 5 in Lithuania. Though human remains are tangential to the paper, the discussion of stable isotope data is important for work in this area on groups that maintained or, in this case, returned to a Mesolithic-like economy.

- Piličiauskas, G., Simčenka, E., Kozakaitė, J., Miliauskienė, Ž., Piličiauskienė, G. & Robson, H.K. (2021) Donkalnis ir Spiginas kapinynų akmens amžiaus žmonių kilmė ir mobilumas Stroncio izotopų analizės duomenimis (The origins and mobility patterns of Stone Age humans from the Donkalnis and Spiginas burial grounds according to strontium isotope analysis). *Lietuvos Archeologija* 47, 209-233 (in Lithuanian with English summary). <https://doi.org/10.33918/25386514-047010>

Abstract: Whilst the analysis of strontium isotope ratios ($^{87}\text{Sr}/^{86}\text{Sr}$) of human remains enables mobility patterns and migration events to be identified archaeologically, its potential is dependent on the heterogeneity of the underlying geology in the research area, and the knowledge of $^{87}\text{Sr}/^{86}\text{Sr}$ ratio variation in the biologically available strontium. In Lithuanian archaeology, strontium isotope analysis has only been relatively recently undertaken (2019–2020). In this paper we discuss the potential of the method, and its application to materials from the Stone Age burial grounds of Donkalnis and Spiginas located on former islands in the Lake Biržulis region, western Lithuania.

Comment: As indicated in the abstract, this paper is one of the first to apply strontium isotope analysis to human remains in Lithuania, focused on the sites of Donkalis and Spiginas. Though the material includes individuals described as Mesolithic and Subneolithic, all are largely within a hunter-gatherer context. The paper provides extended data tables, and also summarises strontium isotope values for Central and Eastern Europe, including the broader Baltic region.

- Posth, C., Yu, H., Ghalichi, A., Rougier, H., Crevecoeur, I., Huang, Y., Ringbauer, H., Rohrlach, A.B., Nägele, K., Villalba-Mouco, V., Radzeviciute, R., Ferraz, T., Stoessel, A., Tikhbatova, R., Drucker, D.G., Lari, M., Modi, A., Vai, S., Saupe, T., Scheib, C.L., Catalano, G., Pagani, L., Talamo, S., Fewlass, H., Klaric, L., Morala, A., Rué, M., Madelaine, S., Crépin, L., Caverne, J.-P., Bocaege, E., Ricci, S., Boschini, F., Bayle, P., Maureille, B., Le Brun-Ricalens, F., Bordes, J.-G., Oxilia, G., Bortolini, E., Bignon-Lau, O., Debout, G., Orliac, M., Zazzo, A., Sparacello, V., Starnini, E., Sineo, L., van der Plicht, J., Laure Pecqueur, L., Merceron, G., Garcia, G., Leuvrey, J.-M., Bay Garcia, C., Gómez-Olivencia, A., Połtowicz-Bobak, M., Bobak, D., Le Luyer, M., Storm, P., Hoffmann, C., Kabaciński, J., Filimonova, T., Shnaider, S., Berezina, N., González-Rabanal, B., González Morales, M.R., Marín-Arroyo, A.B., López, B., Alonso-Llamazares, C., Ronchitelli, A., Polet, C., Jadin, I., Cauwe, N., Soler, J., Coromina, N., Rufí, I., Cottiaux, R., Clark, G., Straus, L.G., Julien, M.-A., Renhart, S., Talaa, D., Benazzi, S., Romandini, M., Amkreutz, L., Bocherens, H., Wißing, C., Villotte, S., Fernández-López de Pablo, J., Gómez-Puche, M., Esquembre-Bebia, M.A., Bodu, P., Smits, L., Souffi, B., Jankauskas, R., Kozakaitė, J., Cupillard, C., Benthien, H., Wehrberger, K., Schmitz, R.W., Feine, S.C., Schüler, T., Thevenet, C., Grigorescu, D., Lüth, F., Kotula, A., Piezonka, H., Schopper, F., Svoboda, J., Sázelová, S., Chizhevsky, A., Khokhlov, A., Conard, N.J., Valentin, F., Harvati, K., Semal, P., Jungklaus, B., Suvorov, A., Schulting, R., Moiseyev, V., Mannermaa, K., Buzhilova, A., Terberger, T., Caramelli, D., Altena, E., Haak, W. & Krause, J. (2023) Palaeogenomics of Upper Palaeolithic to Neolithic European hunter-gatherers. *Nature* 615, 117-126. <https://doi.org/10.1038/s41586-023-05726-0>

Abstract: Modern humans have populated Europe for more than 45,000 years. Our knowledge of the genetic relatedness and structure of ancient hunter-gatherers is however limited, owing to the scarcity and poor molecular preservation of human remains from that period. Here we analyse 356 ancient hunter-gatherer genomes, including new genomic data for 116 individuals from 14 countries in western and central Eurasia, spanning between 35,000 and 5,000 years ago. We identify a genetic ancestry profile in individuals associated with Upper Palaeolithic Gravettian assemblages from western Europe that is distinct from contemporaneous groups related to this archaeological culture in central and southern Europe, but resembles that of preceding individuals associated with the Aurignacian culture. This ancestry profile survived during the Last Glacial Maximum (25,000 to 19,000 years ago) in human populations from southwestern Europe associated with the Solutrean culture, and with the following Magdalenian culture that re-expanded northeastward after the Last Glacial Maximum. Conversely, we reveal a genetic turnover in southern Europe suggesting a local replacement of human groups around the time of the Last Glacial Maximum, accompanied by a north-to-south dispersal of populations associated with the Epigravettian culture. From at least 14,000 years ago, an ancestry related to this culture spread from the south across the rest of Europe, largely replacing the Magdalenian-associated gene pool. After a period of limited admixture that spanned the beginning of the Mesolithic, we find genetic interactions between western and eastern European hunter-gatherers, who were also characterized by marked differences in phenotypically relevant variants.

Comment: This major review of European palaeogenomic evidence since the earliest Upper Palaeolithic joins other papers that have appeared over the last few years, a number appearing in previous

listings here. Most, however, have had a much narrower focus such as the Baltic region (Mittnik *et al.* 2018), the British Mesolithic-Neolithic transition (Brace *et al.* 2019) and the Iberian Peninsula (Olalde *et al.* 2019). Inclusion here is because of the considerable amount of new data from between the Late Upper Palaeolithic and the Mesolithic-Neolithic transition (see the last two sentences of the abstract). Described in the text as post-LGM (Late Glacial maximum) there are specific sections for Italy, Western and Central Europe and post 14 ka through the Neolithic. Particular focus is given to the spread of population groups from earlier LGM refugia. For those interested in the newly available data identified as Mesolithic there are two sources. The briefer is at the very end of the extended on-line series of tables and figures, identified as "extended data table 1 ... summary statistics ...", with data by individual and age period. A total of 63 individuals are identified as Mesolithic, from Russia (Karavaika, Minino, Oleniy Ostrov), Ukraine (Vasilievka 1), Lithuania (Donkalis), Poland (Krzyz), Germany (Bockstein, Criewen, Drigge, Groß Fredenwalde, Urdhöhle), Austria (Wöllersdorf), Belgium (Autours, Malonne Petit Ri, Waulsort Caverne X), Netherlands (Doggerland), France (Achères, Alfort III, Cuiry lès Chaudardes, Henry-Farman) and Spain (Casa Corona, Hou Amieva). Several of the sites were previously unknown to CM, Karavaika in Russia, Krzyz in Poland, Wöllersdorf in Austria and Hou Amieva in Spain. Data include Y and mtDNA haplogroups and broader genetic cluster association, plus bone dated, sex and date. However dates are only given as cal BP at 2 sigma, without actual laboratory date, errors or associated isotope data, making calibrations difficult without further information. Some of this missing information is in the extended Supplementary information available online, in the section "archaeological context information", pages 2-57. However, the data provided are mixed and it is stated that material is "in the format provided by the authors and unedited"; a quick check reveals errors such as incorrect ¹⁴C dates indicating that care is needed in using the files. It does, however, provide references for further information. Additional topics include "admixture between Mesolithic-Neolithic hunter-gatherers".

- Rainio, R., Dmitry V., Gerasimov, D.V., Giryra, E.Y. & Mannermaa, K. (2021) Prehistoric pendants as instigators of sound and body movements: a traceological case study from Northeast Europe, c. 8200 cal. BP. *Cambridge Archaeological Journal* 31(4), 639-660. <https://doi.org/10.1017/S0959774321000275>

Abstract: In the Late Mesolithic graves of Yuzhniy Oleniy Ostrov, northwest Russia, large numbers of Eurasian elk (*Alces alces*) incisors have been found. These teeth, for the most part fashioned into portable pendants, seem to have formed decorative sets for the garments or accessories of the deceased. This article examines both the technologies associated with these artefacts and their uses, as well as reflecting on the sensorial experiences generated by them. Osteological analysis of a sample of 100 specimens indicates that all types of incisors were used for making the pendants. Traceological analysis indicates that the teeth were modified by scraping, grooving, grinding and retouching. Traces of wear consist of general wear and distinctive pits or pecks on the perimeters of the crowns. These traces indicate that the pendants were worn before their deposition in the graves, in such a way that they were in contact with both soft and solid materials. This pattern of pits or pecks has until now been unreported in the traceological literature. In experiments, a similar pattern emerged when pendants of fresh elk incisors were hung in rows and bunches and struck against one another. These strokes created a rattling sound. Thus, the elk incisors of Yuzhniy Oleniy Ostrov appear to provide insight into previously unattainable sonic experiences and activities of Mesolithic hunter-gatherers, as well as the early history of the instrument category of rattles.

Comment: This paper is part of the growing work on interpretation of ornaments from burial contexts in Russian Karelia and Finland, especially by Mannermaa and Rainio, of the University of Helsinki. Previously published in the *Bones and Burials List* are Mannermaa *et al.* (2019) on wild boar teeth and

Mannermaa and Rainio (2020) on an ornamented swan bone. As indicated in the abstract focus is on Eurasian Elk incisors in association with burials at Yuzhny Oleniy Ostrov, giving a detailed analysis of the finds and their interpretation as pendants. The well-illustrated paper includes a reconstruction of the suggested placement of the teeth as rattles in a painting by Tom Björklund of the grave 76a male individual.

- Schülke, A. (2022) Placing – fragmenting – circulating: Mesolithic burial and mortuary practices in Norway in a Northern European perspective. In D.E.F. Olsen (ed.) *The Stone Age Conference in Bergen 2017* (=University of Bergen Archaeological Series (UBAS) 12). University of Bergen, Bergen, 123-154. <http://urn.nb.no/URN:NBN:no-97373>

Abstract: This contribution investigates burial and mortuary practice in the Mesolithic period (9300–3900 BC) in what today is defined as Norway. This issue has received little attention, as poor preservation conditions for bone material in the forest zone of the North has led to a low number of finds. Recent excavations of single burials at e.g. Brunstad and Sømmevågen trigger off a reassessment of the topic. The twelve sites with human bones, which could be identified, dating to the Middle and Late Mesolithic, were studied and compared. Even though statistically not significant, they exhibit some common traits: Human remains are mainly found in the places of the living: on coastal settlement sites, including caves/rockshelters and open-air sites. This broad spectrum of sites indicates human engagement with different natural and cultural elements when dealing with the dead: hollows, water, earth and cultural debris. Both graves with apparently intact human bodies and single (loose) human bones can be identified. Together with sites found in wetlands with seemingly selected types of bones, these bear witness to a broad range of mortuary practices, including inhumation, the fragmenting of corpses and the circulation of selected bones. This is in line with practices observed in other parts of Northern Europe; a special closeness to finds from Western Sweden is observed. As in other areas it is most likely that only a small number of people were actually buried, while most of them received other treatment in death, not easily visible archaeologically. The identification of these various phenomena will hopefully make it possible to identify other find contexts in future, and will be important when discussing social and ritual aspects of Mesolithic hunter-gatherer societies, not least regarding studies on genetics and mobility.

Comment: This is a major overview of Mesolithic human remains from Norway, which have been limited in number. It discusses 12, including burial and loose human bone (LHB) finds and overlaps the list in Schülke *et al.* (2019), focused on Brunstad in the Oslo fjord area (see list in *Mesolithic Miscellany*, 27(1)).

It should be stressed that the focus is on mortuary practice, and the place of human burials in its study. It is not a catalogue of Norwegian human remains, but looks through a broader bioarchaeological approach. It is primarily drawn from available publications, with some use of excavation reports. The core data on human bone finds is in two extended tables (Figures 4 and 5). The first, which provides context, lists sites from oldest to youngest including sources used by site, while the second provides dates and $\delta^{13}\text{C}$ values, lab numbers and calibrations, where available, as well as material dated and sources. There is no site-by-site discussion. Material is discussed by topic, including by general location and site type. Intentional burials are discussed separately from loose bone finds. There is also an extended discussion of burial practices in Mesolithic Norway within a broader European perspective, set within the general topic of social implications of burial.

From the perspective of CM, a key element is the extended discussion of Mesolithic skeletal finds. There is some overlap with Schülke *et al.* (2019; see above), and the same is true with Reitan *et al.* (2019),

listed in *Mesolithic Miscellany*, 28(1). The majority of finds are poorly known by those not familiar with the Norwegian literature. Only three were included in the list of dated European Mesolithic burials prepared for the 2013 Halle burial conference proceedings (Meiklejohn *et al.* 2016), Bleivik, Søgne (Hummervikholmen) and Viste (Svarthåla), discovered in 1952, 1994 and 1907 (LHB finds were not included). The remaining sites discussed having varying coverage and previous publication. As noted above, Brunstad, discovered in 2014, has been discussed in earlier lists in this series, indirectly dated by charcoal as opposed to human bone. Also known is Skipshelleren, loose bone finds discovered between 1929 and 1931 but only described in any detail by Newell *et al.* (1979), and with dates of Mesolithic through Neolithic age. The remaining sites listed were not known to CM and available publication is sparse. Only three have associated direct ^{14}C dates on bone, all Late Mesolithic, Grønehelleren (6080 ± 140 ; T-5847), Sømmevågen (5440 ± 30 ; Beta-381097) and Steigen (5450 ± 30 ; Beta-349961) and only limited information is available on these dates. The other four sites are all dated indirectly by material such as charcoal and further information is needed. This paper is of major importance.

- Schulting, R.J., Mannermaa, K., Tarasov, P.E., Higham, T., Bronk Ramsey, C., Khartanovich, V., Moiseyev, V., Gerasimov, D., O'Shea, J. & Weber, A. (2022) Radiocarbon dating from Yuzhniy Oleniy Ostrov cemetery reveals complex human responses to socio-ecological stress during the 8.2 ka cooling event. *Nature Ecology & Evolution* 6, 155-162. <https://doi.org/10.1038/s41559-021-01628-4>

Abstract: Yuzhniy Oleniy Ostrov in Karelia, northwest Russia, is one of the largest Early Holocene cemeteries in northern Eurasia, with 177 burials recovered in excavations in the 1930s; originally, more than 400 graves may have been present. A new radiocarbon dating programme, taking into account a correction for freshwater reservoir effects, suggests that the main use of the cemetery spanned only some 100–300 years, centring on ca. 8250 to 8000 cal bp. This coincides remarkably closely with the 8.2 ka cooling event, the most dramatic climatic downturn in the Holocene in the northern hemisphere, inviting an interpretation in terms of human response to a climate-driven environmental change. Rather than suggesting a simple deterministic relationship, we draw on a body of anthropological and archaeological theory to argue that the burial of the dead at this location served to demarcate and negotiate rights of access to a favoured locality with particularly rich and resilient fish and game stocks during a period of regional resource depression. This resulted in increased social stress in human communities that exceeded and subverted the 'normal' commitment of many hunter-gatherers to egalitarianism and widespread resource sharing, and gave rise to greater mortuary complexity. However, this seems to have lasted only for the duration of the climate downturn. Our results have implications for understanding the context of the emergence—and dissolution—of socio-economic inequality and territoriality under conditions of socio-ecological stress.

Comment: This paper looks at ^{14}C results, stable isotope values and freshwater reservoir issues involved with dating and interpretation of Yuzhniy Oleniy Ostrov in Russian Karelia (also called Oleni Ostrov and Oleniostrov), arguably the largest Mesolithic burial site in Europe. The abstract gives a clear sense of the direction and results of the paper. Major information, including associated data, is given in the extended Supplementary Information files. Of special interest is that actual use of the site was over a limited time period associated with the 8.2 ka cold event, a topic of wide interest in Mesolithic archaeology, as is the computation of Freshwater Reservoir correction values for the region. Also, the problematic nature of the early ^{14}C dates from the Geological Institute, Russian Academy of Science (GIN) is confirmed, with all rejected.

- Serrano, J.G., Ordóñez, A.C. & Fregel, R. (2021) Paleogenomics of the prehistory of Europe: human migrations, domestication and disease. *Annals of Human Biology* 48(3), 179-190. <https://doi.org/10.1080/03014460.2021.1942205>

Abstract: A substantial portion of ancient DNA research has been centred on understanding European populations' origin and evolution. Archaeological evidence has already shown that the peopling of Europe involved an intricate pattern of demic and/or cultural diffusion since the Upper Palaeolithic, which became more evident during the Neolithic and Bronze Age periods. However, ancient DNA data has been crucial in determining if cultural changes occurred due to the movement of ideas or people. With the advent of next-generation sequencing and population-based paleogenomic research, ancient DNA studies have been directed not only at the study of continental human migrations, but also to the detailed analysis of particular archaeological sites, the processes of domestication, or the spread of disease during prehistoric times. With this vast paleogenomic effort added to a proper archaeological contextualisation of results, a deeper understanding of Europe's peopling is starting to emanate.

Comment: This, the fourth article from *Annals of Human Biology* (see also Calò *et al.*, Feldman *et al.* and Modi *et al.* above), provides a useful overview of Mesolithic and Neolithic palaeogenomic patterns, with major sources and useful figures.

- Sheridan, A., Armit, I., Reich, D., Booth, T., Bernardos, R., Barnes, I., Thomas, M., Charlton, S., Craig, O., Lawson, J., Dulas, K., Edwards, C.J., Pala, M., Richards, M.B., Margaryan, A., Kristiansen, K., Willerslev, E., Allentoft, M., Britton, K., Noble, G., Flink, L.G., Talamo, S., Curtis, N., Cooper, A., Cole, S. & Brown, L. (2019) A summary round-up list of Scottish archaeological human remains that have been sampled/analysed for DNA as of January 2019. *Discovery and excavation in Scotland* 19, 227-250. <https://archaeologyscotland.org.uk/join-us/discovery-and-excavation-scotland/>

Abstract (none; initial paragraph follows): During the 2015 Society of Antiquaries of Scotland series of Rhind lectures on 'British archaeology: its progress and demands', a panel discussion on archaeology and genetics concluded that the time was ripe to apply the powerful technique of DNA analysis to Scottish archaeological human remains, given that there had been a step-change in the development of the method which meant that problems such as contamination and prohibitive cost have largely been overcome. Since then, this approach has been applied to some 267 individuals from Scotland's past (with whole genome data being determined in most cases); and publication of some of the results, within the context of broader DNA research initiatives (Brace *et al.* 2018; Olalde *et al.* 2018), has generated lively discussion about their interpretation.

Comment: This listing is included for the underlying importance of such information, at a time when full lists of dates and associated aDNA by country are seldom available. We note that the only Mesolithic site in the list is Cnoc Coig, indicating need for further work. Note that the online version lists this as a "supplementary DES resource", not published in the hard-copy version.

- Silva, N.M., Kreutzer, S., Souleles, A., Triantaphyllou, S., Kotsakis, K., Urem-Kotsou, D., Halstead, P., Efstratiou, N., Kotsos, S., Karamitrou-Mentessidi, G., Adaktylou, F., Chondroyianni-Metoki, A., Pappa, M., Ziota, C., Sampson, A., Papathanasiou, A., Vitelli, K., Cullen, T., Kyparissi-Apostolika, N., Zeeb Lanz, A., Peters, J., Rio, J., Wegmann, D., Burger, J., Currat, M. & Papa-georgopoulou, C. (2022) Ancient mitochondrial diversity reveals population homogeneity in Neolithic Greece and identifies population dynamics along the Danubian expansion axis. *Scientific Reports* 12, 13474. <https://doi.org/10.1038/s41598-022-16745-8>

Abstract: The aim of the study is to investigate mitochondrial diversity in Neolithic Greece and its relation to hunter-gatherers and farmers who populated the Danubian Neolithic expansion axis. We sequenced 42 mitochondrial palaeogenomes from Greece and analysed them together with European set of 328 mtDNA sequences dating from the Early to the Final Neolithic and 319 modern sequences.

To test for population continuity through time in Greece, we use an original structured population continuity test that simulates DNA from different periods by explicitly considering the spatial and temporal dynamics of populations. We explore specific scenarios of the mode and tempo of the European Neolithic expansion along the Danubian axis applying spatially explicit simulations coupled with Approximate Bayesian Computation. We observe a striking genetic homogeneity for the maternal line throughout the Neolithic in Greece whereas population continuity is rejected between the Neolithic and present-day Greeks. Along the Danubian expansion axis, our best-fitting scenario supports a substantial decrease in mobility and an increasing local hunter-gatherer contribution to the gene-pool of farmers following the initial rapid Neolithic expansion. Our original simulation approach models key demographic parameters rather than inferring them from fragmentary data leading to a better understanding of this important process in European prehistory.

Comment: Inclusion of this paper, with an abstract suggesting attention directed to the Greek and Danubian Neolithic, is for the inclusion and discussion of data from five Greek Mesolithic sites with human burials, four cave sites, Franchthi (Peloponnese), Theopetra (Thessaly), Cyclops Cave (on Youra) and Sarakenos Cave (Boeotia) and one open-air site, Maroulas (on Kythnos). The Mesolithic-Neolithic transition in Greece is placed at ~8000/8200 cal BP (6700/6500 BCE). Mention is made of available mtDNA haplogroup data from two Mesolithic individuals from Theopetra (Hofmanová *et al.* 2016), by a research group that overlaps this paper. Samples for the new paper were from three Mesolithic sites, Franchthi, Theopetra and Maroulas, and 12 Neolithic sites. Among new information, two individuals from Theopetra belong to haplogroup K, not found in any Mesolithic samples from further west, but present in pre-pottery Levant and Early Neolithic Turkey. In addition, there was no evidence of the U5 haplogroup in either Mesolithic or Neolithic context, concluding that "local hunter-gatherer population in the Aegean and northern Greece may have been genetically distinct from those in the northern Balkans and other parts of Europe" (11).

- Simčėnka, E., Kozakaitė, J., Piličiauskienė, G., Gaižauskas, L. & Piličiauskas, G. (2022) Human diet during the Stone Age and Early Metal Period (7000-1 Cal BC) in Lithuania: an update. *Radiocarbon* 64(5), 1171-1189. <https://doi.org/10.1017/RDC.2022.41>

Abstract: In this study we present new carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) stable isotope data of human (n=13) and animal (n=40) bone and/or dentine collagen samples, alongside accelerator mass spectrometry radiocarbon (AMS ^{14}C) dates of human remains (n=16). The studied material was sampled from Lithuanian sites dating from the Late Mesolithic to the pre-Roman Iron Age. For the first time, we present $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ data from Lithuanian freshwater fish as well as AMS ^{14}C , $\delta^{13}\text{C}$, and $\delta^{15}\text{N}$ measurements of human remains from six disturbed graves at the Donkalis cemetery and from two pre-Roman Iron Age graves. According to the new results, human diet derived protein from the Late Mesolithic to Subneolithic (ca. 7000–2900 cal BC) was primarily based on freshwater fish. While previous macrobotanical and stable isotope studies has suggested that C_4 plants, i.e., millet, became more widely used from the Late Bronze Age (1100–500 cal BC), our data suggests that millet consumption may have decreased during the pre-Roman Iron Age (500–1 cal BC) in the southeastern Baltic.

Comment: Interest in this paper lies in evidence of dietary continuity from the Mesolithic until ca. 3000 cal BC in the Baltic region, and extends data for comparison with the larger Mesolithic and Neolithic skeletal series in Lithuania. The overall data set covers ten sites, with key interest from a Mesolithic perspective in Donkalis and Kretuonas. Isotope and ^{14}C data are present in tabular form. Clear summaries of the site are also provided and there is an extensive reference list.

- Skar, B. (2022) Mobility and material culture in the Middle Mesolithic of Fennoscandia – validating the input from biomolecular studies. In D.E.F. Olsen (ed.) *The Stone Age Conference*

in Bergen 2017 (=University of Bergen Archaeological Series (UBAS) 12). University of Bergen, Bergen, 105-121. <https://hdl.handle.net/11250/3043200>

Abstract: Similarities in late-glacial lithic technology (direct percussion) of western Europe and the oldest counterparts of Scandinavia appearing around 11,700 BP have sustained arguments for an early postglacial migration from northwestern Europe into Scandinavia including coastal areas of northern Norway. However, another lithic technology (pressure blade), occurring in Fennoscandia around 10,300 BP, indicates contacts with groups in the east and potentially a second and east-west migration deriving from the Russian mainland.

aDNA studies of some of the oldest coastal human individuals from Europe, represented by two Norwegian skeletons (9500 BP) unveiled admixture of southern hunter gatherer (SHG) and eastern hunter gatherer (EHG), descended from isolated Glacial refugia. The Norwegian samples show dominance of EHG while contemporary samples from Gotland show a dominance of SHG ancestry. Isotopic markers of a diet consisting of more than 80% marine protein deriving from the highest level of the food chain sustain the importance and likely attraction of marine mammal resources. The biomolecular results underpin a second migration into Norway from northeast c. 10,300 BP, likely over the Cap of the North. Recent lithic studies covering larger parts of Central Scandinavia and Russia, however, provide a more fine-tuned narrative of networks and pulses of migration.

Comment: This paper, from the same volume as that by Schülke, above, has a base in Günther *et al.* (2018), included in *Mesolithic Miscellany* 26(1), which looked at aDNA and isotope data and the origin of the initial Postglacial population of Norway and Sweden. The Skar paper expands the discussion in Günther and also that of Skar *et al.* (2016), listed in *Mesolithic Miscellany* 25(1). Core conclusions are covered clearly in the abstract. The sites with aDNA data discussed are Søgne (Hummervikholmen) and Steigen from Norway, and Stora Förvar and Stora Bjers from Sweden.

- Terberger, T., Kotula, A., Jungklaus, B. & Piezonka, H. (2021) The Mesolithic "multiple burial" of Gross Fredenwalde revisited. In S. Gaudzinski-Windheuser & O. Jöris (eds.) *The beef behind all possible pasts. The tandem-festschrift in honour of Elaine Turner and Martin Street*. Römisch-Germanischen Zentralmuseums, Mainz. (=Monographien des Römisch-Germanischen Zentralmuseums 157(2), 671-688. <https://books.ub.uni-heidelberg.de/propylaeum/reader/download/950/950-30-96327-1-10-20211206.pdf>

Abstract: Palaeolithic and Mesolithic burials are rare discoveries in the archaeological record, and frequently receive special attention. As seen for the Late Palaeolithic burial(s) from Bonn-Oberkassel, reconstruction of the burial context can be difficult when they have been unearthed during old excavations, due to differing documentation standards. Here we present results from new investigations at the Mesolithic burial(s) from Groß Fredenwalde, which were poorly documented after their accidental discovery in 1962. New evidence from archival research combined with results from anthropological studies and ¹⁴C-dating provided a new perspective on the original burial context. The results show that re-examination of old finds offer new perspectives, but these come paired with methodological pitfalls in the interpretation of double and multiple interments.

Comment: This paper lies within the context of the recognition of multiple burials within the Late Upper Palaeolithic and Mesolithic of north-central and Northern Europe. Burial sites mentioned in the introduction, which raises the question of security of recognition, are Bonn-Oberkassel in Federmesser context, the roughly contemporary secondary burial at Neuwied-Irlich and the Mesolithic burial of eight individuals at Strøby Egede in Denmark. The paper gives a history of the excavations and then looks at what is referred to as the "multiple burial" at Groß Fredenwalde, six individuals, three adults and three children, recovered in the rescue excavation of the site in 1962. Extended discussion

is given of the debate over the number of events involved in the 1962 finds, based on new findings, and within the framework of the interpretation of multiple burials. Included is an OxCal output model with the full set of ^{14}C dates from the site, with calibrations and stable isotope data, including both the 1962 finds and those from 2012. The further material gives a current number of burials at this complex site as 12.

- Thomas, J. (2022) Neolithization and population replacement in Britain: an alternative view. *Cambridge Archaeological Journal* 32(3), 507-525. <https://doi.org/10.1017/S0959774321000639>

Abstract: Investigation of British Mesolithic and Neolithic genomes suggests discontinuity between the two and has been interpreted as indicating a significant migration of continental farmers, displacing the indigenous population. These incomers had already acquired some hunter-gatherer genetic heritage before their arrival, and this increased little in Britain. However, the proportion of hunter-gatherer genetic ancestry in British Neolithic genomes is generally greater than for most contemporary examples on the continent, particularly in emerging evidence from northern France, while the ultimate origin of British Neolithic populations in Iberia is open to question. Both the date calculated for the arrival of new people in Britain and their westerly origin are at odds with other aspects of the existing evidence. Here, a two-phase model of Neolithization is proposed. The first appearance of Neolithic things and practices significantly predated a more substantial transfer of population, creating the conditions under which new communities could be brought into being. The rather later establishment of a major migration stream coincided with an acceleration in the spread of Neolithic artefacts and activities, as well as an enrichment of the Neolithic material assemblage.

Comment: This is best seen as an ideas paper, as opposed to one centred on new data, re-examining available aDNA data related to the Mesolithic-Neolithic transition in Britain. At the centre are two things, a rethinking by Thomas of his earlier interpretation of the transition focused on processes largely within Britain (Thomas 2013), and an acceptance of the available aDNA data, and especially of ideas put forward by Brace *et al.* (2019). The full aDNA database underlining the discussion is not provided, but is apparently from the Brace article (see Bones and Burials List in *Mesolithic Miscellany* 27(1)). Thomas' conclusions are clearly outlined in the abstract, that initial contact with the continental Neolithic begins shortly after 4400 cal BC with arrival of small numbers of initial migrants after 4100 cal BC, contrasted with that of Sheridan (2007, 2010) who saw the first Neolithic in Ireland at *ca.* 4300 cal BC and in western Wales and Scotland after 4200 cal BC, of Whittle *et al.* (2011) who see the initial Neolithic within the Thames estuary by 4100 cal BC, and the Brace model, that sees the initial appearance as *ca.* 3900 cal BC. This article provides a clear base for considerable further discussion.

- van der Plicht, J. & Kuitens, M. (2022) Fossil bones from the North Sea: radiocarbon and stable isotope ($^{13}\text{C}/^{15}\text{N}$) data. *Radiocarbon* 64(3), 633-668. <https://doi.org/10.1017/RDC.2022.9>

Abstract: The North Sea is considered a unique heritage site that yielded a huge amount of zoological and archaeological data. More than 200 palaeozoological and archaeological fossil bone samples from the North Sea bed are dated by ^{14}C . About 2/3 of these dated bones are Pleistocene in age; the majority of the bones are from extinct species (in particular woolly mammoth); about 1/3 of the sample date to the Holocene. The presented dataset is important in its kind, but interpretation is limited because of a lack of context of the finds. The stable isotopes (^{13}C , ^{15}N) of the dated samples provide additional information on palaeoenvironmental conditions and dietary habits in the past. We present primarily a Groningen list of data; a few fossils dated in other laboratories are included for completeness.

Comment: Though primarily focusing on animal rather than human bones, this paper includes the latter in discussing finds from the North Sea basin. Chronological coverage is the last 50,000 years, though

examination of the date distribution in Figure 2 shows a number of Early Holocene or Mesolithic dates. Inclusion here adds information to and overlaps several previous papers in this series, including van der Plicht *et al.* (2016). The presence of human as well as animal remains has been a rapidly expanding area of study over the past decade.

- Wang, K., Yu, H., Radzeviciute, R., Kiryushin, Y.F., Tishkin, A.A., Frolov, Y.V., Stepanova, N.F., Kiryushin, K.U., Kungurov, A.L., Shnaider, S.V., Tur, S.S., Tiunov, M.P., Zubova, A.V., Pevzner, M., Karimov, T., Buzhilova, A., Slon, V., Jeong, C., Krause, J. & Posth, C. (2023) Middle Holocene Siberian genomes reveal highly connected gene pools throughout North Asia. *Current Biology* 33(3), 423-433. <https://doi.org/10.1016/j.cub.2022.11.062>

Summary: The peopling history of North Asia remains largely unexplored due to the limited number of ancient genomes analyzed from this region. Here, we report genome-wide data of ten individuals dated to as early as 7,500 years before present from three regions in North Asia, namely Altai-Sayan, Russian Far East, and the Kamchatka Peninsula. Our analysis reveals a previously undescribed Middle Holocene Siberian gene pool in Neolithic Altai-Sayan hunter-gatherers as a genetic mixture between paleo-Siberian and ancient North Eurasian (ANE) ancestries. This distinctive gene pool represents an optimal source for the inferred ANE-related population that contributed to Bronze Age groups from North and Inner Asia, such as Lake Baikal hunter-gatherers, Okunevo-associated pastoralists, and possibly Tarim Basin populations. We find the presence of ancient Northeast Asian (ANA) ancestry—initially described in Neolithic groups from the Russian Far East—in another Neolithic Altai-Sayan individual associated with different cultural features, revealing the spread of ANA ancestry 1,500 km further to the west than previously observed. In the Russian Far East, we identify 7,000-year-old individuals that carry Jomon-associated ancestry indicating genetic links with hunter-gatherers in the Japanese archipelago. We also report multiple phases of Native American-related gene flow into north-eastern Asia over the past 5,000 years, reaching the Kamchatka Peninsula and central Siberia. Our findings highlight largely interconnected population dynamics throughout North Asia from the Early Holocene onward.

Comment: This article's focus is to the east of the normal coverage here, as made clear in the summary above. It is included because it deals with a topic that has long been of interest to one of us, the possibility of long-distance east-west gene flow in the Early and Middle Holocene, partially confirmed. Sequential regions of gene flow are shown to stretch from Central Asia as far to the east as Japan, Kamchatka, Alaska and the northwestern US. Exploring further gene flow into areas such as Karelia would be a fascinating topic.

- Yu, H., van de Loosdrecht, M.S., Mannino, M.A., Talamo, S., Rohrlach, A.B., Childebayeva, A., Villalba-Mouco, V., Aron, F., Brandt, G., Burri, M., Freund, C., Radzeviciute, R., Stahl, R., Wissgott, A., Fewlass, H., Tagliacozzo, A., Piperno, M., Tusa, S., Collina, C., Schimmenti, V., Di Salvo, R., Prüfer, K., Posth, C., Hublin, J.-J., Gronenborn, D., Binder, D., Jeong, C., Haak, W. & Krause, J. (2022) Genomic and dietary discontinuities during the Mesolithic and Neolithic in Sicily. *iScience* 25(5), 104244. <https://doi.org/10.1016/j.isci.2022.104244>

Abstract: Sicily is a key region for understanding the agricultural transition in the Mediterranean because of its central position. Here, we present genomic and stable isotopic data for 19 prehistoric Sicilians covering the Mesolithic to Bronze Age periods (10,700–4,100 yBP). We find that Early Mesolithic hunter-gatherers (HGs) from Sicily are a highly drifted lineage of the Early Holocene western European HGs, whereas Late Mesolithic HGs carry 20% ancestry related to northern and (south) eastern European HGs, indicating substantial gene flow. Early Neolithic farmers are genetically most similar to farmers from the Balkans and Greece, with only 7% of ancestry from local Mesolithic HGs. The

genetic discontinuities during the Mesolithic and Early Neolithic match the changes in material culture and diet. Three outlying individuals dated to 8,000 yBP; however, suggest that hunter-gatherers interacted with incoming farmers at Grotta dell'Uzzo, resulting in a mixed economy and diet for a brief interlude at the Mesolithic-Neolithic transition.

Comment: This paper overlaps that by Catalano *et al.* (see above) in topic and authorship, though the chronological coverage differs, focused here on the Mesolithic and later, though with mention of the earlier Oriente C burial. Major focus is on Grotta dell'Uzzo, where material is now shown to date from Early Mesolithic through Early Bronze Age, greatly increasing our understanding of this major site, with different burial periods clearly demonstrated. Genetic similarity is seen between the two oldest Uzzo individuals, 10750-10580 cal BP, and earlier material from Oriente C, San Teodoro and Paglicci. A further nine date to 8650-7790 cal BP, with two further at 7960-7790 cal BC. All are linked to the earliest group, with genetic markers showing ties to Mesolithic hunter-gatherers. Finally, seven individuals date to the Early and Middle Neolithic, 7430-6660 cal BP, and one to the Early Bronze Age, 4150-3970 cal BP, all genetically linked to later European farming groups. Definite changes in diet are shown between the chronologically different periods.

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