

## Preface

Volume 31 of *Archaeologia Baltica* focuses on environmental studies and new methodological approaches to better understand hillforts and enclosed settlements. For this reason, the authors of the articles draw on interdisciplinary research and focus on archaeological sites where investigations are ongoing or have been completed in recent years. Most of the published interdisciplinary studies relevant to the development of archaeological science have been sponsored by the Research Council of Lithuania or the Swedish Ceramic Studies Foundation, were carried out as part of investigations during the construction of the international gas pipeline between Poland and Lithuania, or were realised thanks to the teamwork of fellow researchers. The main theme of this volume is the publication and analysis of new archaeological and interdisciplinary research results and the new insights that have been generated on the basis of these studies. It also recognises that the powerful force of time is a factor in understanding any event. The authors of the articles present chronological dating as determined or clarified through the use of accelerator mass spectrometry (AMS  $^{14}\text{C}$ ) to understand specific events and how they developed. Thus, all the articles in Volume 31 are the result of collaboration between scientists from different fields, opening up new unknown or little-known horizons of prehistory and allowing the formation of new scientific hypotheses.

The volume opens with the article 'Vilūnai 5: A Stone Age and Early Metal period site in the western part of Kalviai Lake valley (southern Lithuania)' by Tomas Rimkus and Gintautas Zabiela. The article presents a new site called Vilūnai 5, which was identified during field surveys in the western valley of Lake Kalviai. A total of 15 prehistoric sites have been identified along the shores of the lake and on the former islands. The artefacts found and the radiocarbon dates obtained have helped to establish that the settlement history of the Vilūnai 5 covers a broad chronology. Some of the flint artefacts found are dated to the Final Palaeolithic (a core and burins) and the majority of the artefacts can be dated to the Mesolithic and Subneolithic periods. In addition, some of the finds date back to the Early Metal period.

The second article in this volume, by Miglė Urbonaitė-Ubė and Torbjörn Brorsson, is titled 'New evidence of contacts across the Baltic Sea: Analysis of Kukuliškiai Late Bronze Age pottery'. This article is a presentation of research results into the pottery assemblage from the Kukuliškiai hilltop settlement (880–400 BC) and the elemental composition of the pottery sherds that was obtained with the aid of ICP-MA/ES (inductively coupled plasma mass atomic emission spectrometry). Visual analysis of the pottery assemblage revealed that it consists of sherds with different surface finishes. Some of the sherds are grained or have a smooth surface, while others can be distinguished as representing the Kukuliškiai-Otterböte type. There are also examples of brushed and burnished pottery. The variety of surface treatments suggests that the assemblage is more comparable to pottery found in Scandinavia and Poland than on the eastern Baltic coast. The ICP-MA/ES analysis showed that the Kukuliškiai pottery was produced locally from several different clay sources, which must have been located in the vicinity of the settlement. The presence and quantity of pottery of the Kukuliškiai-Otterböte type indicates extensive contacts with other Baltic communities, especially in Scandinavia and possibly northern Poland.

The next article is titled 'Adaptability and resilience: Farming practices in Lithuania during the Roman Iron Age' and is by Karolis Minkevičius, Rokas Vengalis, Giedrė Piličiauskienė, Elena Pranckėnaitė, Justinas Račas and Dalia Kisielienė. This study is an analysis and summary of data from 12 Roman settlements in the Trans-Nemunas region, southeastern and central Lithuania, and part of Samogitia. According to the authors, the Roman period (1st–4th centuries) was characterised by sudden and distinct changes in agriculture, including its general intensification, an increase in cleared areas, and the cultivation of new species such as rye and oats. The landscape of the Roman period should therefore be seen as a composite of different agrarian landscapes. According to the authors, the cultivation of legumes such as peas, beans and lentils was not extensive, while the importance of millet declined significantly. In other words, people's diets changed and undoubtedly became more varied. The main focus of this article, however, is the description of crop fertilisation.

This is a new topic in the history of Lithuanian agriculture. The argumentation for this topic is based on the results of nitrogen ( $\delta^{15}\text{N}$ ) and carbon ( $\delta^{13}\text{C}$ ) isotope analyses. It is argued that crops were mainly grown in open, well-watered areas and fertilised with nitrogen of organic origin (most likely animal manure). The isotope measurements also suggest that the fertility of the soil has gradually increased, although the studies show that there were also setbacks.

The article 'Island settlement of Lake Bėlis: New insights into Late Bronze and Pre-Roman Iron Age living spaces in eastern Lithuania' by Rokas Kraniuskas, Ingrida Čičiurkaitė and Elena Pranckėnaitė presents a previously unknown ancient fortified settlement that was discovered in 2021 during underwater archaeological surveys in the lakeland of eastern Lithuania, on the island of Lake Bėlis (Švenčionys district). The settlement was established on a very small area of land of only 0.08 ha in the middle of the lake. The main period of occupation of Lake Bėlis was the Late Bronze Age–Early Iron Age (AMS  $^{14}\text{C}$  dates it to the 8th–4th centuries BC). Most of the artefacts from this island, including stone axes, metalwork and pottery, are typical of the period defined by AMS  $^{14}\text{C}$ . However, there is also evidence (such as the wooden piles) of occupation and specific activities from later periods, dating back to the Roman period (2nd–4th centuries). Although the cultural layers of the Roman period remain to be explored, this fact is a new development in the study of our prehistory.

Alise Gunnarssone, Normunds Stivrins, Aija Ceriņa, Sabīne Krēšliņa, Andrejs Skomorohovs and Oļesja Beke-tova in their article titled 'Human-induced vegetation change in the Turaida vicinity during the Iron Age and the medieval period' highlight the patterns of environmental changes in the vicinity of Turaida during the Iron Age and the medieval period. The aim of the study is to gain a deeper understanding of how the landscape of the Gauja River has changed over time. To achieve this, a number of study methods were combined, including the analysis of pollen, macroscopic plant remains and macroscopic charcoal, which was subsequently linked to historical and archaeological data. The first human influence on the natural environment is evidenced by the presence of barley found in sediments dating back to 700 AD. Barley appears again in 890 and 1070 AD. Between the end of the 9th century and the beginning of the 10th century, a final shift in the agrarian expansion was observed (which could possibly be associated with the appearance of Livs in the area). The abrupt increase in macroscopic charcoal concentration around 980 AD and the decrease in the former abundance of spruce trees suggest that hill farming and burning were used to prepare the land for cultivation. In the late Iron Age, oats were the main cereal crop. Gradually, however,

wheat, rye and barley became the staple foods. This article by our Latvian colleagues thus extends the theme of the development of agriculture in the eastern Baltic Sea region into the Middle Ages.

Volume 31 is concluded by the article titled 'Lead isotopes in the context of the provenance of copper alloys and malleability processes in Lithuania from the second half of the 1st century to the 13th century AD' by Audronė Bliujienė, Irma Vybernaitė-Lubienė, Veronika Biveinytė, Vaidas Pudžaitis and Gediminas Petrauskas. Although this article is not devoted to the study of the environment or habitation areas, the topic discussed approaches the theme of Volume 31 from a different perspective. The complex topic of the origin of copper alloys was explored by examining finds from 55 residential and funerary sites, which were produced in jewellery workshops spread across Lithuania. In total, 208 samples from 180 artefacts were examined. The study covers the period from the second half of the 1st century to the beginning of the 13th century AD. It has been shown that the remelting of alloys and artefacts, and the addition of scrap metal of different compositions to produce new non-ferrous raw material, changes the original chemical composition of the alloy and the isotopic ratios of lead. The remelting process presents researchers with a difficult challenge of determining the nature of the former links between the source of copper alloys (ore deposits) in southern Europe and Asia Minor and the users of the raw material in the Baltic Sea region. During the study, lead isotope ratios were determined and the chemical composition of copper alloys and copper groups was characterised. In addition, the information obtained was combined with the knowledge of techniques used by jewellers. All this made it possible not only to view the movement of goods as a chain of exchange starting with the ore deposits (raw materials) and ending with the consumers of non-ferrous metals but also to reveal the nature of the movement of non-ferrous metals. It was determined that non-ferrous metals reached the present territory of Lithuania and the Eastern Baltic region as part of the European metal flow. The flow of these metals can be further analysed on the local (present-day Lithuanian territory), regional (Eastern Baltic Sea region) or trans-European scales.

Volume 31 of *Archaeologia Baltica* revives the former section on reviews and the presentation of important ideas from scientific conferences to the wider scientific audience.

Gintautas Zabiela's review of the *Atlas of the Hillforts of Britain and Ireland*, edited by Gary Lock and Ian Ralston, follows the theme of the volume. It is a great pleasure that this review was published in the year when, according to the latest data, the thousandth hillfort was recorded in Lithuania.

Tomas Rimkus presents a report from the conference on ‘The Final Palaeolithic and Early Mesolithic of Northern Eurasia. New research and recent discoveries’, which took place on 26–28 June 2024. The annual meeting was organised by the UISPP Commission of the Final Palaeolithic of Northern Eurasia. The conference brought together researchers from Belgium, Denmark, Germany, Lithuania, Norway, Poland, and Scotland to present the latest research findings, new ideas and perspectives.

I sincerely hope that both researchers and those interested in prehistory will enjoy Volume 31 of *Archaeologia Baltica* and find the data they need to formulate their own research and scientific hypotheses.

Audronė Bliujienė