INTERNATIONAL CONFERENCE

The Transformation of Europe in the Third Millennium BC

ABSTRACTS

24–27 April 2024

Budapest, Hungary

HUN-REN RCH Institute of Archaeology

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The Transformation of Europe in the Third Millennium BC
Part 2

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Contents

Foreword

Late April 2024 will bring more exciting progress in our understanding of third millennium BC archaeology in Europe.

We, Volker Heyd (University of Helsinki, Finland), Franco Nicolis (Archaeological Heritage Office, Trento, Italy) and Gabriella Kulcsár (HUN-REN RCH Institute of Archaeology, Budapest, Hungary) have committed ourselves to organizing a special scientific event under the umbrella title "*The Transformation of Europe in the Third Millennium BC*". This major event will, however, be divided into two distinct meetings, to be held in two different parts of Europe and in two different calendar years (2023 and 2024). Our sole purpose for these two meetings is to develop and deepen, through an interdisciplinary approach, all the issues that in recent years have contributed to outlining a new interpretative framework of the cultural and social transformations of Europe in the third millennium BC. We plan to pursue a constructive dialogue between archaeology, anthropology, genetics/genomics, linguistics, and other biological and environmental disciplines.

The first meeting has taken place in Riva del Garda, Trento, Italy, in 25–28 October 2023, 25 years after the International Conference "*Bell Beakers Today*" under the leadership of Franco Nicolis. Its focus was the mid and second half of the third millennium BC, particularly the Bell Beakers in the west and south. Its programme can still be found on the Conference website at www.transformeurope1riva2023.com

The second meeting, under the local guidance of Gabriella Kulcsár (Institute of Archaeology HUN-REN RCH) and funded by the ERC YMPACT project and National Cultural Fund of Hungary, will be held in Budapest in 24–27 April 2024, in the Research Centre for Human Sciences of the Hungarian Academy of Sciences and cover the late fourth and the first half of the third millennium BC, especially the Yamnaya, Globular Amphora, and Corded Ware cultures in the eastern, central, and northern parts of the continent.

Each of the two meetings have been planned to include three-and-a-half days of presentations by about 25 speakers in six thematic sessions with four to five speakers and two keynote speakers per session. Much time has been left for discussion, during and after sessions and in general. The focus of both meetings has been delimited in time and space and aimed at specific themes, taking latest

scientific results into account. Needless to say that an adequate social programme has also been organised.

The second meeting will take place along more spatio-temporal session keywords of

1) Early steppe interactions from the mid to the end of the fourth millennium BC between the Caucasus and the Carpathians;

2) Yamnaya divided? Yamnaya East – Yamnaya West;

3) In and around the Carpathian Basin at the end of the fourth and in the first half of the third millennium BC;

4) Globular Amphora societies in changing worlds; and

5) Corded Ware and parallel societies in the third millennium BC.

6) A special session at the end of the conference is devoted to the 'big picture' of Eurasia, also bringing the two conferences together, while emphasizing migrations, interactions and mixing, and cultural change.

We are looking forward to seeing you in Budapest, either in person or via our remote option.

Volker Heyd (University of Helsinki, Finland)

Franco Nicolis (Archaeological Heritage Office, Trento, Italy)

Gabriella Kulcsár (Hungarian Research Network, Budapest, Hungary)

The Transformation of Europe in the Third Millennium BC

Conference Programme

The Transformation of Europe in the Third Millennium BC — Part 2
Budapest, Hungary
24–27 April 2024
www.transformeurope2budapest2024.com

Location: HUN-REN RCH Institute of Archaeology
Research Centre for Human Sciences of Hungarian Academy of Sciences
Conference hall, ground floor
H-1097 Budapest, 4 Tóth Kálmán Street

Online stream of the conference is available here:
www.youtube.com/@hunrenbolcseszettudomany

Day 1 — Wednesday, April 24, 2024

8.30–	Registration
9.00–9.15	Volker Heyd, Franco Nicolis & Gabriella Kulcsár: *Introduction to the 'Transformation'*

Session 1
Early Steppe Interactions from the Mid to the End of the Fourth Millennium BC between the Caucasus and the Carpathians

9.15–10.00	Keynote paper Svend Hansen: *The 4th Millennium BC between the Carpathians and the Caucasus. New Results on Technologies and Innovations*
10.00–10.30	Sabine Reinhold, Wolfgang Haak, Ayshin Ghalichi, and Christina Warinner: *Bioarchaeology of Innovations – The 4th/3rd Millennium BC in the Caucasus and Beyond*
10.30–11.00	Coffee break
11.00–11.30	Igor Manzura: *Sequence of Changes in the Northwest Pontic Region in the 4th Millennium BC – Reasons and Consequences*

11.30–12.00 Stefan Alexandrov and Piotr Włodarczak: *Pre-Yamna Barrow Graves in Bulgaria. Current State of the Investigations*

12.00–12.45 Keynote paper Piotr Włodarczak: *Migrations – Transformations – Long-distance Unifications on the Steppes of South-Eastern Europe in 4th Millennium BC*

12.45–13.00 Discussion after the first session

13.00–14.30 Lunch for invitees & posters

Session 2
Yamnaya Divided? Yamnaya East – Yamnaya West

14.30–15.15 Keynote paper Elke Kaiser: *The Yamnaya Cultural Horizon North of the Black Sea – The Current State of Research*

15.15–15.45 Stefano Palalidis and Denis Topal: *Yamnaya Funerary Trends and Socio-Economic Dynamics in the East and West*

15.45–16.15 Eva Rosenstock and Martin Trautmann: *On Body Height and Physique: Eneolithic Populations, the Steppe Impact, and Possible Effects on the Metric Phenotype*

16.15–16.45 Coffee break

16.45–17.15 Bianca Preda-Bălănică and Jens Blöcher: *Ancestry and Identity in the Balkans and the Carpathian Basin in the 4th and 3rd Millennia BC*

17.15–18.00 Keynote paper János Dani: *'Moving Westwards' – The Westernmost Yamnaya in the Carpathian Basin*

18.00–18.30 Final discussion after the first day

Day 2 — Thursday, April 25, 2024

8.30– Registration

Session 3
In and around the Carpathian Basin at the End of the Fourth and in the First Half of the Third Millennium BC

9.00–9.45 Keynote paper Florin Gogâltan: *Locals and Foreigners — Transylvania in the 3rd Millennium BC*

9.45–10.15 Enikő Magyari et alii: *Third Millenium BC Climate and Environment in the Pontic Steppe and the Lower and Middle Danube Regions: What do we know and what is missing?*

10.15–10.45 Coffee break

10.45–11.15 Jacqueline Balen and Ina Miloglav: *Late Copper/Early Bronze Age in the Area between the Sava, Drava and Danube Rivers – New Results*

11.15–11.45 Anna Szécsényi-Nagy et alii: *Human Genetics Perspective of the Carpathian Basin at the Dawn of the 3rd Millennium BCE*

11.45–12.30 Keynote paper Gabriella Kulcsár: *Meet along the Danube — Towards to the Bronze Age in the Carpathian Basin*

12.30–13.00 Discussion after the third session

13.00–14.00 Lunch for invitees & posters

Session 4
Globular Amphoras in Changing Worlds

14.00–14.45 Keynote paper Johannes Müller and Marzena Szmyt: *Globular Amphora: Linking Archives of Socio-Cultural Transformations*

14.45–15.15 Anita Szczepanek, Wojciech Pasterkiewicz, and Piotr Włodarczak: *Exploring the Enigmas of Funerary Practices in the Globular Amphora Culture in Southern Poland through Interdisciplinary Analyses*

15.15–15.45 Coffee break

15.45–16.15 Niels N. Johannsen: *Globular Amphora Culture, Networks and Migration: A View from the Jutland Peninsula*

16.15–17.00 Keynote paper Marzena Szmyt and Johannes Müller: *Globular Amphora Sedentary Pastoralists in Changing Landscapes*

17.15–17.45 Final discussion after the second day

19.30 Conference dinner for invitees

Day 3 – Friday, April 26, 2024

8.30– Registration

Session 5
Corded Wares and Parallel Societies in the Third Millennium BC

9.00–9.45 Keynote paper Quentin Bourgeois: *Networks of Information in the Corded Ware Realm*

9.45–10.15 Martin Sikora: *The Origins and Genetic Structure of Corded Ware-Associated Individuals – Insights from Networks of Recent Genetic Co-Ancestry*

10.15–10.45 Coffee break

10.45–11.15 Anna Tornberg: *More than Numbers. Multiproxy Analyses of Conflict in the Nordic Corded Ware Complex*

11.15–11.45 Kerkko Nordqvist: *The Corded Ware Expansion into the Northeast European Lowlands: Assessing Environmental, Social and Cultural Challenges*

11.45–12.30 Keynote paper Albert Hafner: *Insights from the Alpine Periphery: Settlements and (rare) Burials 3400–2400 BC*

12.30–13.00 Discussion after the fifth session

13.00–14.00 Lunch for invitees & posters

14.00 Leaving for excursion to the Kiskunság National Park

Day 4 -– Saturday, April 27, 2024

9.00– Registration

Session 6
Eurasia – A Big Story in the Third Millennium BC

9.30–10.15 Keynote paper Martin Furholt: *Riva 2023 Recap. Big Picture and Important Details on the 3rd Millennium BCE in Europe*

10.15–11.15 Keynote paper David Reich & David Anthony and Dorcas R. Brown: *The Genetic Origin and Linguistic Expansion of the Indo-Europeans*

Part 1: David Reich: *The Genetic Origin of the Indo-Europeans*

Part 2: David Anthony and Dorcas R. Brown: *The Yamnaya Origins and the Expansion of Late PIE Languages*

11.15–11.45 Coffee break and grab a sandwich

11.45–12.30 Keynote paper Kristian Kristiansen et alii: *Pandemics and Migration: The Neolithic–Corded Ware Transition in Northern Europe*

12.30–13.15 Overall discussion, led by session keynote speakers (one of each session)

13.15–13.30 Volker Heyd, Franco Nicolis & Gabriella Kulcsár: *Concluding the Meeting and Farewell*

End of conference

Session 1
Early Steppe Interactions from the Mid to the End of the Fourth Millennium BC between the Caucasus and the Carpathians

Sheep grazing on pastures in the Caucasus
(photo by Anastasia Sorotokina, DAI Eurasia-Department)

The 4th Millennium BC between the Carpathians and the Caucasus. New Results on Technologies and Innovations

Svend Hansen

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The transformations of the 3rd millennium BC – the focus of this conference – were based on the economic and political changes that resulted from a multitude of technical innovations in the 4th millennium BC. These included the wheel and the wagon, the early domestication of the horse, the alloying of copper with arsenic, the introduction of silver, and probably the use of the woolen sheep. The burial of individual potentates under large burial mounds also began in the first half of the 4th millennium. Research in recent years has shown that the old idea that all innovations originated in the Near East needs to be revised. In particular, the clarification of the chronology on the basis of ^{14}C data has contributed significantly to this. Other hot spots of innovative techniques may have been located in the north-western Black Sea region and the Caucasus. In the North Caucasian Maikop culture, arsenic bronze technology was already developed in the first half of the 4th millennium BC and the use of silver began. There is evidence of early domestication of the horse. The erection of large anthropomorphic stelae also began there – as in western Europe – in the 4th millennium BC. For the first time, microbiological analyses have shown that dairy products such as cheese played an important role in the diet. The importance of the new foodstuff cannot be overestimated. As the products were exclusively made from sheep's milk, this indicates the beginning of the pastoral economy. The production and use of wool was probably also associated with this. All these innovations quickly spread westwards, into the Carpathian Basin, which is also supported by recent genetic findings. It would be a necessary research project to investigate in detail which of these innovations played a significant role in the transformations of the 3rd millennium BC, and which of these innovations were needless or even actively opposed.

Marfa Kurgan (North Caucasus) in 2011 (Photo by Sabine Reinhold)

Take-Home Message

Bioarchaeology of Innovations — The 4th/3rd Millennium BC in the Caucasus and Beyond

Sabine Reinhold[1], *Wolfgang Haak*[2], *Ayshin Ghalichi*[2], *and Christina Warinner*[2]

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The 4th and 3rd millennia BC witnessed an acceleration of cultural interaction, which included the rapid spread of new technologies and social concepts at an unprecedented rate across much of Eurasia. In recent years, bioarchaeological research in the wider Caucasus region has revolutionised the understanding of the emergence of the Eurasian interaction sphere by revealing several key factors that were fundamental to a technological, economic and social framework that enabled life in the largely hostile environments of the steppe.

Ancient DNA of humans revealed highly dynamic trajectories in the formation of biological populations, among them the 'steppe genetic ancestry', later prominent in Yamnaya and other steppe populations. It also revealed a complex biological demarcation between people in the steppe and the mountains and piedmonts with a 'Caucasus genetic ancestry' that lasted for about 3,000 years from the 5th to the late 2nd millennium BCE. We find identical cultural formations, such as the Early Bronze Age Maykop culture, associated with several different genetic ancestry profiles, as well as different archaeological cultures of the Middle Bronze Age associated with identical genetic ancestry profiles. Technologies like the development of wheeled vehicles and drought animals crossed this boundary, as did the technology that probably was crucial to the development of the steppe as a permanent human habitat – dairy farming. Palaeoproteomics specifies the first consumers of dairy products in steppe peoples of the late 5th and 4th millennium BCE. The first steps towards the domestication of the horse were taken in the late 4th millennium BC north of the Caucasus, and the decisive steps in the breeding of woolly sheep can probably also be dated to this time.

The multiproxy bioarcheological perspective does not only elucidate these processes but is fundamental to understand the cultural fabric emerging across the Eurasian steppes in the late 4th and 3rd millennia BCE.

Giant burial mounds of Maykop period in the North Caucasus at Kosh Khabl (Photo by Sabine Reinhold, DAI Eurasia-Department)

Take-Home Message

Sequence of Changes in the Northwest Pontic Region in the 4th Millennium BC – Reasons and Consequences

Igor Manzura

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The development of the historical situation in the Northwestern Pontic region in the 4th millennium BC largely corresponded to the trends evidenced in the steppe zone and Southeastern Europe. After the "steppe hiatus" in the Northern Black Sea region and the "Dark Ages" in the Balkans, a series of new cultural groups emerged here at the beginning of the 4th millennium BC. In the North-Eastern Balkans, the Cernavodă I culture was formed, which gradually spread eastward reaching the Dniester Basin. This cultural expansion seems to have been made possible by the development of a new economic model based on more mobile forms of stockbreeding and priority breeding of ovicaprids.

New economic opportunities and the accumulation of technological innovations in the middle of the 4th millennium BC contributed to the emergence of complex stratified societies like the Usatovo culture in the Northwestern Pontic region. Such societies are characterized by a hierarchical structure, the activities of power elites, a redistributive policy in the circulation of resources, products, and services, and a pronounced social differentiation based on highly productive and well-organised production, as well as on an extensive system of exchange relations.

Significant changes occurred around 3200 BC, which could be due to the deterioration of natural and climatic conditions. Complex societies, with their highly individual traits and well-defined boundaries, disappeared. At the same time, there is an extensive spatial unification of culture, which is associated with sites of the Zhivotilovka type. Their spread from the Don towards the Danube probably indicates the beginning of active migration processes with opposite vectors of movement. The amorphous structure of the new cultural groupings and the absence of clearly defined cultural boundaries in the Northern Pontic region seem to have greatly contributed to the rapid spread of the Yamnaya culture at the very end of the 4th millennium BC.

Grave 9 of the Usatovo culture from the Akkembetsky kurgan, Zatoka, Ukraine

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Take-Home Message

Pre-Yamna Barrow Graves in Bulgaria. Current Stage of the Investigations

Stefan Alexandrov[1] *and Piotr Włodarczak*[2]

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It is generally accepted that Yamna population migrated west/south-west from the northern Pontic region around 3000 BC. In this report, 14 barrow graves from Bulgaria, dated with AMS prior to this date, are discussed. They come from both North and South-East Bulgaria. Regarding the body position, three groups of primary barrow graves in North Bulgaria (Lower Danube region) are presented – relaxed hocker inhumations with arms bent at the elbows, both palms in front of the head or one of them in front of the torso (Pliska and Chudomir graves); extended inhumations with arms alongside the body (two graves from Dobrich, Barrow 391-1, Features 9 and 14). The third group, in fact, is presented by four graves with inhumations in supine position with flexed legs, arms alongside the body (Plachi dol, Barrow 4, Grave 1; Riltsi, Barrow 264, Grave 4; Belogradets, Barrow 1, Grave 2, and, Vladinya, Barrow 1, Grave 2). Six more early barrow graves with such dates come from South-East Bulgaria (Upper Thrace) and all presented inhumations with eastern orientation of the head (Malomirovo, Pamukli bair, Barrow graves 19 and 21; Beli bryag, Barrow 5, Grave 2/2; Mednikarovo, Barrow 4, Grave 1; Troyanovo, Kangalova mogila, Graves 3 and 5). Several more primary barrow graves without absolute dating but stratigraphically preceding Yamna graves from both regions such as Goran-Slatina, Polsko Kosovo, Boyanovo etc. are presented as well.

The characteristics and relations of these early barrow graves from Bulgarian lands to such complexes in neighbouring regions are also discussed. The main focus of the rest of the discussion is Yamna – early barrow graves relations and the characteristics of the early dates of the three supine inhumations with flexed legs from North Bulgaria.

The primary barrow grave from Dobrich (barrow 391-1 – feature 14)

Take-Home Message

Migrations – Transformations – Long-distance Unifications on the Steppes of South-Eastern Europe in 4th Millennium BC

Piotr Włodarczak

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Centre for Mountains and Uplands Archaeology, Kraków, Poland;
E-mail: wlodarczak.piotr@gmail.com

At the turn of the 4th and 3rd millennium BC, the funeral ritual of the early Yamna culture was present across all regions of the western part of the Eurasian steppe belt. It is sometimes perceived as a significant unification and intensification of the kurganisation of southeastern Europe, with the migration of Eastern European populations playing a crucial role. Nevertheless, by the second half of the 4th millennium BC, there was already a notable unification of the barrow ritual across various regions. Analogous rites are observed in the North Pontic zone and regions of the Danube-Tisza zone, where barrow communities expanded. Examples include extended inhumations and Zhivotilovka-Volchansk graves, which contain elements associated with the late Trypillian culture. However, the most prominent trend is the burial of individuals in a contracted position with their heads oriented to the east or northeast. Such burials are typified as part of the ritual of the Cernavodă culture and find a close equivalent in the Nizhna-Mikhailivka ritual in regions further east. These burials are associated with the creation of the first large barrow ceremonial and funerary complexes in south-eastern Europe, often reused by people of the Yamna culture. The absorption of local elements, such as Ezero or Coţofeni ceramics, is also evident in these burials. On the other hand, silver items, red pigments, and grave constructions similar to those in the North Pontic zone are found in burials of this type. Therefore, by the end of the 4th millennium BC, a wave of unification in the barrow ritual similar to the later wave associated with the Yamna culture had occurred.

Typical grave dated to the end of the 4th millennium BC from the "Pamukli bair" barrow in Malomirovo, SE Bulgaria (Photo by Piotr Włodarczak)

Take-Home Message

Session 2
Yamnaya Divided? Yamnaya East – Yamnaya West

Kurgan at Hajdúnánás-Fekete-halom (Hungary) (Photo by János Beregszászi)

The Yamnaya Cultural Horizon North of the Black Sea – The Current State of Research

Elke Kaiser

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Session 2 addresses the issue of whether and how the Yamnaya Cultural Horizon can be divided into two large areas. The label 'Cultural Horizon' already makes it clear that the material culture that can be identified between 3100 and 2400 cal BCE between the Balkans and the Urals is of rather heterogeneous character. In my lecture I will present the state of research for the northern Black Sea area, which is central to the eastern part of the Yamnaya Cultural Horizon, and will contribute to several aspects:

(1) First, I will summarise the current state of research on burials in grave mounds (*kurgans*), which are discussed as the most important archaeological record in terms of regional and chronological differences in this central area of the Eastern Yamnaya Cultural Horizon.
(2) In a second part, the results of the archaeological investigations of settlements will be presented including ceramic forms allowing a correlation with vessels found in graves.
(3) Last but not least, I will address results of isotope and organic residue analyses. These bioarchaeological proxy dates provide a first deeper insight into subsistence strategies of the pastoralists in the northern Black Sea area during the first half of the 3rd millennium BCE.

Finally, the information of all three parts will be discussed. The evidence does not allow for definitive conclusions on many points, but rather shows the immense research potential that is necessary for a comprehensive understanding of the Yamnaya Cultural Horizon North of the Black Sea.

Fragments of an interior decorate bowl (so-called censer) found at the settlement Mikhailivka at the lower course of Dnipro (courtesy National Museum of the History of Ukraine; photo by Elke Kaiser)

Take-Home Message

Yamnaya Funerary Trends and Socio-Economic Dynamics in the East and West

Stefano Palalidis[1] *and Denis Topal*[2]

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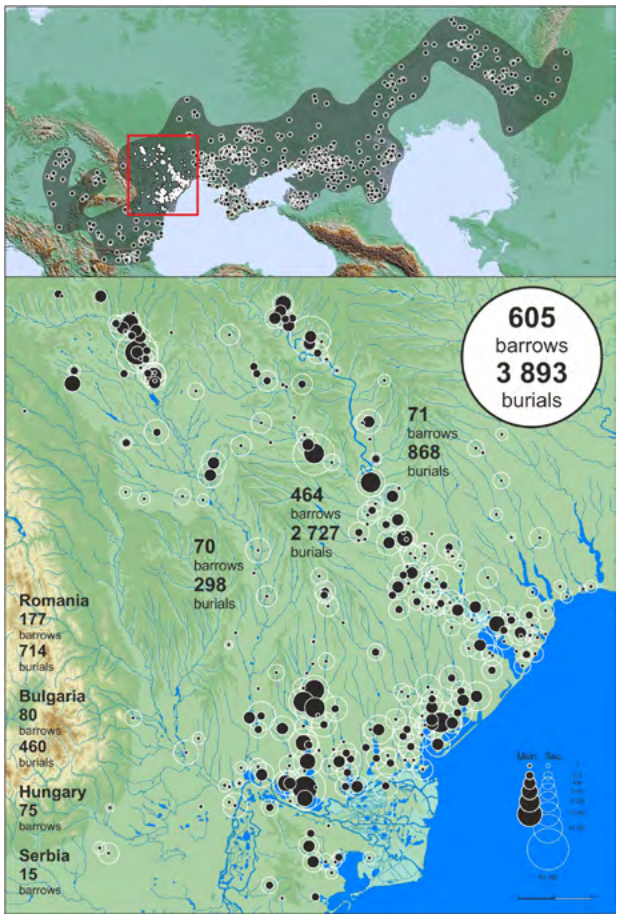
Within the broad geographical and chronological extension of the Yamnaya cultural horizon, much differentiation is observed in the funerary practices, exemplified in grave construction techniques, modes of deposition or grave inventory composition. Evidence from the funerary contexts has been used to address research questions related to the reconstruction of the lifestyle and socio-economic dynamics of the Yamnaya communities, often highlighting a distinction between the Western and Eastern groups. In this talk, two extensive datasets of Yamnaya graves will be used to analyse a selection of the archaeological record that can reflect some aspects of the socio-economical organisation of the Yamnaya groups with a primary focus on its geographical differentiation. A large dataset of graves covering the entire Yamnaya geographical and chronological extension (5,704 burials from 1,963 barrows) will offer a broader bird's-eye overview of the different regions. In contrast, a complete collection of Yamnaya assemblages (2,727 burials from 464 barrows) from the Dniester–Prut area will provide a focused observation of a case study region. The number of individuals buried in graves and faunal remains hints at the mobility of groups. At the same time, reflections on their social organisation are found in the analysis of the sex ratio, evidence of trauma and frequency of weaponry.



The distribution of the Yamnaya burial sites in Europe and Dniester-Carpathian region

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Take-Home Message

On Body Height and Physique: Eneolithic Populations, the Steppe Impact, and Possible Effects on the Metric Phenotype

Eva Rosenstock[1] *and Martin Trautmann*[2]

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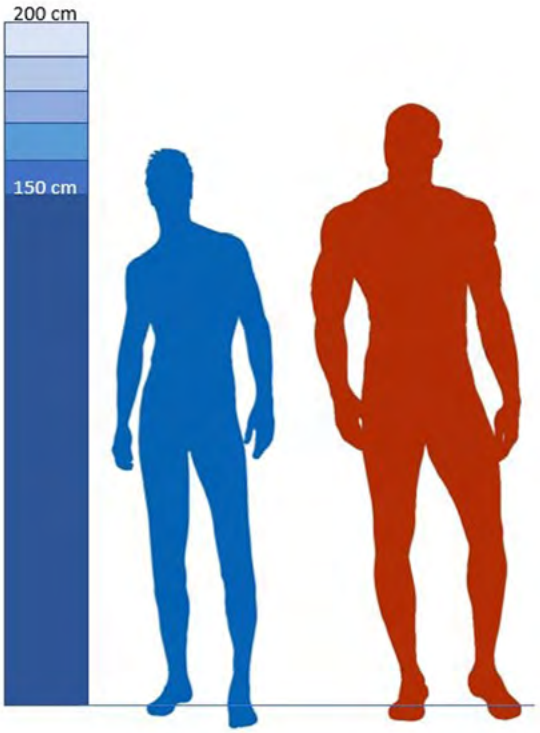
[2] A und O – Anthropologie und Osteoarchäologie, München, Germany; E-mail: ao.anthropologie@googlemail.com

Human remains from the Eneolithic and Early Bronze Age populations of the Western Eurasian steppes, particularly the Yamnaya culture, have long been recognized for their remarkable stature and robust physique, setting them apart from their Western counterparts. Since average human body height in Europe is supposed to have increased significantly afterwards, an admixture or replacement of populations favouring steppe ancestry is proposed.

However, a large body of new data from the last decade, including archeogenetic research, radiocarbon dating, and osteometric data of pre-Yamnaya, Yamnaya and post-Yamnaya individuals from the contact zone in today's Bulgaria, Romania, and Hungary but also in Central Europe, demands a critical re-evaluation the aforementioned statements.

Currently, the procedures of collecting, processing, and comparing the relevant data are disparate and need methodical revision. Data organisation and presentation need to follow comparable standards and must be filtered and re-structured by consistent criteria. Based on that, typological groups can be described, population-wide differences assessed, and the chronological relevance of findings determined reliably.

These comprehensive reassessments aim to provide a foundation for future studies to delve deeper into the complexities of human population interactions and their impact on the metric phenotype, genetic histories, environmental or social selection factors, and population mobility.



Differences in average height and build between pre-Yamna (figure in blue) and Yamna-derived (figure in red) population groups of SE Europe are very obvious. Body size is a trait that is influenced by a multitude of endogenic and exogenic factors, and thus can provide insights in very different aspects of defining differences between human populations

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Take-Home Message

Ancestry and Identity in the Balkans and the Carpathian Basin in the 4th and 3rd Millennia BC

Bianca Preda-Bălănică[1] *and Jens Blöcher*[2]

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In this lecture, we examine the relationship between descent and identity within the kurgans and flat cemeteries of the Balkans and the Carpathian Basin during the 4th and 3rd millennia BC. As a proxy for descent, this approach integrates data on the genetic ancestry of individuals with insights from mortuary archaeology. A preliminary study conducted in 2022 revealed that the conventional distinction between 'local' and 'newcomer', commonly found in archaeological interpretations, oversimplifies the complex dynamics of this region. It emphasised the importance of investigating the relationship between the genetic ancestry of individuals and their identity expressed in mortuary practices on a case-by-case basis (Preda-Bălănică & Diekmann 2022). Leveraging a more precise absolute chronology through extensive radiocarbon dating and utilising the increasing corpus of published aDNA data, our aim is to obtain a more nuanced understanding of mobility and migration among individuals and human groups, interaction and admixture between different communities, and the transmission and transformation of burial customs.

References

B. Preda-Bălănică & Y. Diekmann. 2022. Ancestry and identity in the Balkans and the Carpathian basin between the 5th and 3rd millennia cal BC. In A. Whittle, J. Pollard & S. Greaney (eds.), *Ancient DNA and the European Neolithic: Relations and Descent*. Oxbow Books (Neolithic Studies Group Seminar Papers 19), pp. 107–122.

Early Bronze Age burial mound in northern Muntenia, Romania
(Photo by Bianca Preda-Bălănică)

Take-Home Message

‘Moving Westwards’ – The Westernmost Yamnaya in the Carpathian Basin

János Dani

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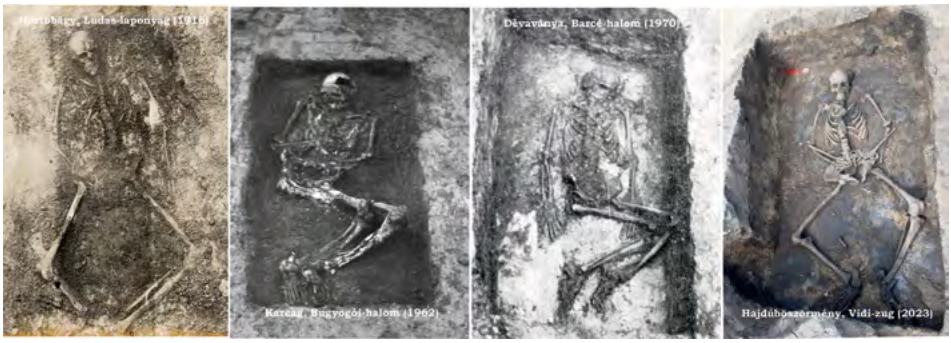
Research on prehistoric kurgans has a history of more than 150 years in the Carpathian Basin. Even among the earliest researchers, some recognised the Eastern European connections of these features. Later, during the 1970s and 1980s, in contrast to the migrationist approaches of V. Gordon Childe and Marija Gimbutas, many prehistorians took the view that the ‘Pit-Grave burials’ found in the Carpathian Basin were not the legacy of Eastern European immigrants but ‘products’ of an acculturation process of the local Late Copper Age population. The Eastern origin of the characteristic anthropological type represented by the people buried under the kurgans was first pointed out by two anthropologists, Zsuzsanna K. Zoffmann and Antónia Marcsik, long before the first aDNA results were obtained. Many researchers were sceptical about their results even in the 1990s and, due to the triumph of the first spectacular results of archaeogenetics, this fact was undeservedly forgotten by high-tech archaeology.

The actual presentation aims to give a brief overview of a century and a half of research on the prehistoric kurgans built by nomadic people (Yamnaya and beyond...) in the Carpathian Basin. In addition to a retrospective review illustrated with case studies, recent excavations, radiocarbon-based chronology and high-end bio-archaeological research will also be reported giving an increasingly detailed picture about the subsistence of the Yamnaya communities, the nature of their relations with the local Copper Age population, and their historical role in the development of the European Bronze Age. Not only can distinct periods of Eastern European influence be distinguished, but also identities on diverse levels and of different roots can be identified amongst the ones buried under the earthen tumuli.



More than a century of Yamnaya research in Hungary

Take-Home Message

Session 3
In and around the Carpathian Basin at the End of the Fourth and in the First Half of the Third Millennium BC

Vučedol pottery style in Transdanubia (Hungary)
(Photo by Fanni Dénes, HUN-REN RCH Institute of Archaeology)

Locals and Foreigners — Transylvania in the 3rd Millennium BC

Florin Gogâltan

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Transylvania, with an area of about 57,000 km², is almost entirely surrounded by the Western, Southern, and Eastern Carpathians. Favourable climatic changes since the beginning of the 3rd millennium BC have led local Coțofeni communities to adopt new subsistence strategies. The warmer Holocene winters explain for the appearance of settlements at altitudes above 800 m or the use of caves in the cycle of pastoral activities. It was these communities that erected the first burial mounds before 3000 BC. They were also the ones who identified and exploited the local copper deposits, producing various types of axes or ornaments by the end of the 4th millennium BC and in the first quarter of the 3rd millennium BC.

The mountains that surrounded them were no barrier to others who came to seek a better life in Transylvania. Following the valley of the Mureș, the first Yamnaya communities arrived here sometime after 2900 BC, coexisting in one way or another with the locals. As in the Great Hungarian Plain, where a similar process took place, the beginning of the Bronze Age is marked by the emergence of new cultural groups. In western Transylvania they these are the Livezile, Copăceni, Șoimuș, and Roșia, continuing the Late Copper Age line. In the centre and south-east of the province, under the influence of other communities of an Eastern (Globular Amphora Culture) or Southern (Zimnicea-Ezerovo) origin, other cultural groups were formed: Jigodin, Schneckenberg, Zăbala, and Sânzieni-Turia. At the end of the 3rd millennium BC, the *"Besenstrich und Textilmuster"* ceramic horizon spread over wide areas.

The 3rd millennium BC in Transylvania marks a series of metallurgical innovations. Even though one cannot speak of a true bronze metallurgy, technological experiments are another hallmark of the Early Bronze Age in the eastern Carpathian Basin.

Izbucul Topliței de Vida Cave. Archaeological discoveries from the middle of the 3rd millennium BC

Take-Home Message

Third Millenium BC Climate and Environment in the Pontic Steppe and the Lower and Middle Danube Regions: What do we know and what is missing?

Enikő K. Magyari[1,2], Seppä[3], H., V., Korponai[4], J.,
Ofosu-Brakoh[2] A. A., Bede Fazekas[2,5], Á.,
Formačkova[2], A., Heyd[6], V.

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During the fourth millennium BC socioeconomic change from a Neo-Eneolithic sedentary village based agriculture to more itinerant pastoralism dramatically changed European society. Following centuries of increased exploitation of the Ukrainian chernozem belt by large animal herder groups, the Yamnaya migration from the Pontic steppe to the Carpathian Basin took place around 3000 cal BC, and Yamnaya burials in the GHP attest their presence in the Great Hungarian Plain between 2800–2700 cal BC. There are opposing views on the transitional vs. abrupt nature of this change, with climate change often invoked as an important driver in addition to technological advance. In this talk we summarize existing climatic and environmental data from East-Central and Eastern Europe to address this question. A prominent decrease in annual mean temperatures is detected in E Romania by lipid biomarkers between 3.4 and 3.2 BCE, coinciding with Bond events 4 and 3. Lowland and alpine lakes indicate increasing summer evaporation, low winter precipitation and drought events with a maximum at ~3kyr BCE, followed by rapid available moisture increase at ~2800 BCE. In the Pontic territory the forest steppe zone enlarged, steppe narrowed down suggesting an increase in

available moisture at the onset of westward Yamnaya migration (~3300 BCE). From vegetation point of view, the Eneolithic was characterised by the expansion of European hornbeam in the lower mountain zone of the Carpathians at the expense of hazel, and divergent forest compositional changes in the lowlands (elm decline in SE Hungary). The third millennium BC was characterised by increased moisture availability in ECE and SE Europe until 2200 cal BC, when a short-term cooling event, the so called 4.2 kyr BP event exerted regional drought in SE Asia, but in our study region the visibility of this event is not general. It appears as a 100–200 yr cooling in summer mean temperatures. Overall, we can conclude that climatic instability during the fourth and early third millennium BCE was regionally variable and resultant demographic responses were highly targeted and heterogeneous in nature.

Take-Home Message

Late Copper/Early Bronze Age in the Area between the Sava, Drava and Danube Rivers – New Results

Jacqueline Balen[1] *and Ina Miloglav*[2]

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The period of the Late Copper Age in Eastern Croatia was marked by the Baden Culture, followed by the Kostolac and, finally, the Vučedol Cultures, which by settlement organization, specialized potters, increased metallurgic activities, and social stratification reflects the new upcoming era in the prehistory – the Bronze Age, marked in northern Croatia by the Vinkovci Culture.

Based on the collected data from the recent archaeological excavation, including 14C dates and a find material analysis, in the area of Eastern Slavonia, Baranja, and Western Syrmia, the authors will present a more comprehensive picture of the Late Copper/Early Bronze Age period. The results indicate the possible long-term duration of these cultures and even their coexistence.

The paper will focus on the results of recent rescue archaeological research as well as several systematic research projects such as those of the Prisunjača, Vinkovci-Ervenica, and Viškovci sites. The paper will also try to review the research conducted at the Lovas and Vučedol sites through new observations about the Late Eneolithic Period in eastern Croatia.

The work was supported in part by the Croatian Science Foundation under the project number (HRZZ-IP-2022-10-9489).

Vučedol culture site at Prisunjača-Ciganica (Croatia)

Take-Home Message

Human Genetics Perspective of the Carpathian Basin at the Dawn of the 3rd Millennium BCE

Anna Szécsényi-Nagy[1], *János Dani*[2], *Gabriella Kulcsár*[3], *Dániel Gerber*[1], *Tamás Hajdu*[4], *Alena Šefčáková*[5], *Ron Pinhasi*[6], *Balázs Gusztáv Mende*[1], *Mária Bondár*[3], *David Reich*[7,8,9,10]

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This paper explores the archaeogenomic landscape of the Carpathian Basin around the transition from the 3rd millennium BCE, leveraging both published and new ancient DNA data.

During the final phase of the Late Copper Age, archaeological cultures such as the Baden Complex and the Coţofeni culture witnessed the emergence of kurgan burials from the westernmost communities related to the Yamnaya culture across the Pannonian Plain and Transylvania. The arrival of these communities is traced back to the northeast Balkans around 3100/3000 BCE. Our analyses indicate that Yamnaya-associated individuals from Hungary and certain burials of the so-called 'East Slovakian Mound cultures' are genetically indistinguishable, reflecting the genetic makeup of the Yamnaya group from the Samara region in Russia. Interestingly, the introgression of additional farmer ancestry within the Yamnaya sample set appears sporadic, while dating of these introgressions reveals local contributions in only a few instances. Our paper presents evidence of potential sex-biased diffusion of Yamnaya-related ancestry into the Carpathian Basin and

the dynamics of the early 3rd millennium BCE spread of steppe components in the area.

Concurrent with the cultural and genetic impacts of the Yamnaya and Corded Ware, the Vučedol culture of Slavonia/north Balkans emerged, significantly influencing the Early Bronze Age community formation in southern Transdanubia. The Vučedol culture was noted for introducing steppe-related genetic ancestry into their region in the early 3rd millennium BCE, thereby diversifying ancestry proportions within the population.

These new findings provide significant insight into the complex genetic and cultural transformations within East-Central Europe during this pivotal era, directly contributing to our understanding of Early Bronze Age population formations.

Take-Home Message

Meet along the Danube — Towards to the Bronze Age in the Carpathian Basin

Gabriella Kulcsár

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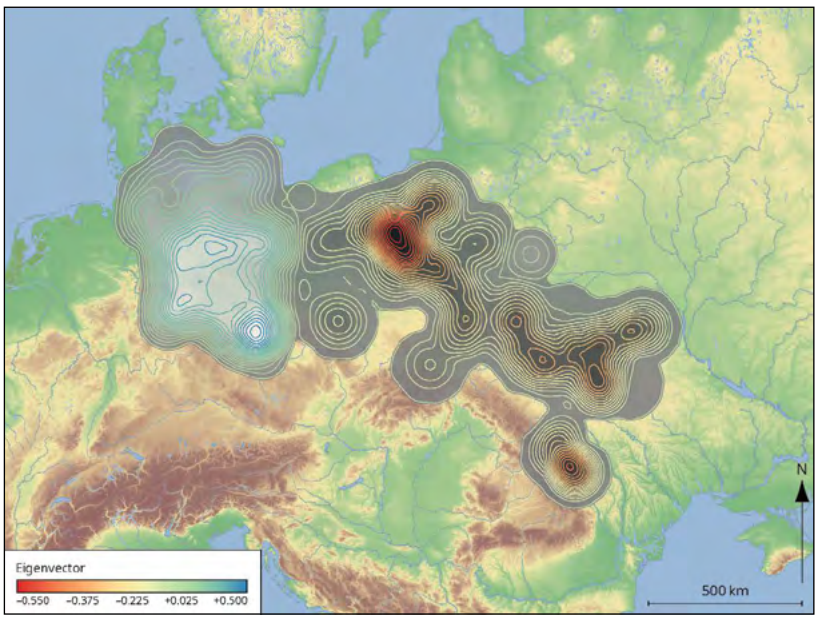
The transition/transformation from Late Copper to Early Bronze Age societies in the Carpathian Basin, the issue of continuity and discontinuity, the interactions from the final fourth to the mid-third millennium BC, and the roles of locals and incomers, remain controversial. Current research faces a number of issues regarding the processes of eastwards and westwards mobility/migrations affecting the Bronze Age Carpathian Basin as well.

In the territory of the Carpathian Basin, the end of the Copper Age and the beginning of the Bronze Age were connected to the appearance of various groups arriving from the East (Yamnaya), West (Bell Beaker) and South (Vučedol, Somogyvár–Vinkovci, Nagyrév, Maros). The changes witnessed by these times are best demonstrated through the transformation of the ceramic styles and the appearance of new types of finds. There are many different analytical aspects of the cultural network architecture and the temporal and spatial dynamics of the 3rd millennia BC Carpathian Basin. The main driving force behind the continuity/stability or the changes of connections is the accessibility and the obtainability of different raw materials and other natural resources. The most important evidence of the geopolitics-based cultural network is the spread of similar-type and -style pottery and metal objects over large geographical areas. With the analytical extension of the ordinary typochronological methodology and the latest material analysis results, we can enrich our knowledge about the 3rd millennium BC interaction zones. With the help of anthropological and geochemical methods, further data can shed light on whether real population movements were present behind the interregional connections or not. Our paper is an attempt to summarize various aspects of this transition in a number of regions of the Carpathian Basin and provide a framework for more detailed discussions that will follow.

Cultural lansdscape of the Carpathian Basin in the first half of the third millennium BC (black: archaeological cultures and groups dating roughly to the first quarter; blue: those dating to the second quarter)

Take-Home Message

Session 4
Globular Amphoras in Changing Worlds



Internal communication networks of the Globular Amphora phenomenon; after Müller 2023

Globular Amphora: Linking Archives of Socio-Cultural Transformations

Johannes Müller[1] *and Marzena Szmyt*[2]

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The Globular Amphora phenomenon was spread over a wide area during a period of decisive transformations. While on the one hand, a basic pattern is discernible in the archaeological remains, on the other hand, there are considerable variations between the different regions. In a multi-cultural milieu, it is all the more important to link information from a wide variety of archives: environmental, economic, demographic, cultural, and social, including geo- and bio-archaeological sources.

In general, the data on subsistence point basically to local to small regional herding of cattle and an increased share of caprovids and pigs in the livestock spectrum in comparison to preceding and contemporaneous farming groups. Evidence of cereal cultivation is sporadic, but it is unlikely to have occurred on a large-scale. Meat production and consumption played a major role, along with milk production.

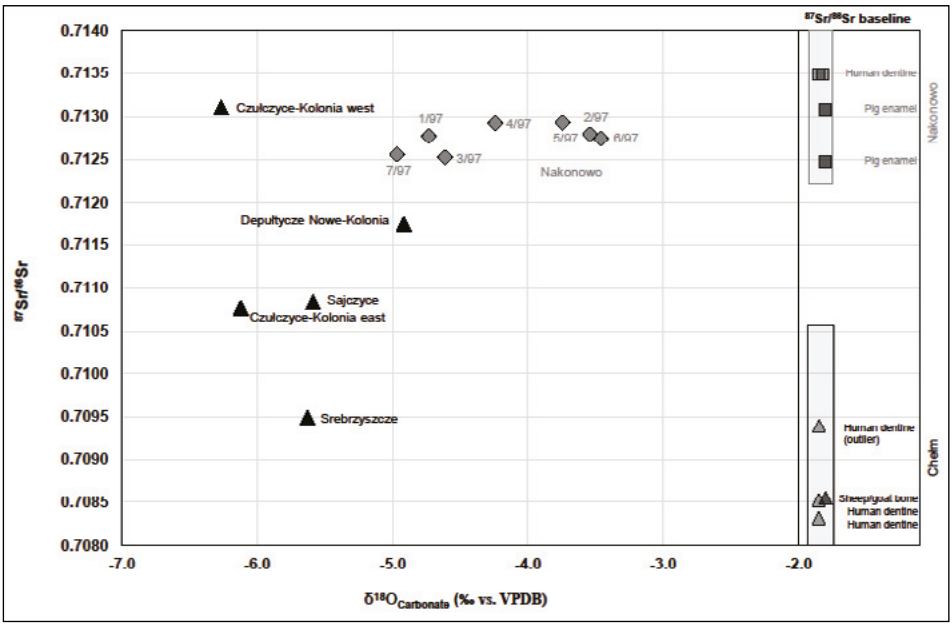
The settlement remains can be described as ephemeral. This is likely to be related to the described herding strategies. Sites with pits and pit huts, also occasionally with post settings for smaller dwellings, are known, but rectangular houses with ridge posts and clearly long-lasting settlement structures are lacking.

In addition to supra-regional raw material networks and local use of raw materials, the mobility patterns identified mainly reflect local or small-scale regional movements of people and animals, often within a radius of less than 50 km. This has been demonstrated by isotopic analyses of humans and animals as well as raw material analyses of artefacts.

Both palaeoecological investigations and the frequency of above-ground, visible grave monuments show that the occurrence of the discussed societies coincides with a reduced openness of the landscape, a reduced human impact, and the end of the construction of megalithic tombs, where that had been practiced. This decline

may be associated with a specific settlement pattern, which may especially have led to a reforestation.

Obviously, the settlement and economic practices of Globular Amphora societies have a different ecological fingerprint than those of preceding or concurrent Late Neolithic groups.



An example of isotopic analyses: scatter plot of $^{87}Sr/^{86}Sr$ and $\delta^{18}O_{Carbonate}$ data of human tooth enamel from the Nakonowo collective burial (diamonds) and several burials in the Chełm region (triangles). After Gerling et al. 2022

Take-Home Message

Exploring the Enigmas of Funerary Practices in the Globular Amphora Culture in Southern Poland through Interdisciplinary Analyses

Anita Szczepanek[1]*, Wojciech Pasterkiewicz*[1]*, and Piotr Włodarczak*[2]

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This study investigates the funeral practices of the Globular Amphora Culture in Southern Poland through an interdisciplinary approach. The focus is primarily the interpretation of mass graves, examining whether they represent victims of intra- or extra-group massacres or if they were constructed as a final act of funeral ritual. This inquiry is addressed through a sequential analysis comprising: (1) determination of the age, sex, and cause of death of the buried individuals; (2) genetic analysis to ascertain familial relationships among the individuals; (3) radiocarbon dating of all individuals interred in the mass graves; (4) analysis of strontium isotopes to assess migration patterns; and (5) stable isotopic analysis to reconstruct dietary habits. Additionally, in consideration of the complex cultural landscape of Late Eneolithic south-eastern Poland, mass graves of the Złota culture are also presented for comparative purposes. This research aims to contribute to a deeper understanding of funeral practices and social dynamics during the Globular Amphora Culture times in Southern Poland.

Mass grave from Koszyce, SE Poland (Photo by E. Włodarczak)

Take-Home Message

Globular Amphora Culture, Networks and Migration: A View from the Jutland Peninsula

Niels N. Johannsen

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The Globular Amphora (GA) network, which extended across large parts of central, eastern, and northern Europe in the early 3rd millennium BCE, raises important questions about the relative and complementary roles of different factors in the spread of shared cultural traits and practices during this period. While such questions about, for example, the roles of various forms of network exchange and diffusion, migration, and other forms of mobility have been given more attention in discussions of the Corded Ware phenomenon, the GA network in many ways poses the same challenge – with the addition that understanding the GA network is one of the prerequisites for understanding the Corded Ware period as well. 'The GA network' is here defined as encompassing regions in which communities were influenced significantly by GA cultural elements, whether including a wide range of GA material culture and customs or only some elements. With an analytical starting point on the Jutland Peninsula, this paper discusses 1) the contribution of different factors in the formation of the vast GA network, 2) questions that are currently difficult to address, and how we might progress, and 3) which implications the spread of cultural similarities across the GA network had in relation to subsequent cultural developments.

Part of an excavated line of stone heap graves at Herrup, northern Jutland Peninsula, Denmark. The features are seen from the east (Photo by The National Museum of Denmark, 1965)

Take-Home Message

Globular Amphora Sedentary Pastoralists in Changing Landscapes

Marzena Szmyt[1] *and Johannes Müller*[2]

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The current general picture of societies with Globular Amphorae reveals different forms of mobility, which essentially point to small-scale catchment areas of actual Globular Amphora communities, and huge networks of communication *(see the cover photo of the Session 4)* and interaction *(Fig. 1)*. Economically, the spatial dimensions of activity areas vary, but the analyses show that we can probably assume sedentary pastoralists.

Under the keywords "separation, hybrydisation, transformation", we can record processes of emergence from previous societies, interactions with other regional groups and the sustainable potential for change of the discussed societies in various areas where their settlement remains are found.

In-depth analyses show the ability of Globular Amphora communities to engage in multiple networks of interaction. They also show their flexibility and resilience in maintaining their own identity. This appears to be rooted in elaborate ceremonies and rituals, involving not only in communally celebrated rites related to ancestral graves but also rituals leading to the placement of the bodies of reared animals in the ground. Participation in these ceremonies and rituals was a major factor of integration for the scattered and distant small communities that gathered periodically into larger entities.

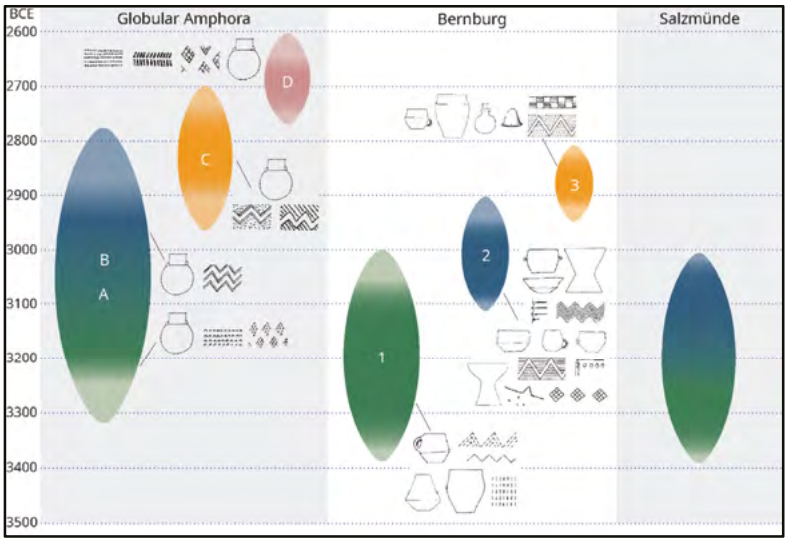

Fig. 1. An example of interaction network: the correspondences between the Globular Amphora, the Bernburg and the Salzmünde ceramic styles. After Müller 2023

Take-Home Message

Session 5
Corded Wares and Parallel Societies in the Third Millennium BC

Abb. 1 Oechlitz. Bef. 25645. Die endneolithische Mehrfachbestattung im Planum.

The late Corded Ware (2558 to 2207 cal BC) multiple burial from Oechlitz, Saxony-Anhalt, Germany

Networks of Information in the Corded Ware Realm

Quentin Bourgeois

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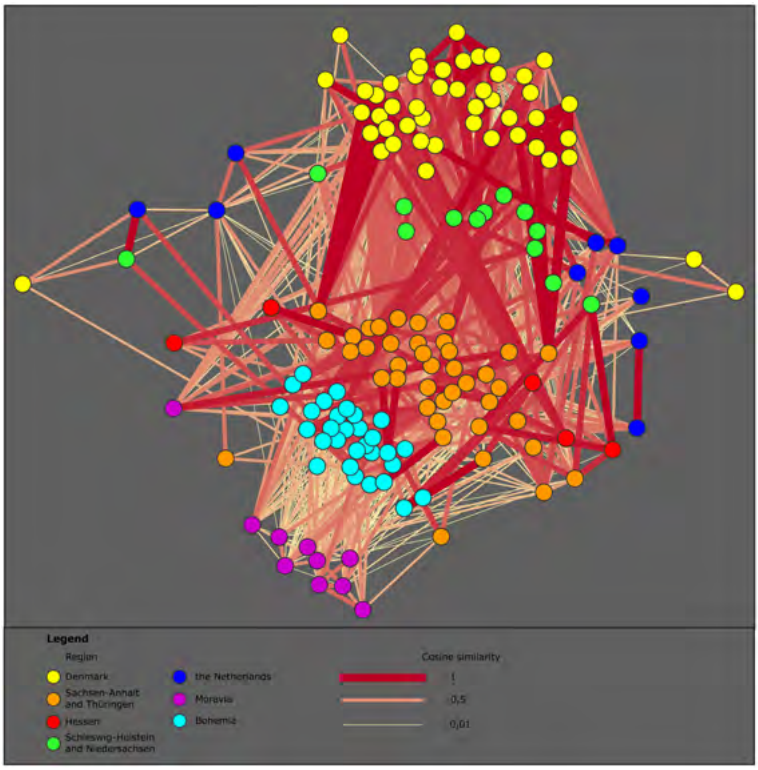
The emergence of the Corded Ware (CW) phenomenon is a defining moment in European prehistory, with a distinct burial tradition appearing across large parts of the continent. In this presentation, I want to focus on two often overlooked aspects and propose new techniques to study these.

Firstly, the nature of CW, which I would argue is an emergent phenomenon. We can archaeologically distinguish CW out of countless decisions by people in the past on how to bury their dead. Ultimately, what we are finding are the material traces of ideas on death, and the strong similarity between them is what we today label as CW. By definition, this is an emergent phenomenon. In this presentation, I will argue that this necessitates a very different approach to the 3rd ME BC. First and foremost, to study CW, we need different tools that are suited to study emergent phenomena. One of those tools is network analysis, as we study the properties of the networks based on the relations between burials. As such, we study the emergent phenomenon itself rather than the individual constituents of the phenomenon.

Secondly, I will argue time matters in this debate. The key question that has often been left unanswered is *when* do we see this phenomenon emerge, and how does it develop temporally. Temporality often provides us with constraints on what we can say, and also on the nature of the phenomenon. A deeper understanding of this temporality is crucial and also highlights the diversity of the CW phenomenon, yet new tools are required here as well.



Network representation of the similarity between Corded Ware right flexed burials (Bourgeois & Kroon 2023). In this visualization the strenght of the ties (thickness and redness of the lines) indicates a strong similarity between (male) right flexed burials. The length of the tie between two burials is proportional to the distance between two nodes. Such types of visualizations help to understand the emergent nature of the Corded Ware Culture.

Take-Home Message

The Origins and Genetic Structure of Corded Ware-Associated Individuals – Insights from Networks of Recent Genetic Co-Ancestry

Martin Sikora

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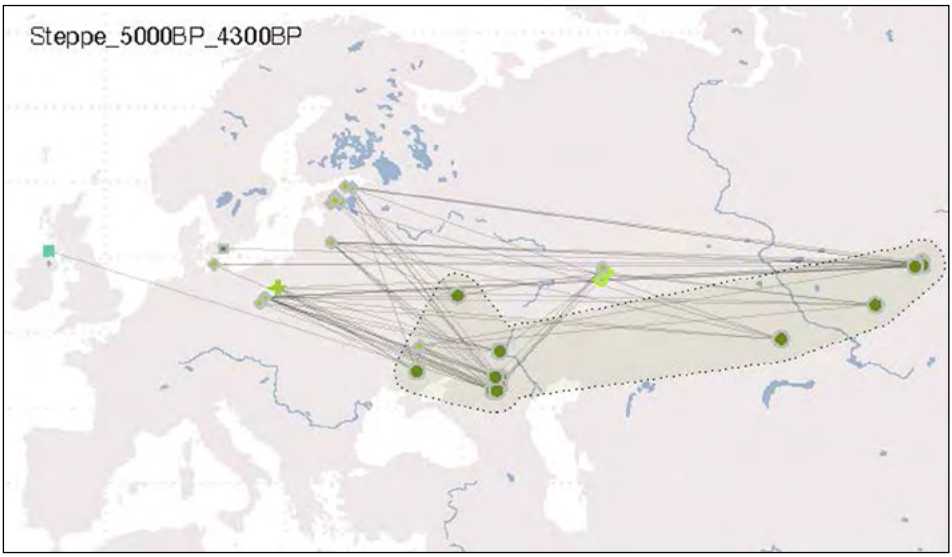
The Corded Ware Complex holds a pivotal position in the use of ancient DNA to study human history. In 2015, a pair of seminal papers pioneered the use of genome-wide data to demonstrate for the first time that individuals associated with Corded Ware carried a high amount of a distinct genetic ancestry related to pastoralists of the Pontic-Caspian Steppes such as the Yamnaya (Allentoft et al 2015; Haak et al 2015). In the nearly ten years since, the spread of this so-called "Steppe ancestry" through Europe and its association with Indo-European language expansions has been a major focus of archaeogenetic studies, resulting in thousands of individuals with genome-wide data published. Despite the availability of these rich datasets, surprisingly little headway has been made into a more fine-scale genetic characterization of early "Steppe ancestry" carrying groups, which have been predominatly described in terms of catch-all deep ancestry sources such as "Yamnaya" or "European farmers".

Recently, the availability of efficient methods for genotype imputation has introduced a new toolset to archaeogenetic studies. In particular, methods for detecting long segments of DNA shared between two individuals, so called identity-by-descent (IBD) segments, have enabled the characterization of recent genealogical connections between pairs of ancient genomes. In this talk, I will present recent work demonstrating how these networks of recent co-ancestry provide a rich source of information about the origins fine-scale genetic structure among Corded Ware-associated individuals.



Map of Western Eurasia showing networks of strongest recent co-ancestry links for individuals associated with Yamnaya and Afanasievo cultural contexts (indicated by green circular shapes). The majority of those links connect them to Corded-Ware associated individuals from northeastern Europe (indicated by green diamond shapes)

Take-Home Message

More than Numbers. Multiproxy Analyses of Conflict in the Nordic Corded Ware Complex

Anna Tornberg

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Violence and warfare in ancient societies have long been understudied but have attracted increased attention during the last decades as new theoretical movements and analytical protocols have developed and new reports of fatal and non-fatal skeletal injuries have been published. Analyses of skeletal remains can provide unsurpassed insight in the presence of violence in ancient societies. Evidence of violence-related trauma provides direct evidence of conflict and can, with population frequency calculations, inform of variations in the scale of conflict within and between groups. These estimates surely inform about the presence of violence in prehistoric societies but fail to provide a deeper understanding of, e.g., the causes and consequences of ancient conflicts. The opportunities for new types of data brought about by the third science revolution in archaeology can aid in such endeavours, as they can enhance our understanding of mobility and migration, kinship and social dynamics, and demography, all of which may be relevant for the understanding of ancient violence and warfare. Through a multiproxy approach, I here present presence, patterns, and possible consequences of conflict in the Nordic Corded Ware Complex. The results of traumapathological analyses are coupled with high-resolution strontium isotope analyses, a large quantity of radiocarbon dates, paleodemography, and genetics, which together outline a picture of violence and warfare that is by far more than only numbers.

Cranium from the site Tygelsjö, Scania, southernmost Sweden. The individual is radiocarbon-dated to 2465–2200 BCE and associated with the Swedish–Norwegian Battle Axe Culture. The antler pick-axe was still embedded in the skull when it was retrieved in the mid-19th Century.

Take-Home Message

The Corded Ware Expansion into the Northeast European Lowlands: Assessing Environmental, Social and Cultural Challenges

Kerkko Nordqvist

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The north-eastern extent of the Corded Ware Complex spread over a large territory in what is today Finland, Estonia, Latvia, Lithuania and north-western Russia. In the early 3rd millennium BC, several regional Corded Ware groups emerged in this area. Although they share many characteristics with other Battle Axe/Corded Ware communities, they often also display local peculiarities. For example, in many parts of the eastern Baltic Sea area settlement site-like materials dominate while burials are rare, and likewise, subsistence practices may have varied regionally. Compared to many other territories of continental Europe, the development of these north-eastern Corded Ware groups occurred in a different environment, both in terms of natural and socio-cultural settings. First, the area largely belongs to the boreal region, which is characterized by forests and aquatic landscapes: the further north and east one goes, the harsher the environmental conditions generally become, and furthermore, the Corded Ware period coincided with increasingly cooler and wetter climate. Second, the Corded Ware Complex in north-eastern Europe established largely in an area previously devoid of agricultural communities but dominated by diverse societies that lived from fishing, hunting, and gathering. This presentation will discuss the potential challenges and impacts of these factors on the expansion and the further development of the Corded Ware Complex in the northeast European Lowlands.

The map shows the extent of the Corded Ware Complex in north-eastern Europe. The dots indicate "settlement sites", i.e. pottery finds from non-burial contexts, in Finland, Estonia, Latvia, Lithuania and the western part of Leningrad Oblast (Russia)

Take-Home Message

Insights from the Alpine Periphery: Settlements and (rare) Burials 3400–2400 BC

Albert Hafner

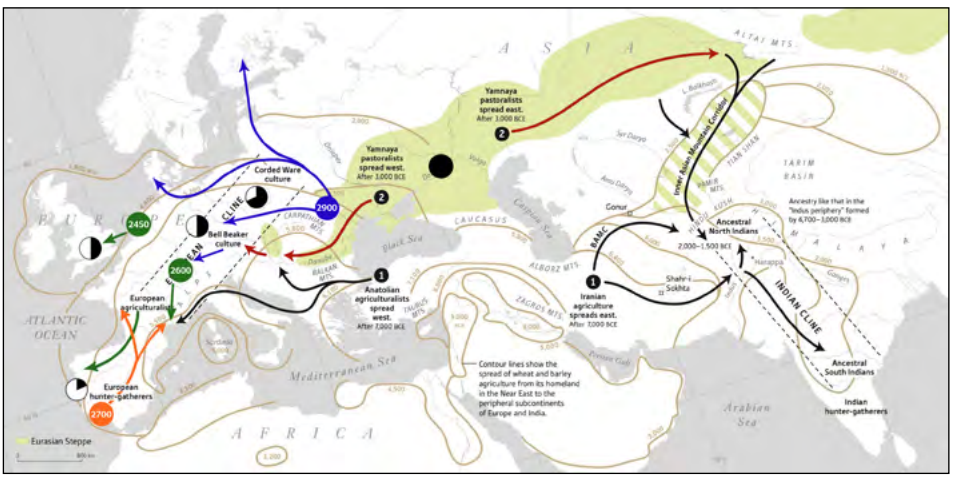
Institute of Archaeological Sciences and Oeschger Centre for Climate Change Research (OCCR), University of Bern, Switzerland; E-mail: albert.hafner@unibe.ch

In the context of the widespread European distribution of the pottery decorated with cord impressions, usually described as 'Corded Ware Culture' or 'Corded Ware Phenomena', the sites situated in Switzerland and along the western Alps occupy a distinctive position on the southwestern periphery. Most Corded Ware areas are featuring typical single graves with gender-differentiated crouched burials and related typical grave goods. This type of graves is completely absent in the western Alpine forelands. Instead, the primary sources of insight into the societies of the early 3rd millennium BC come exclusively from submerged lake shore settlements. Burials previously categorized as Corded Ware graves or roughly fitting within the timeframe of this phenomenon exhibit markedly different architectural styles and feature distinct grave goods. The Alpine foreland exhibits peculiar characteristics that deviate from the known conventional Corded Ware features, sparking prolonged scholarly discourse. This lecture will delve into the distinctive traits of a peripheral Corded Ware region focusing on the time from 3400 to 2400 BC. This also covers the centuries before the first signs of the emergence of a pottery decorated with cord impressions. Novel insights into settlement architecture have been found recently, illuminating long-enduring settlement traditions. These results raise new questions about the impact of the general transformations in the early 3rd millennium BC on peripheral regions. It cannot be ruled out that the Alpine region played a special role and was resistant to new trends.

Lake of Biel, Switzerland, looking direction west and towards Lake of Neuchâtel and Jurassic Mountains, the southwestern periphery of Corded Ware ceramics (Photo by Albert Hafner)

Take-Home Message

Session 6
Eurasia – A Big Story in the Third Millennium BC



A Tale of Two Subcontinents in the Third and Second Millennium BC, after Narasimham et al. 2019, amended

Riva 2023 Recap. Big Picture and Important Details on the 3rd Millennium BCE in Europe

Martin Furholt

Institute of Prehistoric and Protohistoric Archaeology, Christian-Albrecht University, Kiel, Germany; E-mail: martin.furholt@ufg.uni-kiel.de

The purpose of this contribution is to bring content and discussions from the Riva Del Garda conference in October last year onto the Budapest floor. I will focus on what from my own perspective were the main contributions and discussions ranging from fundamental questions to important details. The Riva conference focused on the Bell Beaker phenomenon, and some of the issues presented and discussed included the question of chronology, with special attention to the earliest appearance of Bell Beaker materials, the question of boundaries or connections between the different(ly classified) archaeological phenomena, the mechanisms of Bell Beaker formation, and the underlying demographic, social and cultural dynamics. Here, the role, scale, and migration and concrete migration scenarios (i.e. relation between newcomers and natives) played a huge role, as did the manners in which transmission and homogenization of objects and practices within the Bell Beaker realm has to be thought of. Finally, in terms of narrative creation, the role of axes and daggers as weapons or tools and, consequently, the social role of the individuals buried in a Bell Beaker or Corded Ware fashion was controversially debated.

The first meeting in 25–28 October 2023 in Riva del Garda, Trento, Italy, 25 years after the International Conference "Bell Beakers Today"
www.transformeurope1riva2023.com

The Genetic Origin and Linguistic Expansion of the Indo-Europeans

David Reich[1], *David W. Anthony*[2] *and Dorcas R. Brown*

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Part 1 David Reich: *The Genetic Origin of the Indo-Europeans*

The Yamnaya archaeological complex appeared around 3300 BCE across the steppes north of the Black and Caspian Seas, and by 3000 BCE reached its maximal extent from Hungary in the west to Kazakhstan in the east. To localize the ancestral and geographical origins of the Yamnaya among the diverse Eneolithic people that preceded them, we studied ancient DNA data from 428 individuals of which 299 are reported for the first time, demonstrating three previously unknown Eneolithic genetic clines. First, a "Caucasus-Lower Volga" (CLV) Cline suffused with Caucasus hunter-gatherer (CHG) ancestry extended between a Caucasus Neolithic southern end including people from Neolithic Armenia, and a steppe northern end including Eneolithic people from Berezhnovka in the lower Volga. Bidirectional gene flow across the CLV cline created admixed intermediate populations in both the north Caucasus, such as the Maikop people, and on the steppe, such as those at the site of Remontnoye north of the Manych depression. CLV people also helped form two major riverine clines by admixing with distinct groups of European hunter-gatherers. A "Volga Cline" was formed as lower Volga people mixed with upriver populations that had more Eastern hunter-gatherer (EHG) ancestry, creating genetically hyper-variable populations as at Khvalynsk in the Middle Volga. A "Dnipro Cline" was formed as CLV people bearing both Caucasus Neolithic and lower Volga ancestry moved west and acquired Ukraine Neolithic hunter-gatherer (UNHG) ancestry to establish the population of the Serednii Stih culture from which the direct ancestors of the Yamnaya themselves were formed around 4000 BCE. This population grew rapidly after 3750–3350 BCE, precipitating the expansion of people of the Yamnaya culture who totally

displaced previous groups on the Volga and further east, while admixing with more sedentary groups in the west. CLV cline people with lower Volga ancestry contributed four fifths of the ancestry of the Yamnaya, but also, entering Anatolia from the east, contributed at least a tenth of the ancestry of Bronze Age Central Anatolians, where the Hittite language, related to the Indo-European languages spread by the Yamnaya, was spoken. We thus propose that the final unity of the speakers of the "Proto-Indo-Anatolian" ancestral language of both Anatolian and Indo-European languages can be traced to CLV people living in the north Caucasus, lower Don and lower Volga sometime between 4400–4000 BCE.

Part 2 David Anthony and Dorcas R. Brown: *The Yamnaya Origins and the Expansion of Late PIE Languages*

The origin and expansion of the Yamnaya culture is difficult to understand without adequate aDNA sampling of populations from the Pontic-Caspian steppes. A new study from the David Reich lab of aDNA from more than 400 Eneolithic and Bronze Age individuals from the Pontic-Caspian steppes reveals a complex chronological layering and admixture of multiple ancestries that contributed to Yamnaya genetic origins, probably within the eastern range of Seredni Stih populations in the early to mid-4th millennium BCE. As the Yamnaya population expanded, after about 3000 BCE, people who shared steppe genetic ancestry innovated to create new material (archaeological) cultures on both the eastern (Afanasievo) and western (Corded Ware) wings of the expansion, creating what archaeologists often regard as independent cultural entities that obscured a shared genetic and perhaps linguistic heritage. It seems that people who shared genetic ancestry often created distinct material cultures, and occasionally people with similar material cultures had distinct genetic ancestries (Lower Don and Core Yamnaya). Genes and material culture can follow different trajectories, and the comparison of aDNA & archaeology provides a tool to explore their complex relationship.

Left: Eneolithic steppe individuals sharing IBD segments from the same ancestor ≥ 20cM. Right: Yamnaya individuals sharing IBD segments ≥ 20cM

Pandemics and Migration: The Neolithic–Corded Ware Transition in Northern Europe

Kristian Kristiansen

Department of Historical Studies, University of Gothenburg; The Globe Institute, Lundbeck Center of Geogenetics, Copenhagen University; Sweden/Denmark;
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Co-authors: Frederik Valeur Seersholm, Martin Sikora, Abigail Daisy Ramsøe, Jialu Cao (aDNA analyses), Karl-Goran Sjogren, Laurę Salanova and Philippe Chambon (archaeology), Morten Fischer Mortensen, Ralph Fyfe (pollen summaries), Torben Dehn and Svend Hansen (megalith end-dates)

Recent genetic evidence on the spread of the Neolithic plague indicates that it was a 'global' pandemic covering large tracts of the Eurasian continent. It demands that we re-evaluate its demographic impact on late Neolithic populations, which has been questioned. We present new evidence from two megaliths in respectively western Sweden and NW France, where the effects of the plague can be documented. To this we add new independent evidence from pollen diagrams, as well as 14C dates of the end of megalithic architecture. It all supports a major demographic decline from northwestern France to South Scandinavia. It also adds a new perspective on the 14C sum curves as parameters of demography, which has been debated, but which can be correlated in time with the genetic and environmental results. Taken together they provide a new prelude to the onset of steppe migrations and their geographical expansion. This is followed by an interpretation of the migratory processes, their social and environmental impact in Denmark.

Packed burials from the passage grave of Gökheim, western Sweden, with a high number of plague among the buried population

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Take-Home Message

Poster Session

A Sacred Place in the Urban Landscape: the Kálvária-domb ('Calvary Mound') in Szentes, Hungary

Ádám Bede, Orsolya Valkó, Kristóf Süveges, Balázs Deák

'Lendület' Seed Ecology Research Group; Institute of Ecology and Botany;
HUN-REN Centre for Ecological Research; Hungary

The *Kálvária-domb* ('Calvary Mound') is situated on the outskirts of Szentes, a town in Hungary. It was built in the Late Copper Age by Yamnaya groups, but in subsequent times it was used as sentinel mound. In 1709, during the plague, the German military also used the area for burying several hundred soldiers. Since 1817, the site has been used as a Catholic cemetery, also a calvary and a crucifix were erected there. Although a considerable part of the mound is covered by graves and ornamental shrubs, the rest provides a safe haven for species typical to loess grasslands.

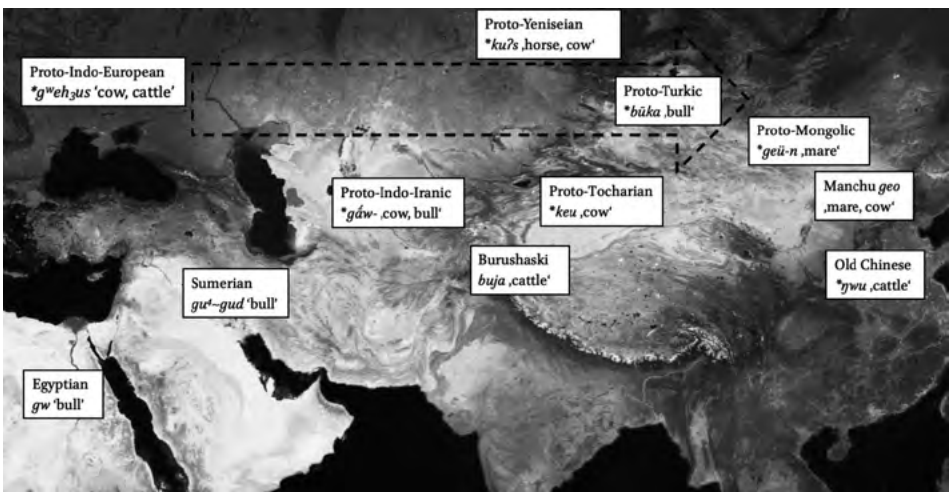
The Kálvária-domb ('Calvary Mound') with old cemetery and calvary

Eurasia Connected — Communication Networks of the 4th and 3rd Millennia BC

Rasmus G. Bjørn

Language and the Anthropocene, Max Planck Institute for Geoanthropology, Jena, Institut für Orientalistik, Indogermanistik, Ur- und Frühgeschichtliche Archäologie (FSU-Jena), Germany

While language reflects changes in society, widespread loanwords may indicate the trajectory of cultural diffusion and help calibrate the relative chronologies of historical linguistics. Emerging lines of evidence from archaeology, genetics, and historical linguistics thus paint an increasingly clear picture of the interconnected world of early Bronze Age Eurasia, where domesticated cattle and horses spread with and between different speech communities, highlighting the complex communication networks transcending language groups. My poster will present some of the salient Bronze Age wandering loanwords treated in my PhD dissertation *Eurasia Connected*, including also words for millet, chicken, and wagons.



Trajectory of domesticated taurine cattle in the Steppe Zone and distribution of formally and functionally similar unetymologizable words

Restoration of Natural Steppe Grasslands after Archaeological Excavations on Kurgans – A Case Study from Hungary

Balázs Deák[1], *Mariann Bálint*[2], *Béla Mester*[3], *Orsolya Valkó*[1], *János Dani*[4]

[1] 'Momentum' Seed Ecology Research Group; Institute of Ecology and Botany; HUN-REN Centre for Ecological Research; Hungary
[2] Hajdúsági Museum; Hungary
[3] Hortobágy National Park Directorate; Hungary
[4] Déri Museum, Debrecen; Hungary

Besides being important sites for exploring the history and genetics of the Yamnaya Culture, kurgans are also iconic landmarks and biodiversity hotspots in today's steppe landscapes. In a cooperation involving archaeologists, nature conservationists, and grassland ecologists, we developed a demonstration project aimed atthe comprehensive restoration of the structure and vegetation of a low kurgan after multiple archaeological excavations (Anonymous kurgan in the Vidi-zug, Hajdúböszörmény, Hungary). After reconstructing the original mound structure and preparing the seedbed, in March 2024, we adopted grassland restoration measures. We used a novel methodology by a combination of sowing seeds of locally typical grassland species and spreading locally harvested hay.

The Anonymous kurgan in Vidi-zug after the first phase of hay spreading (Photo by: Béla Mester)

Genomic Refugium of Pre-Domestication Horse Lineages in the Bronze Age Carpathian Basin

Dániel Gerber[1], *Zoltán Dicső*[1], *Kornél Herpai*[1], *Géza Szabó*[3], *Róbert Bozi*[4], *Noémi Borbély*[1], *Gabriella Kulcsár*[2], *Botond Heltai*[1], *Balázs Gusztáv Mende*[1], *Viktória Kiss*[2], *Anna Szécsényi-Nagy*[1]

[1] Institute of Archaeogenomics, HUN-REN Research Centre for the Humanities, Budapest, Hungary
[2] Institute of Archaeology, HUN-REN Research Centre for the Humanities, Budapest, Hungary
[3] Wosinsky Mór Museum, Szekszárd, Hungary
[4] Bozi Ars Med. Vet. Clinic, Kiskőrös, Hungary

This study explores the previously unaddressed questions of local herding practices in the Carpathian Basin.

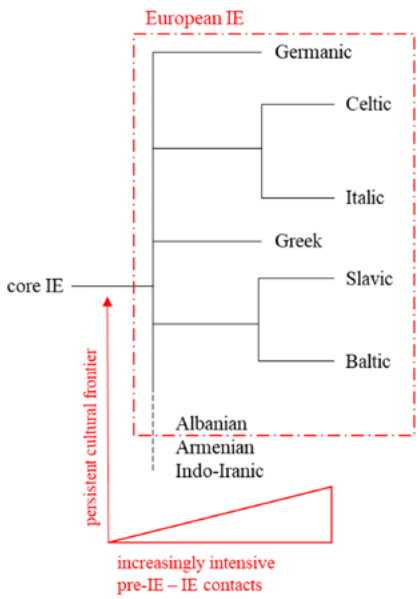
In 2021, Librado *et al.* revealed the origins and the Early Bronze Age spread of domesticated horse lineages across Eurasia. The study served as a milestone but left many questions unanswered. Before the domesticated lineages, referred to as DOM2, Europe was roamed by two major, distantly related, now extinct populations (IBE from Iberia and those we refer to as mainland European). Librado *et al.* revealed that DOM2 lineages, despite being strongly correlated with Yamnaya groups in Eastern-Europe, were not introduced further west until the turn of the 3rd–2nd millennia BCE, regardless of sporadic evidence for horse herding practices. The Carpathian Basin is poorly covered by genetic samples regarding this period, which we aimed to mitigate by sequencing four additional horse remains from the Albertfalva and Tompa sites, dated between ~2400–1630 cal. BCE. Our results indicate a delayed DOM2 introduction to the region compared to the surrounding areas and that local ancient lineages were herd as livestock. We further explored the genomic features of this local population using cutting-edge methods to reveal local processes that resulted in this complex history of horse domestication in the Central European region. Our results highlight the need for further research to fully understand the extent and nature of human–horse interactions in this area throughout prehistory.

Examining the Transformation of Europe in the 3rd Millennium BC through a Socio-linguistic Analysis of the IE — pre-IE interface

Alexander V. Gorelik

Max-Planck-Institute of Geoanthropology, Jena / Institute of Organismic and Molecular Evolutionary Biology, JGU Mainz; Germany

The third millennium BC in Europe was shaped by complex interactions that have left an impact on the cultural, genetic, but also the linguistic records, which are still discernible today. However, despite the pivotal importance of linguistic data for the understanding of socio-cultural transformations during this period, previous analyses have discussed this topic only in a superficial manner. My thesis presents an independent holistic examination and socio-linguistic analysis of the Indoeuropean–pre-Indoeuropean interface, combining it with recent archaeological and genetic insights to offer an interdisciplinary interpretation of cultural, linguistic, and genetic interactions in 3rd-millennium BC Europe.



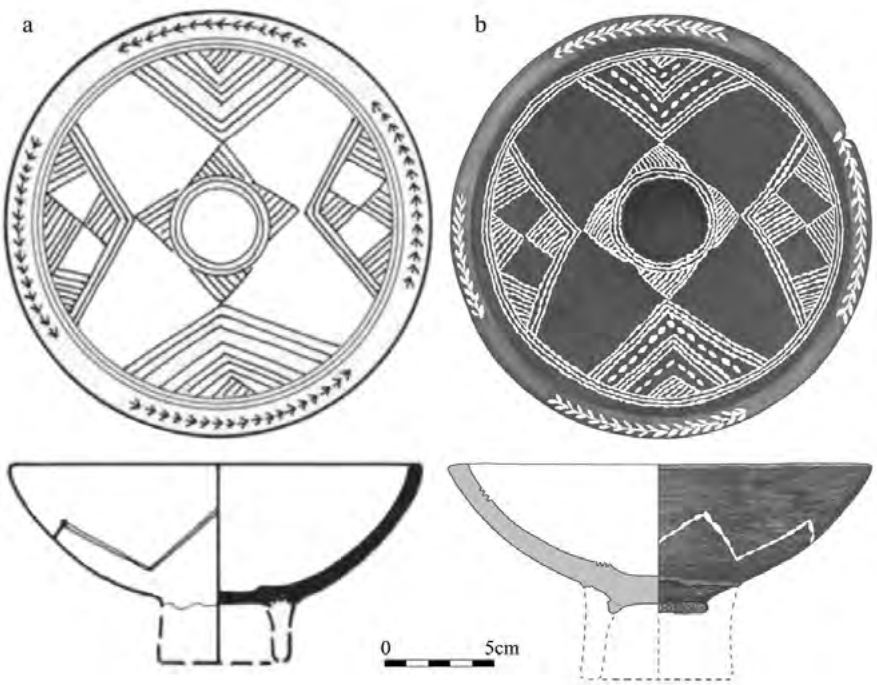
An approximate timeline for the development of the Indoeuropean– pre-Indoeuropean interface in Europe

Reconstructing Encrusted Patterns

László Gucsi

Institute of Archaeology, HUN-REN Research Centre for the Humanities, Budapest, Hungary

The poster is calling attention for the importance of virtual restoration of encrusted pottery. Encrusted decorations are common in many Early Bronze Age pottery traditions; however, their representation is usually differing from their original concept. Restoring these decorations may play a crucial role in the understanding of such ornaments.



Pedestalled bowl with internal decoration from Kaposújlak (Hungary), Early Bronze Age Somogyvár–Vinkovci culture. a – conventional depiction, b – new illustration with the reconstruction of the encrusted pattern

Non-Single Graves in a Single-Graves World. Double and Multiple Burials in Corded Ware Societies

Florian Helmecke

Faculty of Archaeology, Leiden University, Leiden, The Netherlands

Bipolar, gender-differentiated and crouched single burials are generally considered defining elements of the wider Corded Ware complex. Yet, a considerable amount of non-single graves (Non-SGs) challenges this standard. Non-SGs offer a yet understudied complexity, in which deviations from the norm but also (trans) regional conventions are recognisable. While most recent engagements with the topic continue to revolve around prominent but few case studies, the subject remains understudied with its broader overarching patterns in the archaeological record. This poster presents a general outline of the spatiotemporal framework of Non-SGs and delves into the various configurations of buried individuals sharing a grave.

Corded Ware double burial (Grave 6) from Winningen, Central Germany (modified after Schröder & Koiki 1993)

Violent Agriculturalist: Reviewing the Evidence of Hostility Among Eneolithic Societies of Ukraine

Mykyta Ivanov

National University of Kyiv-Mohyla Academy, Kyiv, Ukraine

The abrupt decline of the 'Old Europe cultures' and the quick spread of the Yamna culture throughout Europe is often explained by a stronger military organization of the steppe pastoralists. The old European agriculturalists are described as 'peaceful, sedentary, matrifocal, matrilineal, and sex egalitarian,' while the Kurgan people are characterized as 'warlike, patriarchal, and hierarchical' (Gimbutas 1993, 206). Such a historical interpretation was inspired by the unequal presence of war equipment. The agricultural societies possessed little or no weaponry except for hunting accessories, while pastoral people had plenty of battle axes, long dagger-knives, spears, etc.

Archaeological research of the last thirty years has challenged this belief. Nowadays, we know that agriculturalists were no less violent than their pastoral counterparts. In the following poster, I will depict some of the recent Ukrainian findings of Eneolithic weaponry associated with agricultural societies and will provide a framework of the warcraft development during the 5th and 4th Millenia BC.

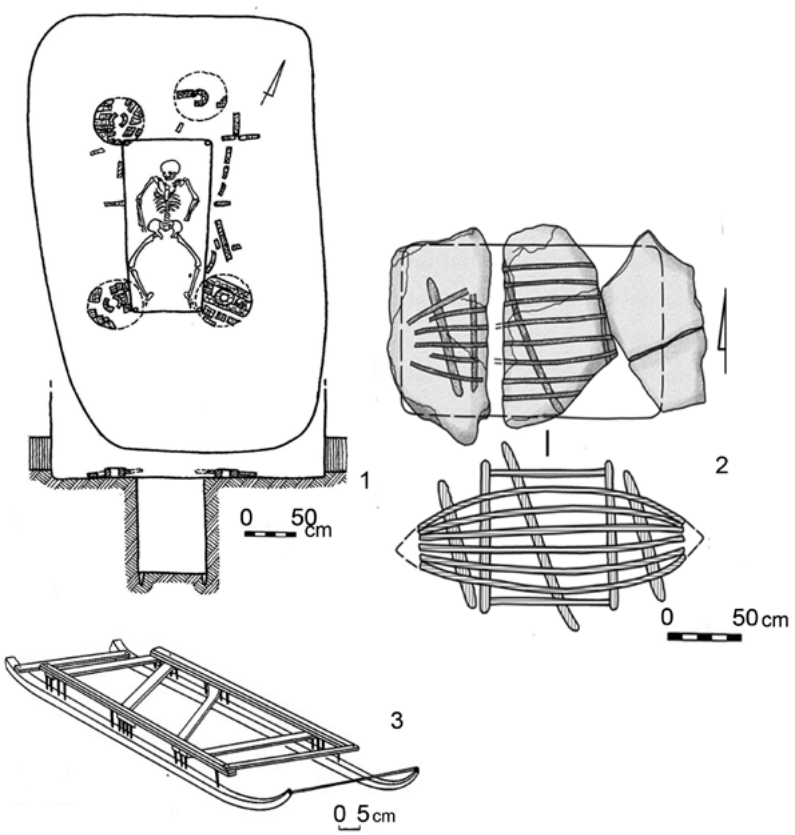
Late Eneolithic/Early Bronze Age weaponry of the cultures and cultural types developed under the influence of Trypillia culture, 3500–3000 BC

Transport of the Budzhak Culture: Wagons, Sleds, Boats

Svitlana Ivanova

Institute of Archaeology of National Academy of Science of Ukraine, Kyiv-Odessa, Ukraine

The poster considers the types of transport of the Budzhak/Yamna culture, which can be reconstructed according to the data of burial rites. Finds of wagons or their parts, models, and their depictions are known. To date, in the kurgans of the Northwestern Black Sea region, discoveries include not only wagons but also sleds and boat.



Budzhak burials with means of transport
1 – Novoselytsya 19/16; 2 – Semenivka 8/8; 3 – Kholmske 1/7

An attempt to Specify the Chronology of Graves (T-3 and T-52) from Zimnicea in the Context of the Yamnaya Culture in Southeastern Thrace

Petar Minkov

D-r, Curator of Late Prehistory depository, Depository Department, NAIM-BAS, Sofia, Bulgaria

The present study is narrowly focused on a particular problem related to the chronology of some Early Bronze Age graves from the necropolis at Zimnicea (T-3 and T-52). An askoi and other grave goods were found. Exact parallels of the askoi from the aforementioned graves have been found in an Early Bronze Age burial mound at Gabrova mogila, assigned to the Yamnaya culture. The published ^{14}C date from the mound, as well as the analogy between the Zimnicea and Gabrovo Mound vessels, enable a more precise determination of the chronological position of the graves from the eponymous site in Romania.

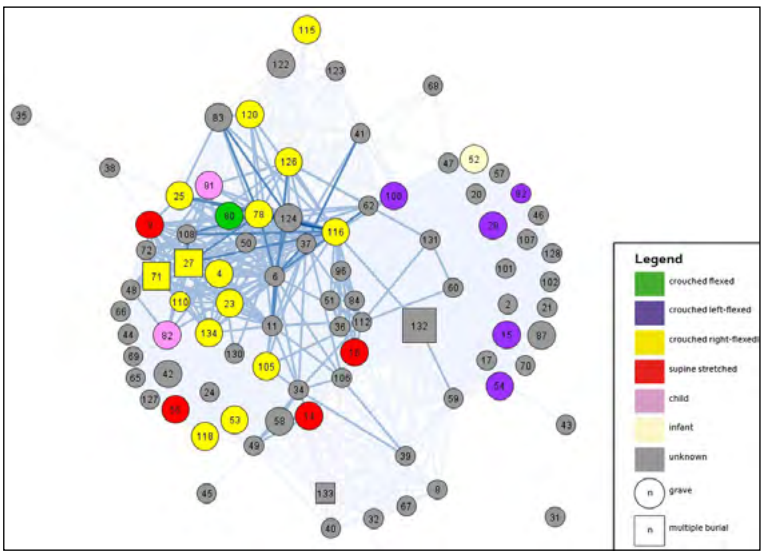
Gabrova mogila mound. Askoi

Becoming Binary? A Network Analysis into Gendered Burial Practices of the Third Millennium BCE

Louise Olerud

Faculty of Archaeology, Leiden University, Leiden, The Netherlands

The third millennium BCE is considered a period of much cultural and social change in European prehistory. This period is associated with, among other things, the emergence of individualism and binary gender symbolism. However, such narratives disregard the variability seen in the archaeological record and are rooted in modern, androcentric assumptions. Through network analysis, my PhD research aims to bring nuance to such narratives by investigating the cultural norms behind burying differently sexed and aged people in north-western Europe. This poster is a discussion of my methodology and of a few preliminary results.



A network of Corded Ware graves from Jutland (c. 2900-2500 BCE), linked on the basis of co-occurring grave goods, and with body positions and subadult age categories shown (Olerud 2021, 24, fig. 9). This graph suggests a binary (gender) distinction between crouched right-flexed ('male') and crouched left-flexed ('female') burials

The Leithaprodersdorf Stele. The Missing Link between Eastern and Western Megalithics

Violetta Reiter

Culex-Cultural Exchange, Vienna-Wolfsthal, Austria

Eastern and western megalithics in Europe are separated by a large area reaching from the Carpathians to the Eastern Alps in which little is known. A link has been sought for a long time, particularly regarding menhirs. This research gap can now be closed by the Leithaprodersdorf stele.

Leithaprodersdorf, a village between Baden near Vienna and Lake Neusiedl, situated at the foot of the Leitha Hills on the banks of the Leitha River, is known for its excellent wines. Between 2005 and 2015, rescue excavations were carried out there by the Federal Monuments Authority in the Kreuzäcker area, leading to the documentation of numerous Roman graves and settlement features, which in turn disturbed older graves from Final Neolithic, the Early Bronze Age, and the later Iron Age periods.

The stele was found in a grave of the Early Bronze Age Wieselburg Culture. Together with other lime sandstones, it was used around 3,700 years ago, during the construction of a grave to consolidate the pit. The secondary location suggests that the stele is older than the Early Bronze Age grave. The oldest features known from Leithaprodersdorf date to the Final Neolithic period. Megalithic tombs are unknown in Austria. Steles have occasionally been found in Early Bronze Age graves, but they have not yet borne traces of stoneworking comparable to the stele discussed here.

The sandstone slab had been flattened on its rear side. The belt had been hacked out on the front side and the hole and slot had been ground down

Metals, Innovations and the Transformation of Society in the Early Bronze Age Carpathian Basin

Vajk Szeverényi

Déri Museum, Debrecen, Hungary

The aim of my poster is to present Early Bronze Age networks in southeast Europe that delineate the route of innovations reaching the Carpathian Basin during the third millennium BC. These innovations include single-edged shaft-hole axes, weapons made of precious metals, golden hair-rings, gold discs, composite headdresses, bronze pins and ingot torques. These objects contributed to transformations of male warrior identities, male and female elite identities as created and manipulated through jewellery and ornaments, the spread of woollen textiles, and possibly of new units of weight measurement.

The "Kvityana Wave": In Whose Footsteps Did the Yamnaya People go into Europe?

Dmytro Teslenko

Protective archaeological service of Ukraine, Institute of Archaeology NAS of Ukraine

M. Gimbutas' three-wave concept of steppe invasion is less favoured today, but the concept of steppe tribes entering Central Europe persists, notably in the Pre-Yamnaya period. Recent discoveries reveal Eneolithic "extended" burial sites from the Dnieper to the Danube, often linked to the Postmariupol or Kvityana cultures, centred around the Dnieper. Later dates of "extended" burials elsewhere support the migration theory from the core region. Eneolithic "extended" burials predate Yamnaya graves in kurgans. Yamnaya burials were typically centralized within existing Eneolithic kurgans, suggesting that the Yamnaya people might have used them as waypoints on their westward journey, following their predecessors' path.

Fig.1 Cromlech from the Postmariupol/Kvityana kurgan 6 near the village Novoalexandrovka (excavation 1988)

Fig.2. Cromlech from the Postmariupol/Kvityana kurgan 1 near the village Novoalexandrovka (excavation 2021)

Fig.3. The main Postmariupol/Kvityana grave #27 from the kurgan 1 near the village Novoalexandrovka (excavation 2021)

Fig.4. Postmariupol/Kvityan a graves frim the Danube region (after Włodarczak, 2020)

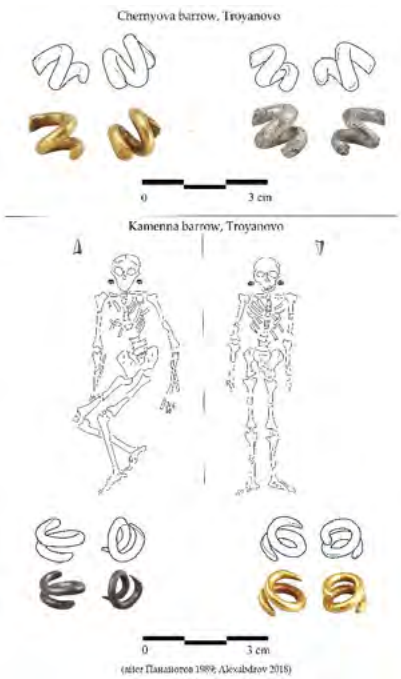
Spirals of Gold and Silver: The Bijoux of the 3rd Millennium BC

Zheni Vasileva

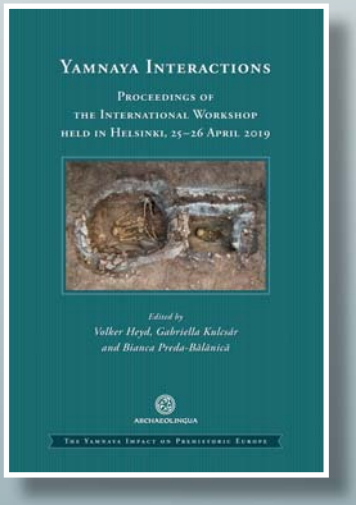
National Archaeological Institute with Museum at the Bulgarian Academy of Sciences, Sofia, Bulgaria

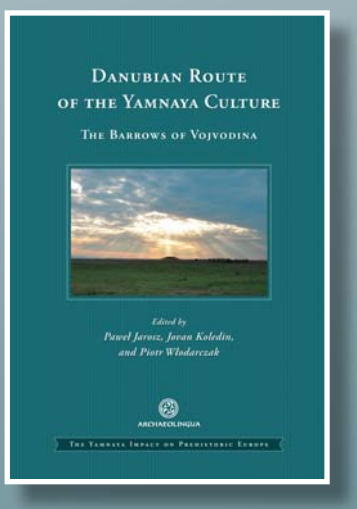
A large number of metal ornaments have been found in present-day Bulgaria since the beginning of the Early Bronze Age. Among the most numerous categories of the jewellery repertoire are various hair ornaments made of gold and silver.

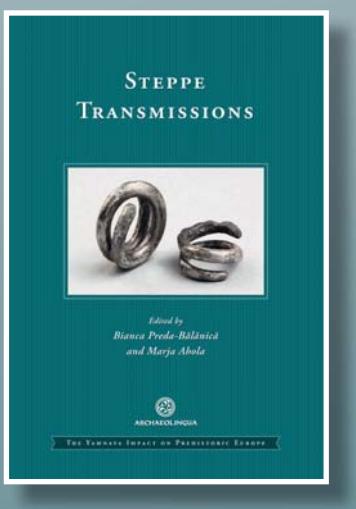
For a long time, it was assumed in archaeological literature that hair-rings were rare finds in present-day Bulgaria (exotica). However, intensive research in recent decades has shown that local societies quickly adopted the fashion of the hair-rings. What is the story behind the small shiny rings; their appearance, their context, and their development? How did the local population accept, adopt, and integrate the ornaments? How did hair-rings become the emblem of third-millennium BC fashion?



THE YAMNAYA IMPACT ON PREHISTORIC EUROPE







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