

TECHNOLOGIES OF THE STONE AGE: THE COASTAL DIMENSION

PrehCOAST network workshop

Riga, Latvia, 6–8 June 2023

Institute of Latvian History, University of Latvia

PROGRAMME AND ABSTRACTS



**UNIVERSITY
OF LATVIA**

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Organizers of the scientific programme: Valdis Bērziņš (Institute of Latvian History, University of Latvia), Inger Marie Berg-Hansen (Museum of Cultural History, University of Oslo) and Miriam Cubas (University of Alcalá)

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University of Latvia

The illustration shows a replica by Baiba Dumpe of a 4th millennium BC pottery vessel from Sārnate, at the coast of western Latvia – blackened by smoke in the course of pottery function experiments.

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Grégor Marchand
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**TECHNOLOGIES OF THE STONE AGE:
THE COASTAL DIMENSION
WORKSHOP PROGRAMME**

TUESDAY 6 JUNE

Institute of Latvian History, Kalpaka bulvāris 4, Riga, Room 110

9:00	<i>Valdis Bērziņš</i> . Introduction to the workshop
	Session 1: Knowledge, networks, movement and landscape use Session chair: Steinar Solheim
9:10	<i>Pablo Arias, Roberto Ontañón, Esteban Álvarez-Fernández, Adriana Chauvin, Marián Cueto, Jean-Jacques Delannoy, Diego Garate, Carlos García-Noriega, Jules Kemper, Stéphane Jaillet, Eric Laval, François Lévêque, Michel Menu, Rodrigo Portero, Olivia Rivero & Luis C. Teira</i> . Domestic technology in a coastal environment: a preliminary approach to the spatial distribution of activities in the Magdalenian structures of La Garma (Spain)
9:30	<i>Axel Mjærum</i> . Technologies for a successful hunt
9:50	<i>Inger Marie Berg-Hansen</i> . Coastal living – a technological approach
10:10	<i>Almut Schülke</i> . Technique or randomness? On the practice of place-making
10:30	Discussion (suggested topic: technological adaptations and knowledge transmission in coastal environments)

Coffee break (11:10–11:40)

11:40	<i>Aija Macāne & Kerikko Nordqvist</i> . Amber, waterways and inter-regional contacts in the eastern Baltic Sea area in the 4th–3rd millennium BC
12:00	<i>Vincent Ard</i> . Prehistoric salt production: A technological approach in ceramic studies
12:20	Discussion (suggested topic: exploring connections along the coast and inland)

Lunch at workshop venue (13:00–14:00)

	Session 2: Technological change and its movers Session chair: Pablo Arias
14:00	<i>Steinar Solheim & Hege Damlien</i> . Exploring temporal trends in human activity, lithic technology, and tool assemblages in South-Eastern Norway
14:20	<i>Hege Damlien</i> . Exploring the social impact of the Storegga tsunami on the Late Mesolithic communities of coastal Western Norway
14:40	Discussion (suggested topic: the significance of environmental change for technological development)
15:00	Visit to permanent archaeological exhibition of National History Museum of Latvia (just across the road at 32 Brīvības bulvāris)

Coffee break (15:45–16:15)

16:15	<i>Izaro Quevedo-Semperena, Urko Santamaria Diaz, Néstor Lozano-López, Marta Francés-Negro & Miriam Cubas</i> . Pottery technology on the Atlantic coast of the Iberian Peninsula during the Late Prehistory (ca. 6000–3000 cal BCE)
please see abstract	<i>Grégor Marchand</i> . From the continent to the Atlantic Ocean: are there marine influences in the technical metamorphoses of the Late Mesolithic?

16:35	Discussion (suggested topic: modelling technological influences in coastal societies)
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WEDNESDAY 7 JUNE
Institute of Latvian History, Kalpaka bulvāris 4, Riga, Room 110

Session 3: Material processing, use and consumption Chair: Inger Marie Berg-Hansen	
9:00	<i>Jorge Calvo-Gómez</i> . Technical systems of the coastal groups around the Bay of Biscay: a functional approach
9:20	<i>Carlos García-Noriega & Pablo Arias</i> . The controversial case of a coastal Mesolithic tool: a geometric approach to the analysis of the Asturian pick
9:40	<i>Mārcis Kalniņš</i> . Flint and the sea: local flint raw materials on the Stone Age coastal sites in Latvia
10:00	<i>Tomas Rimkus</i> . The latest studies on Early and Middle Holocene hunter-gatherer osseous implements in coastal Lithuania
10:20	<i>Rodrigo Portero, Marián Cueto & Esteban Álvarez-Fernández</i> . Breakage patterns of red deer long bones for marrow consumption in the Lower Magdalenian (19.5–18.5 ka cal BP). The case of the El Cierro cave.
10:40	Discussion (suggested topic: Technological systems, tool function and material processing in coastal environments)

Coffee break (11:10–11:40)

Chair: Vincent Ard	
11:40	<i>Agnese Čakare</i> . Flaking, shaving and scraping: an experimental approach to the study of amber processing on the coastal Neolithic Siliņupe site
12:00	<i>Miriam Cubas</i> . Exploring economic changes during the Early Neolithic in South Atlantic Europe: an approach from lipid analyses
12:20	<i>Vanda Visocka & Valdis Bērziņš</i> . Use and re-use: human interaction with pottery production materials in a coastal area of present-day Latvia. A case study of Siliņupe and Slocene settlements
12:40	Discussion (suggested topic: the role of everyday materials in coastal societies)

Lunch at workshop venue (13:00–14:00)

Current and future themes and activities Chair: Valdis Bērziņš	
14:00	<i>Almut Schülke</i> . The MSCA doctoral network ArCHE
14:15	Discussion: <ul style="list-style-type: none"> ○ other actions in national and international funding schemes; ○ available facilities, support and possibilities for training and cooperation; ○ please suggest cooperation proposals!

Coffee break (15:45–16:15)

Current and future themes and activities Chair: Almut Schülke	
16:15	Discussion: Continuation of networking activities in the spirit of PrehCOAST Open discussion

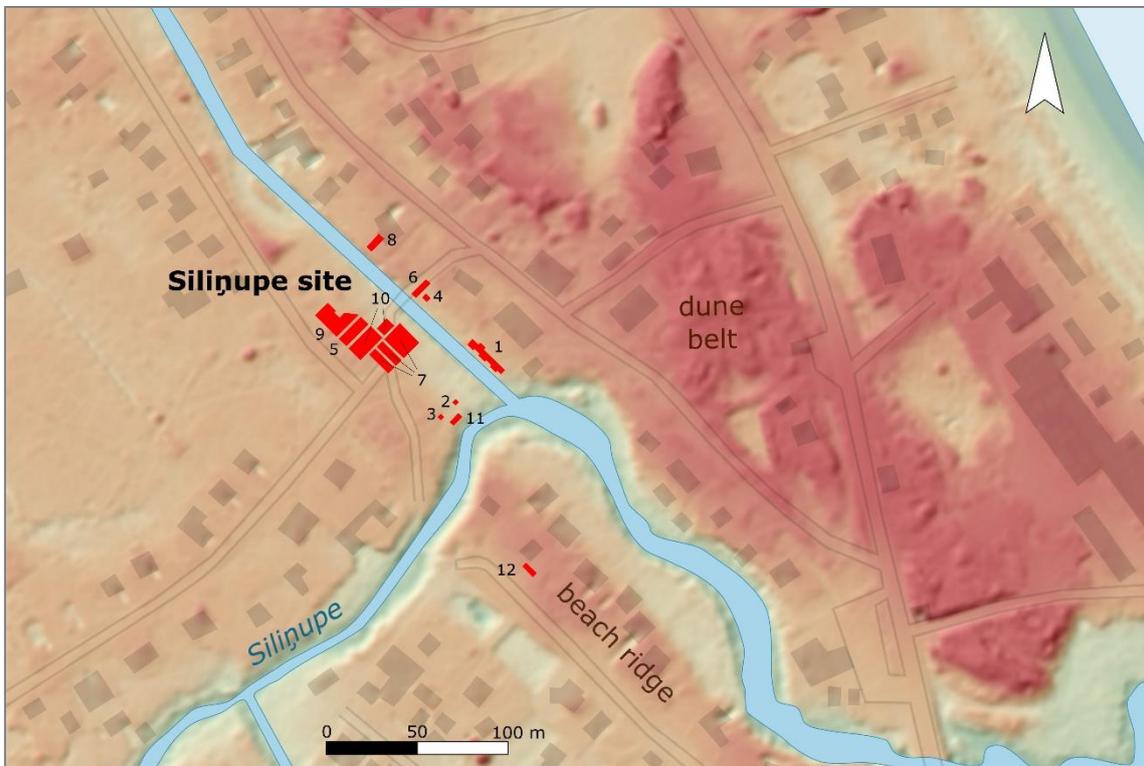
THURSDAY 8 JUNE

Field trip (9:00–16:00; depart from workshop venue)

Gulf of Riga coast (c. 50 km NW of Riga)

Siliņupe Stone Age site (4th mill. BC) – Lake Kaņieris – Ragaciems beach – lunch.

Transport direct to Riga airport in the afternoon for those departing that day.



New publications on the Siliņupe archaeological site

Bērziņš, V., Čakare, A., Kalniņš, M., Lōugas, L., Mīlgrāve, I., Zagorska, I. 2022. Amber wind and porpoise jaw: Resource use at Siliņupe (fourth mill. BC) on the Baltic's Gulf of Riga Coast. *The Journal of Island and Coastal Archaeology*.
<https://doi.org/10.1080/15564894.2022.2125127>

Bērziņš, V., Čakare, A. 2022. Pattern and variation in jewellery production sequences: analysis of 4th millennium BC amber assemblages from the Latvian coast. *Documenta Praehistorica* 49.
<https://doi.org/10.4312\dp.49.5>

Lōugas, L., Bērziņš, V. 2023. Natural History and Exploitation of the Harbor Porpoise (*Phocoena phocoena* Linnaeus, 1758) during the Neolithic (ca. 4000–2000 cal. BC) in the Eastern Baltic. *Animals* 2023: 13(5), 909
<https://doi.org/10.3390/ani13050909>

**TECHNOLOGIES OF THE STONE AGE:
THE COASTAL DIMENSION
ABSTRACTS**

Session 1: Knowledge, networks, movement and landscape use

Domestic technology in a coastal environment: a preliminary approach to the spatial distribution of activities in the Magdalenian structures of La Garma (Spain)

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The Middle Magdalenian floors of La Garma provide a unique insight into the organization of activities among Late Glacial hunter-gatherers living in a coastal environment. The site permits direct observation of a large Palaeolithic camp in the original entrance of the cave, including at least one dwelling structure, and several areas inside the karst where ritual activity appears to have played a certain role. A specific methodological approach has been developed to deal with this exceptional site, based on non-invasive techniques that allow us to analyse the archaeological remains without altering the Magdalenian floors and structures. This communication presents the preliminary results of the interdisciplinary research carried out by our team in a Magdalenian hut in the vestibule of the cave (Zone I) and three stone structures in Zone IV, 130 m from the entrance. Evidence of several technological activities, such as building the structures themselves, flint knapping, elaboration of bone and antler tools, leather tanning, preparation of colorants, manufacture of ornaments, small sculptures and engraved bones and plaquettes, and depiction on the walls and plafond of the cave, have been recognized. The spatial distribution of these activities is analysed, and a preliminary interpretation of the site is discussed.

Keywords: Palaeolithic, hunter-gatherers, dwelling structures, ritual

Technologies for a successful hunt

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Commonly, big-game hunting requires well-made weapons. But weapons are rarely the only prerequisite for a successful outcome. This paper will focus on other technologies, in the form of the craft skills, methods, knowledge, understanding and awareness needed for hunting in Mesolithic Norway.

Since hunting was an embedded part of life, it can be difficult to separate hunting technology, in this broad sense, from other activities, especially in settlement areas. These

technologies are much more visible in areas where people went on hunting expeditions for elk and reindeer in deep forest areas, around mountain lakes and at alpine snow patches.

This paper will discuss hunting technology in the broad sense, based on recently excavated archaeological records that illuminate the deep insight which hunters had into animal migration patterns and habits, and the preparations they made by bringing raw materials and equipment to hunting grounds, constructing huts and even extensively managing nature to optimize the chances of a successful hunt.

Keywords: hunting technology, Norway, coast–inland connections

Coastal living – a technological approach

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In mobile societies, settlement is as much about movement as about choosing a place between movements, and it activates a wide range of considerations and knowledge that depend on different fields of experience.

Living and moving in coastal landscapes requires specific knowledge and know-how. To ensure safety and success in the variety of everyday activities, a certain insight into the local environment and its potential and challenges is a necessity.

This presentation will attempt an approach to settlement and mobility as technologies, including both material and immaterial aspects. Discussing examples from the Mesolithic and Neolithic in South Norway, the approach allows the exploration of the significance of knowledge transmission and experience for phenomena such as site location, dwelling practices and movement in coastal areas.

Keywords: mobility, site variability, technology, Mesolithic/Neolithic, South Norway

Technique or randomness? On the practice of place-making

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Places are important starting points for archaeologists' study and understanding of the past. This goes especially for the Stone Age, where excavation and analysis of finds focus on the unit of sites. These are, due to comprehensive taphonomic processes, mostly invisible to the untrained eye. This talk explores different ways in which people reacted to and used places in the past, and how places were made, changed and perceived, with different temporalities. I would like to discuss, from an archaeological perspective, whether such practices can be addressed as techniques, and to what degree they might be random or even affected by unforeseen events. This explorative talk will activate examples from Mesolithic and Neolithic South-Eastern Norway.

Amber, waterways and inter-regional contacts in the eastern Baltic Sea area in the 4th–3rd millennium BC

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This presentation focuses on the production, use and exchange of amber by fisher-hunter-gatherer societies in the eastern Baltic Sea area in the 4th–3rd millennium BC. Archaeological evidence indicates that the discovery, adoption and much of the production of Baltic amber took place on the southern and south-eastern Baltic Sea coast, where the raw material is mainly found. Nevertheless, ready-made objects were distributed towards the north and east up to 1500 km from the assumed sources. Here we analyse the spatio-temporal distribution of different artefact types and separate three main phases of exchange, all of which focus on different directions and utilize different aquatic routes of communication: 1) north / marine, longshore; 2) east / inland, riverine; 3) south / inland, riverine. This presentation concentrates on the first phase and discusses amber as an indicator of the broader transformations of fisher-hunter-gatherer societies during this time period. Further examples are drawn from the Zvejnieki cemetery (Latvia).

Keywords: amber, hunter-gatherers, exchange, Eastern Baltic

Prehistoric salt production: A technological approach in ceramic studies

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In this presentation, we'll do a quick assessment of our technological approaches in salt ceramics, with some general consideration of salt production and the results of ceramic studies in western France. These ceramics come from causewayed enclosures located around the marshes of western France, dated to the Late Neolithic (3400–2900 cal BC).

In the European Neolithic, most salt exploitation centres have been recognized through work on fired clay artefacts known as briquetage, used for crystallization and moulding of salt cakes. The dominant hypothesis is that salt was used for food consumption.

In reality, far from being homogeneous throughout Europe, the production of salt, or rather of salt cakes, was probably an integral part of a broader process of intensification of social relations and exchange systems, in which control over salt resources and the production and distribution of salt cakes could have become a major preoccupation, where salt, a “hot food”, could have been highly valued.

Keywords: Neolithic, salt production, Atlantic coast, pottery analysis, technology

Session 2: Technological change and its movers

Exploring temporal trends in human activity, lithic technology and tool assemblages in South-Eastern Norway

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In the coastal regions of South-Eastern Norway, major changes in lithic technology and tool assemblages are documented at different stages during the Mesolithic and Neolithic periods. The timing of these events is so far poorly understood. In this paper, we explore the temporal development in human activity and lithic technologies in South-Eastern Norway. To do so, we take advantage of technological analysis of lithic assemblages from several sites dated between 11,500 and 5000 cal BP and a newly collated database of radiocarbon dates in order to investigate the temporal development in lithic technology, tool assemblages and hunter-gatherer activity in the region. First, we aim to investigate long-term temporal development in human activity in the coastal region, and secondly, we aim to estimate when shifts in technology and tool assemblages occurred. By doing this, we provide a better resolution for discussing long-term variation in culture and behaviour in this region.

Keywords: lithic technology, tool assemblages, temporal trends, radiocarbon dates

Exploring the social impact of the Storegga tsunami on the Late Mesolithic communities of coastal Western Norway

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Around 8200 years ago, the Storegga tsunami battered the Norwegian west coast. Since Late Mesolithic settlements were mainly shorebound, it has been widely assumed that the tsunami was a large disruptive event. Although this event is well known from geological and palaeobotanical work, the social impact of the wave on the Mesolithic coastal communities is yet to be explored.

In the project “Life after the Storegga Tsunami” (LAST), lithic technology from 27 Mesolithic sites on the coast of Western Norway is analysed to explore the ways in which prehistoric coastal communities may have withstood or recovered from potential catastrophic events. A central premise is that material culture such as lithic technology is the manifestation of cultural transmitted knowledge that is learned and shared among a group of people and transmitted between generations, thereby reflecting cultural traditions.

This paper uses this known tsunami event as a point of departure to discuss whether lithic technology changed or was modified as a consequence, or whether we can use identified continuity in technology to argue that strong social institutions and the institutional power of craft traditions made knowledge transmission among coastal foragers resilient when challenged.

Keywords: Mesolithic, lithic technology, coastal communities, natural hazards

From the continent to the Atlantic Ocean: are there marine influences in the technical metamorphoses of the Late Mesolithic?

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In the first half of the 7th millennium BC, a range of technical innovations spread to Western Europe from North Africa and the Italian Peninsula. These include new arrowheads (trapezoids), new tools such as the notched blade, as well as techniques such as pressure and punch debitage. In contrast, there was no transformation in the economic domain. In the course of this diffusionist process, stylistic changes occur. The question of these metamorphoses in the Atlantic context has never been clearly asked: can we distinguish the impact of maritime economies in one technical register or another? Examples will be taken from Portugal to France.

Pottery technology on the Atlantic coast of the Iberian Peninsula during Late Prehistory (ca. 6000–3000 cal BCE)

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Technological innovations have motivated new configurations of human groups and have influenced their way of social articulation. Understanding the social context, the chronology and the implications of these technological changes are crucial aspects in our understanding of past societies.

This research project focuses on the analysis of pottery technology at the Atlantic coast of the Iberian Peninsula and its comparison with other nearby areas during the Neolithic, addressing its relationship with the processes of introduction and consolidation of agriculture and livestock farming. It is an interdisciplinary project that deals with aspects related to pottery manufacturing sequences; the reconstruction of cooking practices; and the social organization of production within the different Neolithic populations. The main objective of this work is to understand the role of pottery technology, as a technological innovation, at the time of the introduction and consolidation of agriculture and livestock farming on the Atlantic coast of the Iberian Peninsula and its possible areas of influence (ca. 6000–3000 cal BCE).

Keywords: Neolithic, Atlantic coast, pottery technology, technological innovations

Session 3: Material processing, use and consumption

Technical systems of the coastal groups around the Bay of Biscay: a functional approach

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The occupation and exploitation of the coast have often been studied from the perspective of a process of human adaptation in which technology would have played a major role. If today this evolutionary model has been largely neglected, we still know little about the specificities of the technical systems that have been employed by coastal groups. Along the Atlantic European façade, several archaeological entities attributed to the Holocene period are well known. Around the Bay of Biscay, the shell middens of Brittany (France) or those of Asturias (Spain) testify, by their presence alone, to the major exploitation of marine resources. In these contexts, the production of knapped tools constitutes part of the technical standards of the Second Mesolithic. While these traditions in lithic knapping are not limited to marine environments, the function and functioning of tools could reflect technical traditions specific to these coastal contexts. In this work we have sought to deepen the characterization of the technical system of coastal populations through the functional study of the knapped tools from three shell middens in Brittany (Beg-er-Vil, Téviéc and Port-Neuf) and two in Asturias (El Mazo and El Toral III). The final objective is to address the question of a potential specificity of techniques in the coastal sphere. Study of the use-wear revealed that there is a certain functional consistency in both study regions. However, the functioning of the identified tools cannot be unequivocally associated with specifically coastal techniques. In some cases, the functioning of the tools arises from technical traditions known at a supra-regional scale, transversal to various geographical areas, both terrestrial and coastal. On the other hand, the use of certain tools could be a response to specific technical choices, but choices which seem to respond to essentially cultural realities.

Keywords: Bay of Biscay, lithic tools, use-wear analysis, technical systems

The controversial case of a coastal Mesolithic tool: a geometric approach to the analysis of the Asturian pick

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The coastal Mesolithic of the Cantabrian Region (Spain) is usually labelled as “Asturian”, an archaeological assemblage that has traditionally been defined by the occurrence of shell middens and a particular lithic tool, the Asturian pick. This has been interpreted as the result of a standardization focused on the intensive exploitation of marine resources. However, this tool is still poorly understood from a technological and functional point of view, and neither its morphological relationships, nor the utility of this artefact are clear. The aim of our research is to quantify and analyse the technological processes that influenced its form, verifying possible attributes of selection on its shape or raw material. This novel methodological contribution includes digital techniques, such as photogrammetry and three-dimensional geometric morphometric analysis, which, together with sampling of raw materials, will be analysed through the computational analysis of the geometric characteristics of the models.

Our analysis confirms the homogeneity and standardization of the set of Asturian picks analysed. Furthermore, the virtual reconstruction of the average morphometric model, both for the tool and for the original support, has allowed us to verify the existence of a specific selection of criteria in terms of their morphology and raw material.

Keywords: lithic analysis, photogrammetry, geometric morphometric analysis, hunter-gatherers

Flint and the sea: local flint raw materials on the Stone Age coastal sites in Latvia

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During the Stone Age in the present-day territory of Latvia, several different types of flint were used as raw materials for tool and weapon production. However, only one – Silurian flint – is proved to be of local origin. It has been observed that pebbles of this flint occur in the geological layers of the Baltic Sea coastal belt and in the northern part of Latvia, formed during the Last Glacial. The primary source of this flint is the present-day territory of Estonia and the Silurian period layers located under the Baltic Sea.

The earliest evidence of the use of Silurian flint is from Early Mesolithic sites. The use of local raw material rapidly increased in the Middle Mesolithic, when it became the dominant raw material on western coastal sites, and was frequently used for blade production on the north-eastern sites as well. During the Neolithic period, local flint raw material was used more frequently on the Middle Neolithic coastal sites than on inland sites of the same period or on Late Neolithic sites in general.

Analysis of the chaîne opératoire revealed that a full sequence of tool production from Silurian flint is traceable only on Mesolithic and Neolithic coastal sites and on inland sites located relatively close to the present-day border with Estonia.

Keywords: local lithic raw material, Silurian flint, Mesolithic and Neolithic coastal sites, Latvia

The latest studies on Early and Middle Holocene hunter-gatherer osseous implements in coastal Lithuania

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The coastal lowlands of Lithuania are characterized by numerous wetlands and major river systems; however, hunter-gatherer sites dated to the Mesolithic and the earliest Neolithic (ca. 9000–4500 cal BC) are scarce. Eleven locations situated on riverbanks and in peat bogs dated to this period are known at the moment. Four of them have produced assemblages or single artefacts of terrestrial animal bone and antler. In this paper, the osseous implements from Kalniškiai (Bachmann manor), Melnragė II beach (Klaipėda), Palanga settlement and the Smeltė site are presented and evaluated, emphasizing their technological features, decoration and the latest AMS ¹⁴C datings. The osseous artefacts from Kalniškiai were not available for direct study; however, the latest typological and technological associations with analogous material from adjacent hunter-gatherer sites enable us to re-evaluate their previous interpretation. The remaining sites provide additional data on the tool types fashioned by the coastal hunter-gatherers, permitting comparison of their technology and chronology with the inland sites. The diversity of animal species is not high, and among those identified the Eurasian elk (*Alces alces*) and red deer (*Cervus elaphus*) prevail.

Keywords: hunter-gatherers, osseous technologies, *Cervus elaphus*, AMS ¹⁴C dating, coastal Lithuania

Breakage patterns of red deer long bones for marrow consumption in the Lower Magdalenian (19.5–18.5 ka cal BP). The case of the El Cierro cave

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The breaking of mammals' long bones to access the marrow content is a well-known practice in the Upper Palaeolithic archaeological record. These fractures were used to obtain the fat contained in the long bones of ungulates, which made an important contribution to the diet of human groups, providing essential nutrients and allowing the maximum exploitation of the hunted faunal resources. Furthermore, marrow provides high caloric energy, and has the advantage that its decomposition rate is much lower than that of soft tissues, which allows its consumption even weeks after the death of the animal.

As with other maintenance activities carried out by Lower Magdalenian hunter-gatherer groups, we can analyse the bone remains to understand the technological process carried out to obtain and consume marrow.

In this contribution we present the results obtained from the anthropic breakage process of red deer limb bones from levels F, G and G1 of El Cierro cave, dated to the Lower Magdalenian (19.5–18.5 ka cal BP). For this purpose, we analyse the breakage patterns of the fresh bone through the angles, outline and texture of the fracture edge, as well as the percussion impacts, recording their location in the bone, allowing us to determine the patterns of obtaining the medullary content of this ungulate.

Keywords: subsistence strategies, marrow obtention, Upper Palaeolithic, maintenance activities

Flaking, shaving and scraping: an experimental approach to the study of amber processing on the coastal Neolithic Siliņupe site

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In the archaeological record from the Eastern Baltic region, amber appears and occurs most prominently throughout the Middle and Late Neolithic. It was collected on the shores of the Baltic Sea and worked into jewellery that has been found on most of the sites from this period, testifying to its significance. The processing took place where there was access to plenty of amber raw material. In the present-day territory of Latvia, three major Neolithic amber-working sites are known, one of which is the focus of this study. Research into the amber collections is still in its infancy: mostly typological analyses have been carried out, often lacking a focus on a technological approach relating to amber production, processing residues or the methods and materials used in modifying it. This study presents the first results of combining experiments and traceology to research amber processing techniques and materials used on the coastal site of Siliņupe (4th mill. BC). Specific features identified microscopically on the amber surface provide evidence of the use of sandstone, antler and flint tools in working amber material, applied in various different techniques, for example, flaking, shaving and scraping.

Keywords: amber processing, Siliņupe, Neolithic

Exploring economic changes during the Early Neolithic in South Atlantic Europe: an approach from lipid analyses

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The Neolithization of Western Europe is marked by the introduction of domesticated plants and animals, often assumed to be a homogeneous process. However, this process was not linear, and it adopted different rhythms and dynamics in each geographical area. The spread of pottery vessels in Southern Europe is mainly related to these neolithization

processes and marked important changes in the culinary practices of farming societies. Applying lipid residue analysis, we explore the use of pottery technology during the Early Neolithic in different scenarios along the South Atlantic Coast of Europe, from Portugal to the British Isles, establishing the role of this technology in relation to the arrival of the first domesticates to the region. Our results show that pottery use on these sites was oriented towards different sources, depending on the geographical area, and reflects a diversity of motivations related to the exploitation of animal products.

Keywords: Neolithic, Atlantic Europe, pottery, organic residue analysis, dairy products

Use and re-use: human interaction with pottery production materials in a coastal area of present-day Latvia. A case study of Siliņupe and Slocene settlements

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Pottery production involves many steps, such as collecting clay and tempering material, shaping and decorating the vessel etc., all of them involving deep knowledge of the materials used. The aim of the paper is to build human–material relationship models and apply them to pottery production in coastal Latvia, choosing as a case study the Middle/Late Neolithic (4100–1800 cal BC) settlements of Siliņupe and Slocene. In order to reach this aim, various methods of material study were used: survey of the clays in surroundings of the settlements, study of their properties, visual observations of the pottery and ceramic petrography. Four types of tempering materials were distinguished: shell from freshwater mussels and clams (*Cerastoderma* sp.) as well as granitic rock and grog. Ornamentation includes impressions of harbour porpoise (*Phocoena phocoena*) teeth. Pottery production involved not only technological knowledge, but also use and re-use of different materials. Three models can be observed: 1) the relationship between humans and geological materials (clay, sand, granitic rock and grog); 2) the relationship between humans and animals (remains of mussels, clams and harbour porpoise); 3) relationships between the materials themselves, as seen in the technological aspects of pottery production, namely clay, tempers and decorating tools.

Keywords: Neolithic, pottery, temper, ornamentation, geological materials, animals