ROOTS of Routes: Mobility and Networks between the Past and the Future

ROOTS
Cluster of Excellence

Social, Environmental, and Cultural Connectivity in Past Societies

ROOTS • Booklet Series • 02 / 2023

Edited by:
Henny Piezonka, Lutz Käppel, Andrea Ricci

» *Roots of Routes: Mobility and Networks between the Past and the Future* «

Preface

Perspectives on Past Routes, Networks and Society in Challenging Times

In the Cluster of Excellence 'ROOTS – Social, Environmental and Cultural Connectivity in Past Societies', scholars from diverse disciplines deal with the reconstruction of past societies. Connectivities of individuals and groups, of people and the environment, of events, processes and structures are being investigated from an archaeological and historical perspective. Globalisation as a worldwide process, including the associated regional effects and reactions, is of primary importance. The underlying hypothesis – the more that people are connected, the lower the potential for conflict – was the starting point.

Especially in times of crises and conflicts with their disrupted communication networks and transportation routes, it is even more essential to know how people have reacted in changing and challenging situations: not only in the industrial and post-industrial world but also in distant times, which provide us, so to say, with a mirror of our behaviour and our possibilities. Thus, the question is raised how hunter-gatherers, first farmers, ancient societies or early modern urban communities have acted in general crisis situations?

In this respect, we decided to create a booklet series which presents information in a generally understandable way in current times of massively increasing global conflicts. With the present brochure, ROOTS continues this series, which introduces the discussions and results of our research cluster to a broader public.

The booklet series is conceived to also stimulate discourses and commentaries on future issues from a past perspective in other media. Only those who understand the past are able to sustainably shape the present and develop lasting future perspectives. As humans, we are dependent on the reconstruction of our behaviour in completely different times than today – not only with regard to human societies but especially concerning the human-environment relationship. Thus, a deep understanding of the past can open up opportunities for the future.

Johannes Müller
Speaker of the Cluster of Excellence ROOTS

Contents

Contents

Chapter 6: Conclusion and Outlook

*BCE = 'before the Common Era' as an alternative to BC
CE = 'Common Era' as an alternative to AD.

Henny Piezonka, Lutz Käppel and Andrea Ricci

Introduction

A Deep History of Routes Connecting People, Places, and Ideas

No place that is too distant,
No thing that looks too foreign,
No route that seems too long…

…this is how the world may appear to be in a modern conception, shaped by the metropolitan lifestyle of large cities. Before our eyes, our world seems to spread out as if it were a globally interwoven, borderless free space: physically as well as mentally, economically as well as socially, culturally as well as technologically – a world of networking and mobility. All the more irritating are the new and intensifying experiences of the limitations and vulnerability of this system of supposed limitless availability and accessibility. The great crises of our time – war, increasing inequality, diseases, climate change – relentlessly reveal that there are bottlenecks, borders and barriers in a very specific sense in our increasingly globalised world, because people, goods, food, information and knowledge travel and are connected with each other along very specific routes.

It becomes apparent how trade *routes* of raw materials and goods are essential as passages for the functioning of economic systems, how strongly the food situation in different regions of the world is determined – purely geographically – by special transport *routes* to food resources, how communication and mutual understanding depend on the existence of open channels, and how decisive the opening or closing of very specific escape *routes* is for the social upheavals and societal opportunities of migration. Apparently, it is precisely these passageways that are important when human society in the world is constituted, developed and changed.

This booklet – the second in the booklet series issued by the Cluster of Excellence ROOTS at Kiel University – draws attention to how people's lives in their world have always depended on connecting with each other via very specific *routes* and how the development of humanity itself has been significantly determined by the ways in which they interacted with each other along various paths. From the earliest stages of the Stone Age to the present day, there have been well-defined *routes*, which enabled the exchange of things, practices and knowledge between people, so that networks could form and cultural profiles could develop. Many of these ancient *routes* are not only still visible today, but even continue to operate: from the Silk Roads spanning the continents to the local *routes* of the Ox Trail here in Schleswig-Holstein, from the waterways of Mesopotamia and the river worlds of the forest zone to the spiritual *routes* of philosophical contemplation. Therefore, it is worthwhile to take a look back to the *roots* of these *routes*, indeed to the *'roots of routes'* in general. In a kaleidoscope of perspectives on this topic, the landscape, ecological and climatic conditions are first examined. The following contributions focus on the historical localisation of early trade and migration *routes*. Special attention is given to those *routes* along which objects, rituals, and therefore also cultural practices were demonstrably transported. Moreover, religious rituals, bodies of explicit knowledge, even philosophical insights have their *roots* in movement along *routes*.

In this sense, we wish all readers one or another new insight into the way in which the development of human existence is connected to the emergence, use and expansion of connecting *routes*, but sometimes also to their abandonment. *ROOTS of Routes* may thus also provide a new perspective on present crises that, by looking at past diversity and solutions, also teaches us to better understand the current situation. ◆

Chapter 1:

The ROOTS of Routes:
Framing Connections in (Pre-)History
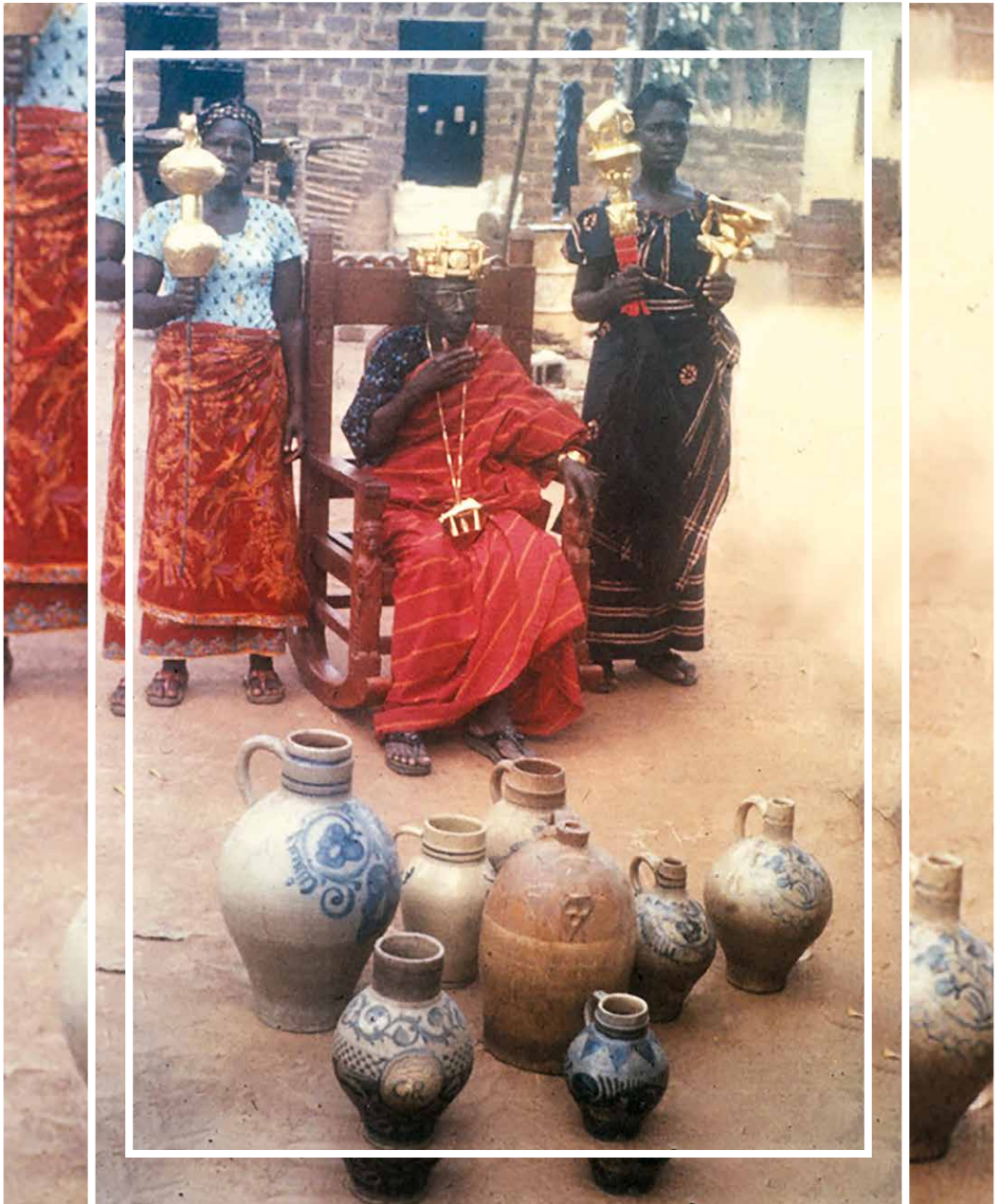
Tim Kerig

Globalisation?
What Globalisation?

Is global exchange globalisation? Objects have always been passed on over long distances, but what does this mean? Historians, especially historians of economy, use the term 'globalisation' quite differently today: Is the early modern European expansion into Africa, America and Asia already to be understood as globalisation, or is only the imperialist seizure in the 19th century CE to be described as such? Was the 19th century CE perhaps even more globalised than the 21st century CE? Or can the expansion of the Roman Empire, or even the Empire of Alexander the Great, be understood as a globalisation process? What about the Persian Empire that preceded it?

Obviously, the term globalisation is understood differently by different people. Archaeologists emphasised far-reaching exchange connections early on and often referred to explanations from historical times when interpreting them. From the 1970s onwards, the world system theory, which is particularly associated with Immanuel Wallerstein, proved to be especially inspiring. This theory explains the interplay of early modern economic zones from the European Arctic to the African Ivory Coast and to the Guatemalan rainforest: Demand that is at the core of the world system – in a quite Eurocentric sense only in the European centres – determined the pro-

duction of exotic products at the outermost edge of the system, such as beaver furs in present-day Canada, just as it explained slave trade between Africa and the European colonies overseas. Accordingly, strong global players establish trade with far weaker partners whose resources are then exploited within the framework of asymmetrical relationships. Such exchange relationships require state action, at least partially developed markets and high demand and purchasing power in the centres.

Elements of the world system theory have also been repeatedly applied in archaeology to very different phenomena. For example, the first spread of urban and state-based societies from the 4th millennium BCE onwards over Mesopotamia and even into Anatolia and Iran was referred to as the Uruk world system. The first wool production of this period is also said to have taken place in the peripheral areas of Southwestern Asia for urban centres such as Uruk.

← N'Goran Koffi, earth lord and cantonal chief of the Ba'ule tribe (Ivory Coast) with his dignity signs and the vessels of his ancestors. The Westerwald jugs, which are especially used for palm wine, are sacred and only used on special occasions (information courtesy of A. Zeischka-Kenzler; photo: Archive of the Documentation Centre Kannenbäckerland e.V.).

The exchange of rare flint varieties, stone axe blades, metals, dyes, amber, gemstones, glass and ivory has been documented by thousands of finds between Bronze Age Western, Northern and Central Europe, the Balkans and the Mediterranean region and ultimately the early states of Egypt, Asia Minor and the Levant. However, it is still unclear whether these exchange systems are so closely connected that – as some assume – we should also speak of a world system here. Did the production and transfer of these goods tend to satisfy local needs, or was it motivated by a demand known to the actors from a great geographical distance? Did traders, slave catchers and mercenaries travel through Bronze Age Europe?

In a world that is increasingly understood as complex, the perspective on the relationships between acting individuals or groups is shifting in line with current technological developments: Modern network research measures the quantity and type of contacts between actors, describes them by means of mathematical graph theory and thus analyses how differently actors shape or can shape their relationships to the world. Questions, such as those brought forth by the aforementioned world system theory, can now be posed more precisely, modelled and answered after a quantitative analysis of the contacts. Who were among the winners in the marginal and exploited areas? Who in the centres were involved in the procurement of exotic luxury goods but excluded from their consumption?

In contrast, the first spread of our earlier relatives and *Homo sapiens* ancestors from Africa over large parts of the rest of the world can hardly be understood as globalisation. The accompanying opening up of a wide variety of habitats sometimes led to markedly isolated phenomena in physical and cultural evolution. The appropriation of new spaces also initially meant a decrease in the number of people per area – the population density and thus contact between people diminished.

Therefore, in the subsequent younger part of the Eurasian Palaeolithic (the Upper Palaeolithic from about 45,000 years ago), for the *Homo sapiens*

sapiens groups roaming through the game-rich cold steppes, a comparatively low number of personal contacts can be assumed for wide-ranging roaming areas: So large the space, so small the number of contacts. This only changed at the height of the Ice Age, about 20,000-16,000 years ago. During this time, the populated area of Europe essentially shrank to the Pyrenean region and its northern foreland. In this condensed space, high population density and thus high frequency of contact can now be assumed.

The spatial relationships of sedentary populations or populations bound to certain types of landscapes were different again since the Mesolithic and the Neolithic. Here, contacts took place through direct neighbourly relations or through journeys to distant destinations, for example, for the purpose of exploration and probably also for the purpose of making specific contacts and procuring materials – be it in the context of a trade journey, for marriage, to visit relatives, or as a raid.

Technical prerequisites of such journeys were, e.g., skis and carrying devices, both proven at the end of the Neolithic period in Scandinavia and in the Alps, respectively. In addition, there were cattle and horses as beasts of burden and draught animals in front of drags and/or wagons. The use of the latter depended decisively on the pathways – on a larger scale for the first time not before the 4th millennium BCE and very roughly at the same time in the mentioned Uruk area as with the Neolithic groups north of the low mountain ranges. In the steppe terrain, the conditions for wheel and wagon, and also for chariots, were clearly more favourable than in the forest zones, wetlands or in river valleys. There, the development of pathways required locally higher efforts, as documented for example in the trackways of Lower Saxony (cf. contribution by J. P. Brozio in this volume).

The development of shipbuilding and navigation, in particular, became a decisive factor for the far-reaching spread and exchange of foreign goods in large quantities. The low transport costs over water meant that large lakes and archipelagos,

» People have always acted globally. [...] Contact with distant lands across diverse routes opens up new knowledge, new techniques and new raw materials. «

the Aegean, the Irish Sea, and the Danish islands could develop into closely networked communication and economic areas. Quite large quantities of goods could already be transported over water in the Neolithic Age. Sailing and the exchange of goods along regular trade routes are securely documented in the Red Sea and in the Mediterranean from the Bronze Age onwards. The Scandinavian rock art of this period shows thousands of ships, all of them rowing boats. Apart from mentions of leather sails in the Channel region from Roman times, there were no ships with both keels and sails in Western and Northern Europe until the 8th century CE, immediately before the first Viking campaigns. From this time onwards, sails – produced in a laborious process that required man-hours for every sail equivalent to several man-years – were also available in the north.

People have always acted globally. Migrations reached new settlement areas and opened up new resources. Contact with distant lands across diverse routes opens up new knowledge, new techniques and new raw materials. The means of development can forge new relationships of kinship or friendship as well as warlike appropriation.

Supra-regional, even global contacts, exchange relationships and migrations existed early on. The modern concept of globalisation also has further implications, among others, the availability of all goods from and at any place on earth is also inferred. Such globalisation is tied to modern monetary economy and to the interests of international free trade. With the modern flows of humans, goods and information, however, such exchange relationships can also be established and maintained, as we already recognise in our earliest history: Communication, knowledge and raw materials enhance the opportunities of humankind, overall and globally. Let's make something out of it! ◆

Chapter 2:

How to Choose a Route

Walter Dörfler

Routes in the Landscape – Ecological and Social Conditions for the Exchange of Goods, Ideas and People in the Past

They made their way through the undergrowth until they came to the pink boulder that told them they were now on the neighbouring village's land and had to be extra careful. The exchange of goods had stalled recently and their precious cargo could easily arouse avarice. Crossing the marshland would be the next challenge.

Easily passable paths through the natural landscape were rather the exception in Central Europe until well into modern times. The 'primeval forest' of the Mesolithic was, unlike our modern forests, a mixed woodland with an inhomogeneous age structure and a lot of deadwoods. Depending on the soil conditions and species composition in the forests, there was also a lot of undergrowth in the form of young trees and shrubs. Trees were the dominant form of vegetation in Central Europe until well into prehistory, with a few exceptions. These exceptions existed on coastal strips influenced by salty seawater, in inland salt patches, in raised bogs and fens, and on rubble heaps in the mountains. Thus, overcoming long distances was a challenge, involving the avoidance of steep slopes, the crossing of rivers and bogs at fords and bottlenecks, and making one's way

← **Forest with deadwood near Kiel-Elmschenhagen (photo: W. Dörfler).**

through the forest. Game trails may have offered paths through the forest that could also have been used by hunter-gatherers, but they are unlikely to have been suitable for transporting goods over long distances. Waterways were characterised by rapids, fallen trees and possible beaver dams on small and medium-sized water bodies. Larger rivers, such as the Elbe, Weser, Ems and Rhine, in contrast, provided good transport routes, but at the same time, they would also have represented gateways for possible aggressors.

On small and medium-sized water bodies, however, it was the beaver that also opened spaces along the streams and rivers that were easier to pass through than the dense forest. Up to 45 m from the protecting watercourse, beavers fell trees and thus created gallery-like clearings along the streams and rivers. This riverine network of thinner forest stands and open spaces may have provided the most suitable traffic routes for a long time. However, swampy

➜ A typical sandy path in the old moraine between Cuxhaven-Duhnen and Sahlenburg (photo: W. Dörfler).

sections and the confluence of tributaries that had to be crossed at fords also hindered the passage of the routes here. Orientation in the dense forest, in contrast, especially when there was no sunlight to indicate the cardinal direction, depended on distinctive landmarks such as boulders or unique trees. Markings on trees or intentionally placed stones may also have provided guidance, but they were of little use to people who were not familiar with the area.

In the Neolithic period, the settlers created spots without vegetation in this forest landscape. These open areas were surrounded by thinner stands or even park-like areas, depending on the duration and intensity of use through logging and grazing. Where the forest was artificially thinned out, however, hazel and other shrubs spread more widely, as can be seen from pollen analyses. Such hazel groves were also difficult to pass. Only towards the end of the Neolithic are there indications of larger open landscapes, in which megalithic graves – and no longer the erratic blocks left behind by the Ice Age – represented landmarks. The tumuli erected in the subsequent Bronze Age are often oriented in rows along obvious transport routes (cf. contribution by J. Kneisel *et al.* in this volume). As evidenced by the construction of the mounds from heath sods in some regions, they were often located in heath landscapes that emerged from the overexploitation of degraded forests. Their visibility apparently formed an important motive in the choice of location. At this time, all paths remained unpaved, apart from trackways across wet areas – the first of which were built as early as the Neolithic (cf. contribution by J. P. Brozio in this volume).

In the Bronze Age, these wooden constructions, preserved in numerous bogs of Northern Central Europe, reached outstanding quality, but in many

» [...] overcoming long distances was a challenge, involving the avoidance of steep slopes, the crossing of rivers and bogs at fords and bottlenecks, and making one's way through the forest. «

»   Only towards the end of the Neolithic are there indications of larger open landscapes, in which megalithic graves – and no longer the erratic blocks left behind by the Ice Age – represented landmarks.   «

↑ A typical long-distance trade route in the young moraine – the Segeberger Landstrasse near Kiel-Wellsee (photo: W. Dörfler).

» Rutted tracks caused the paths to become increasingly wider and led to the formation of hollow-ways on slopes. «

cases, their function is unclear. Lacking traces of usage rather speaks against an intensive utilisation by cattle and wagons or sledges. Often, ritual purposes are attributed to them. In the old moraine landscapes of Northern Germany, the unpaved roads and paths were often worn down into the sandy subsoil and would have been difficult to pass after rainfall. Difficult transport conditions are also documented for supra-regional traffic routes, such as the medieval and modern army or oxen routes through Schleswig-Holstein and Denmark (cf. contribution by J. Kneisel *et al.* in this volume). Rutted tracks caused the paths to become increasingly wider and led to the formation of hollow-ways on slopes. Such long-distance routes served not only for trade, but also as deployment routes for armies and, in the Middle Ages, as pilgrimage routes.

Even in recent times, long-distance trade routes in the young moraine, such as the Segeberger Landstraße between today's Kiel and Bad Segeberg,

were unsurfaced or were paved with simple cobblestones. On the outskirts of the city of Kiel, a section is well preserved due to altered routing of the modern road. It gives us an impression of the appearance of such regional traffic routes until modern times. Frequent complaints about rutted and difficult-to-pass stretches of road were the result. It was not until the end of the 18th century CE that Count Andreas Peter Bernstorff, as head of the German Chancellery in Copenhagen, took up the matter. The road regulations published in 1784 distinguished between three classes: National and military roads with postal and freight traffic, country roads and paths connecting towns and market towns, and church, funeral and estate roads. The respective residents were responsible for the construction and maintenance of the roads, which meant that the quality, especially of the long-distance roads, still did not change for a while.

It was only 200 years ago that roads began to be adapted to better traffic routing. For exam-

ple, the first paved road in Schleswig-Holstein, the "Altona-Kieler Chaussee", was built between 1830 and 1832 using the so-called macadam method, in which three layers of differently sized, crushed and well-compacted stones form the road surface. This made it possible to reduce the travel time for the 91 km route from 24 to 10 hours. Other roads and paths, however, remained in poor condition until modern times, and many villages did not receive a paved or tarred connection until the middle of the 20th century CE. Transporting goods on the unpaved roads was arduous. In impassable terrain, it would have been preferable to use pack animals. This was also the rule on the numerous salt roads documented for the Middle Ages. In the mountains, donkeys and humans are still used today as porters to supply alpine huts.

Moreover, long-distance trade was intensely carried out with boats and ships along the coasts and on the major rivers. Particularly for bulk goods and bulk cargo, transport via waterways provides clear advantages. For example, in order to improve the transport of salt from the Lüneburg salt works via Lübeck to the Baltic region, which was of elementary importance to the Hanseatic League, the *Stecknitzfahrt* was built between 1392 and 1398 CE as the first European watershed canal. This 97 km long waterway had to overcome 18 m in altitude, for which two natural river courses were altered and an 11.5 km long canal with several locks was built. This enabled salt barges carrying just over one tonne of salt to reach Lübeck from Lüneburg in five weeks.

Land and water routes have opened up landscapes since prehistoric times and contributed to their transformation into cultural landscapes. They enabled the exchange of goods and the development of trade networks. At the same time, they ensured contact and exchange between people. However, villages near historical military routes have always suffered greatly from the quartering of soldiers passing through. Routes were and continue to be an important landscape element that is the basis for the exchange of people, information and goods. ◆

» **In order to improve the transport of salt from the Lüneburg salt works via Lübeck to the Baltic region, [...], the *Stecknitzfahrt* was built between 1392 and 1398 CE as the first European watershed canal.** «

» **[...] the first paved road in Schleswig-Holstein, the 'Altona-Kieler Chaussee', was built between 1830 and 1832 [...]. The travel time for the 91 km long route was thus shortened from 24 to 10 hours.** «

Henny Piezonka and Karolina Varkuleviciute

Entangled Mobilities – The Interconnection of Human Routes and Animal Movement

← **A Nenets reindeer keeper on the Yamal peninsula, Siberia, on the way with his animals (photo: O. Kardash, OOO Severnaya Arkheologiya, Nefteyugansk).**

Multispecies societies on the move

Everyone knows images of hunters ambushing a group of game moving by, of a nomadic yurt in the steppe surrounded by horses, or of a shepherd guiding his flock of sheep across a mountain side. All these situations illustrate an important aspect of human mobility: Its interconnection with the movements of animals.

In archaeology, the mobility of people is a central field of inquiry. It can inform us about key aspects of the past life worlds that we study, such as economies, communication networks and even social structures. An aspect that sometimes does not receive sufficient attention, compared to its relevance, is that these human mobility patterns can be deeply entangled with animals and their movements in the landscape. Such mobilities are, so to say, integral parts of "more-than-human", multispecies worlds and, as such, they strongly depend on the non-human actors, their behaviour, needs, and decisions. In academia, including archaeology, the realisation is gaining ground that the nature-culture divide is a (western) construct. Collaboration of researchers with traditional knowledge holders in non-Western societies, e.g. through ethnoarchaeological approaches, and indigenous-led archaeologies increasingly focus on alternative world views and ways of being in the world that are based more on an integration of humans within their animate and inanimate surroundings. Frameworks of traditional ecological knowledge help to shed new light on human-animal relations and their variations in the past, forming the background for our brief account of the role of such relations for the movement and routes of people.

In order to illustrate this conundrum, we will now take a look at forager and herder societies in various Eurasian landscapes. A basic difference between animal-related mobility of hunter-gather-er-fishers and of pastoral nomads is that the former tend to move towards resources for human consumption while the latter move towards resources for consumption by the livestock. As we will see, there is a spectrum in the extent to which human decisions vs. animal behaviour influence these movements.

Hunter-fishers and animal cycles

Mobility patterns of hunter-gatherer-fishers are highly intertwined with the movements of animals and their predictable, or less predictable, presence at certain places in the landscape. The preferred routes of game species as well as hot spots in seasonal abundance of migratory birds and anadromous fish are well known to the hunters, who are experts in animal behaviour, and their own movements in the landscape depend on them. Meetings on these intersecting routes of humans and animals take place at nodes in space and time, which can involve physical constructions, such as rows of pit traps marking hunting activities at favoured migration routes of large mammals, or stationary fish fences at seasonal mass harvesting hot spots of migrating fish. Archaeological traces of such constructions can yield insights of past entangled mobilities of the respective humans and animals. Such movement patterns can entail the active management of the animal populations and their behaviour. People in hunter-fisher communities often try to influence the ways of the animals through rituals, but also through landscape management, for example, by the controlled burning of vegetation in order to open up areas to attract animals. The protection of certain biologically relevant sites through (temporary) hunting and fishing taboos can be practiced in order to ensure the sustainability of economically important animal populations.

> » **Vertical transhumance [...] involves the periodic movement of herds of domestic animals [...] between seasonal pastures in low and high-altitude regions.** «

Nomads and their animals in tundra and steppe landscapes

In the wide-open spaces of the tundra in the north and the steppe belt in Central Eurasia, various forms of nomadic pastoralism, mobile life ways of humans and their herds of animals have developed. A specific system concerns sub-recent and contemporary reindeer herding in the tundra in Northeastern European Russia and Western Siberia. Here, large herds sometimes consisting of thousands of these semi-domesticated animals provide their keepers with more or less everything needed, from food, raw materials for tools and clothing, to transport, as the deer are also used as draught animals for the sledges. What is astonishing in this system of very closely-knit human-animal co-existence in an extreme environment is the fact that the routes of the yearly migration rounds are largely decided by the deer, not the people. Between the airy summer grazing grounds in the northern tundra and the sheltered winter pastures at the edge of the taiga forests to the south, distances of 500 km and more are covered one way. Humans mainly influence the speed of these treks and decide on the numerous stops along the way where camp is set up for a few days.

Mobile pastoralism in the Eurasian steppes already developed thousands of years ago in the remote times of the Stone Age, starting as early as 6500 BCE in the southern regions. This system involved domesticated animals, such as sheep and goat, horses and camels, and cattle, providing humans with food, materials, transport, and company. Nomadic pastoralism in Central Asia is based either on seasonal movement between the sedentary villages and various pasture lands, or between various seasonal settlements in order to get the best pasture for animals. Sufficient good options for the movement of humans and their animals to new places are particularly important when herd sizes are large and can quickly overgraze the land. In the Near East, mobile pastoralism is focussed on routes along the river valleys, when the dry season limits the extent of fertile grazing pastures.

Herder mobility in the mountains: Mediterranean transhumance

Vertical transhumance is a specific pastoral animal husbandry practice. It involves the periodic movement of herds of domestic animals (in Eurasia commonly sheep, goats and cattle, in America camelids such as llamas) between seasonal pastures in low and high-altitude regions.

In the Mediterranean region, this mobility system has been in use as early as the Neolithic from 5000 BCE onwards (soon after the domestication of animals), and it still remains in practice to this day. Most researchers agree that transhumance arose as an adaptation to climatic extremes of the lowland regions. The summer droughts make the lowland pasture unpalatable for the animals, forcing herders to move their animals to the highland pastures to enjoy cool and well-watered grazing. The earliest instances of the practice of transhumance left little archaeological evidence in caves, rock shelters and storage pens, indicating the existence of seasonal occupation of the sites and that they were likely occupied repeatedly for several seasons. Fast-developing scientific techniques, such as stable isotope analysis, have been able to confirm that vertical mobility was practiced to some extent already in the later Stone Age.

In the protohistoric and historic eras, much richer evidence of transhumance is preserved in the form of maps, literary sources, road limit stones and more permanent shelters that exist in the pasture

← A herd moving through a barren grazing area in Southern Jordan near Wadi Finan (photo: K. Varkuleviciute).

sites. We know that there were established networks of big and small roads connecting the lowland settlements and the upland pastures. These routes shaped the way people lived and moved and they also affected the landscape organisation and settlement development. Urban and rural settlements likely developed near the intersections of the transhumance roads, known as *tratturi* in Italy, *cañadas* in Spain, and *carraires* in France. Other important features were also found along and near the roads, such as bridges, churches, taverns, farms and villas, which show that these transhumance routes played a vital part in the everyday life of the communities. Such roads also changed over time to adapt to changing needs, e.g., widening of the roads to accommodate bigger animal herds or the creation of new roads for faster access to certain pasture lands. Even today, transhumance routes are constantly changing as the more traditional roads are being limited, reduced or replaced by more modern ways of transportation such as trains and trucks.

While in the Mediterranean region, seasonal transhumance is mainly practiced due to environmental reasons involving summer droughts in the lower altitudes, in the Alps, transhumance is practiced more strongly for agricultural reasons: Here, the lowlands are cleared for cereal cultivation. Thus, the animals are moved upland for grazing and then brought back down when the conditions in the mountains become too cold.

Conclusions

As our examples from hunter-gatherer and herder life worlds illustrate, animal mobility routes were anchor points for the way that people understood, inhabited and organised their landscapes. Animal mobility routes have been important to humans not only economically (food) but also culturally and socially, for example, as meeting places at intersections or through ritual and cosmological connotations of certain routes and places. In historical times, roads developed alongside the humans and animals to accommodate their lifestyle and needs, leading to new and sustainable networks of connectivity. ◆
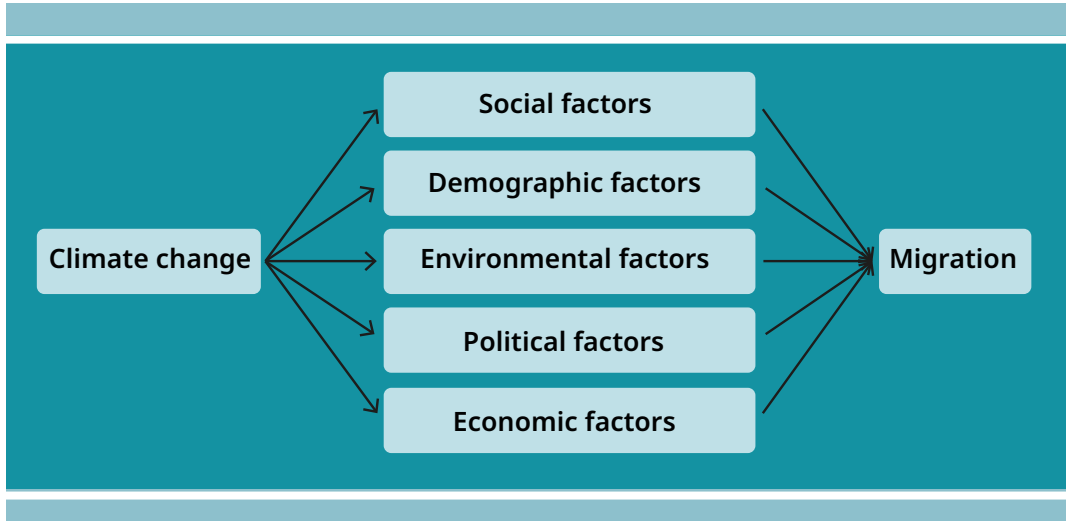
Mara Weinelt

Climate Refugees

Estimates by the Intergovernmental Panel on Climate Change (IPCC) assume, based on modelled predictive climate scenarios, that more than 200 million people will have to leave their homes and become refugees by 2035 due to climate change. Even if it were possible to reduce global warming to below 2°C, the experts assume that there will still be 250 million climate refugees in 2100. Particularly at risk from the consequences of climate change are the Arctic, the small island states in the Pacific, the densely populated estuaries in Asia, and the areas of Africa south of the Sahel, due to warming, rising sea levels, droughts and floods. Not only here, but worldwide, climate change is causing entire ecosystems to change, an acute challenge for humanity still growing in its consequences. In Europe, too, people have recently been increasingly exposed to extreme events. Hazards such as more frequent, more severe droughts and heat waves, as well as flood and storm events, urgently require new strategies to counter climate change.

← **Multi-causal scheme of a concept of climate change and migration (after Felgentreff and Geiger 2013).**

Estimates by the Intergovernmental Panel on Climate Change (IPCC) assume, based on modelled predictive climate scenarios, that more than 200 million people will have to leave their homes and become refugees by 2035 due to climate change. Even if it were possible to reduce global warming to below 2°C, the experts assume that there will still be 250 million climate refugees in 2100. Particularly at risk from the consequences of climate change are the Arctic, the small island states in the Pacific, the densely populated estuaries in Asia, and the areas of Africa south of the Sahel, due to warming, rising sea levels, droughts and floods. Not only here, but worldwide, climate change is causing entire ecosystems to change, an acute challenge for humanity still growing in its consequences. In Europe, too, people have recently been increasingly exposed to extreme events. Hazards such as more frequent, more severe droughts and heat waves, as well as flood and storm events, urgently require new strategies to counter climate change.

However, the concept of the environmental or climate refugee, which originated in the 1980s and was coined in the early 2000s for the people evacuated from New Orleans in the wake of Hurricane Katrina, is by no means uncontroversial. Today, the term "climate refugee" refers rather vaguely to all those people who, due to regional effects of global climate change and their consequences, leave their home territories for a longer period of time or forever and seek to find a livelihood elsewhere. Thus, there is still no definition of environmental and climate refugees, nor is there any monitoring of climate migration at all. Therefore, estimates based on predicted climate scenarios are subject to very large errors, and in some cases the existence of climate refugees is questioned altogether. Consequently, more forward-looking and adequate mitigation strategies are lacking more than ever. Generally, in a one-sided biased political debate (i.e. standpoints of countries potentially obliged to take in refugees), refugee movements are seen as failures of adaptive capacities rather than adaptive strategies. Thus, in the Geneva Refugee Convention as well as in the German asylum law, the right to asylum for climate refugees has so far only been considered if their home country has become altogether uninhabitable. Most studies, however, point to multi-layered causes, with environmental changes being the trigger, but not the sole reason, of migration decisions. Scientifically, too, the connection between climate change, migration and flight is considered to be insufficiently studied so far. In particular, the potential of migration as an adaptation mechanism is still too seldom recognised. There is a view that regards migration as less problematic, appreciating it as a contribution to solve problems caused by climate change.
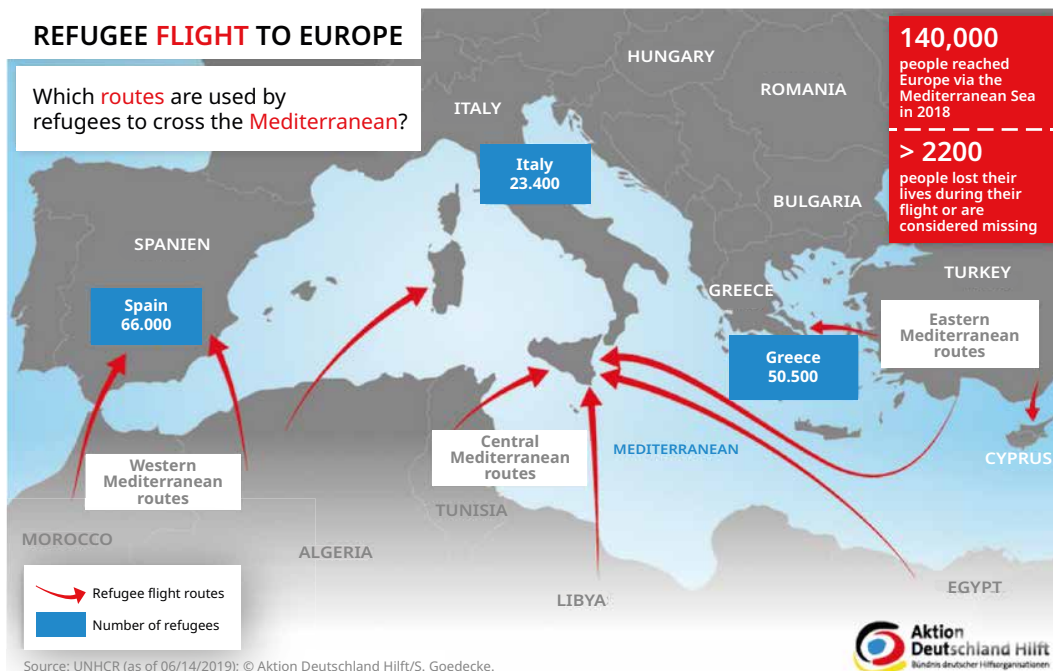
» In particular, the potential of migration as an adaptation mechanism is still too seldom recognised. There is a view that regards migration as less problematic, appreciating it as a contribution to solve problems caused by climate change. «

Understanding long-term processes: A view into the past

To better understand these connectivities and patterns, it is worth taking a look at the past. For example, analysing the roles of climate change and social factors in past migration movements can contribute to a better understanding of what consequences such dynamics would have had for the affected regions in the long term. We can identify alternative strategies, structural features and innovation potentials that made earlier human societies resilient to the threats of climate changes. This makes it possible to test hypotheses asserting that societies with good cohesion and social equilibrium would have developed better ways of balancing resources and other forms of sustainability, thereby mitigating climatic stress in the long term. Ultimately, it is precisely conclusive archaeological-environmental analytical narratives that can contribute to a paradigm shift in the highly political debate, fore-

grounding the adaptive potentials of migration as well as addressing the causes of distress of those affected. To this end, it is of central importance to better empirically grasp the interdependent effects and complex dynamics of climate and societal change over longer periods of time.

While the extent and speed of current anthropogenic climate change and its consequences are indisputably without precedent in human history, historical and prehistoric climate crises can certainly be seen as precursors of present and future crises. Archaeological evidence shows that human settlement patterns have repeatedly responded to rapid climate change and that profound social transformations have often been associated with changes in the climate system and associated environmental transformation. In retrospect, humans as cosmopolitans demonstrated early on their ability to adapt to the most diverse climatic conditions prevailing on earth. They have survived there even under extreme

REFUGEE FLIGHT TO EUROPE

Which routes are used by refugees to cross the Mediterranean?

140,000
people reached Europe via the Mediterranean Sea in 2018

> 2200
people lost their lives during their flight or are considered missing

HUNGARY
ROMANIA
ITALY
BULGARIA
SPANIEN
GREECE
TURKEY

Italy 23.400

Spain 66.000

Greece 50.500

Eastern Mediterranean routes

Western Mediterranean routes

Central Mediterranean routes

MEDITERRANEAN

CYPRUS

MOROCCO
ALGERIA
TUNISIA
LIBYA
EGYPT

→ Refugee flight routes

▮ Number of refugees

Aktion Deutschland Hilft
Bündnis deutscher Hilfsorganisationen

Source: UNHCR (as of 06/14/2019); © Aktion Deutschland Hilft/S. Goedecke.

conditions if the necessary economic, scientific, technical and cultural achievements were accessible and permanently usable. Migration is a deeply rooted adaptive pattern that has also served as a catalyst for the development of appropriate strategies to deal with rapid climate change. Such strategies include not only episodic climate migration, as practised in sub-Saharan Africa for generations, but also agropastoral economic strategies, for example, seasonal transhumance practised in the Mediterranean region for millennia (cf. contribution by H. Piezonka and K. Varkuleviciute in this volume).

A global climate crisis 4200 years ago

New methodological/empirical approaches enable a backward-looking monitoring of past refugee movements under increased climate stress on established/potential routes along ecological and/or economic gradients. For this purpose, archaeologists and environmental scientists jointly

↑ Today's refugee flight routes across the Mediterranean to Europe. The share of "climate refugees" is unclear (map: after © Aktion Deutschland Hilft / S. Goedecke; source: UNHCR, as of 14.06.2019).
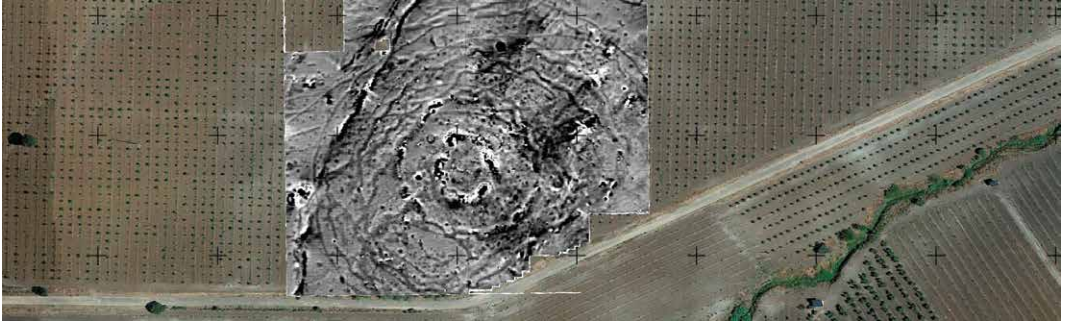
↑ Geomagnetic reconstruction of the large ditch Monte da Contenda, Arronches, Portugal. Such Copper Age mega-settlements, which had previously existed for many centuries, were almost completely abandoned in the wake of the 4.2 ky climate crisis on the southwestern Iberian Peninsula (after A. Ribeiro *et al*. 2019).

identify, reconstruct and analyse the social consequences of past climate crises and evaluate changing settlement and population patterns as well as environmental conditions from different regional archives. Climate crises similarly severe to those of today and the future were last found in the middle Holocene (approx. 8000 to 4000 years ago). At that time, warmer and partly unstable conditions prevailed compared to today's or pre-industrial ones, combined with environmental hazards of a similar nature. Apart from biblical exodus scenarios, the best-known historical example of a "global climate crisis" of the last 5000 years is the so-called 4.2 ky (= kilo year) event. Triggered by a shift of the monsoon system, a prolonged period of drought about 4200 years ago led to the collapse of large urban centres in Mesopotamia and triggered large-scale refugee movements from the arid regions to the riverine areas. New strategies to manage these dense populations against a background of scarce resources is considered an important driving force for the de-

velopment of early societies. Evidence of direct local and long-distance effects of these events is found widely across the northern hemisphere. These effects on different cultures under different climatic and other initial conditions are currently the subject of intensive research.

Climate and Adaptation in Bronze Age Iberia

A study in the Kiel CRC 1266 'Scales of Transformation' has shown that the 4.2 ky event manifested itself with pronounced periods of drought on the southern Iberian Peninsula, a marginal region for which above-average increases in aridity are predicted today. These were accompanied by large-scale population changes at the transition from the Copper Age to the Bronze Age, but proceeded differently and partly in opposite directions in the eastern and western sectors. Southwestern Iberia experienced a sharp population decline under dry cold winter conditions, with activity in almost all promi-

> **» [...] it is of central importance to better empirically grasp the interdependent effects and complex dynamics of climate and societal change over longer periods of time. «**

nent Copper Age large settlement complexes ceasing around 4200 years before present. The emerging El Agar culture in the southeast boomed despite similarly unfavourable climatic conditions with large population increases and apparently well-adapted economic and resource management strategies until around 3600 before present. A slow recovery of population numbers and the establishment of new Bronze Age cultures in the southwest, on the other hand, cannot be recorded until several centuries later. What role population movements from east to west actually played at that time is currently still difficult to reconstruct. Further studies of kinship relations between the two regions on the basis of their genetic and cultural signatures will provide further information here. ◆

Chapter 3:

How Far Back Do Our Routes Go?

Ahrensburgian site
Federmesser site
Hamburgian site
Heligoland

Berit Valentin Eriksen and Wolfgang Rabbel

Sunken Pathways in the North Sea: Tracking Late Palaeolithic Reindeer Hunters off the Coast of Heligoland

Towards the end of the last Ice Age, hunter-gatherer groups had to cope with extensive climatic changes. As the world warmed, glaciers melted, oceanic water levels rose, large areas were flooded, and entire landscapes disappeared beneath the sea. This dynamic pattern of landscape change is a major focus of our research, as we investigate the timing and nature of hunter-gatherer colonisation of Northern Europe during the Late Pleistocene and Early Holocene (ca. 15,000-9500 BCE). Our study region accordingly extends far beyond today's terra firma, into the past landscapes flooded by the North Sea.

Archaeological artefacts as well as faunal remains dredged from the sea bed show that mobile hunter-gatherer groups once exploited Doggerland, a now submerged area in the North Sea. Evidently, the past human use of this extensive region – connecting Denmark, Germany, the Netherlands, Belgium and Great Britain – is crucial for our understanding of prehistoric colonisation and occupation behaviour in Northern Europe. Today, the southern North Sea, in particular, is known as a treasure trove of sediments, bones and artefacts dating from the Pleistocene and the Early Holocene. From the area around the island of Heligoland, Stone Age artefacts have not yet been reported. However, onshore archaeological finds indicate that during the Late Palaeolithic period (ca. 15,000-9500 BCE), prehistoric hunter-gatherer groups may have travelled between Heligoland and the present-day mainland with toolkits manufactured from highly characteristic red Heligoland flint.

The Late Palaeolithic hunter-gatherer groups were highly dependent on reindeer, and it is most likely that these people ventured out into the Doggerland area in pursuit of migrating reindeer herds. Reindeer bones are often fished or dredged from the North Sea bed, and it is generally assumed that reindeer herds migrated between the present-day mainland and past Doggerland areas on a regular basis. Thus, results of isotopic analysis suggest that reindeer herds largely moved in an east-west direction through the region during the period in question, probably wintering in the east, and migrating along the large river systems and glacial meltwater valleys to summer pastures in the west, i.e. to Dog-

← Approximate extension of Doggerland (blue shades) in Late Glacial times. Sea level and glaciers at ca. 11,000 BCE. The map shows the location of archaeological inventories from the main Late Palaeolithic cultural groups (*Hamburgian*, *Federmesser* and *Ahrensburgian*) with artefacts manufactured from red Heligoland flint (after C. Lux-Kannenberg, Stiftung Schleswig-Holsteinische Landesmuseen, Schloss Gottorf).

» Past humans would have followed certain routes based on the environmental preconditions. «

gerland. The existence of means of transport (boats, sledges, skis) in the Late Palaeolithic is controversially discussed, as no direct evidence is available. Thus, we must presume that the "pursuit of reindeer" took place by intercepting the herds on their seasonal migrations, and that human groups would have set up camps at vantage points that also provided other resources while waiting.

The modern terms used for the most important Late Palaeolithic cultural groups of reindeer hunters (*Hamburgian* and *Ahrensburgian*) derive from eponymic sites located north of the Elbe River in the Ahrensburg Tunnel Valley near Hamburg. Over a course of several thousand years, the prehistoric hunters repeatedly set up camp here. Unquestionably, the ancient course of the Elbe River marked a very important migration route throughout the period in question. This route would have taken the reindeer and their hunters straight to Heligoland, which back then stood out as a permanent landmark in a vast and transforming landscape. The reminiscence of Australia's "Ayers Rock" is obviously speculative, but it may not be too far-fetched from the point of view of the past hunter-gatherer groups. Heligoland would certainly have been a vantage point giving the hunters a perfect view across the landscape and the ability to spot moving reindeer herds from far away. Moreover, Heligoland is the only place west of the young morainic area that provides a good-quality flint outcrop. In the Stone Age, this would have been a much-coveted resource, even worth a detour from reindeer hunting.

Investigations under water

Due to its recent history, including severe bombing during WW2, there are no remains of Stone Age settlements left on Heligoland. Even the outcrops of flint formerly exposed on the nearby Düne Island have now vanished completely. To investigate the settlement and mobility patterns of past hunter-gatherer groups, we must accordingly turn to look at the submerged surroundings. Here the sunken landscape in the area to the north and northeast of Heligoland presents a highly interesting option in order to model and predict prehistoric site locations. We presume that this area once would have offered great potential for Late Palaeolithic settlements. Admittedly, we do not yet know to which degree these prehistoric landforms and settlement sites are still preserved under the sea: This is research in progress.

Prehistoric hunter-gatherer groups are usually characterised by a high degree of mobility and even on dry land, their campsites are often elusive and accordingly hard to find. Yet, based on ethno-archaeological studies and regional surveys examining large numbers of prehistoric settlement remains, we find that there are certain rules of thumb per-

↓ **Example of red Heligoland flint (courtesy of S. Hartz, Museum for Archaeology, Stiftung Schleswig-Holsteinische Landesmuseen, Schloss Gottorf).**

↑ **Artist's depiction of Late Palaeolithic reindeer hunters in front of Heligoland (courtesy of the Museum for Archaeology, Stiftung Schleswig-Holsteinische Landesmuseen, Schloss Gottorf).**

taining to the location of settlements. Past humans would have followed certain routes based on the environmental preconditions. These routes are especially easy to track if there is a large waterbody (e.g. a lake or a major river) to guide the movements in the landscape. Vantage points (i.e. hilltop locations with a good view of the surroundings) are usually only occupied briefly due to the exposed location of such places. More often, sheltered locations near a freshwater source are preferred.
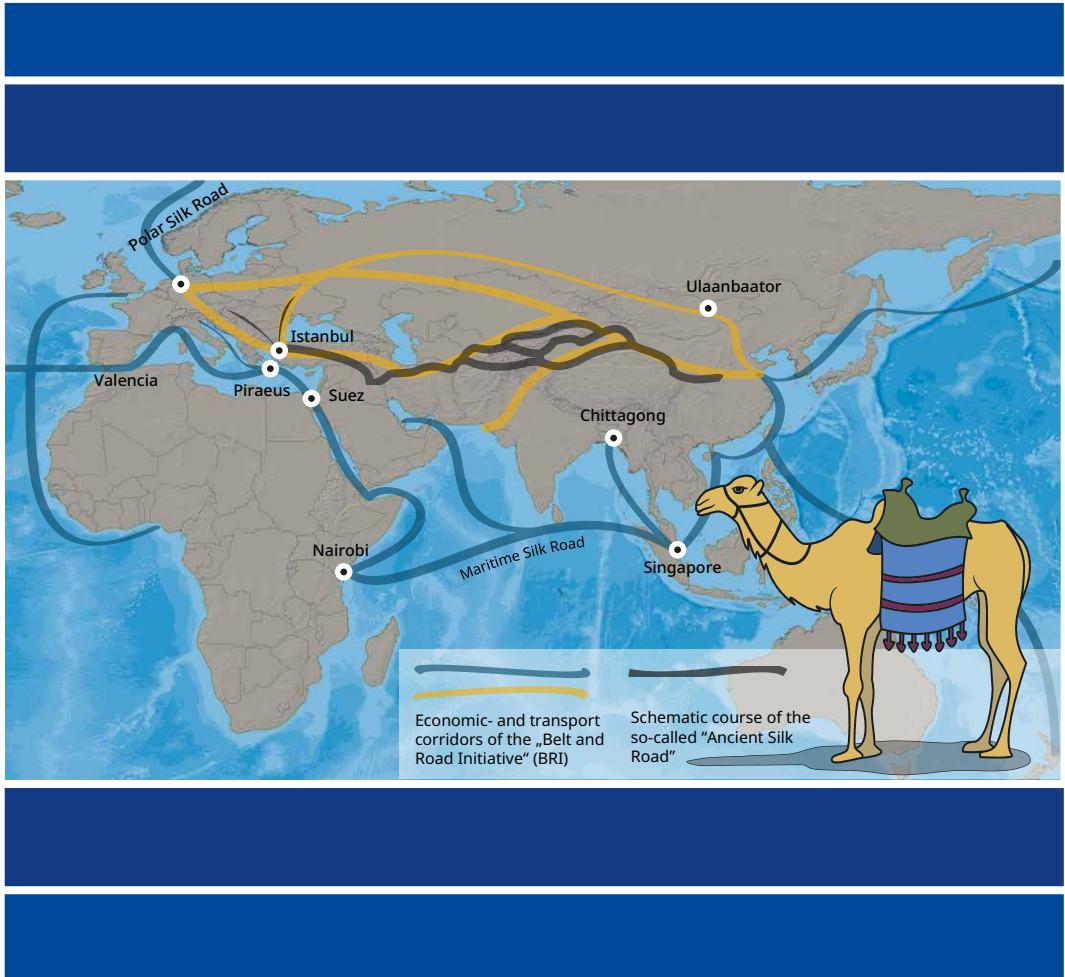
Perspectives for research

In our research, we aim to reconstruct the Late Pleistocene and Early Holocene landscape in the present-day North Sea area north of Heligoland that was once extensively exploited by Late Palaeolithic hunter-gatherer groups. For this early population, Heligoland must have been of immense importance as a landmark that could be seen from afar. It must have been a reference point in a vast landscape and at times perhaps the only solid object in a dynamic environment. At the same time, Heligoland was the source of high-quality flint which was already transported in the Late Palaeolithic over long distances into the present-day inland areas. The reconstruction of the prehistoric settlement patterns and mi-

gration routes in the submerged area is therefore one of the central unresolved questions of today's Stone Age research for Northern Central Europe.

To address this research question, we apply high-resolution marine geophysics measurement methods (e.g. hydro-acoustics) to investigate and map the past landforms that lie under the sea today. Special focus will be put on the drainage patterns, as they have played a vital role for the mobility and settlement dynamics of prehistoric hunter-gatherer groups. The sedimentary fill of channels will be investigated in detail in order to reconstruct their development. For ground truthing, a number of sediment cores will be analysed using high-resolution, multi-proxy methods (looking at sediment, pollen, foraminifera, as well as plant and insect macrofossils). Integration of the core data and the sediment echo-sounder data will eventually lead to a detailed model of the now submerged palaeolandscape, potentially allowing us to determine likely locations of hunter-gatherer settlements and related migration paths on land and water from the period in question. ◆

Johanna Hilpert and Jutta Kneisel

Rooting the Silk Road

Economic- and transport corridors of the „Belt and Road Initiative" (BRI)

Schematic course of the so-called "Ancient Silk Road"

Since time immemorial, people have used certain routes for migration, exchange and trade. They developed long-distance communication networks. Not only were goods distributed along these routes, but ideas, innovations, technologies and genes or diseases also spread. These corridors, shaped by geographical conditions, have always had a great influence on local as well as trans- and intercontinental developments. Sites in advantageous locations could, for example, gain control over the flow of goods, and they thus would have developed strategic advantages over more remote settlements.

"The New Silk Road", aim and process

The economic importance of these corridors has recently been brought back into the focus of public interest by the Chinese Belt and Road Initiative (BRI). BRI aims to enable and consolidate the connection from East Asia to Africa and Europe by establishing an economic route through the development of infrastructure over land and sea. In doing so, existing structures are further developed. Moreover, new supply routes and hubs such as ports, freight stations and entire associated cities are being created.

Connections from China to Europe exist along four main routes. Maritime routes reach the European continent via the Far North ("Polar Silk Road") and in the south via the Mediterranean ("21st Century Maritime Silk Road"). The land-based corridors run, on the one hand, across the land bridge south of the Black Sea and, on the other hand, in the northeast across the Urals. The southwestern route runs through Iran, Afghanistan and Turkey, crossing the Bosporus, and continues along the Danube lowlands into Central Europe. The northeastern route runs through Siberia and across the North European Plain, where it joins the southeastern route near Berlin and leads to the major transhipment centres around Nuremberg and Duisburg.

← Economic and transport corridors of the Belt and Road Initiative (BRI) and schematic course of the ancient Silk Roads (map: J. Hilpert).

It is obvious that the course of these routes has been influenced by the landscapes through which they pass. Thus, river valleys, mountain passes and land bridges form natural corridors. Human intervention and technical innovations, such as the construction of the Suez Canal or the development of aeroplanes, have had profound effects on the flow of goods and people. However, the basic course of shipping routes, roads and railways has always been subject to the same laws. Thus, the major patterns of today's trade and communication routes can be traced far back into the past.

"Silk Road(s)" in the 2nd century BCE

The "New Silk Road", which refers back to (pre-)historical times, is also part of the Chinese narrative of the 21st century CE. Since the beginning of the initiative, references have been made to the famous ancient Silk Road, which is said to have connected the Chinese region with Europe since as early as the 2nd century BCE. The term "Silk Road(s)" was coined at the end of the 19th century CE by the geographer Ferdinand Freiherr von Richthofen. He used it to describe the routes that connected the Far Eastern Han Dynasty with the Mediterranean region and Rome more than 2000 years ago. However, this was not a single defined road across the Asian continent, but a whole network of connecting routes that linked a very large geographical area. Far more than just silk as a commodity moved along these routes. Not only animals, people, languages, innovations and religions but also conflicts and diseases, such as the plague, spread along them.

Examples of prehistoric routes (1): The first migration wave of *Homo sapiens*, from ca. 100,000 to 25,000 BCE

The aforementioned corridors, which were so extremely important today in the development of the BRI and in the historical so-called Silk Roads, already played an important role much earlier. In prehistory, i.e. in the time before the beginning of recorded history, the connecting routes from the Bosporus over the Carpathians and the Alps in the south and the route from the Urals to the North European Plain in the north were important. The use of these routes can be traced in the distribution patterns of archaeological finds.

ern humans reached Romania no later than 40,000 years ago, and then arrived in Portugal at least 25,000 years ago.

Examples of prehistoric routes (2): Spread of new life concepts with the first farmers in Central Europe, from 8000 to 5000 BCE

The spread of the first farmers towards Central Europe also took place along the same corridors as before. In the area of the Fertile Crescent in the north of the Arabian Peninsula, the first groups of people gave up their existence as hunter-gatherers about 10,000 years ago and became sedentary.
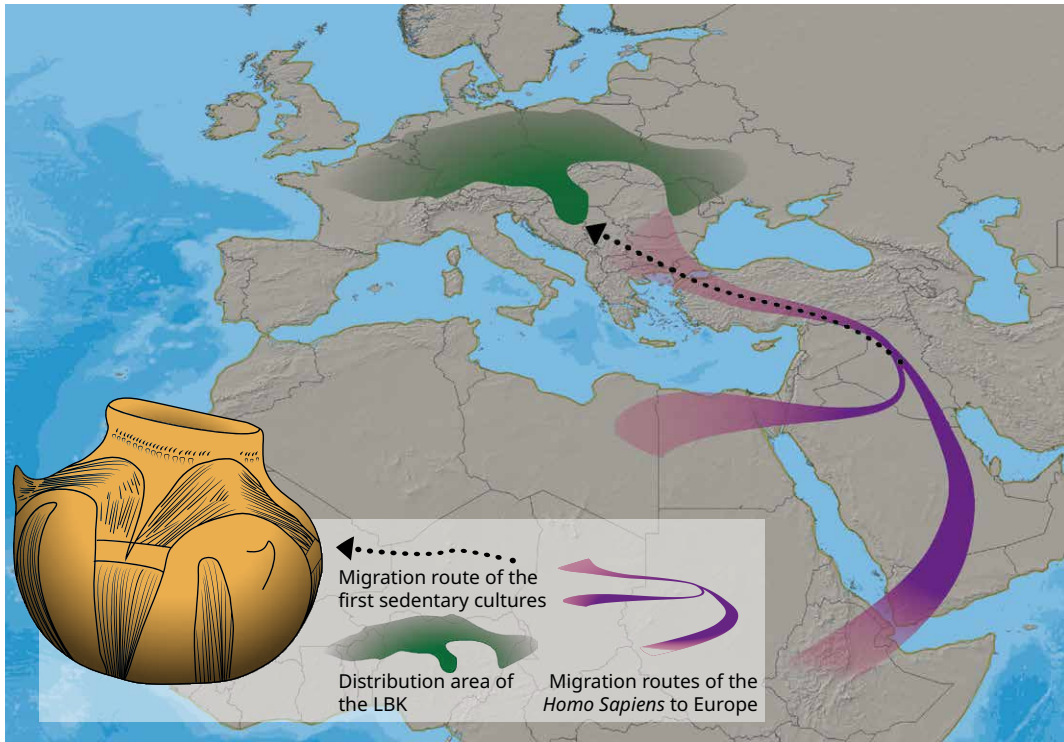
» **Since time immemorial, people have used certain routes for migration, exchange and trade. Not only were goods distributed along these routes, but also ideas, innovations, technologies as well as genes or diseases.** «

The remains of the first modern humans, *Homo sapiens*, for example, make it possible to trace their migration to Europe. The earliest findings indicate that the first groups left the African continent more than 100,000 years ago, passing through the same geographical corridors that the BRI uses today. They reached the Arabian Peninsula via the Sinai Peninsula as well as by crossing the "Gate of Tears" – the Bab-el-Mendeb Strait – between the Red Sea and the Gulf of Aden. Human bones, but also other finds, such as stone tools as well as genetic studies, prove that a main route of migration traversed the Levant and led across the strait between the Black Sea and the Sea of Marmara to Europe.

The settlement of the rest of the world from Africa occurred in several waves. While it is impossible to assess whether all waves of emigration were successful, it is certain that the first groups of mod-

They began to build houses, grow crops, and domesticate sheep, goats and cattle, as well as to produce clay vessels for cooking and storing food.

Overland, these first Neolithic groups reached the Danube Basin via the Bosporus, where the so-called Linear Pottery groups emerged. The Linear Pottery people embarked on great migrations to establish new settlements on the fertile loess soils of Central Europe. They used the Danube Valley as a natural passage through the great mountains of the Alps and Carpathians on their way to the Northern European lowlands. Within a few centuries, the Linear Pottery culture reached its maximum extent. Its territory included the Hungarian Plain and extended from the plains west of the Black Sea in the east to Kujawy in Poland. Running north along the Alps, it reached as far as Western France and the Lower Rhine Plain.

Migration route of the
first sedentary cultures

Distribution area of
the LBK

Migration routes of the
Homo Sapiens to Europe

↑ **Migration routes of anatomically modern humans to Europe and expansion of the first sedentary communities (map: J. Hilpert).**

However, communication within the large dispersal areas of these first sedentary cultures did not break down. Based on decorative elements of the pottery and the distribution of artefacts, such as personal adornments made from spondylus shells from the Adriatic and the Aegean, far-reaching connections can be traced. People did not stop travelling, but rather kept in contact with each other over long distances.

Examples of prehistoric routes (3): New technologies and status symbols in the Bronze Age, from 1700 to 800 BCE
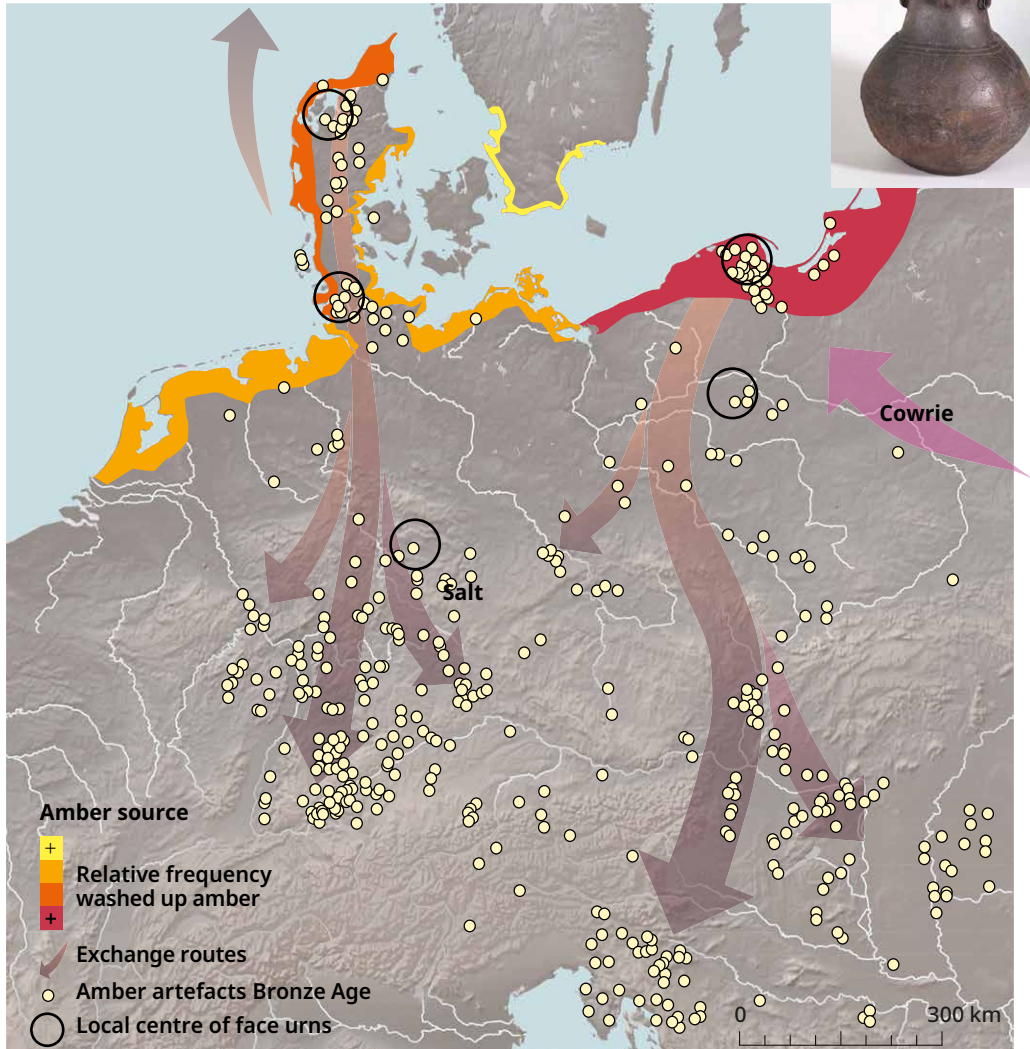
At the beginning of the Bronze Age, the new demand for raw materials, such as copper and tin, led to an intensification of networks. The technical "know-how" of bronze production and the raw material needed for it spread along the Caucasus via the Carpathians further to Northern Europe. This process lasted for over two millennia. Wherever the new metal was used, we witness social changes and an increase in social inequality. Magnificent monumental buildings and rich tombs in many parts of Europe testify to a wealthy upper class that had gained control and power over copper and tin.

These routes can be traced by the distribution of luxury goods such as amber (cf. contribution by B. Serbe in this volume). Amber reached the most remote areas with regular trade goods from the

↓ Natural amber deposits in the North Sea and Baltic Sea regions, distribution of amber artefacts and cowries, and local centres with face urns in the Bronze and Iron Ages (map: S. Beyer and J. Kneisel).

Cowrie

Salt

Amber source

Relative frequency washed up amber

Exchange routes

Amber artefacts Bronze Age

Local centre of face urns

0   300 km

» People have always been mobile. They shape their environment, but the environment also shapes people and their mobility patterns. «

Baltic sites to Egypt and the Levant. The distribution patterns of amber were variable over time, depending on supply and demand. The collapse of entire social systems led to the development of new trading partners and the emergence of new centres that persisted for several centuries. Wealth accumulated in these centres, and far-reaching connections are visible through exotic artefacts.

In the wake of goods and technology, world views and religious elements also spread along these routes. The introduction of cremation as a burial custom, for example, followed the major exchange routes described at the beginning.

Examples of prehistoric routes (4): Iron Age trading centres and traders, from 800 to 400 BCE

But who were the traders? In the Iron Age, centres of power emerge in Europe, again characterised by monumental barrows. Central settlements and individual regions with an accumulation of goods, such as gold and amber, and exotica like glass and cowrie shells as well as ivory testify to trans-regional contacts from the Baltic to the Indian Ocean. Glass and ivory spread via the Mediterranean and the Balkan route to Northern Europe during this period. The cowries, in contrast, reached Poland via the northern route, probably through the mediation of early equestrian nomads, and later via the southern route through Hungary and the Carpathians to Southern Germany.

The wealth of these centres is linked to the control of particular raw materials, such as salt in the southern Harz or in the Alps, amber in Jutland or on the Bay of Gdansk, or metals. In Northern Europe, the traders who travelled back and forth between the centres can be documented by their burial customs. We find urns with faces in Denmark, at the Bay of Gdansk as well as in Central Germany and Italy, always in areas rich in raw materials and always with gaps between these regions (cf. contribution by J. Kneisel in this volume). Individual specimens reach as far as Norway via the polar route.

Conclusion

A view over the millennia shows that the modern Silk Road follows age-old mobility patterns that have promoted the spread of innovations, techniques, raw materials, ideas and also social developments since the beginning of humankind. The routes over land and sea follow natural features such as river valleys, mountain passes, currents and wind directions. Along these routes, centres emerged that had a decisive influence on regional development and where wealth and luxury accumulated in the form of exotica.

People have always been mobile. They shape their environment, but the environment also shapes them and their mobility patterns. For it is the same routes – along which groups of refugees move – that bring new ideas and conceptions to Europe. But they are also the same routes along which technology is disseminated and goods are negotiated. ◆
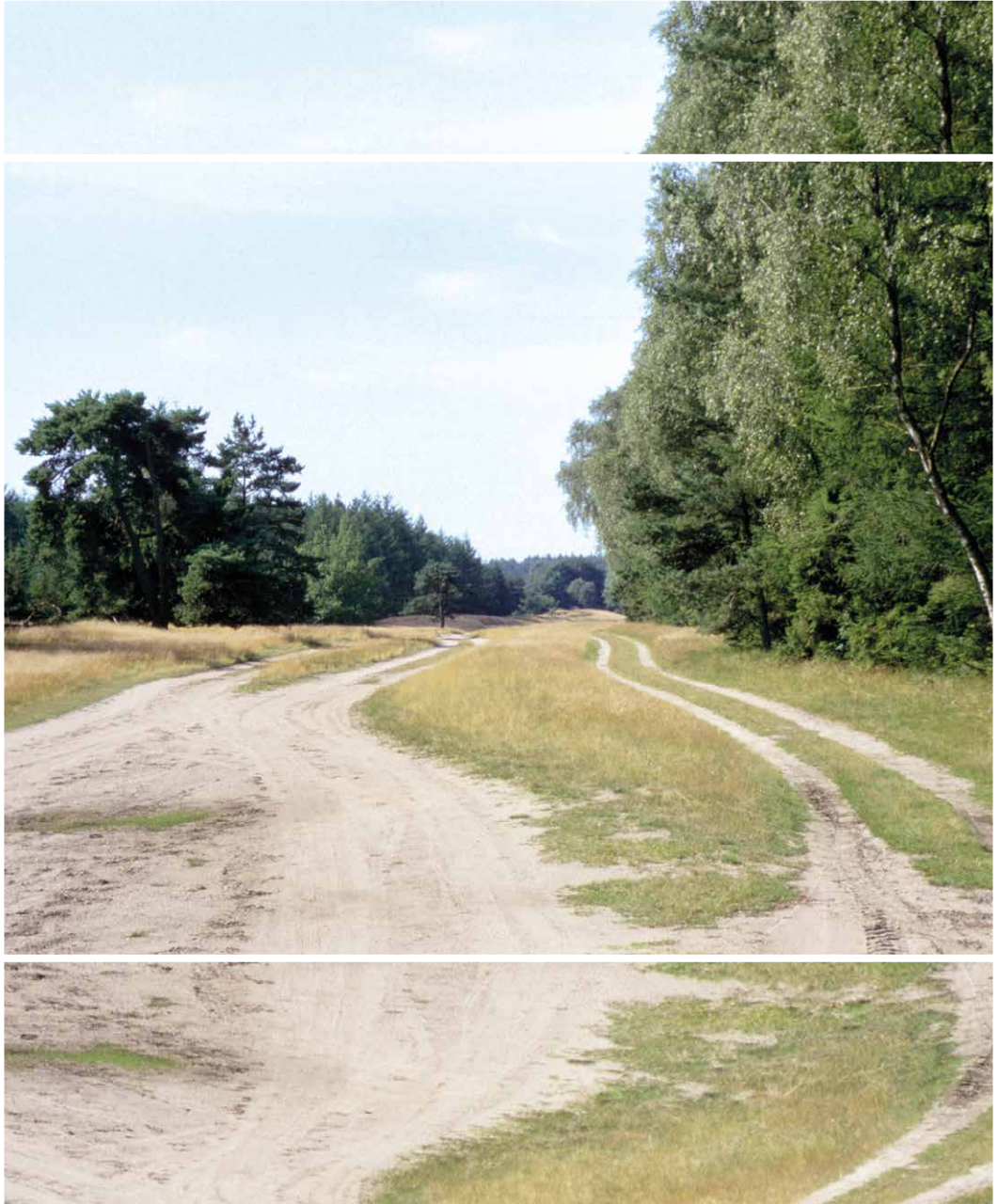
Jutta Kneisel, Bente Majchczack, Franziska Engelbogen, Anna K. Loy, Oliver Nakoinz

On the Road Again: Travelling through Jutland – The Ox Trail, a Millennia-old Route

On the road again. Every summer, a caravan of cars and camper vans moves north to Denmark, Sweden and on to Norway. The destination for thousands of visitors are the summer cottages and campsites of Scandinavia. Counts of overnight stays from 2019 show that the west coast of Denmark around centres such as Ribe and Ringkøbing, Skagen, and Djursland on the east coast are preferred. Two main routes bring the summer guests to their resorts. The European Road E45 (Autobahn A7) leads along the geest moraine ridge from Schleswig-Holstein to the ferry ports in Hirtshals or Frederikshavn, providing connection to Sweden and Norway. The federal roads B5 and B11 run along the west coast towards the north. Today, these well-developed roads make it possible to cover these distances quickly within a day. But the modern routes follow millennia-old trail systems that stretch across the Jutland Peninsula. These routes were not always open, and the destination was not always the north.

The Ox Trail

Today, the Ox Trail is a popular tourist attraction in Schleswig-Holstein. On routes that still bear the name *Ochsenweg* or *Heerweg*, it can be explored by bicycle from Hamburg all the way to Northern Jutland. The name "Ox Trail" dates back to the 16th-18th centuries CE, when the route was used for the mass transport of oxen to Western Europe. Cattle drift was a lucrative business for merchants. They

← The Ox Trail in Schleswig-Holstein (here near Lürschau) formed a route up to 80 m wide (photo: L. Hermannsen, Archäologisches Landesamt Schleswig-Holstein).

»   The Ox Trail is by no means to be understood as a single route. Several trails ran from north to south and sometimes had cross connections.   «
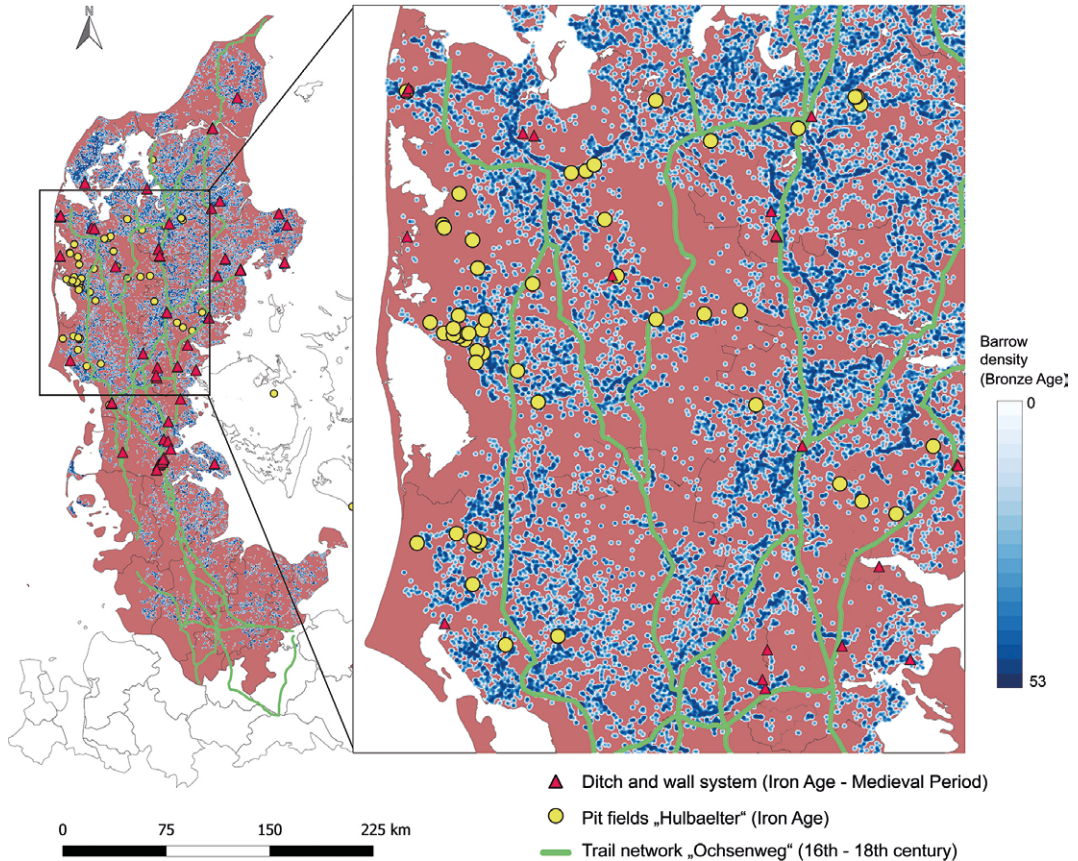
acquired the overstocked cattle in Northern Jutland and drove them to the markets in Itzehoe and Husum for sale in the spring. There the cattle recovered on the fat summer pastures and were sold in the autumn. Up to 24,000 oxen passed the border to Holstein in one year. Along the routes there were rest houses with large grazing areas where the drivers and the cattle could take a break. Depending on the starting point, the journey took one-two weeks with daily distances of about 30-40 km. The Ox Trail is by no means to be understood as a single route. Several trails ran from north to south and sometimes had cross connections. Parts of the main route run parallel to today's European Road E45 and the federal roads along the west coast. Least cost path analysis proves that the route of the *Ochsenweg* actually follows the most cost-effective and shortest paths. Even today, the broadly trodden paths are well visible in some places in the landscape.

Older path systems

The Ox Trail was not created in the Middle Ages, but is based on even older trail systems that existed as early as 5500 years ago. These older path systems are visible in the form of striking monuments in the landscape, the large megalithic structures of the Stone Age, and the barrows of the Bronze Age. Especially the Bronze Age burial mounds, of which we know more than 90,000 today, form a dense network of landmarks. It is very likely that these mounds were built along older paths. Their locations on hilltops and at moraine edges makes them ideal waymarks for Bronze Age connecting routes on the Jutland Peninsula. Even today, the mounds are visible over great distances in the landscape. They represent a complex system of paths. Unlike the Ox Trail, which focuses on exchange along a north-south axis, the Bronze Age routes also indicate local communication networks. They link the hinterland to the higher-level road network. In the Danish Ringkøbing district, the paths run in a circle before they meet the main route again. Ranges of barrows along the Limfjord provide east-west connections between the Baltic and the North Sea. However, the main orientation of the trail routes run in a north-south direction and overlap with the Ox Trail in many parts.

In the Bronze Age, from about 1700 BCE, the north is integrated into a pan-European exchange network. Raw materials, such as copper and tin from which bronze is made, came from the Carpathian Basin or the Alpine region (cf. contribution by J. Hilpert and J. Kneisel in this volume). This important north-south connection and its branches to the east and west facilitated the rise of local centres. In turn, they caused or supported the development of the road network, and wealth could accumulate at their end points. At the same time, during certain peri-

Barrow density (Bronze Age)

0

53

▲ Ditch and wall system (Iron Age - Medieval Period)
◯ Pit fields „Hulbaelter" (Iron Age)
— Trail network „Ochsenweg" (16th - 18th century)

0   75   150   225 km

ods, they were the starting points of cultural development, which spread from there throughout the entire Baltic region. Particularly rich bronze grave goods have survived from the time when the burial mounds were built (1700-1100 BCE). Jewellery discs, fibulas, swords and daggers indicate wealthy social classes that had access to the resources of the south and were buried with ostentatious grave goods and status symbols of the new era. Bronze reached the north via the main route along today's European Road E45 and was then dispersed in Central and Northern Jutland via the smaller road networks.

↑ **The distribution of Bronze Age burial mounds, Iron Age pit fields and Iron Age to Medieval ramparts and ditches, as well as the course of the Ox Trail on the Jutland Peninsula (map: J. Kneisel and B. Majchczack).**

Borders and barriers

But road networks were not always open and accessible. From the Iron Age onwards (ca. 500 BCE), we observe the emergence of fortification ditches and land barriers. The land barriers consist of small dense pit fields and are mainly attested on the west coast north of Esbjerg and near Ringkøbing. They often cross the rows of barrows and block the access of the circular routes in Ribe and Ringkøbing region to the North Sea. Rampart and ditch complexes, such as the *Olgerdiget* from the 1st century BCE, are located on the east coast of the Jutland peninsula and are regarded as border fortifications between the Jutes and the Angles. The Danevirke, a wall system that experienced its largest state of construction in the High Middle Ages, demarcates the Jutland peninsula from the south at its narrowest point. But not every narrow point formed a border: It was precisely at narrow intersections or crossroads between waterways and land routes that the most important trading centres and towns were founded, such as Hedeby/Schleswig, Ribe or Aalborg.

And they travelled far...

The described route systems – from the Stone Age paths to today's motorways – follow the natural features of the landscape. The main routes ran along the ridges of the geest moraines, which, with their sandy surfaces, allowed rainwater to run off quickly and, in contrast to the wet marshes, were easier to cross. They crossed fords and formed the shortest walkable connection between the Jutland Penin-

← **Ydby Hede, North Jutland: Bronze Age landscape with burial mounds and a modern path (photo: J. Kneisel).**

» Even today, we can still observe the great impact that closures of these main routes can have, and how important a functioning road network is for contact and transport between the regions. «

sula and the south. One of the best-known routes led from the area around Rendsburg via Schleswig and Flensburg to Aalborg on the Limfjord since the Late Stone Age. Other routes led to the North Frisian Islands or the Thy region in Northwest Jutland. Rows of burial mounds and megalithic tombs have marked the course of these routes for 5000 years.

However, interests in and directions of trade changed over the centuries: First bronze from the south, to cattle from the north, and then to holiday guests from the south. At the same time, these network routes were also always susceptible to interruptions and closures, as we know from the Iron Age and the Middle Ages. Existing road networks were controlled by fortifications. Regional boundaries were drawn and closed off between population groups. Thus, these path systems mirror Jutland's history over many millennia.

Even today, we can still observe the great impact that closures of these main routes can have, and how important a functioning road network is for contact and transport between the regions. The Jutland road systems are part of a European road network and thus an expression of European connectivities. They have documented exchange processes since the Stone Age and, as infrastructure, are at the same time a means of this exchange. ◆
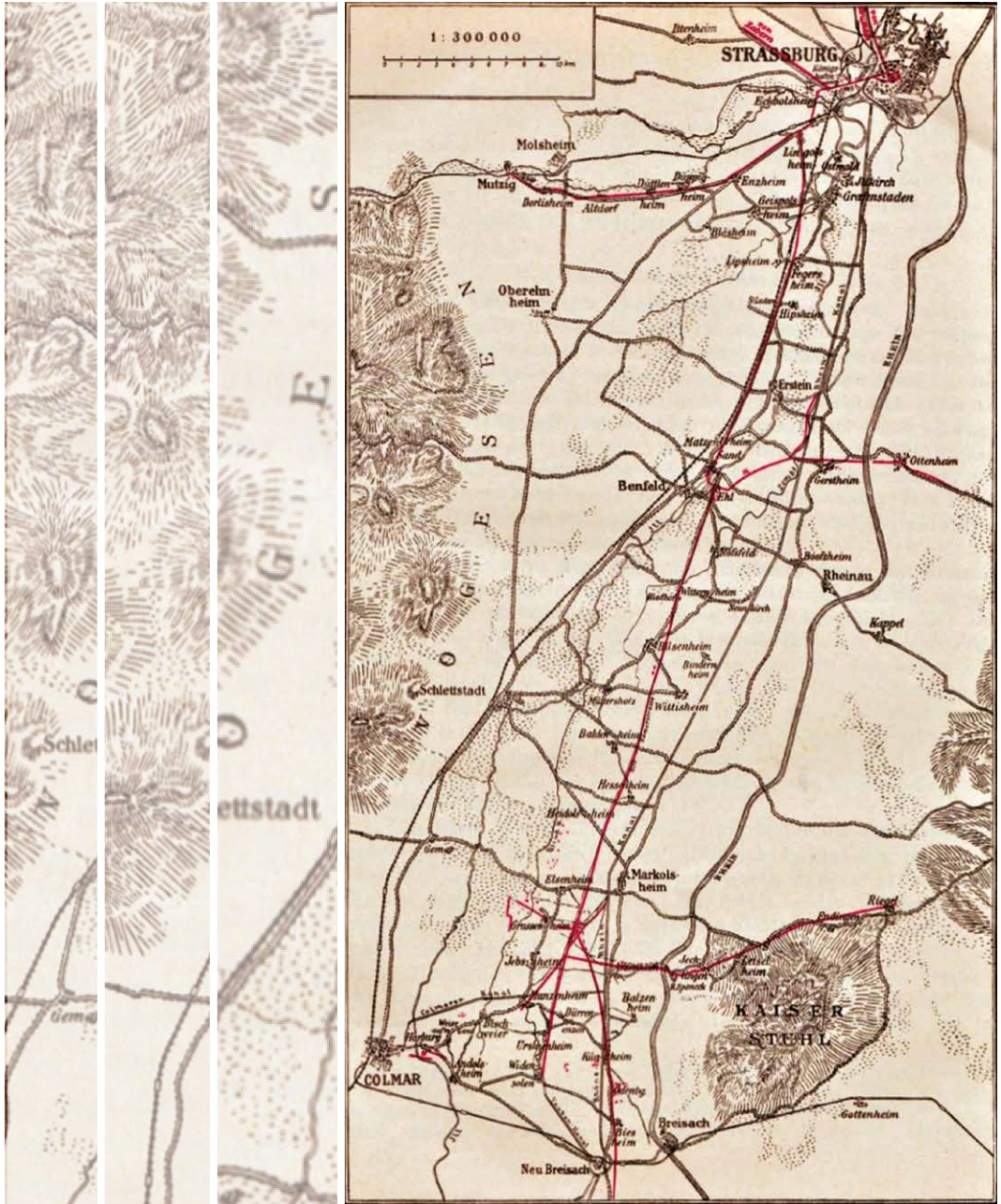
Franziska Engelbogen

Walking on Ancient Paths – Are We Still Using Celtic Trails?

If you are travelling on a highway or country road today, thoughts of prehistoric times do not exactly come to mind. The most likely thing one might ponder about is perhaps Roman roads that ran straight through the countryside and made the "uncivilised" north accessible to the Roman invaders. But the fact that many of our routes are actually based on much older trails is less well known. How far back do our paths go into the past? Are we still walking on Celtic, or even older routes today?

## How do archaeologists find paths?

With a path paved with gravel or cobblestones, the likelihood that it will remain intact even after two thousand years is high. It is therefore not surprising that Roman paved roads are much better known than their even older predecessors. However, roads can also be preserved without substantial structural features. Hollow-ways from the Middle Ages, for example, are known throughout Europe. A hollow-way is a beaten path or road way that deepened further and further into the subsoil over time due to intensive use. Because of a lack of vegetation, a slight slope and soft sediments, soil has thus been lost over the years and centuries due to every pedestrian, ox cart or horse cart passing through. Another example is represented by wooden trackways, some of which can be traced back to the Neolithic, especially in boggy terrain (cf. contribution by J. P. Brozio in this volume). Here, two favourable factors come together: On the one hand, the damp, boggy and

quite dangerous subsoil makes an enforcement by planks and other wooden elements necessary. On the other hand, the wood might remain preserved in the waterlogged soil until today. However, these conditions only apply to certain special places in a few areas in Europe. In order to be able to recognise old paths in other regions and times, archaeologists resort to other clues.

From ancient stones and burial mounds to paths

At the beginning, the first consideration is how people oriented themselves in the landscape in prehistoric times without maps, road signs or navigation systems. Conspicuous trees, rocks or river bends were certainly used as landmarks, but these are not always very stable. The recent floods in the Ahr Valley in Western Germany, for example, show us drastically how a landscape can change after just one disastrous rain event. So how can connections be preserved that have lasted for centuries or even millennia?

← Roman roads between the Kaiserstuhl and Strasbourg (after K. S. Gutmann 1912).
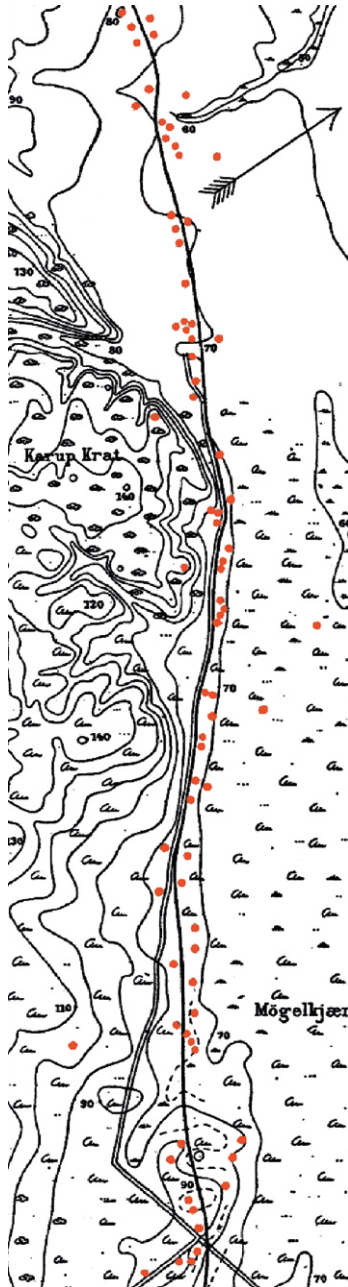
← Burial mounds in Jutland as signposts for the Ox Trail (S. Müller 1904).

» **At the beginning, the first consideration is how people oriented themselves in the landscape in prehistoric times without maps, road signs or navigation systems.** «

Since the Bronze Age, burial mounds were erected almost all over Europe, and large numbers of them are still visible in the landscape today. They are burial sites that were built and used until the Iron Age. A mound of earth was heaped up over a central grave, in which other people were sometimes buried later or further layers of earth were added. Such funerary monuments can therefore vary greatly in size. For example, the Magdalenenberg (Baden-Württemberg) is one of the largest burial mounds of the Early Iron Age, measuring approximately 100 m in diameter. Their usually exposed location on hill ridges, their sometimes immense size, their location within sight of rivers and also references to them in sagas, such as the saga of Beowulf, suggest that these monuments were intended to be noticed, to be seen, and thus also served as orientation.

Early on in the study of routes, the Danish antiquarian Sophus Müller established the connection between paths and burial mounds using the example of the Ox Trail (cf. contribution by J. Kneisel *et al.* in this volume). The map clearly shows that the burial mounds are arranged along a line. The Ox Trail follows this imaginary line. It is enough to be able to see the barrow, one did not necessarily have to climb on it to follow the path. However, for a better all-round view, a diversion to the top of the mound is a good idea.

Due to modern agriculture, many burial mounds have been lost. However, they are still clearly visible in forested areas. The tradition of burial mounds began in the Bronze Age and ended with the Iron Age. Most of the burial mounds that are still visible today will therefore have existed during this period. For archaeologists, these mounds are therefore a wonderful source to detect ancient prehistoric paths.

← Iron Age road network and known burial mounds in Baden-Württemberg (after F. Faupel 2021).
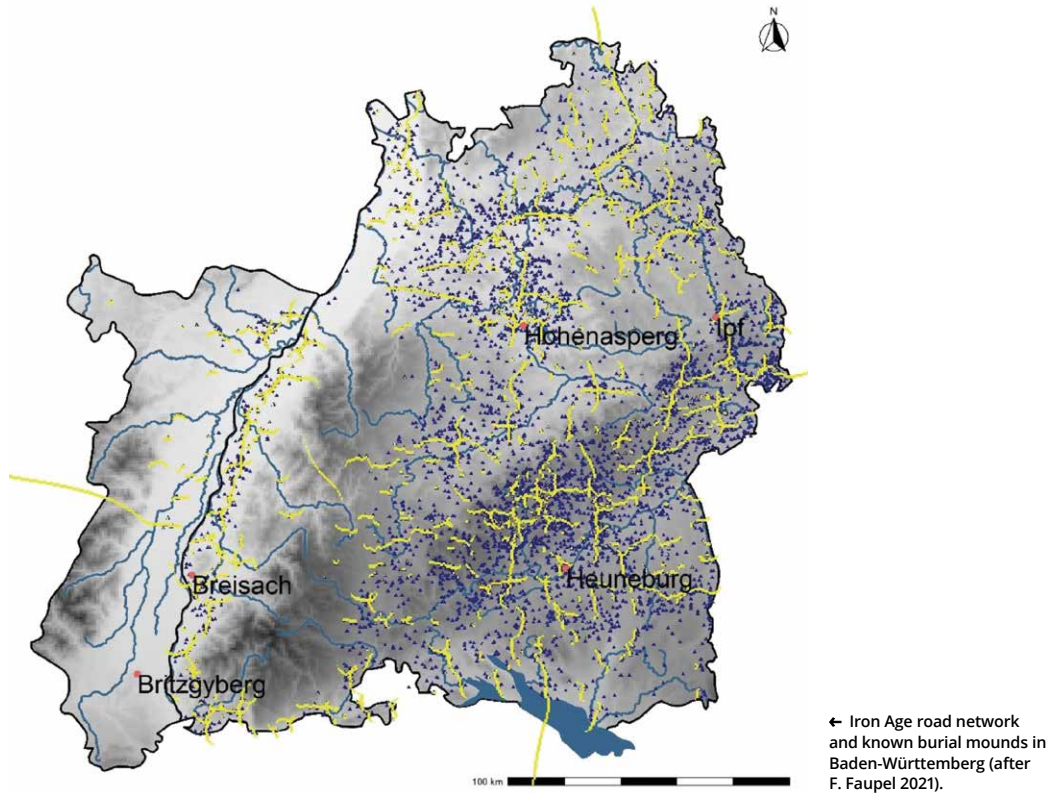
### Are we still walking along Celtic paths?

From the locations of the burial mounds, an algorithm may calculate the ideal route along the mounds, bypassing detours over the mounds and thus reconstructing the Iron Age paths. The algorithm guides the paths through dense clusters of burial mounds and not over the actual mounds. In a second step, intersections and curves are reduced to obtain a realistic path without losing sight of the burial mound. The result is a map of old paths which, compared to Roman roads and Bronze Age crossings over the Rhine, have astonishing congruence. Even today, numerous rural and district roads follow these ancient trails, and do not only exist in Baden-Württemberg or along the *Ochsenweg*. A look out of the window while driving can therefore be well worthwhile!

> » **We still use the same routes and we cross rivers at the same places – even if it is much faster and more convenient today** «

Since the invention of the car and especially after 1950, the reality of our lives has changed drastically. A journey from Stuttgart to Hamburg has become a weekend trip. Motorways, petrol stations and rest stops make travelling comfortable and fast. Even though lifestyle and travel habits have changed a lot since the Iron Age, some things have also remained the same: We still use the same routes and we cross rivers at the same places – even if it is much faster and more convenient today. ◆

Jens Schneeweiß and Henny Piezonka

Connection Breakdown –
Three Vikings Abroad
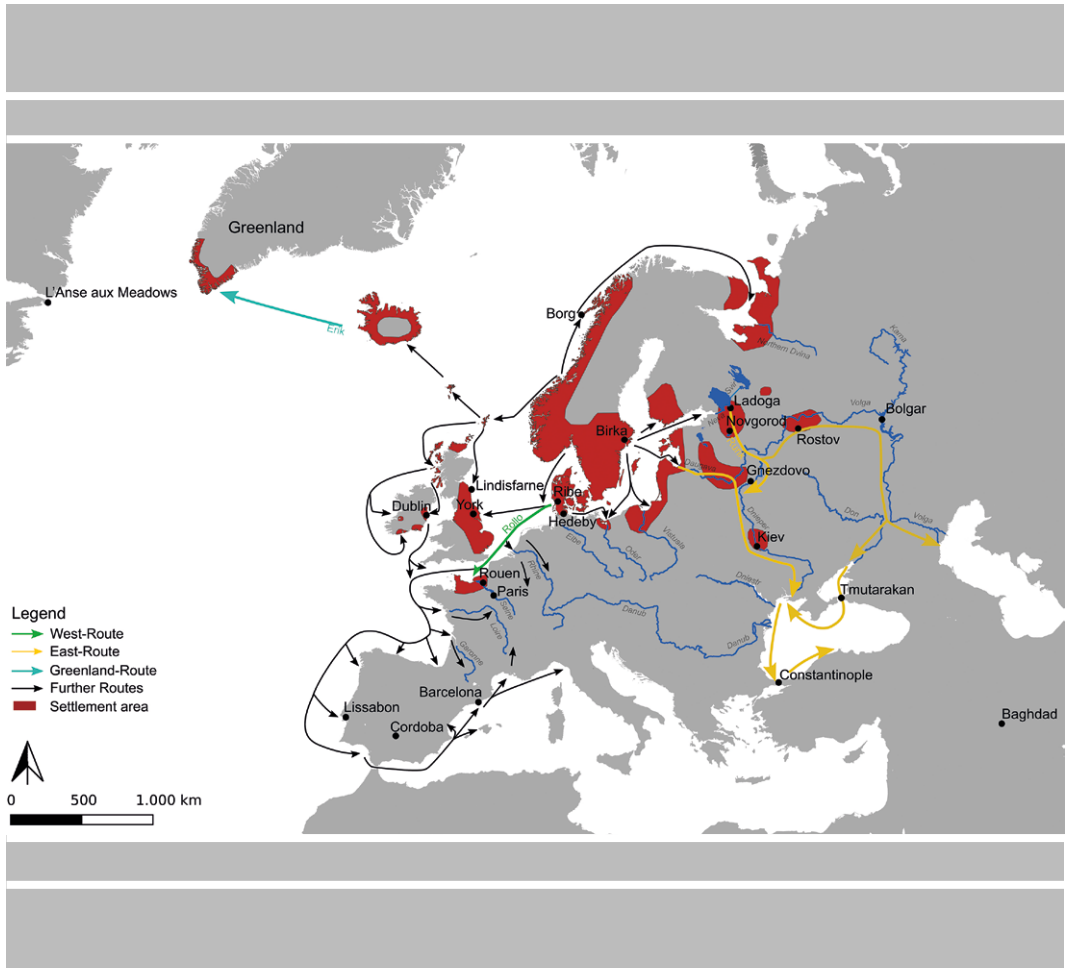
← Routes and settlement areas of the Vikings; the western, eastern and northern routes considered in more detail here are highlighted (map: S. Juncker, Kiel University).

Who does not know the Vikings? As traders, robbers and explorers, the skilful seafarers are famous for their far-reaching networks. Their much-travelled routes took them all over Europe and beyond. They cultivated diplomatic relations and trading connections with the great empires of the Early Middle Ages, they sacked the riches of the Christian West in small, swift, and mobile groups, and they set out for parts of the world that had not been "discovered". They often returned home packed with Arabian silver, Byzantine gold, Carolingian valuables, or just wild stories. Some settled in the new regions that they had opened up. In order to secure the connection to the Scandinavian homeland, they founded bases along the routes on which travelling lasted many days. Thus, these routes became established as fixed paths.

But where did these traders, robbers and explorers end up? What happened to those who had started a new life far away from home? And what occurred when the connection was severed? The stories of Rollo, Rurik and Erik, three Viking leaders from different times and regions, will illustrate how difficult it is to answer these questions and how different and at the same time complex developments can be.

Rollo and the Normans in the west

From the late 8th century CE, Vikings increasingly went on raids across the North Sea to the British Isles, Ireland and the Frankish Empire. In the 9th century CE, the intensity of the raids in these regions decreased. At that time in Scandinavia and the Baltic region, connections to the southeast with the Arabs began to flourish, while in the west only a few Norman remnant units were soon on the move. They had been in touch with Frankish culture for some time, and with the link to Scandinavia becoming less important, they increasingly settled in the north of France and on the British Isles. One of them was Rollo, who settled with his warriors in the area of the Lower Seine at the end of the 9th century CE. Even though they were probably more pirates than traders, Rollo certainly belonged to the Norman

» **[...] where did these traders, robbers and explorers end up? What happened to those who had started a new life far away from home? And what occurred when the connection was severed?** «

(a)
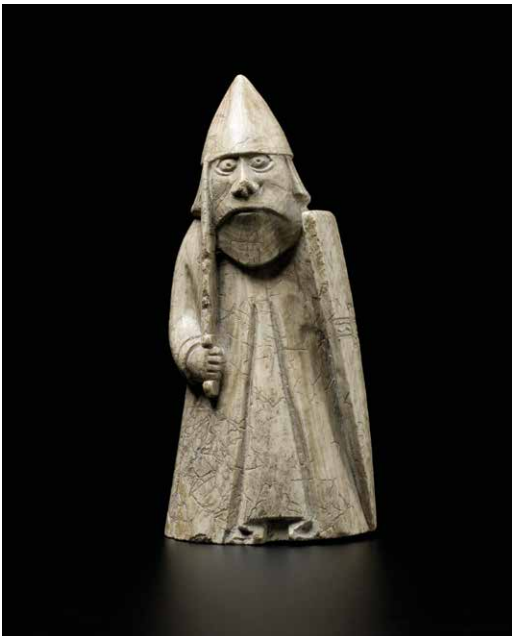
(c)

(b)

← Material evidence of the western, eastern and northern routes:

(a) Detail from the Bayeux Tapestry with a Norman ship (source: © public domain, https://upload.wikimedia.org/wikipedia/commons/f/fe/Flotte_normande.jpg).

(b) Dirham of Abbasid Caliph, Hārūn ar-Raschīd, minted in Baghdad in 786 CE (source: © CC BY-SA 3.0, author: Yevlem, own work, https://commons.wikimedia.org/w/index.php?curid=12146489).

(c) Chess piece from the famous Lewis Chessmen Hoard made of walrus tooth (source: © CC-BY-SA 4.0, https://en.wikipedia.org/wiki/Game_pieces_of_the_Lewis_chessmen_hoard).

elite class. In 911, he concluded a peace treaty with the Carolingian king Charles the Simple. He and his comrades-in-arms accepted the Christian faith and defended the Seine estuary against other Norman raiders. The close ties with their mother country, Denmark, now broke away, and the Rollonids quickly integrated themselves into the Christian feudal system. Richard I, a grandson of Rollo, extended his domain westwards to Normandy. The integrative function of Christianity and the Church, with which participation in power was closely linked, had given a particular boost to the career of the Rollonids. Their most famous representative was probably William the Conqueror, a great-grandson of Richard I, and the House of Windsor can also be traced back to the Rollonids.

Rurik and the Varangians in the east

At the same time as the Vikings' orientation towards the west was declining, connections via Eastern Europe to Central Asia and Byzantium intensified. The development of the route south along the Dnepr and the Volga had already begun in the 8th century CE, but the intensive expansion only took place during the rise of the Persian Samanid dynasty in Central Asia in the late 9th and 10th centuries CE. The supremacy of the Varangians, as the Viking groups in Eastern Europe are called, is justified by

a legend reported in the written sources: The Slavic and Finno-Ugric tribes were in conflict with each other and in 862 they invited the Varangian Rurik from across the sea (Scandinavia) to rule over them. This legend probably served as an afterthought to legitimise the conquest. The Varangians settled and founded bases that served as transhipment points for goods and to control trade on the long route through the Eastern European forests. Enormous amounts of Arabian silver now flowed into the Scandinavian homeland along this route. Assimilation cannot yet be detected in this phase, because the Varangians who settled in the east retained their customs, garb and language.

This only changed in the second half of the 10th century CE. With the collapse of the Samanid dynasty, the source of silver dried up and with it an essential basis of the Viking economy. Thus, while the eastern route lost its importance completely and the connection to the homeland increasingly weakened, the resident Varangians remained in place as members of the ruling class. Southern influence grew and ultimately led to Christianisation and state-building: In 988, the Rurikid Vladimir made Orthodox Christianity the state religion of Kievan Rus', thus sealing the connection to Byzantium. The adoption of the new faith thus led to the stronger formation of a separate identity that now distinguished Rus' from its surrounding pagan, Jewish, Muslim, and Roman Catholic neighbours. From the 11th century CE onwards, there are no archaeological finds from Scandinavia, for example, fibula jewellery in Ringerike or Urnes style; assimilation was now complete. Rurik is considered the founder of the first Russian ruling dynasty, which provided Moscow with tsars until the 16th century CE.

Erik and the Greenlanders in the north

The drying up of the Arab sources of silver led to a renewed orientation of the Baltic region towards the west. This is impressively demonstrated by the western coins that now increasingly appeared in Scandinavia, replacing the Arab dirhams from the late 10th century CE onwards, but also by

new Viking activities in England and voyages to Iceland and beyond. Erik the Red, a roughneck who had many a man's death on his conscience, sailed further west from Iceland in 984 CE. He euphemistically called the newly discovered island "Green Land", for the name was programmatic, promising flourishing landscapes to attract further settlers. Thus, two settlements were established on Greenland's west coast, which together housed about 3000 people. The settlers hunted walruses, whose ivory was brought to Europe as a luxury good, and practised a simple form of agriculture that provided them with a self-sufficient diet.

From the early 14th century CE onwards, the climate became slowly colder on the eve of the "Little Ice Age", and the shipping routes between Greenland and Norway were now often impassable due to icy conditions. The connection to Norway declined and the Greenlandic Norsemen gradually lost touch with Europe. Life on Greenland became a challenge. But the Old Norse community on Greenland was very hierarchically organised; religion and church were considered the cornerstones of society. Since the time around 1200, Inuit had immigrated, with whom the Norsemen now shared the west coast. However, the European settlers did not adopt the much better adapted way of life of the Inuit. Around 1350, the eastern settlement had to be abandoned, and Inuit now settled there. The last news from Greenland dates from 1408, shortly after which shipping between Norway and Greenland ceased completely. We do not know how long the settlers lasted in Greenland. Their disappearance is still unclear with regard to its exact causes and course. The self-sufficient European way of life was unable to withstand climate change in Greenland, and the cultural barriers were apparently too high for adaptation to the Inuit's better-suited survival techniques.

What happened when the connection broke down?

In all three examples, it was especially the severing of the connection to the motherland that forced the Viking groups in the distance to make

ground-breaking decisions for their further fate. External factors, such as climate change or the altered access to raw material and trade goods, influenced the maintenance or the end of existing routes and networks. It was precisely these – the far-reaching networks and trade routes – that determined the fame and success of the Norsemen in the Viking Age. For their functionality, the "home" connection obviously played a fundamental role, to which identity and corresponding political action were also tied. In the case of a loss of connections, when a group was cut off in the midst of a different environment, we see two opposing possibilities of further development. On the one hand, clinging to a merely imagined, supposed connection to the old (and increasingly transfigured) homeland leads to cultural conservatism. An extreme example of this are the Nordic settlers in Greenland. Their insistence on their traditional homeland possibly prevented them from taking the vital step of adapting their way of life and economy to the changing climatic conditions, even though they had the example of the better adapted Inuit before their eyes. In contrast, rapid assimilation in a different living environment, as we can observe in the case of both Rollo and the Rurik-

» External factors, such as climate change or the altered access to raw material and trade goods, influenced the maintenance or the end of existing routes and networks. «

ids after the disconnection, goes hand in hand with the creation of a completely new cultural identity. In both cases, the actors had already become well acquainted with the "other" customs beforehand, and in both cases, Christianity was the most important identity-forming element. The connections to the motherland, the Viking roots, became a legend that now played a role, above all, as a legitimisation of rule, and it helped the new identity to have a particularly powerful impact.

What remains? Traces of past connections in archaeology and language

Archaeologists are trackers. They reconstruct old routes and connections based on objects that seem foreign in one area but are well known in another (cf. contribution by J. Schneeweiß in this volume). But how can the timing and reasons for connection cut-offs be identified? In the case of cultural conservatism, old forms and techniques are clung to, the archaeological-typological method no longer applies because no new impulses arrive. We do not "see" that the objects have sometimes been in use for centuries. Assimilation, on the other hand,

quickly leads to the actual foreigners adopting what is customary around them; in this way they become archaeologically "invisible". With regard to the role of the Vikings, the discrepancy between the written tradition and the almost non-existent archaeological sources is particularly pronounced in Normandy. The time of the severing of routes can thus still be halfway determined, but in order to obtain information about the reasons and further events, we have to rely on other genres of sources. What can last for centuries and into the present are linguistic traces. To this day, Normandy is named after the Norsemen. It is less well-known that Russia or Belarus also have the Norsemen in their names, for Rus' is what the Finns called the Scandinavians. The name of Greenland also has – for the time being – nothing to do with today's reality and heralds old Viking routes that have long since disappeared. ◆
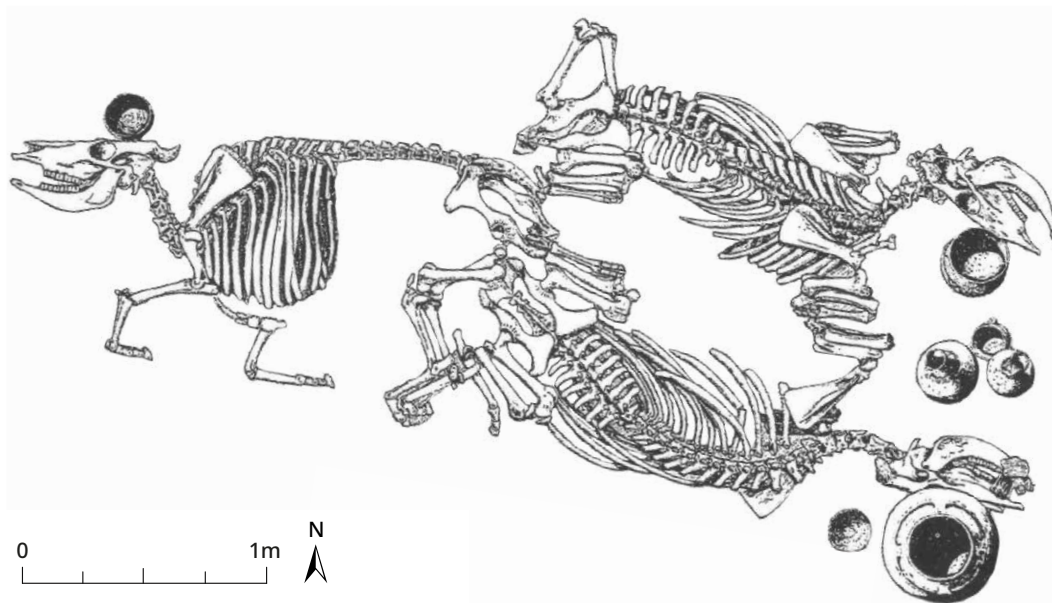
Chapter 4:

Routes of Things and Technologies

Johannes Müller

Cattle and Wagons – The First "Wild West" in Europe? The Wheel Innovation in the Baltic-Pontic Region 3500-2500 BCE

The European continent has been repeatedly shaped at different times by specific connections that develop through technical or social innovations. One of these, which is of great importance for human history, concerns the invention of the wheel and the wagon. Wheel and wagon were invented in Europe 5400 years ago. Apart from animal-drawn sledges in the vast steppes of the Northern Pontic region, it is the traces of wheels in the megalithic tomb of Flintbek near Kiel or the images of a cattle-drawn wagon in Bronocice near Krakow that provide archaeological evidence of this innovation. In addition, wooden wheels in the circum-Alpine lakes bear witness to this novelty from about 3300 BCE onwards.

0   1m   **N**

↑ **Three cattle buried around 2900 BCE near Zauschwitz close to Leipzig (Saxony): Both the antipodean double burial in the eastern part of the burial pit and the cattle in the west are provided with grave goods for the afterlife (after Bergemann 2018, 314 fig. 179 left).**
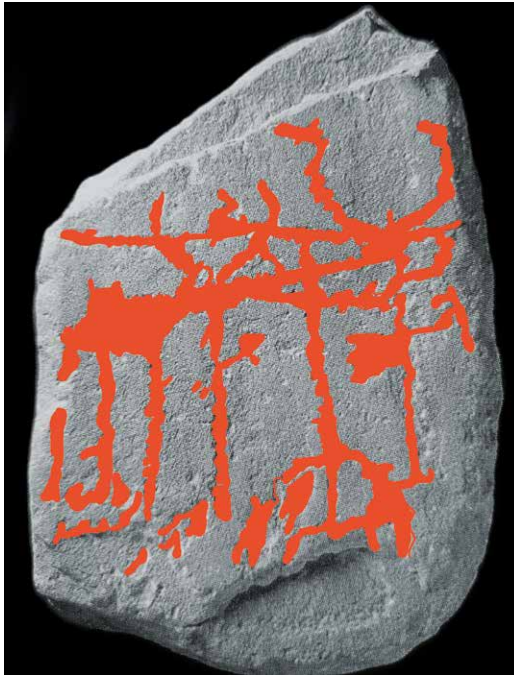
Cattle and wagons became a successful model in the course of the Neolithic period. They were used from Northern Jutland to Mesopotamia, apparently at first ritually for religious ceremonies and later also for economic transport purposes. Increasingly, we also see the construction of wooden plank trackways, connecting drier areas across fords or wetlands.

The power to have the new technology at one's disposal apparently gained particular importance from about 3200 BCE onwards between the Black Sea and the North Sea within the so-called Globular Amphora societies. These communities produced calabash-like ceramic vessels, the eponymous globular amphorae. They settled mainly on terraces at the edge of river floodplains and began to integrate cattle and wagons into their ritual practices. While in the last centuries of the fourth millennium BCE, different groups still carried out animal burials, from 2950 BCE at the latest the Globular Amphora societies "monopolised" the burial of cattle and wagons. Between Western Ukraine and Northwestern Jut-

» Large-scale networks, referred to as 'Corded Ware' or 'Bell Beakers', emerged, which now link large areas together in communities of interaction. «

↑ Engraved representations of cattle teams with wagons from the gallery grave of Züschen near Kassel (Hesse) (ca. 3000 BCE) (T. Pape, after photo by S. Burmeister 2004).

land, we now find double burials of cattle, often in opposite, so-called antipodal postures in the grave pits. They are sometimes also associated with other pits in which, on the basis of the traces, there was also a wagon. The burial of wagon teams is all the more striking because here the animals, similar to humans in contemporaneous other burials, are provided with food and drink offerings for life after death.

A ritual practice consequently becomes a social practice. It is not only an expression of appreciation towards the animals concerned, but also illustrates and underpins the far-reaching network relationships that had developed between Podolia in the east and Holstein in the west. Obviously, during these times, we encounter the beginning of large-scale "cultural phenomena" – a reflection of the possibilities that the invention of wheel and wagon also meant for cattle farmers.

Corresponding developments continued throughout the third millennium BCE. Large-scale networks, referred to as "Corded Ware" or "Bell Beakers", emerged, which now link large areas together in communities of interaction. Here, too, trackways continued to be built when climatic changes required fords to be bridged by other means. An exciting time of connectivity! However, instead of a colonisation movement like in the "Wild West", here, old practices are replaced by new ones – cattle and wagons thus have a completely different meaning. ◆

Jan Piet Brozio

Trackways across the Bog

Trackways made of planks or horizontal poles are among the oldest paths known to us. In the Northern European lowlands, they were often built to cross terrain that was difficult to pass, such as bogs, without detouring. In 2021, an international excavation team uncovered a 3 m long section of such a Neolithic trackway in Lower Saxony. Already during the excavation, it became apparent that the trackway had been built of alder and birch trunks, which had been arranged close together on birch branches lying lengthwise. Due to the water-logged environment, many of the timbers were excellently preserved, so that even the work traces of the stone axes were still visible. The dating of the trackway around 2450 BCE falls in a period that is associated with increased mobility of people in Europe, whereby reactions to climatic changes can also be observed. The fact that the trackway was also travelled by wheel and wagon is proven by two wagon axles that were disposed of in the bog at another location next to the wooden path. ∎

← Neolithic trackway
Pr 7 near Dümmer Lake, Lower Saxony, during excavations in 2021 (photo: J. P. Brozio).
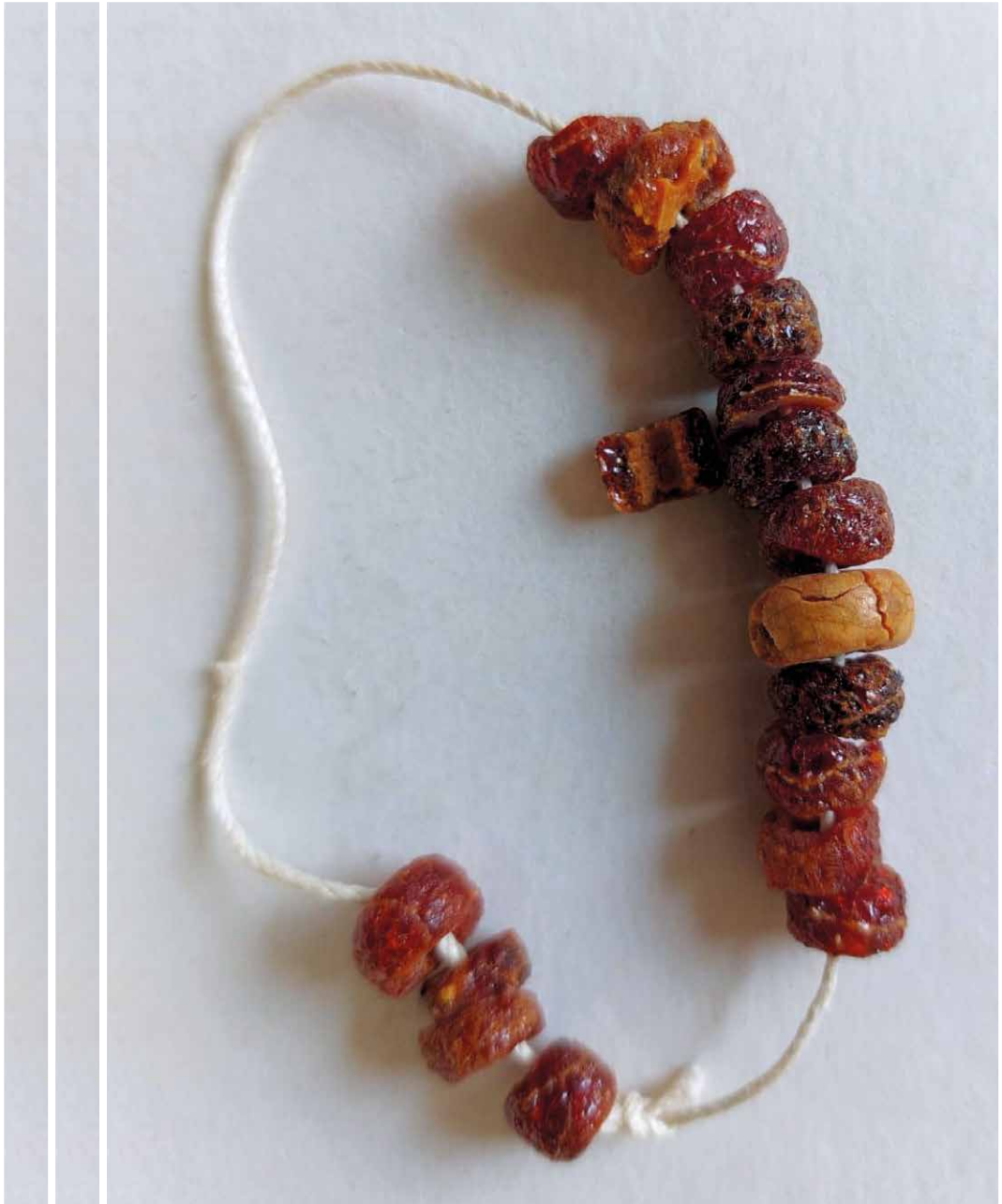
Benjamin Serbe and Khurram Saleem

The "Road to Riches" –
Amber Routes in Bronze Age Europe

"One Belt, One Road" – this concept originating in the Peoples Republic of China has been in focus of international politics for quite some time. Also known as the "New Silk Road", this project describes the expansion of specific trade infrastructures between mainland China and the three continents Africa, Asia and Europe. Its name refers to the historic "Silk Road", the famous trade connection between Europe and China dedicated to the silk trade between the 1st and the 13th century CE (cf. contribution by J. Hilpert and J. Kneisel in this volume). The idea for long distance trade and exchange between different parts of the world – globalisation – is not something modern (cf. contribution by T. Kerig in this volume). Even the "Silk Road" is not the earliest known trade route (cf. contribution by J. Kneisel et al. in this volume). Let us discuss an even older one, the so-called "Amber Road".

Baltic Amber in Bronze Age Greece?

In fact, the Bronze Age "Amber Road" cannot actually be called a "road". First discussions on this topic set in more than a hundred years ago, and in today's archaeology, the term "Amber Road" is considered to refer more to a concept then to an actual road. But what is so significant about amber? Why was it so important especially in the Bronze Age?

A scientific focus on this question sets in with the discovery of amber ornaments in the Mycenaean shaft graves by archaeologist Heinrich Schliemann and his team in 1876. These graves date to around 1600 BCE. The amber finds in them were regarded as a sensation, since no one ever thought that something like amber from about 2500 km away would

← Amber beads from the Bronze Age cemetery of Jelšovce, Slovakia (photo: F. Wilkes).

appear in the rich graves. No idea existed about a possible connection between the "civilised high cultures" of the Mediterranean and the supposed "barbaric, primitive and uncivilised" north. Everyone knew about the rich amber deposits on the west coast of Denmark, or from the Sambia Peninsula in the Eastern Baltic. It is not by chance that the "Amber Chamber" was made in the 18th century CE by an amber cutter from Danzig (today's Gdansk) and was one of the most prestigious objects, denoted at that time as the "Eighth Wonder of the World".

Because such connections were deemed impossible in the late 19th century CE, a discussion evolved whether the amber really came from the north, or whether it rather originated from some other deposit, e.g., in Sicily, which is not only geographically much closer but is also known to have finds of Mycenaean pottery, indicating the existence of contacts between Bronze Age Greece and Sicily.

The discovery of succinic acid

At that time, the Danzig-based pharmacist Otto Helm discovered something remarkable – the "succinic acid" which was present in the "Baltic Amber" from the north but not in the "Sicilian Amber". The process of extracting the acid was very specialised and destructive for the archaeological finds at that time. Today, the general idea of origin determination for amber is the same but the specific methods have been refined. In the 1960s, Curt W. Beck, Professor at Vassar College in New York, discovered that Baltic Amber has a specific kind of infrared absorption which can be identified by the method of spectroscopy (cf. the textbox by K. Saleem and B. Serbe in this volume). Several amber finds have also been analysed in the Technical Faculty, CAU Kiel, using Fourier Transform Infrared Spectroscopy (FTIR) and were identified as Baltic Amber because of the presence of the "Baltic Shoulder". The specific pattern, referred to as the "Baltic shoulder", has not been seen in any other type of European fossil resin. It is believed to arise from the presence of succinic esters which are organic components that are specific to the Baltic Amber.

One of the major perks of this new method is its non-destructiveness. The method is also cheaper and faster than previous approaches and enables the analysis of many samples of amber in a short period. This revolution in amber analysis facilitates the sampling of many archaeological finds from all over Europe. The result: Most of the amber in archaeological contexts is indeed "Baltic Amber", meaning it originally comes from the areas of Denmark or the Sambia Peninsula. The same applies for the amber finds of the Mycenaean shaft graves, as this was first proven at the end of the 19th century CE and without doubt in the 1960s. This indicates a mechanism of long-distance distribution.

### Amber connects prehistoric Europe

As mentioned before, the idea of amber trade routes is not new. After the discovery of succinic acid through Otto Helm, the discussion took on momentum, at first referring to the known Roman

» But it would most likely reveal a highly complex social system tied to the idea of trade: The Road to Riches. «

trade routes which were named by antique authors. In 1925, Jose Maria de Navarro, an archaeologist teaching in England, published a first study on amber trade and its routes through Europe on the basis of archaeological finds, linking different sites to nearby geographic features like rivers and mountain passes. His method sparked a lot of discussion – from people stating that it was the "most complete system in existence" to voices saying it only works if all Bronze Age sites with amber (spanning 1200 years) were included at once. Nevertheless, this model was favoured for a long time and played an important role in the discussion on the "diffusion of civilisation" from Greece to the rest of Europe.
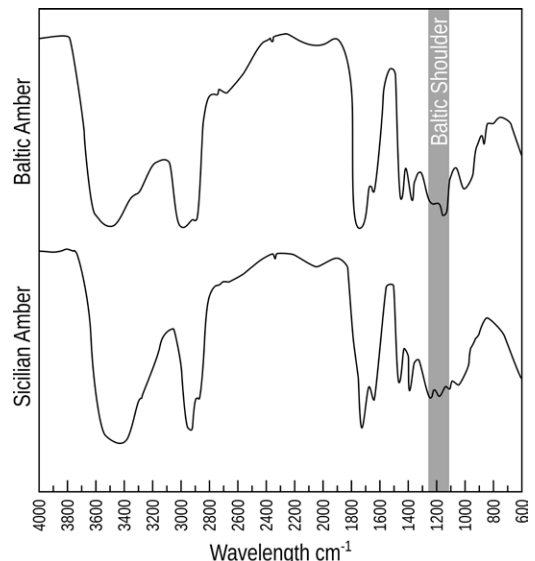
↑ Absorption spectra of Baltic and of Sicilian amber types (assembled after Murillio-Barroso and Martinón-Torres 2012, fig. 2 and 3).
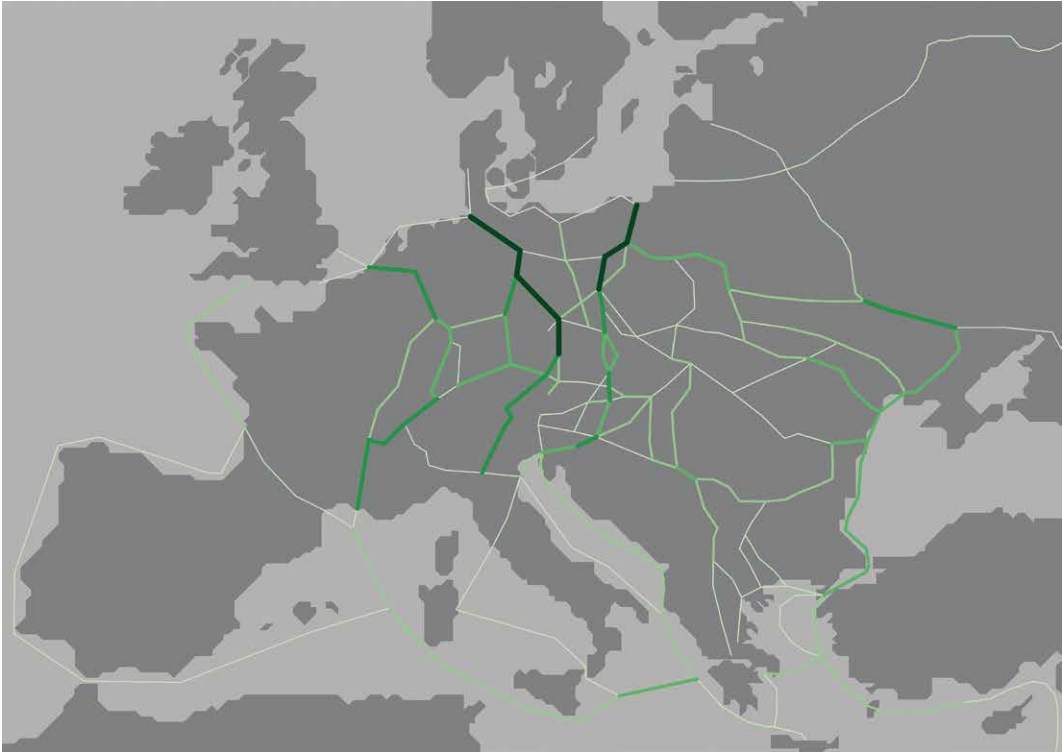
↑ **Mentioning frequency of proposed parts of the "Amber Road" (map: B. Serbe).**

Other authors contributed to the discussion by extending the system of "Amber Roads" further and by then arguing about the right route.

Today this approach and its initial method are viewed more critically. The dissemination of amber is not a natural process which results in an observable pattern, but rather a cultural process in which different and complex social factors play a role. Therefore, linking different sites with amber finds results in a model of a social network of influences, rather than the representation of a complete road system as it exists today.

If we did not have all the written and digital sources on the "One Belt, One Road" infrastructural program, in some thousands of years archaeologists and historians might also argue on the exact route of the "One Road", questioning which ports might have been part of the maritime silk road, and which land routes and railways would have been used in the "One Belt Economies". Different authors might propose different routes, some, for example, focusing on the influence of the Asian Infrastructure Investment Bank in Africa and Europe. The method may be different in future times, but the determination of the exact route based solely on material finds would still be as hard as it is today. But it would most likely reveal a highly complex social system tied to the idea of trade: "The Road to Riches". ◆
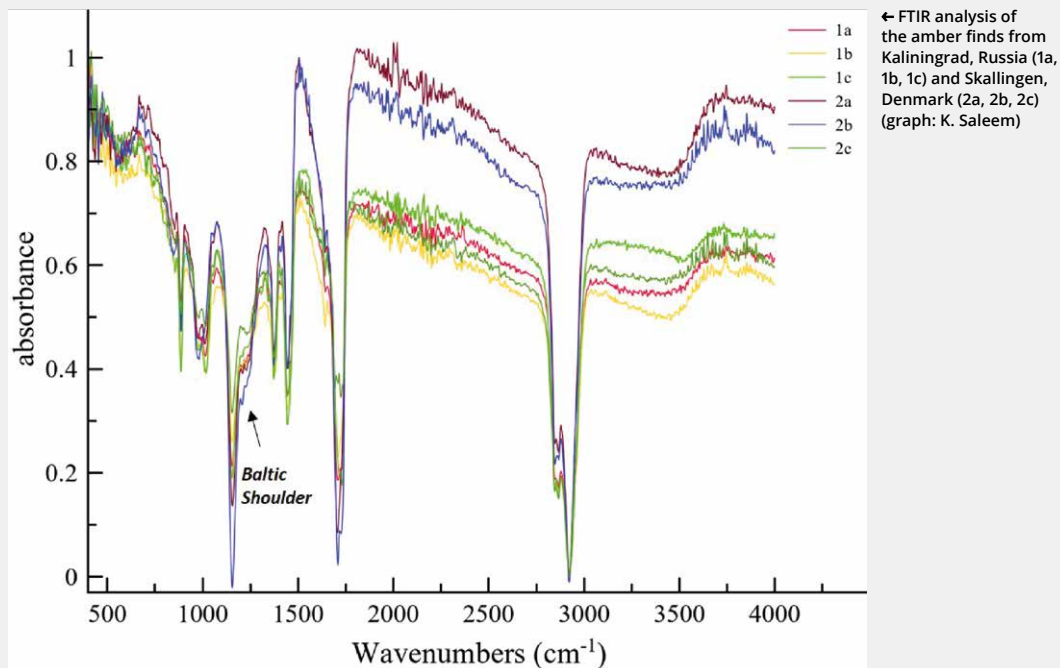
Khurram Saleem and Benjamin Serbe

Analysing Amber

Amber is a resin that plants exudate and which then undergoes maturation and cross-linking processes over time. Geological conditions, such as volcanic activity, can accelerate these processes. Comparative studies of fossil resins of various ages on botanical sources, geological environments and geographic provenience can be done via scientific methods. Such comparative studies can identify the origins of specific amber finds and thus can help to reconstruct amber distribution networks across different geographical regions. From a chemical point of view, ambers are water-insoluble complex mixtures of organic compounds such as terpenes. They differ on the basis of material properties as well as the presence of organic/inorganic inclusions. Resins from the same botanical source could undergo different fossilisation processes, hence resulting in a variety of fossil resins. Baltic amber constitutes the majority of the world's amber and, as a specific trait, contains succinic acid.

To investigate the origin of a specific amber find, various analytical methods are combined with geological, palaeogeographical and palaeoclimatic background data. A non-destructive approach explores the chemical profiles of amber finds through the spectroscopic analyses. Spectral profiles depend mostly on geographical origin of the samples, their botanical sources as well as maturation grades and geological conditions of their alterations. During fossilisation, the resins undergo many chemical processes, and these specific features can be quantified by using techniques like Raman and Infrared spectroscopy.

Raman spectroscopy:

Looking at the chemical profile attained by Raman spectroscopy, the degradation of fossil resins results in loss of carbon double bonds, which is marked by the lower intensity of the band at 1640 cm^{-1} compared with 1440 cm^{-1} in the spectra. Thus, the intensity ratio between these two bands has been proposed as an indicator of the maturation degree of organic matter, especially for fossil resins. The chemical profile measured by Raman spectroscopy has applications for a comparison of the age of samples altered under the same or similar pressure-temperature conditions in host deposits and from the same kind of botanical sources.

← FTIR analysis of the amber finds from Kaliningrad, Russia (1a, 1b, 1c) and Skallingen, Denmark (2a, 2b, 2c) (graph: K. Saleem)

Infrared spectroscopy:

When infrared radiation interacts with a molecule, vibrational energy levels are excited, resulting in an absorption spectrum of well-defined bands in the region between 400 and 4000 cm^{-1}, corresponding to bonds between atoms and/or functional groups. The spectral data obtained for a particular sample may be compared with other samples to identify differences or similarities. Through the Fourier Transform Infrared Spectroscopy (FTIR) technique, a pattern can be identified which is referred to as "Baltic shoulder": In the region between 1250 and 1110 cm^{-1}, a horizontal band appears followed by a sharp drop and then by a well-defined band at 1155 cm^{-1}. This pattern has not been seen in any other type of European fossil resin. The unique Baltic shoulder is believed to arise from the presence of succinic esters which are organic components that are specific to the Baltic amber. Thus, the non-destructive FTIR technique is especially well-suited to conduct provenience studies of prehistoric amber artefacts. ■
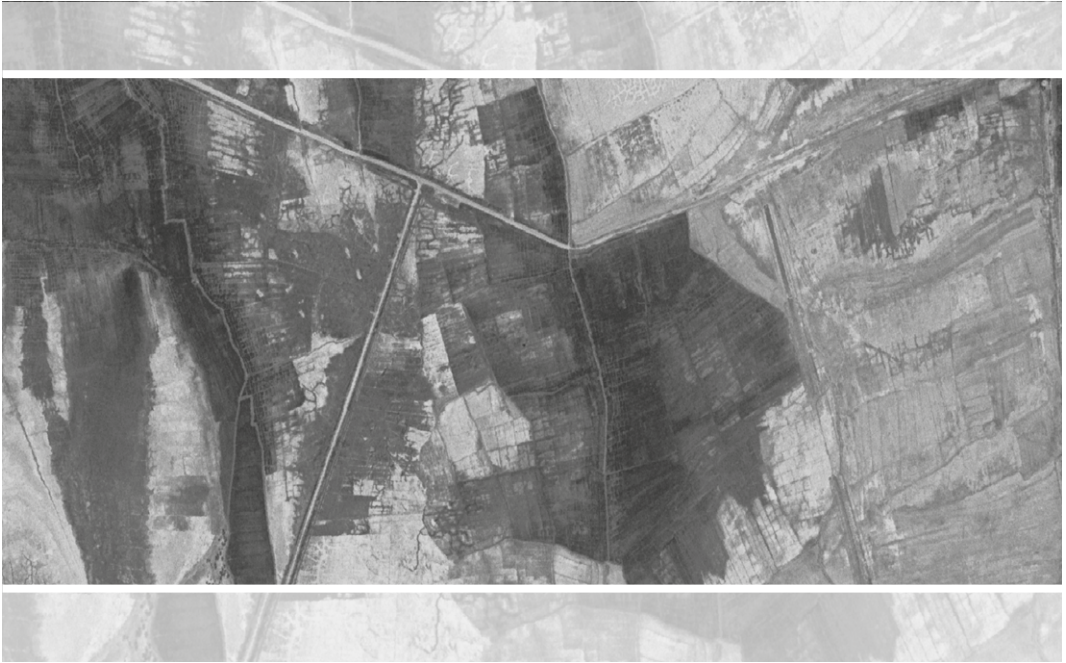
Andrea Ricci

The Power of Water –
Water Connectivities in Mesopotamia

The availability of water is a decisive factor for life. The life-giving power and life-taking force of water renders its control one of the major elements for the establishment and maintenance of human civilisation. At different scales, the control of natural watercourses and the construction and maintenance of water systems are always crucial in shaping socio-cultural and environmental connectivities. The control of water and waterways creates opportunities for the emergence of new connections and dependencies between individuals and communities. Furthermore, watercourses are frequently an efficient means of transportation. In all regions beyond the moderate temperate rainfed zone, techniques to supply and divert water from and to specific locations have been developed millennia ago, and since then have exacted their influence on the formation of cultural landscapes.

← **Complex palimpsest of relict canals south of Babylon, Iraq, viewed on a satellite CORONA imagery of August 1968 (mission 1104; courtesy of USGS. ©: not applicable).**

Ancient urbanism and water management

The study of water is a long-standing agenda in archaeological and historical research.

Major ancient civilisations developed along the banks of rivers, which provided ideal conditions for agricultural, garden, and aquatic resources. Establishing large-scale irrigation systems requires the management of the necessary workforce and complex engineering, and hence is correlated with the emergence of state institutions. Mesopotamia – i.e. the land between the two rivers Tigris and Euphrates – has been one of the core case studies in the discussion of the development and growth of ancient urbanisation in correlation with water management. In particular, in Southern Mesopotamia, i.e. the region that extends from the south of Baghdad to the Persian Gulf, every year the drainage of the rivers brings alluvial deposits to the land along them. These deposits are mainly composed of silt (i.e. a mixture of rich soil and water) and make the soil highly fertile so that lush vegetation can grow there. Intrinsically connected to this waterscape, the communities of Southern Mesopotamia – also called Sumer or Babylonia – developed and applied a series of technologies and knowledge to control and organise water resources at least since the 6th millennium BCE. The farmers living along the Tigris and Euphrates Rivers formed levees to restrain the floods from their fields and dug canals to channel water from the rivers to their agricultural land. Complex canal systems were built and numerous urbanised centres, including Uruk, Eridu, and many others, flourished as early as the 5th millennium BCE. From the time of the emergence of these early cities, the use and application of irrigation evolved over millennia and included major imperial water-related investments of the 2nd and 1st millennia BCE. Hence, the control and maintenance of the irrigation systems forever shaped the landscape of the Southern Mesopotamian alluvium.

Waterways connecting people and goods

The regional morphology and the topography of Mesopotamia offer opportunities and set boundaries for the establishment and expansion of the local water systems. In the very flat landscape of Sumer, waterways provide possibilities for low-friction transportation that make the movement of goods easier, as boats can be pulled by animals and/or humans more efficiently than transporting goods overland. The alignment of water supply structures and canals determines the location and pattern of settlements, and in some cases even the internal distribution of buildings, streets, and infrastructures, including harbours. A dug canal connects cities and villages along it. These conditions have the power to establish new human relationships, as people meet during the construction and use of the canal, creating opportunities for communication and the exchange of goods and ideas, as well as potentials for disputes over the control of water and new agricultural lands. This is demonstrated by the oldest

> » **At different scales, the control of natural watercourses and the construction and maintenance of water systems are always crucial in shaping socio-cultural and environmental connectivities. «**

↑ Clay tablet showing part of an agricultural area and canals near the city of Nippur, Cassite period, ca. 1500 BCE (object number CBS13885 Penn Museum. ©: https://www.penn.museum/ collections/object_images. php?irn=98408).

known record of a border dispute, which describes the series of conflicts over land and canal management that occurred between the cities of Lagaš and Umma during the Early Dynastic III period (ca. 2600-2334 BCE; cf. fragment of the Stele of the Vultures). Canals might have been abandoned for reasons that include the lack of maintenance, clogging with deposits, economic factors, or natural catastrophes. When this happened, villages and cities may have faced dramatic consequences due to water shortages, unless the control of the water supply was regained by digging a new canal or reactivating a former one, while other, less efficient ways for communication and movement had to be explored.

Long-distance river networks

On a larger scale, waterways often served as critical lines for movement over long distances. For example, during the 4th millennium BCE, the Uruk communities of Southern Mesopotamia expanded into the north (as well as in the Susiana Plain in Iran to the east). This also possibly occurred in relation to the procurement of raw materials (e.g. metals, stones, wood), which are lacking in the Southern Mesopotamian alluvium. At this time, large-scale cultural and economic networks linked distant regions together in communities of interaction, which gravitated along the Tigris and Euphrates basins. Along their valleys, a number of new sites were founded and various sets of interactions were established between local groups and the southern communities. Writing and administrative devices, which were first invented in the south, also started to appear in the north along the Tigris and Euphrates valleys and their tributaries, testifying to the importance of these two major routes for the transfer of knowledge. Despite the collapse of the complex Uruk networks towards the end of the 4th millennium BCE, the Tigris and Euphrates continued to be crucial routes of communication and socio-cultural-economic interactions for all of Southwest Asia in the following millennia.

In ancient Mesopotamia, water-human connectivities supported the emergence and development of urban systems as well as the establishment of local and long-distance routes and networks. During this exciting time that represents the deep roots of our civilisation, urbanisation, labour specialisation, bureaucracy and new socio-cultural networks emerged along the axes of waterpower. Amid this rich, sedimented history, water continues to provide important forms of connection and to prompt new struggles over its control. ◆

↑ One of the fragments of the Stele of the Vultures, Early Dynastic III period, ca. 2600-2334 BCE (object number AO50 Louvre Museum. ©: CC BY-SA 3.0; cf. https://commons.wikimedia.org/wiki/File:Stele_of_Vultures_detail_01a.jpg).

» In ancient Mesopotamia, water-human connectivities supported the emergence and development of urban systems as well as the establishment of local and long-distance routes and networks. «

Jens Schneeweiß

How Did Buddha Come to the Norsemen in Sweden?

In 2015, Sweden issued an inconspicuous postal stamp depicting a small Buddha statuette. Its value enables the Buddha stamp to travel within Sweden. The depicted statuette, however, has travelled much further. It was found almost 60 years earlier during excavations on the island of Helgö not far from the Viking long-distance trading centre of Birka. The find was a sensation at the time, and it is still one of Sweden's most outstanding early historical finds. Nevertheless, the wisely smiling Buddha poses riddles and will probably always keep the details of his long and far journey to himself. We know that the bronze statuette, only 8.4 cm high, was made in the Swat Valley (now Pakistan) in the 6th century CE. It was inlaid with silver, glass and copper, traces of which have survived. When it was discovered in 1956 in the third year of excavations on Helgö, 6000 km away from its origin, it still had a leather strap around its neck, with which it was probably fastened somewhere.

What brings a small Buddha from the Himalayas to the Vikings in Northern Europe? Who brought him here and by what route? To find this out, it would be good to know when the Buddha exactly reached Scandinavia. Helgö was the most important predecessor of Birka and had its heyday in the middle of the 1st millennium CE. In the 6th century CE, there was an elaborate jewellery workshop and goldsmiths here, processing gold and precious stones that also came from far away and were probably mediated via networks that went back to late antique structures. However, as the sea level changed, access to Helgö became less convenient and its importance slowly passed to Birka. During the 1956 excavations, no observations were made on the find context that would help to decide when the Buddha entered the ground there between the 6th and 9th centuries CE. Considerations of the route that it may have taken can perhaps help.

← Swedish postal stamp, 2015 (after Piotr Jerzy Naszarkowski 1952; source: https://www.lastdodo.de/de/items/5697253-der-spaten-eisenzeit-wikingerzeit).

»   As exotic and foreign as the small Buddha statuette appears at first glance, it probably travelled to Scandinavia on a route that thousands of objects – mainly silver coins – travelled with it and after it.   «

The Swat Valley, an important centre of Buddhism in its time, lies on a southern branch of the Middle Silk Road, which ran west via Bactria, Samarkand and Bukhara to the Caspian Sea and on to the Mediterranean. The Silk Road was not only used to transport silk from China to Europe, but also many other goods, religions, diseases and ideas (cf. contribution by J. Hilpert and J. Kneisel in this volume). It is quite certain that the Buddha made his way west on the Silk Road in the personal possession of a traveller.

Supremacy over the Silk Road was highly contested. In the 7th century CE, the Chinese of the Tang Dynasty took control from the Persians, which led to further flourishing of this trade route. In 751, the Battle of Talas took place, in which the Arabs defeated the Tang Chinese and finally established their power in Central Asia. It was the culmination of decades of power struggles and is considered a decisive battle in world history. Since then, the Arab dynasty of the Abbasids controlled the Middle Silk Road. The Arab caliphate was vast and powerful. Samarkand and large parts of the Silk Road belonged to it. The Swat Valley now lay in the Far East, where the cali-

phate's influence reached as far as the Indus, and in the west, it encompassed large parts of North Africa. The huge empire flourished and attracted scholars and merchants from all over the world. Baghdad became the newly founded capital. In the "Round City", the metropolis of the still young Islam, Jews, Christians, Buddhists and many others lived, who were attracted to the wealth.

Perhaps one of them had brought the small Buddha west, which was by now already over 150 years old. For an object with religious significance, such an age is nothing unusual. We do not know. But we do know that one of the most famous diplomatic gifts in European history also came from India: The Abul Abbas elephant (†810). The Abbasid caliph, Hārūn ar-Raschīd, who is also known from the Tales of 1001 Nights, gave the elephant as a generous counter-gift to a legation of Charlemagne. Abul Abbas was truly a gift of imperial dignity. Therefore, we are quite well informed about the elephant's route from India via Baghdad and Italy to Aachen – with regard to the small Buddha statuette, however, we have to rely on conjecture. What is certain, after all, is that the Abbasid caliphs not only maintained dip-

lomatic relations with China, India and Western Europe, but that the flourishing of the Viking economic area in Eastern Europe was also very closely linked to the Abbasid caliphate (cf. contribution by J. Schneeweiß and H. Piezonka in this volume). Practically at the same time, from the 8th century CE onwards, the Norsemen, Vikings or Varangians, opened up the great river areas of the Eastern European forest zone as trade routes to the south. The "road from the Varangians to the Greeks", as it is called in medieval sources, came into being. This refers to the Byzantine Empire, whose capital Constantinople could be reached via the Dnieper and the Black Sea. At the same time, the Volga led to the Caspian Sea and thus directly to the Abbasid Caliphate, where furs and slaves could be exchanged for coveted silver. Thousands of Arab silver coins, so-called dirhams that were recovered in Eastern Europe and Scandinavia, bear witness to this trade. However, the great Eastern European river systems were not only a road of silver, furs and slaves, but traders and warriors travelled here as well as legations. In the 9th century CE, the direct connection from Bukhara to Bolgar on the Volga gained importance as the northern branch of the Silk Road. Here, the Khazars, who converted to Judaism around that time, played an essential mediating role.

With the rise of the silver trade came the rise of Birka. Helgö's heyday had long passed. But the island was by no means abandoned. Among other finds, Arabic dirhams from the 8th and early 9th centuries CE, which come not only from graves but also from the immediate vicinity of the Buddha statuette, prove that the island was used until the Viking Age. Another extraordinary find must be mentioned in this context: The enamelled crest of a crook from the late 8th or early 9th century CE. The copper alloy artefact is 9.3 cm high, comes from Ireland and was found only 7 m away from the Buddha. We are interested here first of all in the dating, which points to the same period as the dirham. From the late 8th century CE onwards, Viking raids on monasteries in the British Isles and Ireland increased, reaching their peak in the 9th century CE. It is therefore plausible that the crook brought from there was laid down in Helgö sometime in the decades around or shortly after 800, possibly by a participant in a crossing to Ireland. However, whether it was a gift, some kind of consecration offering or raw material for jewellery making is unclear. We do not know whether these two exotic finds, which come from completely different worlds and times, arrived on Helgö with the same intention, indeed whether they had anything to do with each other at all. The only thing that is certain is that they took completely different routes. Both routes were well travelled and well-known in the early Viking Age.

It will not be possible to obtain certainty. But it may have some significance that the Buddha and the crook were found not far from a building addressed as a "temple" or a place that was probably revered as sacred. The whole island is also regarded as a centuries-old supra-regional sanctuary. It is safe to assume that those who brought the Buddha and the crook to this place knew that these objects had a religious meaning in their original contexts, because that is what both objects have in common. In this respect, they are perhaps to be regarded as deliberately laid down offerings of consecration after all. As exotic and foreign as the small Buddha statuette appears at first glance, it probably travelled to Scandinavia on a route that thousands of objects – mainly silver coins – travelled with it and after it. ◆

Chapter 5:

Routes of Rituals and Knowledge

Fynn Wilkes and Henry Skorna

At the End of the Road – What Graves Tell Us about Networks and Contacts in Prehistory

Graves, versatile sources of archaeology

In archaeology, dealing with transience – death – is commonplace. Remains of past societies, whether houses, pits or graves, are the sources of our research data. These provide us with a multi-layered view into prehistory and early history. On the one hand, the type of burial allows us to interpret and discuss past worlds of belief, on the other hand, the graves tell us a lot about social structures of past societies. Here, we provide information about our work with the prehistoric dead and their grave goods and what they can tell us about past transport routes of raw materials and long-distance social contacts.

In the Carpathian Basin in Southeastern Europe, there are a number of cemeteries where such studies can be conducted. From the Neolithic onwards, this region, which has fertile soils, was increasingly inhabited by agricultural societies. However, people settled at a considerable distance from the places where vital raw materials, such as flint, obsidian, copper or amber, were extracted. These raw materials were needed to produce important tools as well as prestigious jewellery. Therefore, an extensive transport and trade network within the Carpathian Basin and beyond was of great importance.

If we consider the means of transport in prehistoric times, we must not forget that the transfer of goods on foot or later with the development of the wheel (oldest finds in Slovenia date back to around 3200 BCE) required a lot of time. Products of local origin are those that could be obtained within a day's radius (about 30 km by horseback). In contrast, the procurement of raw materials from medium and long distances required several weeks to months. Rivers played a special role in the exchange and trade of raw materials. With the help of finds from two burials, we would like to show how networks already emerged six millennia ago.

Grave 201 from Rákóczifalva (Hungary, ca. 4350-4000 BCE)

In the Eastern Carpathian Basin, the site of Rákóczifalva is located near the Tisza River. The site was excavated by the János Damjanich Museum in Szolnok and the Archaeological Institute of Loránd Eötvös University in Budapest between 2005 and 2007. It is comprised of a settlement and a Copper Age cemetery with about 80 graves. In grave 201, the remains of a man in a crouched position were uncovered together with a generous grave inventory. His grave goods included a golden staff end, a copper axe, two flint blades, three obsidian arrowheads, six ceramic vessels, animal bones and some fragments of red ochre.

While the material and decoration of the ceramic vessels indicate local origin, the copper axe as well as the obsidian and flint artefacts prove that a transport and trade network of raw materials over greater distances existed in the Copper Age. Copper, obsidian and flint do not occur in the region around Rákóczifalva and therefore must have been transported from their deposits to the site.

Using chemical methods, so-called trace element and lead isotope analyses, it was possible to determine a chemical signature for the copper axe, which was compared with the values of known copper mining areas in Europe. Two possible deposits were identified. Most likely, the copper originates from the region of Majdanpek in Serbia, located about 330 km to the south, not far from the Danube. Before the axe was buried at the side of the man in grave 201, the raw material or perhaps even the finished axe must have travelled across the river valleys of the Danube and the Tisza. This is a distance considerably further than the 330 km as the crow flies, which must have represented a great distance at that time.

The three obsidian arrowheads have not yet been subjected to chemical analysis, but there are only a few deposits of this volcanic glass in Europe. Investigations of other sites in the region revealed an origin of obsidian mostly from the Tokaj Mountains, which lie on the northern edge of the Carpathian Basin. This mountainous area is connected to the Tisza River via the Hornád River. The obsidian for the arrowheads would most probably have reached Rákóczifalva about 210 km downstream via the Tisza. Unfortunately, there is no exact information on the type of flint used for the blades, but the material for these artefacts must also have reached the site over a considerable distance. Known deposits of different types of flint, such as radiolarite or Balkan flint, are located more than 150 km away. As raw material or end product, they have been transported to Rákóczifalva via the river network of the Danube, Tisza and Maros. No analyses are available in the literature on the golden rod end – a small cylindrical spout. It can be assumed that the origin of the artefact lies in the Carpathian Mountains.

» **These raw materials were needed to produce important tools as well as prestigious jewellery. Therefore, an extensive transport and trade network within the Carpathian Basin and beyond was of great importance.** «
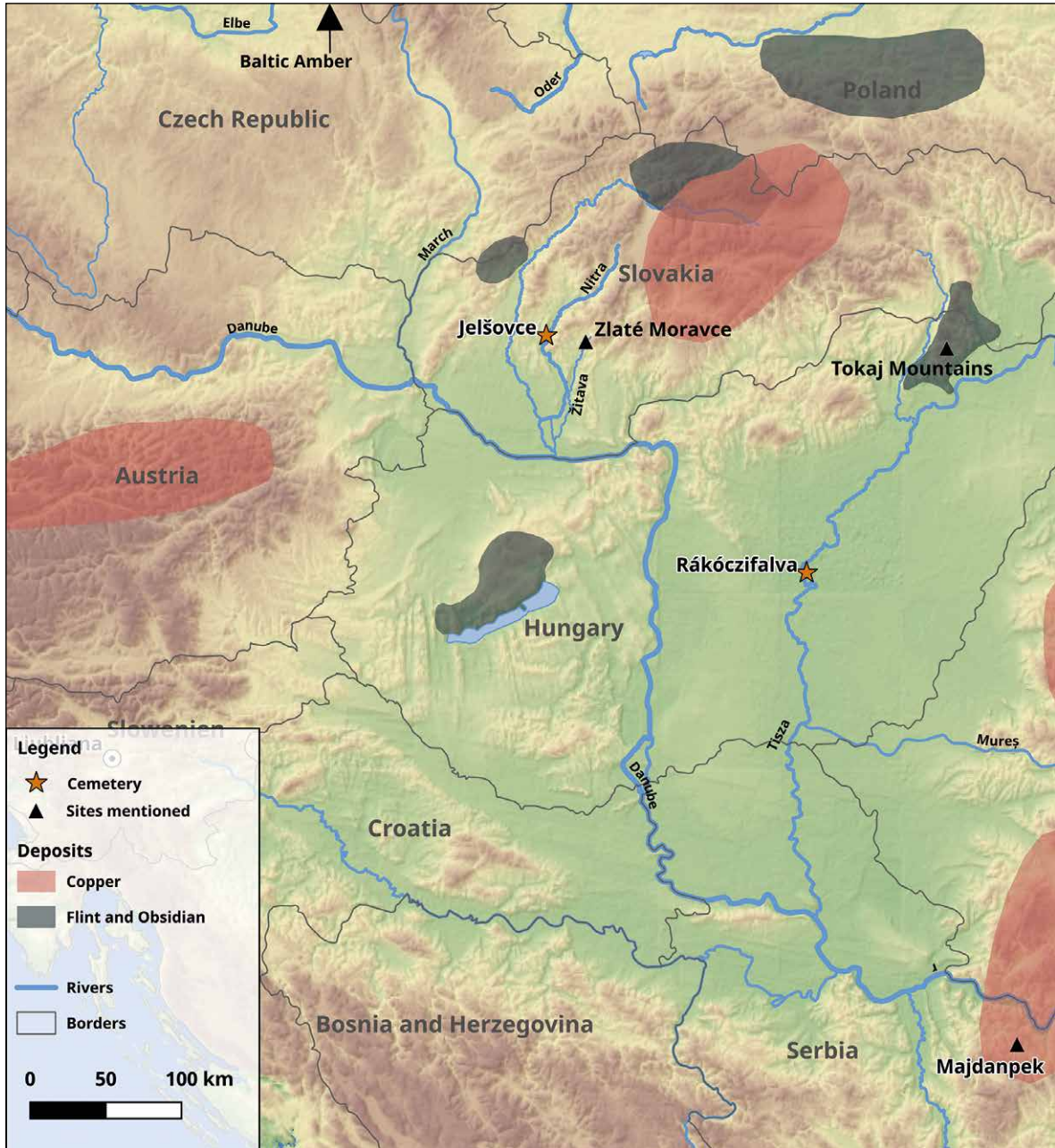
← The Carpathian Basin and the places and rivers mentioned in the text. Regions with a large number of raw material deposits are marked in colour; outside these regions there are isolated known deposits (map basis: European Environment Agency Creative Commons Attribution 4.0 International).

← Documentation and sampling of bone material from Jelšovce in the find archive of the Archaeological Institute of the Slovakian Academy of Sciences (photo: H. Skorna)

The grave goods in grave 201 at Rákóczifalva thus provide evidence of a well-developed network of transport routes and trade relations for raw materials in Southeastern Europe as early as the Copper Age, 6000 years ago. The raw materials for the production of the artefacts in the grave were transported along the rivers and through a wide network of settlements until they reached the man in grave 201 and served him during his lifetime as material and jewellery or as symbols of his social status.

Grave 110 from Jelšovce (Slovakia, ca. 2100 to 1600 BCE)

Near Jelšovce on the banks of the Nitra River, which flows into the Danube, is the burial site of an Early Bronze Age society. The site was excavated by Jozef Bátora and the Archaeological Institute of the Slovak Academy of Sciences in Nitra between 1982 and 1987. Over a period of about five hundred years,

630 dead people were buried here, some with rich grave goods. In grave 110, a woman aged between 50 and 60 was buried in a crouched position. Some of the grave goods as well as the bones of the deceased, which were scientifically examined, indicate an extensive network of exchange of goods and raw materials as well as a high mobility of these Bronze Age people. The woman's grave goods included a gold earring, an amber bead, a copper needle, a copper dagger, an obsidian blade and two ceramic vessels. In terms of material and decoration, the ceramic vessels are most likely of local origin. The source of the copper, from which the copper objects are made, cannot be clearly identified. Only about 40 km away, near Zlaté Moravce in the Western Carpathians, there is a metal deposit from which the copper could have come. Nevertheless, the copper objects in the grave can be identified by the previously mentioned investigations as a type of copper that was also used for the production of Early Bronze Age objects from Lower Austria and Southern Germany. The gold in the earring probably came from the neighbouring Žitava River Valley, where river gold has been mined up until modern times. This is also indicated by the name of the small town of Zlaté Moravce (the word 'zlato' in a number of Eastern European languages means 'gold' in English). The blade made of obsidian, on the other hand, is a

» Then as now, the exchange of goods, raw materials and ideas is one of the engines of human development. «

clear import via a long-distance transport route. The nearest known deposits of this volcanic glass are the mountain ranges of the Zemplin or the Tokaj Mountains in Eastern Slovakia and Hungary at a distance of about 260 km, although the possible transport route via the rivers would have been even longer.

But the longest journey, which finally ended in the woman's grave in Jelšovce, would have been made by the amber. According to the analysis, it is Baltic amber, whose best-known occurrence is in the Southeastern Baltic region. Although amber has also been mined in other parts of Northern Central Europe since around the end of the 19th century BCE, it can be assumed that in prehistoric times it was probably collected from the beaches of the Baltic coast. The least costly route from the Baltic Sea (approx. 600 km) leads along the Odra and Morava River catchments through the Moravian Gate to the Danube and Nitra in present-day Slovakia, a long distance with a long travel time (cf. contribution by B. Serbe in this volume).

Numerous scientific methods have been increasingly applied in archaeology in recent years. These include, in particular, isotope analyses of human remains from graves to reconstruct diet and mobility. Strontium isotope analysis was also used in Jelšovce to reconstruct mobility. The examined skeletal remains of the buried person from grave 110 indicate that she did not spend at least her childhood and early youth in the vicinity of Jelšovce.

These scientific approaches are currently being continued in a large-scale study at the Jelšovce cemetery within the framework of the ROOTS Cluster of Excellence in order to gain insights into the diet of this Bronze Age society on the basis of isotopes (nitrogen and carbon).

The end of the road?

Both grave 201 from Rákóczifalva and grave 110 from Jelšovce point to extensive exchange networks and individual mobility in prehistoric societies. In view of the ease and speed with which goods as well as information are traded and exchanged today, it is astonishing that already 6000 years ago, i.e. before the invention of the wheel, goods have been transported over very long distances and under much more difficult conditions, so that different societies were connected by networks with each other.

Then as now, the exchange of goods, raw materials and ideas is one of the engines of human development. In the future, constantly evolving scientific methods will enable us to gain an even better understanding of the routes and networks of prehistoric societies in order to fathom the roots of our society today. ◆
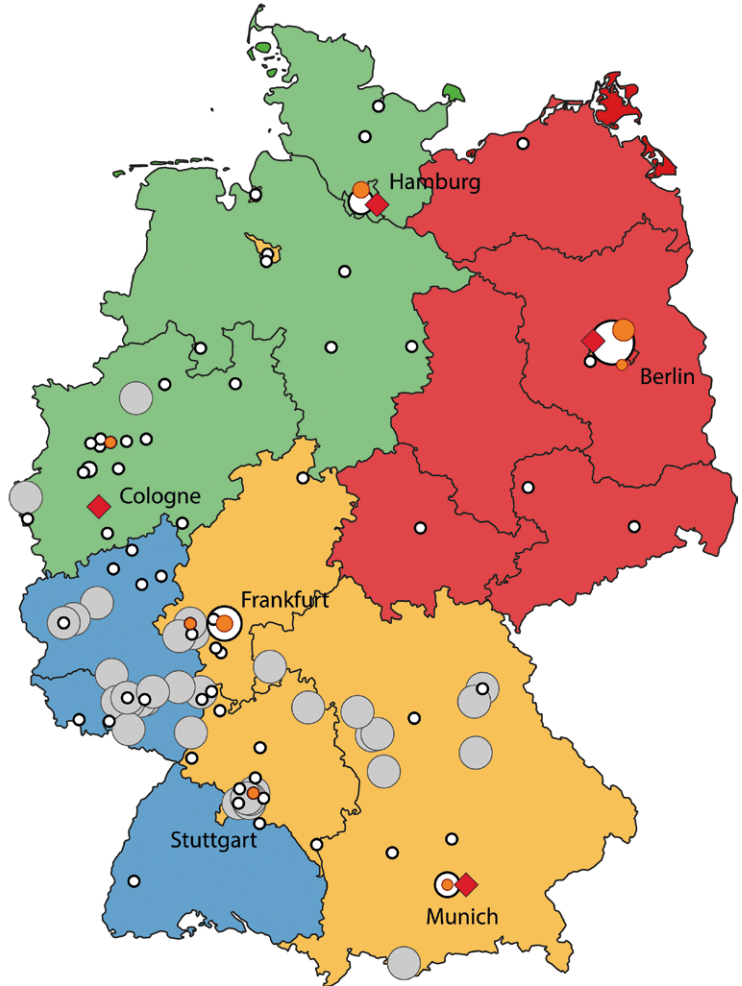
Häagen-Dazs

- ● 1
- ● 1-4
- ● 5-6

Hard Rock Cafe

- ◆

Starbucks

- ○ 1-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ 21-25

- ● Active US Military Base
- ■ French occupied zone
- ■ Soviet occupied zone
- ■ American occupied zone
- ■ British occupied zone

Hamburg

Berlin

Cologne

Frankfurt

Stuttgart

Munich

Jutta Kneisel

Mermaids, Faces, Houses and Birds – Symbols of Connectivity

Today: Starbucks & Co.

The green mermaid on a white background is a global symbol of lifestyle, status and prestige. The symbol conveys a sense of belonging to a polyglot community, youthful, mobile, well-travelled, financially well-off and urban. Visitors to Starbucks cafés experience connectivity, social recognition and have access to the internet. Starbucks realises the concept of a third place besides home and work where people feel comfortable. At the same time, the wide selection of beverages allows people to emphasise their own individuality. Starbucks is a company from the USA that spread globally beyond America from the mid-1990s. In 2002, the first two branches opened in Berlin. Other branches in other major cities and at international airports followed. These are the locations of the target group: Young urban-

← **The distribution of Starbucks & Co in Germany according to frequencies and the US military locations in Germany (map: J. Kneisel).**

ites and travellers who see the symbol as a guarantee of consistent quality, a pleasant environment and internet access. With increasing recognition, the mermaid logo was changed again and again to adapt it internationally, until finally the lettering was dropped altogether in 2011. The mermaid is sufficient as a distinctive sign.

A map of Starbucks cafés by frequency shows precisely this concentration in major German cities such as Berlin, Munich, Hamburg, Frankfurt or in metropolitan areas such as the Ruhr region. Individual branches are scattered throughout Germany, including Dresden, Leipzig or Rostock. However, a clear concentration can also be seen in the southwest of the country. Places like Grafenwöhr or Ramstein with fewer than 7000 inhabitants do not fit the picture of the target group. These are US military sites. By mapping the active US military bases in Germany, a coincidence appears in Southwest Germany. Obviously, in addition to the young, dynamic

urban audience, the home effect also plays a role for members of the US military, because this is the only way to explain the Starbucks in Spangdahlem, a place with just under 1000 inhabitants. Starbucks is thus a label that functions on two levels. On the one hand, it is representative of American culture in Germany (as one of many things). On the other hand, it is associated with a social group that links the depiction of the mermaid on a coffee cup with a certain attitude to life. The mermaid symbolises the connectivity of this group, brings prestige and a sense of belonging.

Two more labels should be mentioned at this point: Hard Rock Café and Häagen-Dazs. Hard Rock Café started its business, like Starbucks, in the early 1970s and spread from London to North America and Europe. The first German branch opened in Berlin in 1992. Here, too, a lifestyle is conveyed: American food, music and exhibits from the music scene make the visit a special experience. However, the target group is an older one. Altogether smaller than Starbucks, there are only four branches, spread over the four largest cities in Germany: Berlin, Hamburg, Munich and Cologne. Häagen-Dazs is also an American product that has been expanding in Europe and Asia with its cafés since the 1990s. The high-priced ice cream has been available in Germany since the late 1980s. Unlike Starbucks, the American origin is not recognisable from the name. The intention is to use the Danish-sounding name as a kind of European seal of quality. There are now 18 branches in Germany, six of them in Berlin and four in Frank-

← Face, house and box urns and bird figu-
rines of the Late Bronze Age and the Early
Iron Age (1100-500 BCE).
1. Face urn, Rzadkowo, Poland
   (photo: A. Heimann, Kiel University).
2. Face urn, Bilsen, Schleswig-Holstein
   (photo: S. Jagiolla, Kiel University).
3. House urns, Saxony-Anhalt (photo: K.
   Göken, Museum für Vor- und Früh-
   geschichte, Staatliche Museen zu Berlin).
4. Box urn, Schleswig-Holstein
   (photo: Museum für Archäologie Schloss
   Gottorf, Landesmuseen Schleswig-Hol-
   stein).
5. Bird figurine, Poland
   (photo: T. Skorupka, Archaeologisches
   Museum Poznań).

furt. The others are dispersed across large cities. The only exception is the location in Wustermark, a small town in Brandenburg with a population of just under 10,000 in the outskirts of Berlin. The café is located in an outlet centre and is thus linked to retail and brand tourism. Due to its high price, a certain prestige is also associated with eating the ice cream here. At the same time, one behaves in a health-con-scious and ecologically correct manner, as this ice cream advertises that is free of additives.

All three brands promote their products with a logo that has a high recognition effect and, in the case of Starbucks and Hard Rock Café, is also linked to locally influenced souvenirs. T-shirts or coffee mugs that combine the company's symbol with the city name give the wearer a certain prestige. The

customers belong to different groups, each with a common connectivity. But there is a common de-nominator. One is the location in big cities as melt-ing pots and tourist centres where interconnectivity is a given. Another is the location away from the cen-tres in regions where foreigners have settled who want to cultivate their local coffee tradition, such as Ramstein and Spangdahlem. A third location factor is represented by places with a special resource, such as the outlet centre in Wustermark, visited by many people.

3000 years ago: Face urns & Co.

These links between logo and symbol for a way of life can also be traced to prehistoric times in Europe. The period between 1100 and 600 BCE covers the end of the Bronze Age and the begin-ning of the Iron Age. At that time, networking had long taken place right across Europe. Raw materi-als, such as copper and tin, but also gold, amber or salt, became important trade goods. The rarity of the resources made long journeys as well as inter-mediaries between raw material sources and end users necessary.

From 1100 BCE onwards, a burial practice devel-oped in one of the Bronze Age "agglomerations" that formed faces on urns. The urns are thus humanised. Through the face, the long-necked and bulbous ves-sel becomes a body, which encloses the human cremated remains. The faces, which were rather indistinct and small at first, become increasingly larger over time. From 900 BCE, this burial prac-tice spreads across the Baltic region and to Central Germany. Somewhat later, the first vessels are also found in Northern Poland and Italy. The faces are different and vary greatly. Another urn form of this period are house imitations made of clay, so-called house urns, which are attested in Italy from the 14th century BCE. From the 9th century BCE onwards, we observe them in Central Germany, Scandinavia and Poland. A third type of urn originates from Branden-burg and is most common along the Spree River and the Havel River. These are clay boxes that contain the cremated remains. The rectangular shape is un-
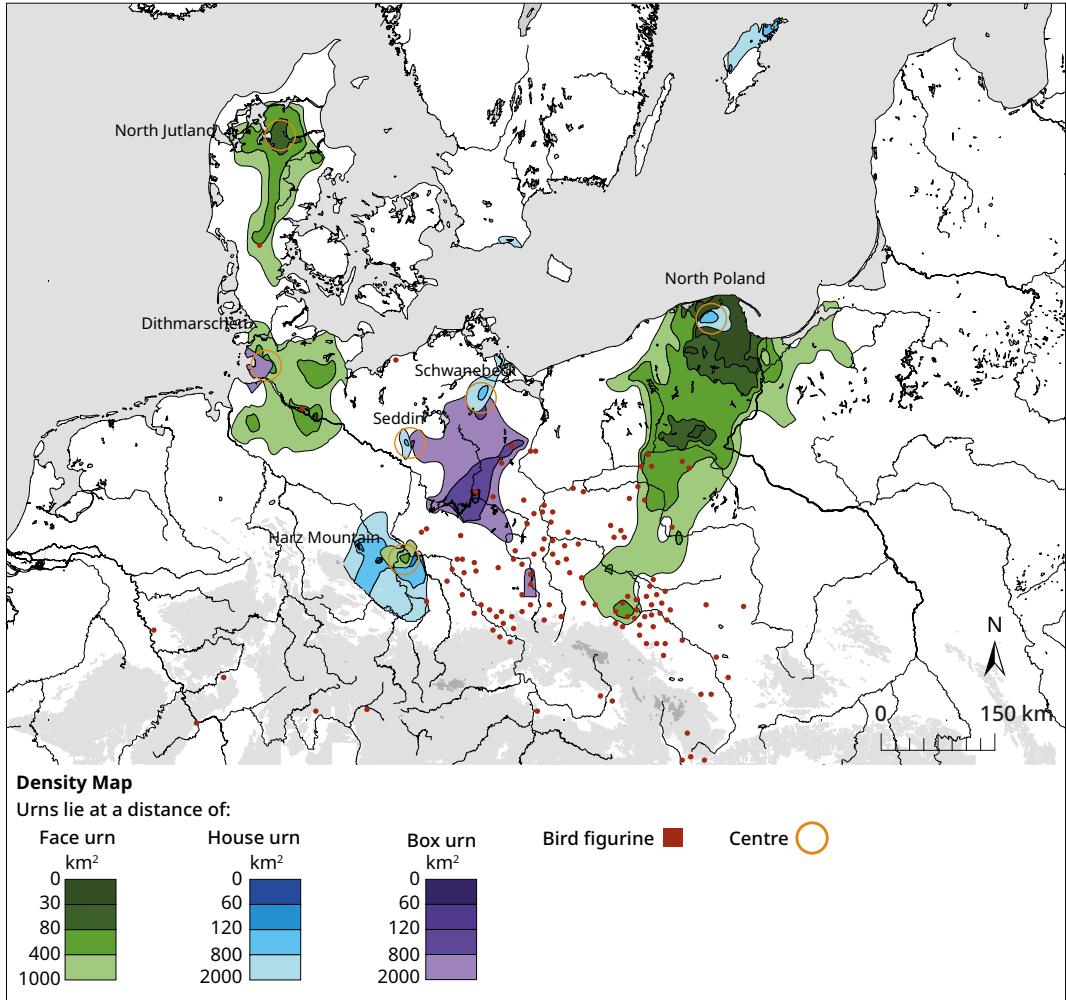
»   For the box urns, house urns and face urns, somewhat similar to Starbucks, Hard Rock Café and Häagen-Dazs, an interconnectivity is evident in centres where different imaginative worlds meet and specific burial forms are cultivated.   «

usual and requires special pottery skills, especially for the lid. An important symbol of the Late Bronze Age and the Early Iron Age is the bird. Clay birds or bird rattles are linked to the burial ritual and are found on burial grounds especially in Brandenburg and Wielkopolska, but also in Southern Germany. Bird depictions in the form of carvings are found on single urns in Poland, Germany and occasionally in Scandinavia.

These four different forms of burial practice are not evenly distributed. Each urn form has a different distribution area, and there are large gaps between the individual occurrences. Nevertheless, there are overlaps in small regions where at least two of the three urn forms occur. These are regions such as Northern Jutland, Dithmarschen in Schleswig-Holstein, the Northern Harz region and the area around Seddin in Brandenburg and Schwanebeck in Mecklenburg-Western Pomerania. All these small regions are characterised by a conspicuous concentration of bronze finds, which stand for a local centre with far-reaching exchange connections. At the same time, they are resource-rich regions with amber (Northern Jutland, Albersdorf, Northern Poland) or salt (Harz region) or regions that lie on exchange routes between Sweden and the Alps (copper), such as Seddin or Schwanebeck. In these places, different worlds of conceptions meet and find expression in different burial forms. These centres form a network and are connected by routes on which raw materials are negotiated and exchanged between Scandinavia and Italy and by sea in the Baltic. In the regions in between, other burial forms are popular or determine the ritual everyday life such as bird figurines. These groups tend to be oriented towards the south and southwest rather than to the north.

For the box urns, house urns and face urns, somewhat similar to Starbucks, Hard Rock Café and Häagen-Dazs, an interconnectivity is evident in centres where different imaginative worlds meet and specific burial forms are cultivated. In these centres, people from different regions come together during the Late Bronze Age and the Early Iron Age. They exchange goods, ideas, knowledge and conceptions that find their echoes in the rich archaeological heritage of the small regions. The region and the people benefit from interconnectivity. ◆

Density Map

Urns lie at a distance of:

Face urn km²	House urn km²	Box urn km²	Bird figurine	Centre
0	0	0		
30	60	60		
80	120	120		
400	800	800		
1000	2000	2000		

⇡ The distribution of face, house and box urns and bird figurines. The urns are mapped according to density of occurrence. Central regions with overlaps of several urn types are marked in yellow (map: J. Kneisel).

Lutz Käppel

Theoria –The Pilgrimage to the Sanctuary as a Journey to Knowledge or *What the Modern Concept of "Theory" Has to Do with a Religious Practice in Ancient Greece*
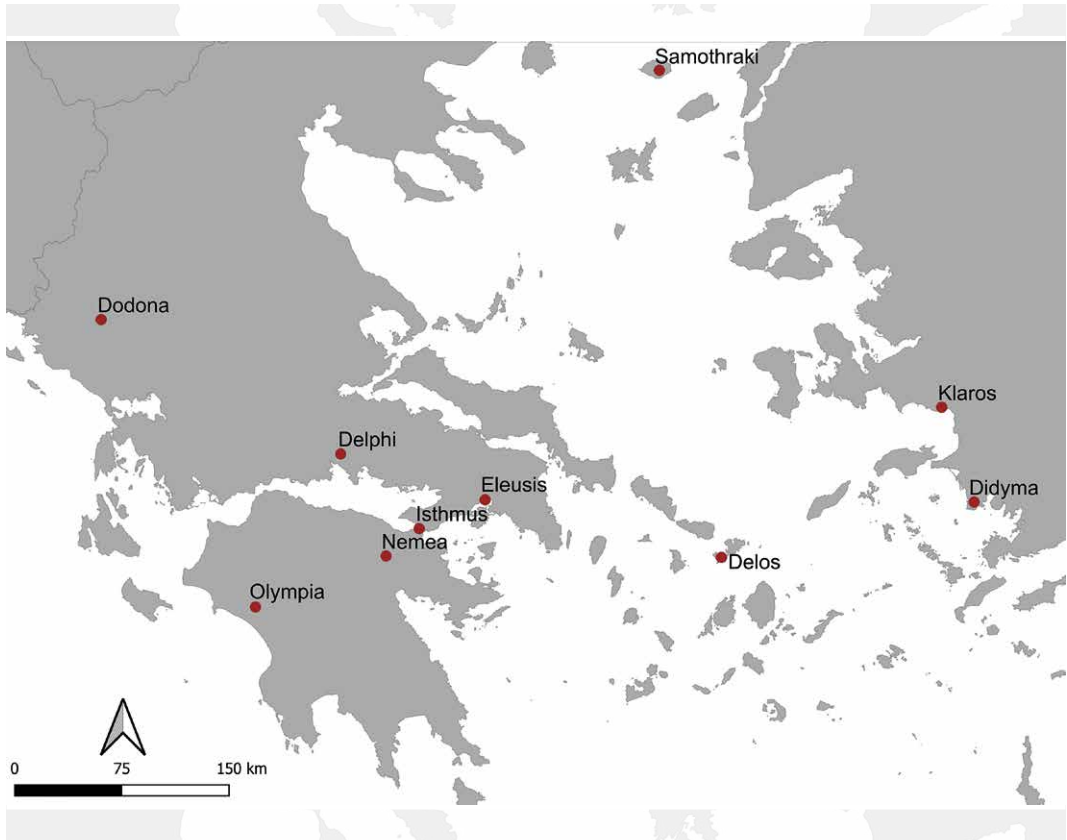
Theory and practice, theory and model, theories and data – hardly any term is as much at the core of all concepts of knowledge as the term theory: in normal everyday life as well as in the most rigorous disciplines of science. What a theory is seems prima facie clear: "A theory is [...] knowledge gained through thought as opposed to knowledge gained through experience. In science, theory [...] denotes a system of scientifically substantiated statements that serves to explain sections of reality and the underlying laws [...]" (e.g. wikipedia s.v. "T."). More in-depth scientific-theoretical drafts differentiate this picture and in turn arrive at highly theoretical theories of theory on the basis of current uses and concepts. What all modern understandings seem to have in common is that they emphasise the factual-static of a given theory, not least in order to distinguish it as an instrument of justification from the processual and volatile character of practice, reality, data, etc.

A look at the historical roots of the term leads to a surprising finding: The Greek word *theoria* originally referred to a ritual festival delegation and its journey to one of the great Greek sanctuaries of antiquity: Delos, Didyma, Klaros, Dodona, Eleusis, Samothrace with their oracle, mystery or tribal festivals, but also Olympia, Delphi, Nemea and Isthmia with their 'sport' festivals were the preferred destinations. Regularly – usually once a year, as to Delos, but also every four years, as to Olympia – festive delegations (*theoriai*) from the Greek city-states (poleis) went to the festivals of the gods of these central sanctuaries. In this way, they established a network of political-religious relations that connected the Greek poleis not only with these very sanctuaries, but also with each other. In the form of 'hubs' (sanctuaries), 'nodes' (poleis) and 'links' (*theoriai*), a lively-dynamic network of religious-political 'connectivities' was formed, on which Greek identity as a cultural-religious construct was ultimately based.

The word *theoria* itself goes back to *theorós*, the 'festival envoy', which in turn is derived from the verb *theáomai*, 'to look'. The *theoroí* thus travelled to the respective sanctuaries and 'watched' the sacrificial rituals, musical performances or sacred sports competitions. Their activity, in turn, is denot-

← **Important destinations of *theoroí* in Greece (after I. Rutherford 2013, 8).**
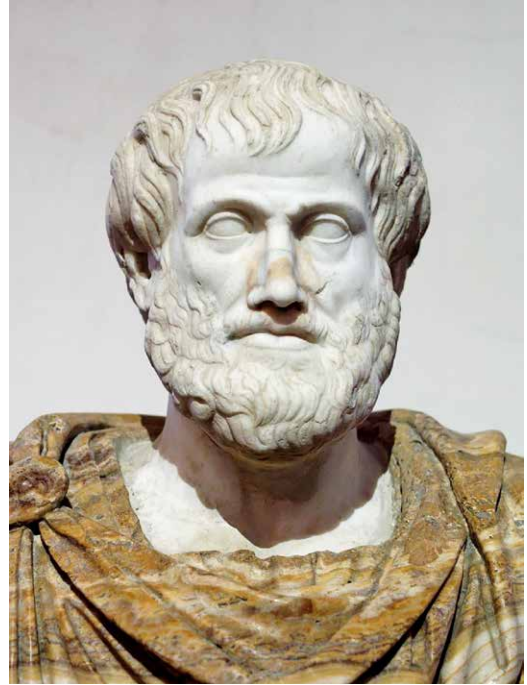
← Bust of Solon of Athens (ca. 640-560 BCE): Copy after Greek original (ca. 110 BCE) in the National Archaeological Museum in Naples (photo: © CC BY-SA 3.0; cf. https://en.wikipedia.org/wiki/Solon).

↑ Portrait of Aristotle in modern bust, Roman copy after a sculpture by the sculptor Lysipp, Rome, Palazzo Altemps (photo: public domain; cf. https://en.wikipedia.org/wiki/Aristotle#/media/File:Aristotle_Altemps_Inv8575.jpg).

ed by the verb *theoréo* derived from it, which now no longer includes only the 'watching' itself, but the entire *theoria* from the departure to the journey to the participation in the ritual with its religious show. The main goal and climax of the entire undertaking was, of course, to 'watch' this very 'show'. After all, its name derived from it. It does not take much imagination to realise that for the individual participants, who often came from remote small communities, large-scale Greek religious events such as the Apollo Festival on Delos or the Olympic Games with their pompously staged rituals were impressive experiences: People went there to see *this*.

Early on, the word *theoria* began to develop a 'life of its own' beyond its terminologically specific application. Probably the most impressive example of this is the supposed educational journeys of the Athenian statesman Solon. He was not only a politician but also a poet and was considered one of the so-called Seven Wise Men. Since the traditional image of the wise man in archaic times included travelling to distant lands, he too is said to have

» Early on, the word *theoria* began to develop a 'life of its own' beyond its terminologically specific application. «

travelled to Egypt, Cyprus and Asia Minor after his constitutional reform in the early 6th century BCE. The historian Herodotus (late 5th century BCE) reports in his Histories (1, 29 f.) that Solon, in order not to be forced to change individual elements of his laws after the constitutional reform, went out of the country for ten years and left by ship under the pretext of a *theoria*. This is how he reached Egypt and finally Sardis to visit King Croesus, where he had profound conversations about human happiness. What is interesting about Herodotus' account, however, is that from the 'pretext' of *theoria*, the word is transferred from the terminologically narrow meaning of pilgrimage to a general educational value of travel: Solon's journey to the sights of the world is in the end *theoria*. Hence, Herodotus even has Croesus greet his guest Solon with the words: "We have received much tidings of you because of your *sophia*, your prudence, and your *pláne*, your wanderings: As a *philosophéon*, as a philo-sophist (i.e. one who loves prudence/knowledge), you have travelled many lands of the earth for the sake of *theoria*.". Here, the desire to gain knowledge through travel

is evidenced by, of all things, the two key words that were to play the decisive role in the history of scientific thought in the period that followed: Philosopheîn and *theoria* – philosophy as a pilgrimage to the show. Incidentally, a little later in the text (4, 76) it is also said of the Egyptian king Anacharsis that he travelled a large area as *theorós*.

The word *theoria* did not find a systematic place in philosophy until Plato in the 4th century BCE. This development probably has a certain foundation in the fact that even before him, Anaxagoras is said to have described the observation of the heavenly bodies as *theoria* and declared it to be the goal of all life (59 A 29/30 DK). Since Parmenides (28 B 1 DK *et al.*), the journey and the path up to the truth had also been present as an idea in philosophy. But it was only with Plato that the concept of 'theory' became part of the philosophical apparatus. It appears whenever the path from the here and now of the material world to purely spiritual ideas and principles is to be described and terminologically fixed. At first, the word *theoria* is still clearly recognisable as a metaphor. Thus, at the beginning of his writing of

» Especially the fact that 'theory' is pursued for its own sake allows it to stand as an equal counterpart next to the old sacred *theoria*. «

the 'State' (327a-b), Plato has Socrates as *theorós* go outside the walls of the city to watch the spectacular Bendis festival – a symbolic anticipation of the pilgrimage to the Ideas that culminates in the Allegory of the Cave in Book 7. Socrates has his profound conversation about the immortality of the soul in prison awaiting death at the very time that the Athenian *theoria* is on route to the Apollo festival on Delos ('Phaidon' 58b), delaying the execution of the death sentence. Also, the descriptions of the soul's ascent to the vision of the beautiful ('Symposon' 210a-d) or to the vision of truth ('Phaidros' 247d) are modelled on the religious *theoria* to the mystery celebrations at Eleusis. For Plato, 'theoretical' philosophy always involves a detachment from the known, a vision of the true, and a return to (and re-evaluation of) the known. Philosophical theory is thus philosophical practice, just as sacred *theoria* was eminently political-social practice: No comprehensive philosophical action without the contemplative element of 'seeing' the truth.

The element of *theory* finds its ultimate place in a system of science through Aristotle's writings. For him, theoretical science is that which speculatively researches the principles of being: Mathematics, physics, also theology (Metaphysics 5, 1026a and 10, 1064b). *Theoria* as the activity of pure reason, of *noûs*, represents the ideal, because truly philosophical, form of life, the *bios theoretikós*, is distinguished from the *bios politikós*, the life of politics, and the *bios apolaustikós*, the life of pleasure (Nicomachean Ethics, Book 10). An essential moment is the purposelessness of theory: It is pursued purely for its own sake; in this respect it is 'free' (Met. 1, 981b. 982b) and truly divine (Nic. Eth. 10, 1177b). Thus: 'Theory is the most pleasant and best' (Met. 12, 1072b; De caelo 292a).

Especially the fact that 'theory' is pursued for its own sake allows it to stand as an equal counterpart next to the old sacred theoria. In this respect, Aristotle was also still fully aware of the metaphorical character of his choice of terms: Here as there, the 'show' of truth – as he put it in his 'Protreptikos', an advertising pamphlet for philosophy itself – proves to be valuable for its own sake (Protr. B 44 Dür.: see text box).

In the modern era, however, the image of theory changed considerably. With the emergence of modern natural sciences, the relationship between theory and empiricism, theory and practice, theory and reality required new differentiations. Nevertheless, it is still worthwhile today to let the word 'theory' always resonate a little with the old stratum of its metaphorical origin: A regular pilgrimage to pure vision, for its own sake, just like that. And after returning to the phenomena, one sees the world with different eyes, like the *theoroí* who went out from the Greek poleis to make their city a little better upon their return after what they had experienced and seen. ◆

Aristotle, Protrepticus

(transl. by Hutchinson and Johnson, 51)

It is not a terrible thing at all, then, if it does not seem to be useful or beneficial; for we don't claim that it is beneficial but that it is in itself good, and it is appropriate to choose it for itself, not for the sake of some other thing. For just as we travel abroad to Olympia for the sake of the spectacle itself, even if there is going to be nothing more to get from it (for the observing itself is superior to lots of money), and as we observe the Dionysia not in order to acquire anything from the actors (rather than actually spending), and as there are many other spectacles we would choose instead of lots of money, so too the observation of the universe should be honored above everything that is thought to be useful. For surely one should not travel with great effort for the sake of beholding people imitating girls and slaves, or fighting and running, and not think one should behold the nature of existing things, i.e. the truth, for free. ■

Henny Piezonka

Pathways between the Worlds –
The Sacred Ecology of River Routes

In the boreal forests of the northern hemisphere, rivers have been the most important landscape feature associated with human mobility and dynamic life worlds for many millennia. In some regions, this remains the case today, for instance in the vast expanses of the Siberian taiga where indigenous groups continue to lead partly mobile lives as hunter-fishers and reindeer herders. The multitude of water bodies in such densely forested environments basically corresponds to the branching system of routes and pathways available to people that want to travel from A to B. In summer, movement and transport is carried out by boat, while in the cold season, the rivers turn into icy roads.

River routes are so important for the people in these regions that they form a basic unit for the conceptualisation of spatial as well as social structures: Distances are communicated as numbers of river bends (a Selkup explanation of a location would, *e.g.*, be: "Our old summer station is located at the 7th bend."). Populations both in the North American and the North Eurasian forest zone are structured in totemic kinship groups connected to respective river catchments between the watersheds, and ethno-linguistic communities are identified and named according to rivers (*e.g.* the Yugan Khanty, the Taz Selkup). Besides these connecting and categorising functions, rivers also have transitory properties. They can represent boundaries that need to be crossed at fords or bridges, they embody a steady transition from the upper towards the lower course,

← **Pole tent of a Selkup fisher by the Taz River, summer 2020. In the Siberian taiga, mobilities, life worlds and cosmologies are deeply entangled with rivers (photo: A. Novikov, IAE SB RAS, Novosibirsk).**

and river mouths can be important meeting points and nodes of connectivity. Closely interconnected with seasonal cycles, spatial and temporal categories intersect at such places.

Rivers connecting worlds

However, in the traditional life worlds in the forest zone, rivers, which function as linear and relational structures, are much more. As the British anthropologist Tim Ingold stated, "Every line is a relation ... not *between* one thing and another ... [but] rather a line *along* which materials flow, mix and mutate". In this sense, rivers are integral parts of the cosmological meshwork within which Indigenous people dwell, in the North Eurasian taiga as well as in other densely forested areas.

In the cosmology of the Khanty and other hunter-fisher groups of Western Siberia, the course of a river is equated with the three-partite setup of their world: The upper course is related to the upper world of the sacred which is located in the south

and equated to the sky. The riverside settlements of the living people are part of the middle world, the human realm. Finally, the lower course leads to the underworld, the north, which is connected with the realm of the dead and of evil spirits. Anthropologists, such as the Russian scholar Vladimir Adaev, see a reflection of an old, horizontally structured world concept in this system, which is syncretically combined with the vertical division into an upper, middle and lower world in the current cosmology of the taiga groups. The rivers and water bodies in the taiga are the home of spirits that can be unfavourable or even dangerous to people, *e.g.*, by influencing seasonal fish migrations. Hence, a multitude of taboos and prohibitions exist at sacred places along the rivers, concerning, e.g., access by certain groups such as women, as well as fishing and hunting taboos, *etc.*

Understanding landscapes of the past

In an ethno-archaeological study among the Yugan Khanty, the British archaeologist Peter Jordan describes numerous interconnectivities between the properties and roles of rivers within the cosmology and their manifestations as physical patterns in the enculturated landscape. For example, to establish a new settlement or dwelling downstream from the former one is considered unlucky, so sequences of houses always spread upriver. This reflects how the cosmologically constituted direction of the river flow influences new dwelling locations. Likewise, cemeteries are never located upstream from close-by settlements, and the deceased are interred with their heads aligned to the north in the direction of the river flow.

We have seen how the sacred ecology of rivers can be closely intertwined with the (re)production and transformation of social, practical and symbolic spaces. A broader cosmology of an animated world influences social practice. Bearing in mind such possibilities, as based on the expert knowledge and practices of (modern) hunter-fishers living in the northern forests, there is a lot of potential for a better understanding and more valid interpretations of archaeological patterns as well. For example, studies of enculturated landscapes of Mesolithic foragers in the post-glacial forests of Central and Northern Europe can benefit from these recent examples, as they illustrate the roles of rivers as connections, flows and relational lines, rather than physical and mental boundaries. The locations of prominent archaeological features left by Stone Age hunter-fishers, such as settlement sites and burials, can be assessed in a more comprehensive way in the face of symbolic, ritual and practical entanglements as described above. Thus, as archaeologists biographically routed in metropolitan, industrial societies, we can learn to better approach the strangers of the past and their dynamic ways and routes through their forest worlds. ◆

↓ From the helicopter on the way to fieldwork in the northern taiga, there is an amazing view of the meandering rivers (photo: J. Schneeweiß).

» **In the cosmology of [...] hunter-fisher groups of Western Siberia, the course of a river is equated with the three-partite setup of their world:**

The upper course is related to the upper world of the sacred [...]. The riverside settlements of the living people are part of the middle world, the human realm. Finally, the lower course leads to the underworld, [...] the realm of the dead and of evil spirits. «

↑ Indigenous Selkup hunter-fishers carry out their short distance tasks by log boat (photo: C. Engel, Berlin).

Chapter 6:

Conclusion and Outlook

Lutz Käppel, Henny Piezonka, Andrea Ricci

Along the Way – A Look Back Ahead

People and spaces have always been connected by routes: Paths, trails, roads – on land, on water and sometimes even through the air, over hill and dale as well as over wooden planks, pavement and asphalt. Humans and animals followed them, the routes directed the circulation of raw materials and goods, they determined the paths on which humans fled from misery and danger, they constituted the physical and imagined veins of networks between communities. The roots of these routes, which we have uncovered in this booklet, date back to the Palaeolithic at ca. 15,000 BCE: State-of-the-art research methods have been able to identify hunting routes of Stone Age foragers off the coast of Heligoland that have been covered by the sea long ago. The so-called 'New Silk Road' between Asia and the countries of Africa and Europe did not only have one, but rather a multitude of predecessors, reaching back well into antiquity. Moreover, isolation and disruptions of formerly established routes, such as those of the 'Vikings Abroad', have also proven to be directional for cultural developments, in that diaspora situations have acted partly as a means to preserve ancient cultural traditions, and partly as impulses for innovation.

These and the many other examples in this booklet illustrate how much the development of human societies is determined by the routes through which they are connected – or not connected. Modern narratives of a limitless, openly accessible world, grounded in an urban-industrialised experience (or agenda), can get cracks if we look deep enough into the past. It is the paths, the very concrete connections in a material as well as a spiritual sense that influence human lives, their existence and their development in the world. Communication and dialogue along the routes and networks must be maintained, as they were and are the guarantors for a good coexistence of humans in this world. However, they are also always at risk and require attentive care.

In this sense, every look back is also always a look forward... ◆

Map of the Topics

1 /

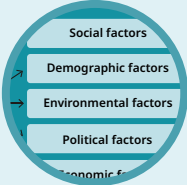**Globalisation?
What Globalisation?**
by Tim Kerig

2 /

Routes in the Landscape – Ecological and Social Conditions for the Exchange of Goods, Ideas and People in the Past
by Walter Dörfler

3 /

**Entangled Mobilities –
The Interconnection of Human Routes and Animal Movement**
by Henny Piezonka and Karolina Varkuleviciute

4 /

Climate Refugees
by Mara Weinelt

5 /

How Far Back Do Our Routes Go? Sunken Pathways in the North Sea: Tracking Late Palaeolithic Reindeer Hunters off the Coast of Heligoland
by Berit Valentin Eriksen and Wolfgang Rabbel

6 /

Rooting the Silk Road
by Johanna Hilpert and Jutta Kneisel

7 /

On the Road again: Travelling through Jutland – The Ox Trail, a Millennia-old Route
by Jutta Kneisel, Bente Majchczack, Franziska Engelbogen, Anna K. Loy, Oliver Nakoinz

8 /

**Walking on Ancient Paths –
Are We Still Using Celtic Trails?**
by Franziska Engelbogen

9 /

**Connection Breakdown –
Three Vikings Abroad**
by Jens Schneeweiß and Henny Piezonka

Contributors

Jan Piet Brozio

Institute of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Berit Valentin Eriksen

Cluster of Excellence
ROOTS, Kiel University /
Centre for Baltic
and Scandinavian
Archaeology, Schleswig-
Holstein State Museums
Foundation Gottorf Castle

Walter Dörfler

Cluster of Excellence
ROOTS / Institute
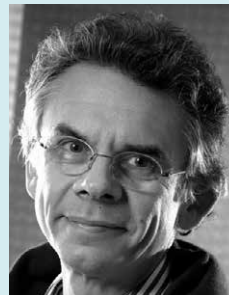of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Johanna Hilpert

Institute of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Franziska Engelbogen

CRC 1266 /
Institute of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Lutz Käppel

Cluster of Excellence
ROOTS / Institute of
Classics, Kiel University

Tim Kerig

Cluster of Excellence
ROOTS / Institute
of Prehistoric
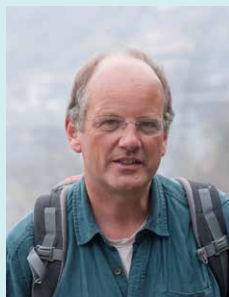and Protohistoric
Archaeology,
Kiel University

Bente Sven Majchczack

Cluster of Excellence
ROOTS / Applied
Geophysics, Institute
of Geosciences,
Kiel University

Jutta Kneisel

Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Johannes Müller

Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Anna K. Loy

Young Academy, Cluster
of Excellence ROOTS /
Institute of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Oliver Nakoinz

Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Henny Piezonka

Institute of Prehistoric
Archaeology,
Free University Berlin

Khurram Saleem

Young Academy,
Cluster of Excellence
ROOTS / Institute
of Material Science,
Kiel University

Wolfgang Rabbel

Cluster of Excellence
ROOTS / Applied
Geophysics, Institute
of Geosciences,
Kiel University

Jens Schneeweiß

Cluster of Excellence
ROOTS, Kiel University /
Centre for Baltic and
Scandinavian Archaeology,
Schleswig-Holstein State
Museums Foundation
Gottorf Castle

Andrea Ricci

Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Benjamin Serbe

Young Academy,
Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University

Henry Skorna

**Young Academy,
Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University**

Fynn Wilkes

**Young Academy,
Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University**

Karolina Varkuleviciute

**Young Academy,
Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University**

Mara Weinelt

**Cluster of Excellence
ROOTS / Institute
of Prehistoric
and Protohistoric
Archaeology,
Kiel University**

For further reading

TIM KERIG

Algaze, G., 1993. *The Uruk world system: the dynamics of expansion of early Mesopotamian civilisation.* Chicago: Univ. of Chicago Press.

Kerig, T., Hilpert, J., Strohm, S., Berger, D., Denis, S., Gauthier, E., Gibaja, J.F., Mallet, N., Massa, M., Mazzucco, N., Nessel, B., Pelegrin, J., Pétrequin, P., Sabatini, S., Schumacher, T.X., Serbe, B., Wilkinson, T., forthcoming. *Interlinking research: The Big Exchange project.* Antiquity.

Ling, J., Chacon, R., Kristiansen, K., eds., 2022. *Trade before Civilization – Long Distance Exchange and the Rise of Social Complexity.* Cambridge: Cambridge Univ. Press.

Wallerstein, I.M., 1974. *Capitalist agriculture and the origins of the European world economy in the sixteenth century.* New York, San Diego, London: Academic Press (in German: *Die Anfänge kapitalistischer Landwirtschaft und die europäische Weltökonomie im 16. Jahrhundert.* Wien: Promedia).

WALTER DÖRFLER

Dörfler, W., 2017. Von der Dichte des naturnahen Waldes und den „Flaschenhälsen" der Wildpopulationen. *In:* J. Lechterbeck and E. Fischer, eds. *Kontrapunkte – Festschrift Manfred Rösch.* Universitätsforschungen zur prähistorischen Archäologie 300. Bonn: Habelt, 95-113.

Ellenberg, H., 1986. *Vegetation Mitteleuropas mit den Alpen in ökologischer Sicht.* 4th ed. Stuttgart: Eugen Ulmer.

Hill, T., Zich, B., Götze, W., Hubrich-Messow, G., Jacobs, E., Kämmer, G., Klinger, K.-H., Mahrt, K., Müller, M.J., 2002. *Von Wegen – Auf den Spuren des Ochsenweges (Heerweg) zwischen dänischer Grenze und Eider.* Flensburger Regionale Studien 12. Flensburg: Univ., Inst. für Geographie und ihre Didaktik, Landeskunde und Regionalforschung.

Johnston, C.A. and Naiman R.J., 1990. Browse selection by beaver: effects on riparian forest composition. *Canadian Journal of Forest Research*, 20 (7), 1036-1043.

Müller, W., 2002. *Die Stecknitzfahrt.* 3rd ed. Büchen: Goedeke.

Willroth, K.-H., 1986. Landwege auf der cimbrischen Halbinsel aus der Sicht der Archäologie. *Siedlungsforschung*, 4, 9-44.

HENNY PIEZONKA AND KAROLINA VARKULEVICIUTE

Barnard, H. and Wendrich, W., eds., 2008. *The Archaeology of Mobility. Old World and New World Nomadism.* Cotsen Advanced Seminars 4. Los Angeles: University of California.

Berkes, F., 2018. *Sacred Ecology.* 4th ed. New York, London: Routledge.

Descola, P., 2013. *Beyond Culture and Nature.* Chicago: Chicago University Press.

Golovnev, A., 2018. *Arctic: Atlas of Nomadic Technologies.* Saint Petersburg: MAE RAN (in Russian).

Isaakidou, V., Styring, A., Halstead, P., Nitsch, E., Stroud, E., le Roux, P., Lee-Thorp, J., Bogaard, A., 2019. From texts to teeth: A multi-isotope study of sheep and goat herding practices in the Late Bronze Age ('Mycenaean') polity of Knossos, Crete. *Journal of Archaeological Science: Reports,* 23, 36-56.

Landi, F. and Calzolai, L. 2015. Transhumance routes in Tuscany: Cartography, place names, virtual landscaping. *Review of Historical Geography and Toponomastics* 10 (19-20), 99-124.

MARA WEINELT

Felgentreff, C. and Geiger, M., 2013. *Themenheft Migration and Umwelt.* IMIS-Beiträge 44. Universität Osnabrück: Institut für Migrationsforschung und Interkulturelle Studien.

Ionesco, D., Mokhnacheva, D., Gemenne, F., 2017. *Atlas der Umweltmigration.* Broschüre der Bundeszentrale für politische Bildung, Schriftenreihe 10017. München: oekom verlag. (Transl. from English by B. Steckhan, S. Schuhmacher, G. Gockel, Kollektiv Druck-Reif).

Ribeiro, A., Rinne, C., Valera, A., 2019. Geomagnetic investigations at Monte da Contenda, Arronches, Portugal – Results from the 2018 campaign. *Journal of Neolithic Archaeology,* 21, 61-74. doi 10.12766/jna.2019.3.

Schmidt-Verkerk, K., 2013. Klimawandel und Migration: ein konzeptioneller und methodologischer Ansatz am Beispiel Mexikos. *In:* C. Felgentreff and M. Geiger, eds. *Migration und Umwelt.* IMIS-Beiträge 44. Universität Osnabrück: Institut für Migrationsforschung und Interkulturelle Studien (IMIS), 45-79.

Weinelt, M., Kneisel, J., Schirrmacher, J., Hinz, M., and Ribeiro, A., 2021. Potential responses and resilience of Late Chalcolithic and Early Bronze Age societies to mid-to Late Holocene climate change on the southern Iberian Peninsula. *Environmental Research Letters,* 16, 055007.

BERIT VALENTIN ERIKSEN AND WOLFGANG RABBEL

Amkreutz, L., Verpoorte, A., Waters-Rist, A., Niekus, M., van Heekeren, V., van der Merwe, A., van der Plicht, H., Glimmerveen, J., Stapert, D., Johansen, L., 2018. What lies beneath… Late Glacial human occupation of the submerged North Sea landscape. *Antiquity*, 92 (361), 22-37. Available at: https://doi.org/10.15184/aqy.2017.195.

Bailey, G., Galanidou, N., Peeters, H., Jöns, H., Mennenga, M., eds., 2020. *The Archaeology of Europe's Drowned Landscapes.* Coastal Research Library 35. Cham, Switzerland: Springer Open. Available at: https://doi.org/10.1007/978-3-030-37367-2.

Coles, B.J., 1998. Doggerland: A Speculative Survey. *Proceedings of the Prehistoric Society,* 64, 45-81.

Gaffney, V., Fitch, S., Smith, D., 2009. *Europe's lost world: the rediscovery of Doggerland.* York: Council for British Archaeology Research.

Glimmerveen, J., Mol, D., van der Pflicht, H., 2006. The Pleistocene reindeer of the North Sea – initial palaeontological data and archaeological remarks. *Quaternary International,* 142/143, 242-246. Available at: https://doi.org/10.1016/j.quaint.2005.03.021.

Price, T.D., Meiggs, D., Weber, M.-J., Pike-Tay, A., 2017. The migration of Late Pleistocene reindeer: isotopic evidence from northern Europe. *Archaeological and Anthropological Sciences,* 9 (3), 371-394. Available at: https://doi.org/10.1007/s12520-015-0290-z.

Prins, L.T., Andresen, K.J., 2019. Buried late Quaternary channel systems in the Danish North Sea – Genesis and geological evolution. *Quaternary Science Reviews,* 223, 105943. Available at: https://doi.org/10.1016/j.quascirev.2019.105943.

van Heteren, S., Meekes, J.A.C., Bakker, M.A.J., Gaffney, V., Fitch, S., Gearey, B.R., Paap, B.F., 2014. Reconstructing North Sea palaeolandscapes from 3D and high-density 2D seismic data: An overview. *Netherlands Journal of Geosciences – Geologie en Mijnbouw,* 93 (1), 31-42. Available at: https://doi.org/10.1017/njg.2014.4.

JOHANNA HILPERT AND JUTTA KNEISEL

Hilpert, J., 2017. *Viehzucht und Landnutzung: das Neolithikum im Vergleich zu den preußischen Rheinlanden (1800 AD).* Köln: Universität zu Köln.

Kneisel, J., 2018: *Gesichtsurnen, Menschenbilder der Vergangenheit.* Bonn: Habelt Verlag.

Litt, T., Richter, J., Schäbitz, F., eds., 2021. *The journey of modern humans from Africa to Europe: culture-environmental interaction and mobility.* Stuttgart: Schweizerbart.

Scharl, S., 2021. *Jungsteinzeit: wie die Menschen sesshaft wurden.* Stuttgart: Kohlhammer.

JUTTA KNEISEL, BENTE MAJCHCZACK, FRANZISKA ENGELBOGEN, ANNA K. LOY, OLIVER NAKOINZ

Faupel, F. and Nakoinz, O., 2018. Rekonstruktion des Wegesystems and Identifikation von Wegparametern der Bronzezeit in Schleswig-Holstein. *In:* B. Nessel, D. Neumann, M. Bartelheim, eds. *Bronzezeitlicher Transport, Akteure, Mittel und Wege.* Ressourcenkulturen 8. Tübingen: Tübingen University Press, 249-268.

Johannsen, A., 1967. *In den Spuren des Heidweges.* 2nd ed. Leck: Nielsen.

Løvschal, M., 2013. Ways of Wandering – In the Late Bronze Age Barrow Landscape of the Himmerland-area, Denmark. *In:* D. Fontijn, A.J. Louwen, S. Van Der Vaart, K. Wentink, eds. *Beyond Barrows. Current research on the structuration and perception of the Prehistoric Landscape through Monuments.* Leiden: Sidestone Press, 225-250.

Zich, B., 2002. Ochsenweg/Hærvejen – Nordeuropas kulturhistorische Wirbelsäule. *In:* B. Knoche, ed. *Wege als Ziel.* Kolloquium zur Wegeforschung in Münster, 30. November -1. Dezember 2000. Veröffentlichungen der Altertumskommission für Westfalen 13. Münster: Aschendorff, 67-86.

Zich, B., 2003. Der Ochsenweg in Schleswig-Holstein. *Archäologie in Deutschland,* 4, 40-41.

FRANZISKA ENGELBOGEN

Faupel, F., 2021. *Modelling Spatial Interaction during the Early Iron Age: Reconstructing and Modelling Ancient Infrastructure, Interaction and Distribution Systems in Southwest Germany and the Alsace.* Available at: https://macau.uni-kiel.de/receive/macau_mods_00001330.

Faupel, F. and Nakoinz, O., 2018. Rekonstruktion des Wegesystems und Identifikation von Wegparametern der Bronzezeit in Schleswig-Holstein. *In:* B. Nessel, D. Neumann, M. Bartelheim, eds. *Bronzezeitlicher Transport. Akteure, Mittel und Wege.* Ressourcenkulturen 8. Tübingen: Tübingen University Press, 249-268.

Gutmann, K.S., 1912. Bericht über Strassenforschung im Elsass im Jahre 1912. *Berichte der Römisch-germanischen Kommission,* 7, 16-25.

Müller, S., 1904. *Vej og Bygd i Sten- og Bronzealderen.* Aarboger.

Wassong, R., 2015. Tumulus et milieux humides. Rites, ostentation et lieux de passages. Les tertres de l'Âge du Fer dans le fossé rhénan. *In:* F. Olmer and R. Roure, eds. *Les gaulois au fil de l'eau. Actes du 37e colloque international de l'Association Française pour l'Étude de l'Âge du Fer, Montpellier 2013.* Bordeaux: Ausonius, 11153-11162.

JENS SCHNEEWEISS AND HENNY PIEZONKA

Bauduin, P., Lebouteiller, S., Bourgeois. L., eds., 2021. *Les transferts culturels dans les mondes normands médiévaux (VIIIe–XIIe siècle). Objets, acteurs et passeurs.* Turnhout: Brepols.

Jackson, R., Arneborg, J., Dugmore, A., Madsen, C., McGovern, T., Smiarowski, K., Streeter, R., 2018. Disequilibrium, Adaptation, and the Norse Settlement of Greenland. *Human ecology: an interdisciplinary journal,* 46 (5), 665-684. Available at: https://doi.org/10.1007/s10745-018-0020-0.

Schneeweiß, J., 2012. Normannen, Dänen, Wikinger, Waräger. Eine vergleichende historisch-archäologische Betrachtung zwischen Normandie, unterer Elbregion und Novgorod zur Wikingerzeit. *Zeitschrift für Archäologie des Mittelalters,* 40, 99-125.

JOHANNES MÜLLER

Bergemann, S., 2018. *Zauschwitz (Landkreis Leipzig): Siedlungen und Gräber eines neolithischen Fundplatzes.* Bonn: Habelt, 314.

Burmeister, S., 2004. Der Wagen im Neolithikum und in der Bronzezeit: Erfindung, Ausbreitung und Funktion der ersten Fahrzeuge. *In:* M. Fansa and S. Burmeister, eds. *Rad und Wagen. Der Ursprung einer Innovation. Wagen im Vorderen Orient und Europa.* Mainz: Zabern, 13-40.

Fansa, M. und Burmeister, S., eds., 2004. *Rad und Wagen: der Ursprung einer Innovation: Wagen im Vorderen Orient und Europa.* Sonderausstellung des Landesmuseums für Natur und Mensch, Oldenburg März-Juni 2004. Mainz am Rhein: von Zabern.

Müller, J., in print. *Separation, hybridisation, and networks: Globular Amphora sedentary pastoralists ca. 3200-2700 BCE.* Leiden: Sidestone Press.

Szmyt, M., 2017. Collective graves, flint axes, and cows. The people of Globular Amphora culture on the Vistula and Odra. *In:* P. Włodarcak, ed. *The Past Societies 2: 5500-2000 BC.* Warschau: Institute of Archaeology and Ethnology. Polish Academy of Sciences, 211-273.

BENJAMIN SERBE AND KHURRAM SALEEM

Beck, C.W., Wilbur, E., Meret, S., Kossove, D., Kermani, K., 1965. The Infrared Spectra of Amber and the Identification of Baltic Amber. *Archaeometry,* 8, 96-109.

Beck, C.W., 1966. Analysis and provenience of Minoan and Mycenaean amber. *Greek, Roman and Byzantine Studies,* 7, 191-211.

de Navarro, J.M., 1925. Prehistoric Routes between Northern Europe and Italy defined by the Amber Trade. *The Geographical Journal,* 66, 481-503.

Murillo-Barroso, M. and Martinón-Torres, M., 2012. Amber Sources and Trade in the Prehistory of the Iberian Peninsula. *European Journal of Archaeology,* 15 (2), 187-216.

Palavestra, A., 2007. Was There an Amber Route? *In:* I. Galankai, H. Tomas, Y. Galanakis, R. Laffineur, eds. *Between the Aegean and Baltic Seas – Prehistory Across Borders: Proceedings of the International Conference Bronze and Early Iron Age Interconnections and Contemporary Developments between the Aegean and the Regions of the Balkan Peninsula, Central and Northern Europe,* University of Zagreb, 11-14 April 2005. Aegaeum 27. Liège: Université de Liège, 349-359.

ANDREA RICCI

Adams, R.M., 1981. *Heartland of cities: Surveys of ancient settlement and land use on the central floodplain of the Euphrates.* Chicago, London: The University of Chicago Press.

Algaze, G., 1993. *The Uruk World System: The Dynamics of Expansion of Early Mesopotamian Civilization.* Chicago: University of Chicago Press.

Altaweel, M., 2019. Southern Mesopotamia: Water and the rise of urbanism. *WIREs Water,* 6, e1362. Available at: https://doi.org/10.1002/wat2.1362.

Holt, E., ed., 2018. *Water and Power in Past Societies.* Albany: SUNY Press.

Liverani, M., 2014. *The ancient Near East: history, society and economy.* London, New York: Routledge.

Rost, S., 2017. Water management in Mesopotamia from the sixth till the first millennium B.C. *WIREs Water,* 4, e1230. Available at: https://doi.org/10.1002/wat2.1230.

Scarborough, V.L., 2003. *The flow of power: ancient water systems and landscapes.* Santa Fe: SAR Press.

Stein, G., 1999. *Rethinking world-systems: diasporas, colonies, and interaction in Uruk Mesopotamia.* Tucson: University of Arizona Press.

Wilkinson, T.J., 2003. *Archaeological landscapes of the Near East.* Tucson: University of Arizona Press.

And a video: https://www.youtube.com/watch?v=_K7EXUBqN50&t=1174s.

JENS SCHNEEWEISS

Clarke, H. and Lamm, K., 2017. *Helgö Revisited. A new look at the excavated evidence for Helgö, central Sweden.* Schleswig: Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorf.

Gyllensvärd, B., 2004. The Buddha found at Helgö. *In:* B. Gyllensvärd, ed., *Excavations at Helgö XVI.* Stockholm: Almqvist & Wiksell, 10-27.

FYNN WILKES AND HENRY SKORNA

Bátora, J., Das Gräberfeld von *Jelšovce/Slowakei. Ein Beitrag zur Frühbronzezeit im nordwestlichen Karpatenbecken.* Prähistorische Archäologie in Südosteuropa 16. Available at: https://zenon.dainst.org/Record/000194334. [Accessed on: 27 January 2022].

Reiter, S. and Frei, M., 2015. Migration and Identity at the Early Bronze Age Cemetery of Jelšovce, Southwest Slovakia: The Strontium Evidence. *In:* P. Suchowska-Ducke, S.S. Reiter, H. Vandkilde, eds. *Forging identities. The mobility of culture in Bronze Age Europe: Report from a Marie Curie project 2009-2012 with concluding conference at Aarhus University, Moesgaard 2012.* Aarhus universitet. BAR international series, 2771-2772. Oxford: British Archaeological Reports.

Faragó, N., 2021. Technológiai megfigyelések a rákóczifalvi temető bifaciális levélhegyén (Technological observations of a bifacial leaf point from the cemetery of Rákóczifalva). *In:* N. Faragó, A. Király, K.I. Szegedi, eds. *A tealevelektől a levélhegyekig. Tanulmányok Mester Zsolt tisztele-tére 60. születésnapja alkalmából.* Litikum & ELTE BTK Régészettu-dományi Intézet, 77-94. Available at: https://doi.org/10.23898/litikumsi01a04.

Siklósi, Z. and Szilágy, M., 2019. New data on the provenance of copper finds from the Early-Middle Copper Age of the Great Hungarian Plain. *Archaeological and Anthropological Sciences,* 11, 5275-5285. Available at: https://doi.org/10.1007/s12520-019-00867-8.

Csányi, M., Raczky, P., Tárnoki, J., 2010. Das kupferzeitliche Gräberfeld von Rákóczifalva-Bagi föld in Ungarn. *Das Altertum,* 55, 241-270.

JUTTA KNEISEL

Sabatini, S., 2007. *House urns: A European Late Bronze Age trans-cultural phenomenon.* GOTARC Serie B. Gothenburg archaeological theses 47. Göteborg: Göteborgs Univ., Inst. för Arkeologi och Antikens Kultur.

Kneisel, J., 2012. *Anthropomorphe Gefäße in Nord- und Mitteleuropa während der Bronze- und Eisenzeit. Studien zu den Gesichtsurnen – Kontaktzonen, Chronologie und sozialer Kontext.* Studien zur Archäologie in Ostmitteleuropa 7. Bonn: Habelt Verlag.

Kneisel, J., Szmyt, M., von Carnap-Bornheim, C., Müller, J., eds., 2018. *Gesichtsurnen, Menschenbilder der Vergangenheit.* Bonn: Habelt Verlag.

Skorupka, T., 2008. *Na skrzydłach przeszłości. Motywy ptaków na zabytkach archeologicznych z ziem polskich (I w. p.n.e. – XVII w. n. e.).* Exhibition Catalogue Poznań. Poznań: Archaeological Museum Poznań.

LUTZ KÄPPEL

Dillon, M., 1997. *Pilgrims and Pilgrimage in Ancient Greece.* London: Routledge.

Elsner, J. and Rutherford, I., eds., 2005. *Patterns of Pilgrimage in Greco-Roman and Early Christian Antiquity: Seeing the Gods.* Oxford: Oxford University Press.

Mittelstraß, J., ed., 1996. *Enzyklopädie Philosophie und Wissenschaftstheorie 4* (Enzykl. Phil. u. Wiss.). Stuttgart-Weimar: Metzler.

Nightingale, A.W., 2004. *Spectacles of Truth in Classical Greek Philosophy: Theoria in its Cultural Context.* Cambridge: Cambridge University Press.

120

Ritter, J. and Gründer, K., eds., 1998. *Historisches Wörterbuch der Philosophie 10* (Hist. WB Phil.). Basel: Schwabe.

Rutherford, I., 2013. *State Pilgrims and Sacred Observers in Ancient Greece.* Cambridge: Cambridge University Press.

HENNY PIEZONKA

Adaev, V.N., 2007. T*raditionnaya ekologicheskaya kul'tura khantov i nencev.* Tyumen': Vektor Buk.

Berkes, F., 2018. *Sacred Ecology.* 4th ed. New York, London: Routledge.

Golovnev, A.V., 1995. *Govoryashchie kul'tury: tradicii samodijcev i ugrov.* Ekaterinburg.

Ingold, T., 2007. Materials against materiality. *Archaeological Dialogues,* 14 (1), 1-38.

Jordan, P., 2003. *Material Culture and Sacred Landscape. The Anthropology of the Siberian Khanty. Archaeology of Religion.* Walnut Creek, Lanham, New York, Oxford: Rowman & Littlefield Publishers, Inc.

Mahlstedt, S., 2020. Flüsse im Steinzeit-Wald – Grenzen oder Wege? *In:* J. Menne and M. Brunner, eds. *Grenzräume in der Archäologie.* Archäologie in Deutschland, Sonderheft 18. Darmstadt: wbg Theiss, 22-27.

Imprint

Instead of static blocks of „archaeological cultures", past communities are now seen as fluid, constantly reshaping formations. Hence, an increasing focus lies on novel research questions about the engines of this fluidity: contacts, networks, and social connections that go together with physical paths and routes, but also mind maps and information webs. Beyond doubt, humans were on the move from the very beginning: driven by hunger, drought or coldness, following opportunities for seasonal access to game, fish or fruit, or wishing to obtain access to fertile soils and good-quality raw materials. This mobility had "side effects": Intensified connectedness, information networks, exchange, long-distance trade and, potentially, intermarriages. All these cultural and biological mobilities and connectivities are the building blocks of reshaping past (and present) societies.

Over the millennia, some encounters culminated in conflicts, while, in other cases, entangled communities established long-distance trade routes, like the Silk Road, or spread ground-breaking innovations, such as the wheel, or new technologies like metallurgy. Alas, also pandemics: pest and leprosy found their way along the contact routes.

The **ROOTS** of mobility and connectivity are tied to the social nature of humankind. But what do we know about the **routes** behind then? In an era when transcontinental flights link distant parts of the world within just a few hours, we tend to underestimate the capacities of (pre-)historic people, who were, yet, able to cover large distances within a few weeks by finding mountain passes, walking along the green corridors of river valleys, or building boats to venture along rivers and across the seas. In one of the great migrations that determined the 6th millennium BCE, the first farmers of Central Europe walked along the Danube Valley and then occupied vast regions between modern West Germany and East Poland within just a few generations' time. It is a pivotal task for archaeology to learn more about these physical paths and information routes. Along with these routes, another map unfolds which sheds new light on the distribution of ideas, beliefs, and religions. Studying routes in space and time, much can be learnt about human history, about human nature. One of the lessons is that migration has always existed, while static, steady, closed societies never survived. These valuable insights might assist us on our future routes to be chosen.

Eszter Bánffy
President of the European Association of Archaeologists

ROOTS
cluster of excellence

C|A|U
Kiel University
Christian-Albrechts-Universität zu Kiel