EARLY MEDIEVAL ELITE CULTURE IN SUPRA-REGIONAL PERSPECTIVE



ŠÁRKA KRUPIČKOVÁ
RUDOLF PROCHÁZKA
ŠIMON UNGERMAN ET AL.

Czech Academy of Sciences, Institute of Archaeology, Brno

Early medieval elite culture in supra-regional perspective: Society, centres, artefacts

Spisy Archeologického ústavu AV ČR Brno 85
Editor-in-chief: Balázs Komoróczy

ISSN 1804-1345

Early medieval elite culture in supra-regional perspective: Society, centres, artefacts

Šárka Krupičková, Rudolf Procházka, Šimon Ungerman et al.

Czech Academy of Sciences, Institute of Archaeology, Brno

Brno 2025

The book was published with financial support of the Czech Academy of Sciences.

The Institutional support for the long-term conceptual development of a research organisation RVO: 68081758 – Czech Academy of Sciences, Institute of Archaeology, Brno.





Authors in alphabetical order:
Ludmila Barčáková, Felix Biermann, Ivana Boháčová, † Jaroslav Brůžek, Falko Daim, Sylva Drtikolová Kaupová, Daniel Dvořáček, Soňa Dvořáčková, Martin Fořt, Jana Fořtová Torňošová, Jan Frolík, Drahomíra Frolíková, Gabriel Fusek, Luděk Galuška, Matylda Gierszewska-Noszczyńska, Michal Hlavica, Eva Jamrichová, David Kalhous, Pavel Kouřil, Šárka Krupičková, Jakub Langr, Michaela Látková, Michael Lebsak, Dorota Malarczyk, Piotr Noszczyński, Karol Pieta, Michał Pługawko, Rudolf Procházka, Naďa Profantová, Zbigniew Robak, Kayleigh Saunderson, Šimon Ungerman, Lucie Valášková, Jana Velemínská, Petr Velemínský, Jozef Zábojník

Reviewers:
Prof. Dr. Orsolya Heinrich-Tamáska
Prof. Dr. Marcin Wołoszyn

Reviewers of individual chapters:
Mag. Dr. Birgit Bühler, BSc, MSc, BEd
RNDr. Martina Fojtová, Ph.D.
PhDr. Michal Lutovský
Mgr. Tereza Šálková, Ph.D.
doc. PhDr. Ivo Štefan, Ph.D.
PhDr. Kateřina Tomková, Ph.D.

Czech Academy of Sciences, Institute of Archaeology, Brno

Brno 2025

© Czech Academy of Sciences, Institute of Archaeology, Brno, and the authors


The book is published under the License CC BY-NC-ND 4.0

ISBN 978-80-7524-104-7 (print)
ISBN 978-80-7524-105-4 (online ; pdf)

DOI: 10.47382/arub2025-05

ISSN 1804-1345

Contents

Introduction 7

I Society

Chapter 1
Did iron come from the Moravian *utmark*? Reconsidering the economic and political context of early medieval iron production 15
Michal Hlavica

Chapter 2
'Elites' and iron production: The Carolingian perspective 25
Michael Lebsak

Chapter 3
Reges gentium or Carolingian *comites*? The status of a prince on the periphery of the Carolingian Empire – Moravia, Brittany and Catalonia in comparison 39
David Kalhous

II Centres

Chapter 4
Pitfalls of archaeological interpretation of cultural phenomena: The influence of church in the lives of the residents of early medieval Stará Boleslav (Czech Republic) 55
Ivana Boháčová

Chapter 5
The hinterland of the Kouřim centres in the Early Middle Ages 69
Daniel Dvořáček, Soňa Dvořáčková

Chapter 6
Power centre from the Avar Khaganate period at the confluence of the Danube and the Váh 83
Jozef Zábojník

Chapter 7
Hinterland of early medieval Veľký vrch hillfort in Divinka 91
Gabriel Fusek

Chapter 8
Three turning points in the early medieval history of Ingelheim 103
Matylda Gierszewska-Noszczyńska, Piotr Noszczyński

Chapter 9
Early life histories of the inhabitants of medieval Mikulčice-Valy (Czech Republic): Estimate of weaning age and onset of puberty in elite and non-elite population groups 123
Jaroslav Brůžek, Sylva Drtikolová Kaupová, Jana Velemínská, Petr Velemínský

Chapter 10
Secondary and primary evidence of the occurrence of *Fagus sylvatica* in Mikulčice 131
Michaela Látková, Eva Jamrichová

II Artefacts

Chapter 11
The little helpers: Amulets in Avar graves 139
Falko Daim, Kayleigh Saunderson

Chapter 12
Heracles or some other hero: A fragment of a story on a late 8th-century fitting from Tismice hillfort 153
Naďa Profantová

Chapter 13
A hoard of silver dirhams from the early medieval ringfort of Phöben (Brandenburg) – numismatics, archaeology, cultural and historical context 165
Felix Biermann, Dorota Malarczyk

Chapter 14
Bird-shaped hooks from western Slovakia: The material culture of Great Moravian elites 189
Zbygniew Robak, Karol Pieta

Chapter 15
How to fish: Ceramic fishing net weights from the early medieval period at the stronghold in Chotěbuz-Podobora 199
Pavel Kouřil

Chapter 16
Gold gombíky from Mikulčice and Staré Město – Uherské Hradiště: An analysis and comparison of two unique find assemblages 209
Šárka Krupičková, Luděk Galuška, Šimon Ungerman, Martin Fořt, Michał Pługawko, Jana Fořtová Torňošová, Lucie Valášková, Jakub Langr

Chapter 17
A luxury button/gombík and the elite in the Chrudim region in the Middle Ages 249
Jan Frolík, Drahomíra Frolíková, Ludmila Barčáková

References 255
List of authors 295

Introduction

The topic of the monograph *Early medieval elite culture in supra-regional perspective: Society, centres, artefacts* loosely builds thematically on the longer research tradition of the former Centre for Slavic and Early Medieval Archaeology (now the Centre for Historical Archaeology) of the Institute of Archaeology of the Czech Academy of Sciences, Brno. Given the nature of the main field workplace at the Great Moravian stronghold in Mikulčice, the Centre is naturally directed towards researching elites from the end of the first millennium AD. The stronghold at the Mikulčice-Valy site, to which in recent decades the settlement on the Slovak side of the border in the cadastral area of Kopčany has also been inseparably included, represents the most significant monument of the Great Moravian period due to the number of discovered stone buildings, especially churches, the number of graves with extraordinary furnishings, and the total number and variety of other immovable and movable archaeological finds. From the very beginning of local archaeological excavations, there has been no doubt about the connection of Mikulčice to the highest social classes, and the designation of the site as the central location of Great Moravia appears to be a very likely interpretation even from today's perspective (Poulík 1975; Poláček 2020, 143–147; Hlavica 2023, 50). The importance of the site is also underscored by its relatively good state of preservation, without significant disturbance by modern settlement activity (for more about the state of preservation see Poláček et al. 2014).

The systematic processing of local finds associated with the elite has its own significant publication platform in the series *Studien zum Burgwall von Mikulčice*, which has been published since 1995. Of the 14 volumes published to date, several were entirely or partially dedicated to finds or find contexts that have a clear connection to the Mikulčice Great Moravian elites; this is especially true for the publication of the burial site around the largest Great Moravian church (Klanica et al. 2019), the processing of grave finds of swords (Košta, Hošek 2014) and the analysis of Mikulčice spherical buttons (Krupičková 2024). Additional categories of elite finds were processed within other editorial series or individual publications and articles, e.g. editorial series *Internationale Tagungen in Mikulčice* dedicated to the publication of contributions from the International Mikulčice Colloquia, and also the Czech-English monograph *Great Moravia and the Beginnings of Christianity* (Kouřil ed. 2014) with detailed photographs of characteristic Great Moravian finds associated with the elite from Mikulčice and other locations.

Many of these publications have an editorial and/or authorial association with Lumír Poláček, who headed archaeological research in Mikulčice for 30 years (1992–2022) and made a fundamental contribution to the gradual and systematic multidisciplinary processing of local finds and the revision of key field situations. Lumír Poláček's greatest achievement to date, summarising knowledge of the Great Moravian social elite residing in Mikulčice, was the archaeological-anthropological project of the Czech Science Foundation (*Lifestyle and Identity of the Great Moravian Nobility: Archaeological and Bioarchaeological Analysis of the Evidence of Mikulčice's Uppermost Elites*, GA17-01878), which his team successfully implemented in 2017–2019. In addition to a number of individual studies, collaboration between 35 authors, experts in the fields of archaeology, history, physical anthropology, archaeozoology, and paleobotany, resulted in the comprehensive publication *Great Moravian Elites from Mikulčice* (Poláček et al. 2020), which, at the request of the authors and readers, was also published in Czech as *Velkomoravské elity z Mikulčic* (Poláček et al. 2022).

The early medieval elite is a highly complex subject addressed by numerous publications, though a cursory overview of research itself would take up an entire book, albeit one that would not be simple to write, due in large part to the long tradition of study, the diversity of available sources, and the range of scientific disciplines dealing with these sources. Simplifying the situation considerably, we can distinguish between written sources dealt with by historiography and auxiliary historical sciences, and material sources that are acquired and analysed by archaeology in close cooperation with a whole range of 'collaborating' scientific fields. In the text below, we reflect briefly on both groups of sources (or scientific disciplines).

The focus of Western European historiography from the very beginning has been political history and the closely related emphasis on the study of ruling dynasties and the nobility. Interest has continued over roughly the last quarter of a century – especially in German-language historiography – in questions related to the nature of statehood in the Early Middle Ages, decision-making and governance mechanisms, etc. (e.g. Pohl, Wieser Hrsg. 2009; Epp, Meyer Hrsg. 2017; Depreux, Patzold Hrsg. 2023), along with an unprecedented flourishing of research on the elite itself, the 'showcase' of which is the entire series of publications in the *Collection Haut Moyen Âge* edition from Brepols Publishers. The most prominent historians from Western and Central Europe met at conferences, the resulting anthologies from which are each dedicated to a selected topic: the definition of the lay and ecclesiastical elite and its internal hierarchy (Bougard, Iogna-Prat, Le Jan eds. 2008; Bougard, Goetz, Le Jan eds. 2011), games, competition and rivalry within the aristocracy (Bougard, Le Jan, Lienhard eds. 2012), the mobility of elite members and their relationship to space (Depreux, Bougard, Le Jan eds. 2007; Bührer-Thierry, Patzold, Schneider eds. 2018), the relationship to property and ownership (Devroey, Feller, Le Jan eds. 2010), the question of 'high' culture and education as largely 'elite products' (Bougard, Le Jan, McKitterick eds. 2009), etc. Naturally, there have been many other monographs and collective works by other publishers that address some of the aforementioned topics; we also consider it important to mention research on queens and noblewomen (e.g. Garver 2009; Dailey 2015; Santinelli-Foltz 2022), on the phenomena of gift-giving (e.g. Davies, Fouracre eds. 2010), and inheritance or *memoria*, which are largely associated with the elite (e.g. Bougard, La Rocca, Le Jan eds. 2005).

Comparable publication efforts in the field of early medieval archaeology focused on specific phenomena associated with elites have not yet been produced, and while at first glance this does not sound entirely flattering for archaeology, it is in fact greatly influenced by the nature of the available sources. A significant part of Western and Central Europe in the Merovingian and even larger part in the Carolingian periods was occupied by the Frankish Empire, in whose territory established types of written sources were used. Moreover, numerous collections of similar written sources have also survived from areas located outside the borders of the Frankish Empire, allowing historians to create regional and supra-regional studies and, for example, in the Carolingian period, to directly compare documents of the life of the ruling class in the area between Brittany, Catalonia, and Lower Austria. In contrast, the archaeological image of elites in early medieval Europe is much more disparate due to the fundamental chronological and geographical differences in the nature of archeaological record. Whereas from the Merovingian period we have thousands of row cemeteries, which contain, among other things, very richly furnished graves and where members of the elite appear 'as if served up on a silver platter', in the Carolingian period in the territory of the Frankish Empire, with only a few exceptions, any richer furnishings disappear from the graves, so that identifying traces of the elite in archaeological sources is suddenly much more difficult (cf. graves in the interior of churches, graves with tombstones, fragments of luxury items in settlement layers, opulent secular stone buildings). In other words, if the collections of skeletons are largely devoid of individuals demonstrably attributable to the elite, the most important source for archaeological research into this social group is absent.

In contrast, in the regions just beyond the borders of the Frankish Empire in the Carolingian period, the situation can be entirely different. A typical example is Great Moravia, about which only relatively few contemporary written sources (i.e. from the 9th century) have survived, which, moreover, are not of local provenance but represent a 'view from the outside'. The main focus of the reports – especially those from East Frankish annalists – is the ruling Moravian princes and their actions, but it is not possible to form a more definite idea about other members of the elite (e.g. Kalhous 2014). The nature of archaeological record is considerably more favourable, especially in the territory of present-day

Moravia, where a number of burial grounds with many inhumation graves containing militaria, lavish jewellery, and other objects made of precious metals have been investigated, so we have both luxury products and the skeletal remains of their owners (members of the elite) available for scientific research. In other words, given that inhumation associated with the deposition of grave goods became widespread in Great Moravia several centuries later than in Western and Southern Europe, the quantity and type range of Great Moravian grave goods have a much more 'Merovingian' than 'Carolingian' character. As a result, at Great Moravian cemeteries we find, for example, Carolingian imports in the form of lavish components of warrior gear that were no longer being deposited in graves in the Frankish Empire at that time (e.g. Ungerman 2011; 2019). On a more general level, we can conclude that the image of the elite in Moravia and Bohemia in the 9th–10th centuries is heavily influenced – given the character of the source base outlined above – by the interpretation of archaeological record (cf. more works in Antonín, Macháček eds. in print). Knowledge of elites in other parts of early medieval Europe obtained from written sources can only be used as a general model. Despite Great Moravia's proximity to the Frankish Empire and the contacts between the two elites, it cannot be assumed that the Moravian elite had the same character as, for example, the Frankish elite, as the previous development of the two societies was simply too different.

Given this temporal and geographical variability of archaeological record, it is no simple matter to analyse problems related to early medieval elites across Europe, which is only further complicated by the uneven state of research in the different regions, given, among other things, by research tradition and social demand, as well as the fact that archaeological institutions perform their activities mainly within the borders of current states. In the face of these obstacles, perhaps the only meaningful path to further knowledge is to organise international scientific projects involving institutions from countries where archaeological record suitable for their solutions has been preserved. An example of one such project is HistoGenes, which focuses on analysing the DNA of people from a number of early medieval burial grounds in various parts of Central Europe (primarily Avars and Slavs; selected skeletal remains from Mikulčice have also been analysed as part of this project). The project has already produced, and will undoubtedly continue to produce, a great deal of crucial information for understanding the common population and the elite from a genetic perspective, and offers unimagined possibilities, including when comparing archaeological and anthropological data. Of course, 'one-off' international conferences focused on a specific problem or phenomenon associated with the early medieval elite are also valuable, as they allow for direct dialogue between participating experts, and the resulting conference publication is a reflection of the current state of research in the relevant countries. Recent conferences dedicated to the hoards of hacksilver (Biermann et al. Hrsg. 2022) and the Preslav Treasure (Bosselmann-Ruickbie, Daim, Greiff eds. 2025) are fine examples of these events.

The collective monograph *Early medieval elite culture in supra-regional perspective: Society, centres, artefacts* is an expression of an effort to look at the issue of early medieval elites in a broader temporal, spatial and thematic context. It managed to collect 17 contributions, the creation of which was contributed by 36 authors, who tackled the topic of early medieval elites more or less broadly, but always in accordance with their research specialisation and erudition. The general idea of what could be associated with the elite was dominated for many years by the material culture of graves, especially artefacts made with sophisticated craftsmanship from precious metals. A new way of looking at elites is evident in this book – the authors more often embrace interdisciplinary collaboration, the use of theoretical models, and they often view the elite from less traditional perspectives than merely the analysis of weapons or jewellery (although analysis of these traditional categories is also necessary).

The book is thematically divided into three separate sections. The first called 'Society' is comprised of three chapters, two of which discuss the subject of the managed extraction and processing of a key raw material – iron – by the early medieval elite. In his chapter, Michal Hlavica models the economic and political background of early medieval ironworking in Moravia (Czech Republic)using the Scandinavian concept of *utmark*, i.e. through the use of an unpopulated peripheral area from which natural resources are seasonally extracted. The author discusses the transformation of ironmaking over time and also attempts to illustrate the environmental pressure generated by production activities. In the second chapter, Michael Lebsak discusses the 'Carolingian Iron Economy' in the late 8th and 9th centuries and reaches the conclusion, based on archaeological and written sources, that the mining, smelting and

processing of iron ore does not show a clearly defined organisational structure on the part of elites and instead appears to have been decentralised and managed on a local basis. The historically focused third chapter written by David Kalhous compares three peripheries of the Frankish Empire that could not be more spatially distant. The eastern region is represented by Great Moravia, the western tip of Europe is represented by Brittany, and brief attention is also paid to the territory of the Spanish March. The author deals with the issue of the social and political status of the rulers of these peripheral regions and notes similarities between the approach of the rulers of Moravia and Brittany, who often pursued their own power interests at the expense of Frankish hegemony, and, conversely, the loyalty of the Catalan ruling dynasty to the Frankish kings.

The second section of the book composed of seven chapters is named 'Centres'. Ivana Boháčová begins this block with a chapter dedicated to Stará Boleslav (Bohemia, Czech Republic), the former Přemyslid centre and, in its later phase, a primary church centre that is incomprehensibly poor in objects demonstrating the presence of social elites. On the one hand, the author explains this paradox by the limits resulting from the nature of rescue excavation, but she also links the absence of elite material culture to the process of Christianisation and the influence of the church on society at the time, which may have been more intense in the oldest collegiate chapter in Bohemia than elsewhere. In their chapter, Daniel Dvořáček and Soňa Dvořáčková present the background of the early medieval central locations of Stará Kouřim and Kouřim – St George (Bohemia, Czech Republic). In an area of approximately 5.5 km around the centres, they analyse finds from settlements and burial grounds and define two time horizons. The Middle Hillfort horizon of activities in the hinterland is related to settlement in Stará Kouřim, while the Late Hillfort horizon is related to the Kouřim – St George site. The analysis also takes into account the presence and appearance of sacred buildings, with the authors considering who built them and whether they were proprietary churches. In the following chapter, Josef Zábojník deals with the Avar settlement at the confluence of the Danube and Váh rivers near the city of Komárno (Slovakia). An extraordinary concentration of Avar sites is known from this small area, mostly cemeteries with richly furnished graves (including equestrian burials), which the author interprets as indirect evidence of the presence of an important power centre in this area, where the highest-ranking dignitaries of the Avar Khaganate resided. Gabriel Fusek, on the other hand, takes us to northwest Slovakia and critically evaluates the possibilities of discovering the early medieval settlement of the Veľký vrch hillfort in the cadastral area of Divinka, which is traditionally considered the main local territorial-administrative centre of the given region. In the next chapter of the second section, our attention is redirected to the territory of the Frankish Empire, where Matylda Gierszewska-Noszczyńska and Piotr Noszczyński examine the dynamics of the development of the settlement chamber in the area of present-day Ingelheim (Rhineland-Palatinate, Germany) from the population change at the end of Late Antiquity to the time of the construction of Charlemagne's Imperial Palace. The authors depict three turning points in the history of Ingelheim between 500 and 800 serving as a guide for their narrative of settlement changes. The second section on early medieval centres also includes two science-oriented chapters related to the research of the Great Moravian centre of Mikulčice-Valy (Moravia, Czech Republic). That is why there were added to the 'Centres' section. In their chapter, Michaela Látková and Eva Jamrichová analyse the occurrence of beech (*Fagus sylvatica*) in the Mikulčice area. The presence of plant macroremains and pollen is important evidence of the occurrence of beech outside its main current distribution and indicates that the species could grow at lower altitudes during the Great Moravian period than today. Likewise valuable is the finding on the nature of the use of beechwood at the stronghold, not primarily as construction material but mainly as firewood, which could have been related to the need for high-quality wood with a high calorific value for specialised craft production (e.g. jewellery making). The anthropological chapter by the author collective of Jaroslav Brůžek, Sylva Drtikolová Kaupová, Jana Velemínská and Petr Velemínský focuses on the early life stages of the inhabitants of the Mikulčice stronghold and its hinterland in the 9th century with the aim of reconstructing the age of weaning and the onset of puberty in various social groups. The research shows that elite children were often weaned earlier, suggesting different care strategies in the power centre of Great Moravia. Conversely, socioeconomic differences had only a minimal effect on the timing of puberty, suggesting relatively stable nutritional and living conditions in the population. This chapter is one of the last publications by anthropologist Jaroslav Brůžek, an outstanding and

internationally renowned scholar and wonderful person who unexpectedly passed away in mid-2025 during the preparation of the book. This work pays tribute to his legacy.

The third and most comprehensive section of the book, 'Artefacts', is made up of chapters on the subject of material culture. In their chapter, Falko Daim and Kayleigh Saunderson take us back to the period of the Avar Khaganate in Lower Austria. The authors analyse a set of small, inconspicuous, but all the more interesting objects related to religious and magical ideas. Their 'little helpers' include parts of chain mail and bells (both often with preserved corroded textiles), as well as late antique amulets with magical inscriptions. In the following chapter, Nad'a Profantová presents a rare find of a cast belt fitting of the Byzantine-Late Avar type discovered in 2022 at the Tismice hillfort in central Bohemia (Czech Republic). The scene at the strap-end depicts a story from ancient mythology, and given the dating of the object to the end of the 8th century or beginning of the 9th century, it is the oldest pictorial narration of an ancient myth from early medieval Bohemia. In the next chapter, we learn that a hoard of Islamic silver dirhams was discovered at the Phöben Slavic hillfort in Brandenburg (Germany) in 2017. Fragments of all 42 dirhams of the Samanid emirs, the Abbasid caliphs, and imitations of Volga-Bulgarian dirhams were probably hidden around 920. Felix Biermann and Dorota Malarczyk reflect on the reasons for the hiding of the hoard at an otherwise local hillfort in this period of an underdeveloped region. The slave trade appears to be a likely source of coins for the owner of the fortified settlement, who hid the currency there in times of danger. The next chapter by authors Karol Pieta and Zbygniew Robak addresses the issue of belt fittings in the shape of birds, which are typical for luxury belts of the Great Moravian nobility and are found mainly at central sites in Moravia, where they were probably also produced. New discoveries from the Dolné Vestenice II hillfort in western Slovakia suggest that their production may have also taken place elsewhere. Together with the finds of bird clasps from Bojná and Nitra, the authors consider this evidence to be a significant argument for interpreting the western Slovak Nitra region as the second political centre of Great Moravia. Pavel Kouřil focuses on rare material culture – archaeological artefacts related to fishing. Seventeen well-fired ceramic weights with a central hole formed part of trawling fishing nets. This is the largest published and chronologically well-classified assemblage of similar artefacts to date, with clear find situations confirming the function of the objects. In the next chapter, the collective of authors of the NAKI project: 'Into the Great Moravian Jewellery' prepared a publication dedicated to gold spherical buttons (gombíky) from the two most important Great Moravian strongholds in Mikulčice and Staré Město (Moravia, Czech Republic), which also represent the vast majority of the finds of their kind discovered thus far – a total of 40 gold gombíky. Based on a production-technological and material analysis, the authors demonstrate the differences between gombíky from the two locations, thus proving that separate jewellery workshops operated at each stronghold. In the last chapter in the third section, Jan Frolík, Drahomíra Frolíková and Ludmila Barčáková present a randomly discovered gombík of an unusual appearance, which, due to its material and decoration, ranks among luxury medieval products and is unique in the Chrudim region (Bohemia, Czech Republic). The interpretation of the occurrence of the gombík is set in the context of the presence of elites in the region, e.g. in connection with the 'Trstenice Trail', an important route connecting Bohemia with Moravia.

We thank all the authors who contributed to the publication of the book and would like to dedicate this collective monograph to our aforementioned experienced colleague and great person, Lumír Poláček, whom we thank for his contribution to the research of the Early Middle Ages. His lifelong efforts to comprehensively address individual topics related to his 'home' research site in Mikulčice is admirable. His vision and comprehensive view of the world already drew him in the first half of the 1990s to interdisciplinary cooperation with paleoecologists, geologists, archaeobotanists, archaeozoologists, anthropologists, and later also with historians, material analysts, archaeogeneticists, and other specialised experts. He found great inspiration for his work during his stays abroad – especially at several workplaces in Germany and Austria (Kiel, Berlin, Vienna). The foreign laboratories he visited became a model for him in building the modern research base of the Czech Academy of Sciences, Institute of Archaeology, Brno, in Mikulčice – Trapíkov. Lumír Poláček considers both international cooperation and interdisciplinarity to be extremely important for the development of research. He maintains long-term professional contacts with a number of foreign colleagues, which was strengthened in the past, among other things, at the International Mikulčice Colloquia (*Internationale Tagungen in Mikulčice*). He

has an unusually broad scope of professional activities, from environmental issues related to the paleoecology of river floodplains to research on early medieval churches and other elite stone architecture, as well as, more recently, representative elite objects of fine metalwork. From the beginning of his career, Poláček adopted a project-based approach to work and over the years has managed to secure financial support for Mikulčice research through more than twenty successfully completed grant projects, of which he was the principal investigator. His path to professional success is connected to his passion for this scientific discipline and his creative approach, but also to his diligence and reliability. Lumír Poláček recently celebrated a milestone birthday, on which we sincerely wish him good health and much strength to work on topics that he enjoys and finds meaningful.

Brno, 30 November 2025
Šárka Krupičková, Šimon Ungerman,
Rudolf Procházka

I Society

Chapter 1

Did iron come from the Moravian *utmark*? Reconsidering the economic and political context of early medieval iron production

Michal Hlavica

1. Introduction

In the chapter on the Great Moravian economy written for Lumír Poláček's volume Great Moravian Elites from Mikulčice, R. Procházka and I (Hlavica, Procházka 2020a) highlighted iron as one of the regionally distributed commodities with the potential to shed light on the configuration of the contemporary economy. At that time, however, we were unable to form a complete picture of iron production and distribution, or of the role elites played in these production-distribution networks. The preserved relics from 9th-century Moravia include no written records addressing this topic, and archaeological research up to that point had yielded only a fragmented and incomplete understanding, isolated from any broader economic model.

Since then, the situation has gradually become clearer. Owing to L. Poláček's strong support for junior scholars researching the Great Moravian economy during his directorship of the Institute, a new generation of archaeologists has begun to revise earlier interpretations of early medieval iron-production areas in Moravia. They are also examining previously unanalysed assemblages of artefacts related to iron production, originating both from Moravian hillforts – the principal economic and political centres of the 9th-century Mojmirid polity – and from rural settlements.

The main aim of this paper is to provide a comprehensive overview of current knowledge on early medieval iron production in Moravia, with particular attention to recent evaluations and a specific focus on the Great Moravian period (9th century) and peripheral mining landscapes. It also outlines preliminary steps toward constructing a coherent model situated within the economic and political framework of Great Moravia, as defined in my previous research (Hlavica 2023). For heuristic purposes, I employ a tripartite division of early medieval iron production in Moravia, even though this framework may be somewhat misleading, as it rests on our still-incomplete understanding of iron production in the Moravian Karst.

The first phase corresponds to pre-Great Moravian production in the 8th and early 9th centuries, when the systematic exploitation of iron resources in peripheral areas likely began. This phase is particularly problematic, as the precise onset of Moravian unification remains uncertain, and absolute data to verify the relative chronology of 'pre-Great Moravian' smelting sites are still lacking. Furthermore, the distinction between this phase and the subsequent 'Great Moravian' phase is based almost solely on technological differences. Although a different smelting technology was employed during this period, it does not necessarily indicate a different socio-political structure.

The second phase encompasses the 9th century, when central places in Moravia flourished and demand for regionally distributed commodities presumably reached its peak. A more intensive exploitation of outlying resources appears to have occurred, accompanied by some technological advancements. As I attempt to illustrate, this phase may have seen the consolidation of customary rights in the exploitation of peripheral woodland areas near Great Moravian centres and the stronger integration of elites who resided in these centres.

The third phase follows the collapse of the Great Moravian polity and its central places in the 10th century. Available data suggest that the exploitation of

peripheral resources underwent a qualitative shift, along with changes in production technology. The disintegration of the Great Moravian market system appears to have decentralised peripheral resource exploitation, possibly reflecting a transition from a surplus-based economy to self-subsistence among surviving communities. This shift may also reflect the dissolution of customary land-use restrictions in outlying areas.

In the discussion section, where I attempt to model the dynamics and broader economic context of iron production during this period, I introduce the Scandinavian concept of *utmark* into the analysis. I argue that this concept corresponds well to the available archaeological evidence from Moravia and offers valuable insights into the region's past. Moreover, it has the potential to enhance our understanding of elite economic agendas, regional market systems, and the function of contemporary central places as market nodes. Through this comparison with other regions of Europe, I aim to emphasise that the environmental changes resulting from this exploitation were a key factor in determining the eventual permanent colonisation of these areas.

2. Beginning of Moravian iron production (8th and early 9th centuries)

The economic and socio-political background of iron production in the 8th and early 9th centuries remains rather obscure. The current understanding is based solely on a few sites located in two areas, which provide insight primarily into the technological aspects of early iron production. These regions include the Moravian Karst and the area surrounding the present-day cities of Uničov and Litovel (Fig. 1.1).

The earliest smelting workshops in the Moravian Karst were identified in its central part, within the cadastral area of today's village of Olomučany (Souchopová 1986, 15–23; Souchopová, Stránský 2008, 137–139). Evidence of smelting activity was recorded in densely forested areas lacking permanent settlement, specifically within forest units 98/2 and 98/3 (Fig. 1.2). These sites are notable for their use of underground furnaces capable of producing high-carbon steel (Pleiner 1958, 217–220; 1969, 485; 2000, 190–194). Direct analogies for these furnaces have not yet been identified

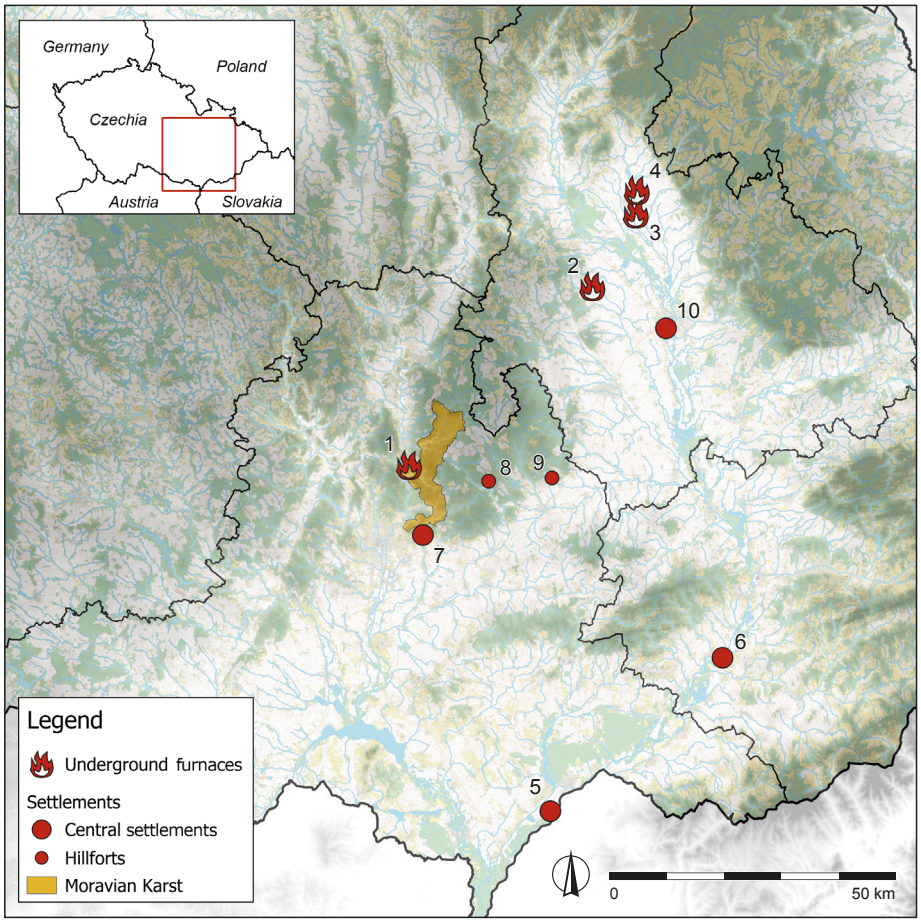


Fig. 1.1. Iron smelting sites with underground 'Želechovice-type' furnaces documented up to the date of publication, and Great Moravian centres with evidence of 8th-century settlement mentioned in the text. 1 – Olomučany; 2 – Senička; 3 – Želechovice; 4 – Dolní Sukolom; 5 – Mikulčice; 6 – Staré Město (Uherské Hradiště District); 7 – Staré Zámky (Brno-Líšeň cadastral area); 8 – Černov (Ježkovice cadastral area); 9 – Zelená Hora (Vyškov District); 10 – Olomouc-Povel. Author M. Hlavica.

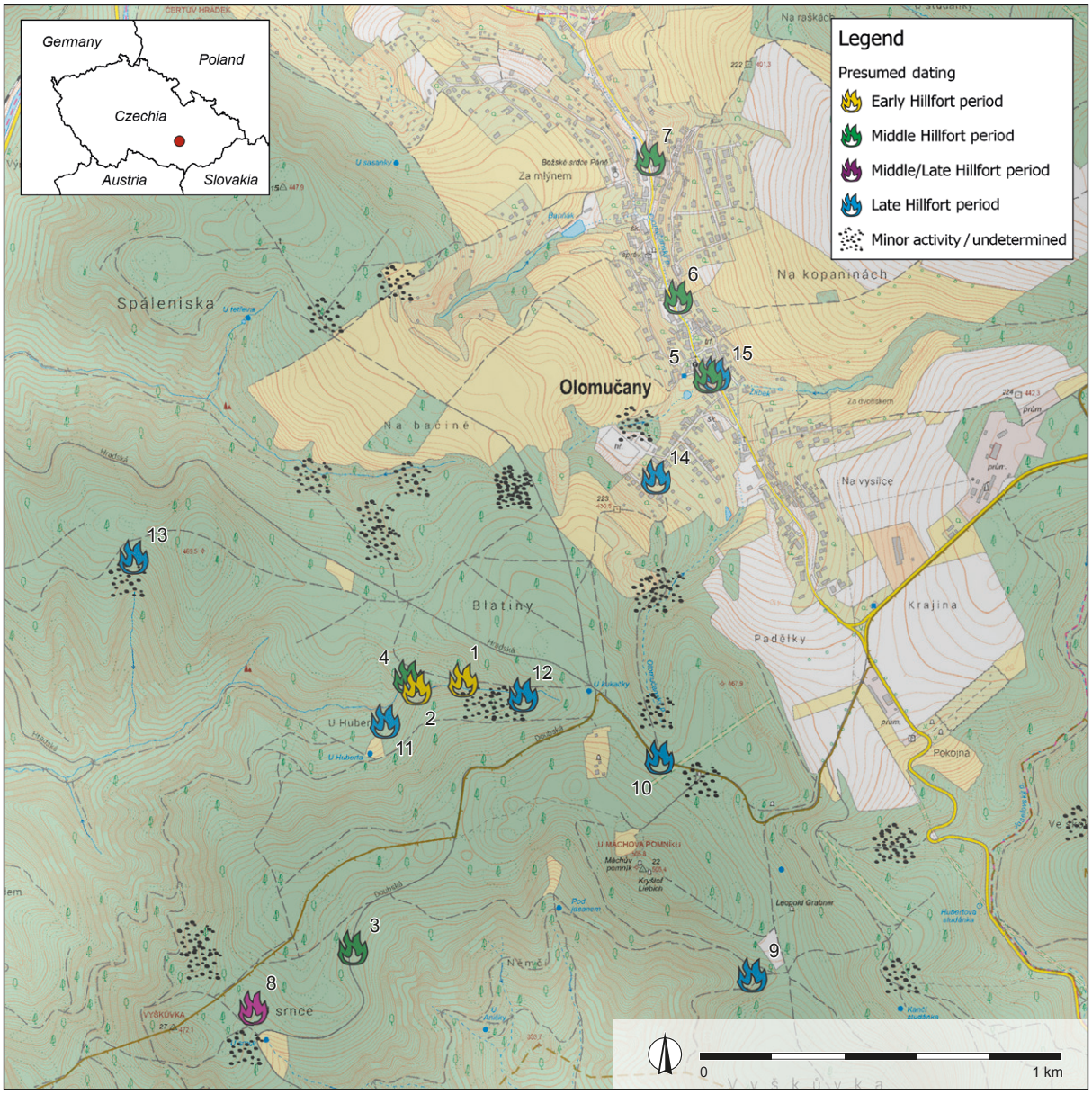


Fig. 1.2. Iron smelting activities documented up to the date of publication in the cadastral area of Olomučany (Blansko District). Early Hillfort period (8th and early 9th centuries): 1 – forest unit 98/2; 2 – forest unit 98/3. Middle Hillfort period (9th century): 3 – forest unit 86/3; 4 – forest unit 98/1; 5 – house No. 79 (non-professional find); 6 – plot No. 455 (former house No. 50, non-professional find); 7 – plots No. 561, 562 (unpublished finds). Middle and Late Hillfort period: 8 – forest unit 86/1; unknown location – forest unit 86/2. Late Hillfort period (late 10th century onwards): 9 – forest unit 84; 10 – forest unit 107; 11 – forest unit 91; 12 – forest unit 89; 13 – forest unit 100; 14 – plots No. 951/2, 951/3 (Růžová Street); 15 – plots No. 411/1, 412/1 (unpublished). Author M. Hlavica. Spatial data after O. Merta in collaboration with J. Štětina and K. Machač.

outside Moravia, suggesting that they represent either a local innovation or a technological adaptation of earlier smelting methods, possibly influenced by eastern steppe traditions (Pleiner 2000, 189–190).

The best-known analogies to these smelting furnaces come from another iron-producing region near the cities of Uničov and Litovel, located approximately 60 km northeast of Olomučany. Besides Želechovice (Pleiner 1955; 2000, 190–192), other contemporary sites in the area include Dolní Sukolom (Pleiner 1958, 206–207; Marešová 2014, 7–8), and most likely also Senička (Hlubek, Šlézar 2014, 593–594). Like the Moravian Karst sites, these areas – except for a single settlement feature at Želechovice (Fig. 1.3: 1; Pleiner 1955, 13–14) – show no evidence of permanent settlement. However, they were situated roughly half a day's journey (cf. Hlavica 2023, 17–18) northwest of the pre-Great Moravian centre at Olomouc-Povel, a lightly fortified settlement noted for iron processing and participation in long-distance trade (Šlézar 2014, 214–216; 2018, 116–120; Procházka 2009, 183–184). The proximity of these

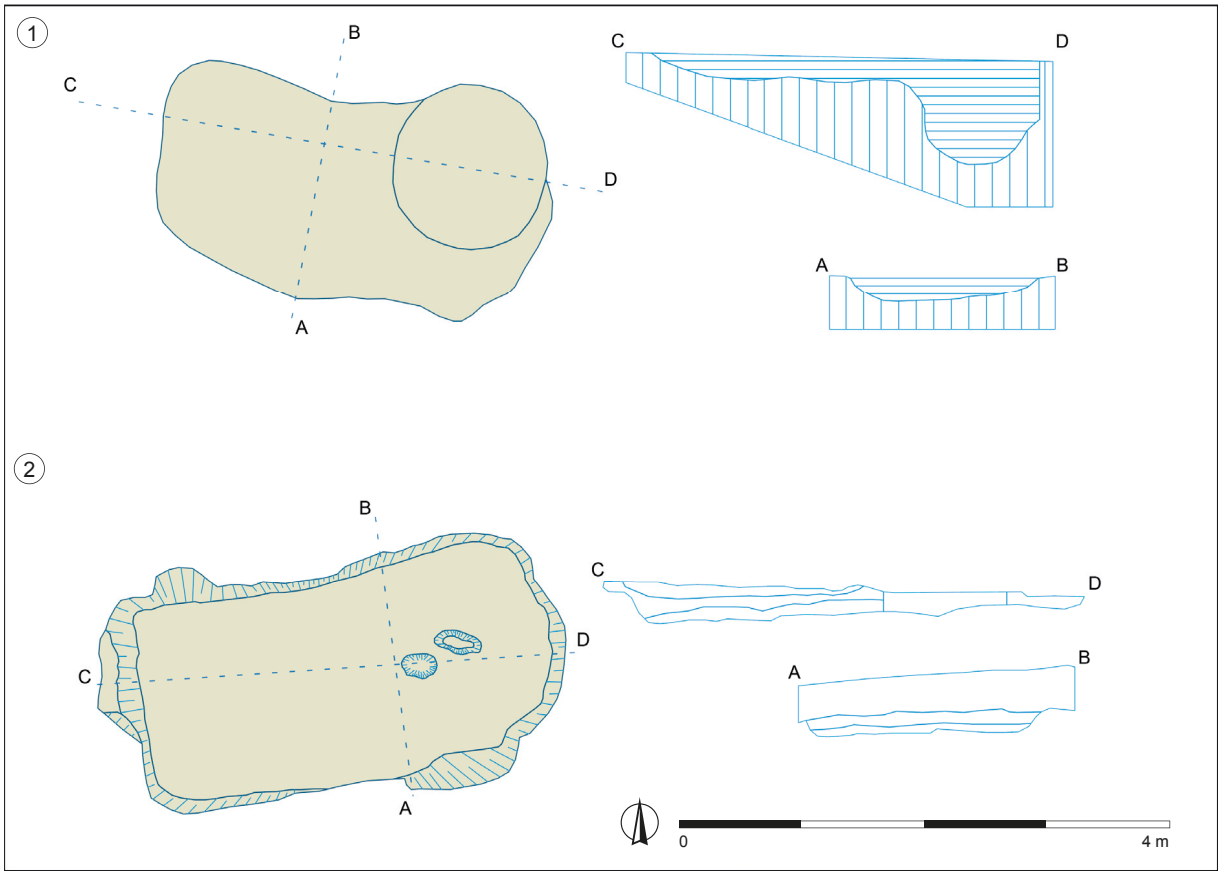


Fig. 1.3. Presumed seasonal dwellings discovered at early medieval smelting sites. 1 – Želechovice, late 8th to early 9th centuries (redrawn from Pleiner 1955, obr. 4); 2 – Haňovice, 10th century (redrawn from Hlubek, Šlézar 2014, obr. 9).

sites, together with pottery fragments from Želechovice exhibiting northern stylistic influences, suggest a plausible connection between iron-smelting activities and this centre (Pleiner 1955, 38, Fig. 10, Tab. XI–XIV). The ceramic assemblage from Želechovice closely resembles those from pre-Great Moravian settlements at Olomouc-Slavonín (Balcárková 2010) and Olomouc-Řepčín (Pomykalová 2011), both located within the hinterland of the Olomouc-Povel centre. Additionally, there is no evidence for the continuation of production at the aforementioned smelting sites following the decline of Olomouc-Povel during the transition from the 8th to the 9th centuries. The centre appears to have been depopulated at this time, with a new 9th-century settlement core emerging in the Olomoucký kopec area within the present-day built-up area of Olomouc (Šlézar 2014, 216–218, Fig. 4; 2018, 120–121; see also Bláha 2001a).

Although direct evidence is scarce, the possibility that the underground furnace technology at Želechovice represented a technological innovation linked to the Olomouc-Povel centre – and later transferred south to the Moravian Karst – cannot be ruled out. A recent find of a bronze belt fitting, possibly of Merovingian origin, at a newly discovered smelting site in Olomučany (Machač et al. in print) suggests connections between the production activities and a central-place community. This aligns with the portfolio of long-distance imports documented at Olomouc-Povel during this period (Šlézar 2014, 215). Moreover, the name of the village Olomučany, first recorded in written sources in 1346 as '*castrum Olomuczan*' (Chytil 1860, 633, 461–463), has been interpreted as meaning '*people of Olomouc*' or '*subordinates of Olomouc*' (Hosák, Šrámek 1980, 178), suggesting a historical connection with the Olomouc centre during the Middle Ages. The hillfort at Zelená hora (see Procházka 2009, 195; Staňa 1964, 57; see also Staňa 1967), together with the Černov hillfort (Poulík 1988, 197, obr. 15), both with evidence of settlement as early as the 8th century and, unfortunately, only partially investigated and published, may have functioned as strategic nodes linking north Moravia with the iron-producing regions of the Moravian Karst.

Conversely, ceramic assemblages from the pre-Great Moravian Olomučany smelting site in forest unit 98/3 analysed by Věra Souchopová exhibit certain features in common with southern cemeteries, such as those at Blučina and Lanžhot (Souchopová 1986, 19, obr. 7–9). There is also evidence of contemporary bronze belt fitting production at the Staré Zámky hillfort in Brno-Líšeň (Měřínský 2014, 204, Fig. 6). Given its proximity, Staré Zámky is the nearest contemporary centre and there are strong indicators that it was involved in iron production in Olomučany in the subsequent period. Its potential role in earlier phases of iron production cannot be entirely rejected.

3. Great Moravian iron production (9th century)

During the 9th century, the unification of Moravia under Mojmirid rule accelerated. While iron production in the Uničov and Litovel region appears to have dwindled alongside the decline of the Olomouc-Povel centre – with only minor exceptions noted (Hlubek, Šlézar 2014, 590–591) – iron production in the Moravian Karst seems to have expanded. This period saw the adoption of new and more efficient slag-tapping smelting technologies, better suited for continuous operation (see Crew 1991, 35; Pleiner 2000, 262; cf. Joosten 2004, 26). Evidence for these developments comes from embanked furnaces with thin front walls and free-standing shaft furnaces with shallow hearths, identified at Olomučany, specifically in forest unit 98/1 situated near pre-Great Moravian smelting sites (Fig. 1.2).

The smelting site in forest unit 98/1 appears to represent large-scale production aimed at satisfying a significant demand for iron. Estimates based on a surviving slag heap near one of the furnaces suggest the furnace produced approximately 54 to 270 kg of iron (Souchopová 1986, 31–32). Given that at least ten furnaces operated at this site – and assuming that slag heaps were periodically cleared to nearby watercourses (cf. Souchopová et al. 2011, 79) – the total amount of raw iron produced over the site's lifetime likely amounted to several tonnes.

In addition to site 98/1, several other 9th-century smelting sites have been identified in the Olomučany cadastral area. Many more sites are suspected to exist or have been indicated by non-professional finds, while systematic investigation remains limited due to the area's dense forest cover. Documented sites include those in forest units 86/2 and 86/3, as well as others that are likely within the present-day built-up area of Olomučany. The extent of production at these sites cannot be estimated due to the limitations of earlier research. For forest units 86/2 and 86/3, only small artefact collections were obtained, allowing only a broad chronological assignment to the 9th century (Souchopová 1986, 38–39; Souchopová, Stránský 2008, 140). Sites within the built-up area of Olomučany have been identified through the recovery of thin-walled tuyeres, which are currently recognised as chronological markers of 9th-century smelting in the Moravian Karst (see also Mikulec et al. 2022, 788; cf. Hlavica et al. 2025).

The hypothesis that the nearby hillfort of Staré Zámky in Brno-Líšeň was involved in 9th-century smelting at Olomučany (Souchopová 1995, 38) is primarily supported by ceramic assemblages recovered from individual smelting sites. Pottery from forest unit 98/1 closely resembles ceramics from Staré Zámky, particularly those of the Blučina ceramic group. Similarly, pottery from the smelting site in forest unit 86/2 closely resembles that from both Staré Zámky and site 98/1 (Souchopová 1986, 37–38; see also Mazuch 2020).

However, recent analysis of iron slag from the Staré Zámky hillfort suggests that iron processing there was relatively minor (Hlavica et al. 2022, 332, note 3), raising questions about the nature of the centre's involvement in Moravian Karst iron production. Nonetheless, multiple finds of notched iron blooms from the centre are known (Merta 2019, 8; Merta et al. 2022, 5). Their presence implies that while production may not have occurred at the centre itself, it was at least distributed or channelled through it. Possible destinations for this output include Mikulčice and Břeclav–Pohansko – major central places within the presumed core of the Great Moravian polity. Extensive evidence of iron processing is present at these sites, particularly in the recently evaluated iron production remains from Mikulčice, as documented by M. Lebsak and J. Kapusta (2024, Tab. 3).

One intriguing, though still understudied, case is the possible early medieval mining landscape near today's towns of Bojkovice and Rudimov (Zlín District), located about 28 km east of another important 9th-century centre, Staré Město near Uherské Hradiště (see Galuška 2014b). Although surface mining relics have not been definitively dated and early medieval smelting sites have yet to be discovered due to limited research in the area, a cluster of early medieval burial mounds has been documented on sources

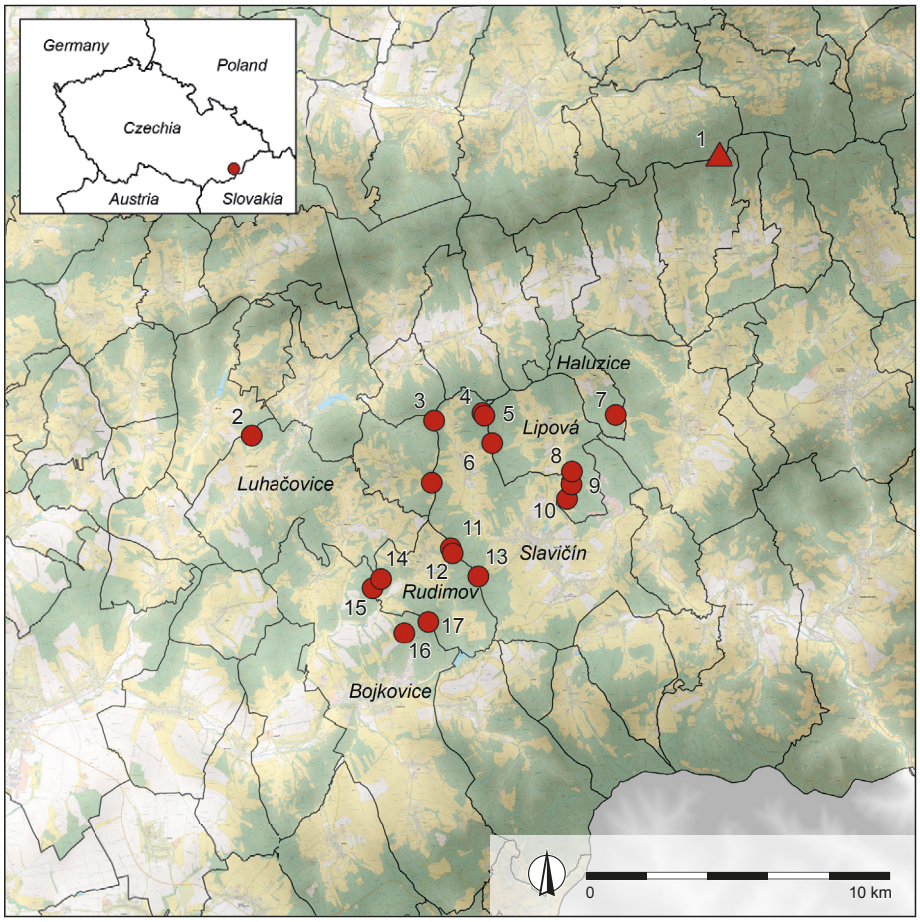


Fig. 1.4. Cluster of early medieval burial mound fields (8th–12th centuries) concentrated in the ore-bearing area of Rudimov and extending toward Klášťov Hill, a site evidencing iron-related ritual activities. 1 – Klášťov; 2 – Luhačovice – Obora; 3 – Nevšová – Nivka/Nivky; 4 – Nevšová – Kulatý trávník I – Mladý háj; 5 – Nevšová – Kulatý trávník II – Nový háj; 6 – Nevšová – Medumné/ Vršek; 7 – Haluzice – Volavá; 8 – Lipová – Starý háj I/Nový háj; 9 – Lipová – Starý háj II / Kopánky; 10 – Lipová – Starý háj III; 11 – Rudimov-Spálice; 12 – Rudimov – Gradca; 13 – Slavičín – Nad Vodojemem / Jamné; 14 – Rudimov – Doubravy/Bátorky; 15 – Rudimov-Kamenná; 16 – Bojkovice – Hradská Niva; 17 – Rudimov – Kouty (Kruhy)/Ploští. Author M. Hlavica, spatial data after O. Minařík (2020).

of clay ironstone (Fig. 1.4; for more details, see Červinka 1928, 148; Pavelčík 1958; Dohnal 1963; 1980; Dostál 1966, 109–111, 141–143, 162–164; Kruťa 1966, 226; Kohoutek, Plášek 1993; Kohoutek 2003, 97–105; see also Minařík 2020, 22–101). The spatial arrangement of the mounds suggests a connection with Klášťov Hill, a site yielding evidence of early medieval cult practices linked to iron objects, including multiple hoards and hundreds of isolated iron finds (see Geisler, Kohoutek 2014; Profantová 2014; Frolíková-Kaliszová 2016; Kouřil 2021b).

Based solely on isolated ceramic finds, settlement activity around this cluster of burial mounds appears to have been sporadic and uncertain (Minařík 2020, 103–104; Kohoutek 1995, 137). The only clear evidence of contemporary settlement in this region is a single rectangular hut, dated to the 9th century, discovered within the present-day built-up area of Bojkovice. Alongside pottery and animal bones, fragments of locally unavailable andesite were recovered from this feature (Kundera 1989; 1990).

An exception to the trend of iron exploitation in regions with sparse settlements is the Boskovice Furrow region, which is currently being studied by R. Mikulec (2022; Mikulec et al. 2022, 768). Although this research is ongoing and the settlement dynamics of the region remain unclear, the better-documented case of Bořitov demonstrates that iron production was also occurring during the 9th century near areas where environmental conditions permitted permanent habitation. Current findings in Bořitov also indicate that rural communities were capable of independent iron production at the time. This production seems to be mainly self-sufficient in nature, with the potential for occasional surplus exchange (Mikulec et al. 2022, 789).

4. Post-Great Moravian iron production (second half of the 10th century to the end of the 12th century)

The collapse of the Great Moravian polity at the beginning of the 10th century remains poorly understood, both in geopolitical and economic terms. Nevertheless, some insights into the transformation of the contemporary economy can be derived from developments in iron production, particularly in the Moravian Karst, which appears to have declined and undergone

a technological shift following the fall of Great Moravian centres including Staré Zámky in Brno-Líšeň (Měřínský 2014, 203–204; Kouřil 2019, 82). During this period, smelters began to favour slag-pit furnaces lacking slag-tapping capabilities. Although the reasons behind this technological transition are not yet fully understood, current research suggests that slag-pit furnaces may have been better suited for processing ores of variable quality, particularly those with higher silica and gangue content (see Pleiner 2000, 149–150; 259; cf. Dabal 2018, 800–801).

While older smelting sites appear to have been abandoned in the first half of the 10th century, iron-smelting activity seems to have increased again from the latter half of the century. In recent years, dozens of new archaeological sites – both in Olomučany and across the broader Moravian Karst – have been reported, mostly by non-professional researchers.[1] Although minor sites appear to predominate, some large-scale workshops also existed, such as the site at Habrůvecká bučina (Merta, D., Merta, J. 2000; Mikulec 2024) and Padouch (Souchopová 1986, 46–53). To date, only a small fraction of these sites has undergone archaeological investigation and publication. Those that have (Souchopová 1986, 39–59; Souchopová, Stránský 2008, 141–145) provide evidence not only of smelting but also of smithing activities, which had gone unrecognised at earlier smelting sites. Although dating relies primarily on surface finds of thick-walled tuyeres – which should be treated cautiously as chronological indicators (Hlavica et al. 2025) – the available evidence nonetheless suggests that production during this period was more decentralised and spatially dispersed.

Parallel developments can be observed in the region around Uničov and Litovel. Following a presumed decline in the 9th century, settlements began to appear in the 10th century, some of which include evidence of iron production in the form of typical smelting residues (Hlubek, Šlézar 2014, 585–591). However, there are indications that parts of the region were exploited only seasonally during this period. Archaeological excavation at Haňovice uncovered a 10th-century settlement feature (Fig. 1.3: 2) similar to the one previously discovered at Želechovice. The contexts of these finds, especially lack of other adjacent settlement features, indicate that both features were likely simple seasonal huts used by smelters (Hlubek, Šlézar 2014, 590, 596, obr. 9; cf. Pleiner 1955, 13–14, obr. 4).

Data from the Bojkovice and Rudimov regions remain sparse and inadequately published. What is known suggests that the nearby central place at Staré Město near Uherské Hradiště declined and was depopulated following the collapse of Great Moravia (Galuška 2014b, 194–195), while evidence of settlement begins to appear in Rudimov during the same period. At least one site, Gradca, located near a burial mound cluster, yielded evidence of iron production in the form of slag (Diatel 1962, 12). However, a clearer understanding of the nature and extent of these settlements requires further and more systematic research.

5. *Utmark* as a structuring concept

Iron production in early medieval Moravia has never been researched in a systematic or large-scale manner. As a result, our knowledge remains uneven and fragmentary. Despite these limitations, available data indicate that iron production was a widespread activity focused on exploiting outlying, sparsely inhabited, or entirely uninhabited areas. Moreover, the organisation of iron production evolved in tandem with broader economic structures in Moravia. Due to the limitations of current data, developing a more coherent diachronic model will require the integration of comparative evidence from other regions of Europe.

Scandinavian archaeology has contributed more extensively than other regions to the study of medieval peripheral production. The concept of *utmark* – referring to outlands or marginal, uncultivated territories – has been developed to understand how medieval populations related to resources lying beyond their immediate settlements. As Ingvild Øye describes these areas:

'*In the Early Middle Ages, they were places of innovation and change: stone industry, iron, charcoal and tar production, mountain farming, etc. They were, however, also areas of conflict and social contrasts, and people who worked or lived there may have not only used them but also experienced and conceptualised them differently*' (Øye 2005, 9).

The concept of *utmark* is particularly relevant for understanding the nature and broader context of iron production in Moravian peripheries. All of the previously discussed regions – the Moravian Karst, the Uničov–Litovel region, and the Bojkovice–Rudimov region – show an absence or only marginal presence of settlement during their early

1 These sites are being documented and currently researched by O. Merta from the Technical Museum in Brno.

phases of exploitation, including during the Great Moravian period. This suggests that these areas were occupied and utilised only seasonally at that time.

In Scandinavia, peripheral production zones are linked to seasonal pastoralism and forest-based farming. During the summer months, farmers moved to temporary dwellings in remote sites, which served as operational bases for livestock grazing and resource collection. These seasonal dwellings typically consisted of one or more simple structures suitable for short-term occupation, often accompanied by enclosures for animal stabling. Alongside pastoralism, these peripheral sites also supported various resource-gathering and production activities, including iron smelting. The scale and intensity of such production varied in response to market conditions. When markets flourished, production was geared toward surplus; in times of decline, production returned to self-sufficiency (Øye 2005, 12–14; Svensson et al. 2008, 140; Svensson 2018, 15).

Kjetil Loftsgarden offers a more detailed seasonal model of iron production in the Norwegian *utmark*, situating different activities in relation to the agricultural calendar (Loftsgarden 2021, 225–226). Activities such as ore extraction and tree felling were typically carried out in spring. In late autumn, already-dried wood was converted to charcoal and ore was roasted, while smelting furnaces were constructed. The smelting itself was likely undertaken during winter, when snow facilitated the transportation of raw materials and finished products by sleigh.

The hypothesis of winter smelting is further supported by historical references. In the Egil's Saga, the Icelandic character Skallagrim, Egil's father, is described as:

'[A] *great iron-smith and had great smelting of ore in winter time. He let make a smithy beside the sea a long way out from Burg, there where it is called Raufarness: he thought the woods lay not over far away there*' (Eddison 1930, 59).

This passage not only supports the notion of wintertime smelting in remote locations but also illustrates one of the key reasons for situating smelting activities away from permanent settlements: iron production required enormous quantities of wood. In medieval England, for instance, it was estimated that about 2 acres (approximately 0.8 ha) of woodland were needed for every ton of iron produced (Cleere, Crossley 1995, 100).

Such demand placed considerable pressure on the environment. English records provide ample evidence of the environmental impact of woodland exploitation. Based on data from the Domesday Book, C. Lewis argues that large parts of lowland England were wooded *utmark* during the late 11th century, used seasonally for forest grazing and resource extraction, including iron smelting. These practices eventually led to extensive deforestation. By the mid-14th century, it is estimated that about one-third of all English woodland had been cleared and converted to arable land, laying the groundwork for permanent settlement. Seasonal production activities based around shielings (seasonal dwellings) and dens (woodland grazing zones) appear to have been central to this transformation (Lewis 2005, 119–123, 131).

A catalytic role in these processes was played by the market. Scandinavian research shows that market demand influenced the scale and organisation of production (Svensson et al. 2008, 140) and that networks of marketplaces were required to distribute surplus goods to consumers, as seen in the Viking period (Loftsgarden 2020, 101–106, 108–109). Meeting the demand for key commodities attracted not only small producers but also major landowners including the nobility, Church, and royalty – who were actively engaged in entrepreneurial activities. This necessitated the development of legal frameworks to govern the exploitation of the *utmark* and prevent potential conflicts (Øye 2005, 10–12, 15).

In early medieval Moravia, little is known about land tenure systems or the identities of leading economic actors. However, based on the current understanding of the Moravian market system (Hlavica, Procházka 2020b; Hlavica 2023, 34–38), it is likely that princely lineages – of which only the Mojmirids are known from written sources – inhabiting major centres played key roles. These central places likely functioned as nodes within a regional market network, coordinating the distribution of essential goods such as regionally produced iron, stone, and imported salt. Elites may have organised or supported the exploitation of peripheral woodlands and ensured markets for surplus production, both for local use and export. This integrated system appears to have collapsed along with the fall of Great Moravia.

The specifics of customary rights for *utmark* exploitation in Moravia remain unknown and may never be fully recovered. Elite 'entrepreneurs' may have sought to assert exclusive claims over certain *utmark* areas, potentially leading to conflicts among them. This likely created pressure to establish a customary or legal framework for the extraction of

peripheral resources. The dramatic spatial and quantitative expansion of smelting sites in the Moravian Karst during the late 10th and early 11th centuries indicates a shift to decentralised production, likely carried out by smaller producers with unrestricted access to wood and ore. This stands in contrast to the Great Moravian period, when evidence of such minor production remains scarce. It is therefore plausible that some form of restriction on land and resource use existed during the Great Moravian era. Still, other explanations – such as increased demand following market collapse, or environmental degradation resulting in the dispersal of production – must also be considered.

6. Towards a diachronic model of early iron medieval production in Moravia

Integrating the concept of *utmark*, particularly through Scandinavian and English case studies, is undoubtedly illuminating. It helps structure fragmentary archaeological evidence from early medieval Moravia and offers fresh insights on its political and economic systems. It also provides a framework for future research – both on the political economy of Great Moravia and on the broader colonisation of East-Central European territories by Slavic communities.

Paleoenvironmental research on early medieval anthropogenic landscape changes in Moravia remains limited; however, written sources – such as the account of Ibn Rustah – indicate that territories inhabited by Slavs were originally densely forested, with the earliest settlements established within these wooded areas (Bartoňková et al. 1969, 345). Although knowledge of the vegetation surrounding early medieval Moravian centres remains fragmentary (e.g. Kočár et al. 2016), current evidence of Moravian iron production indicates that systematic exploitation of the outlying areas – and the resulting deforestation – began as early as the 8th century. This process was likely carried out under the oversight of pre-Mojmirid elites based at central places such as Olomouc-Povel and Staré Zámky in Brno-Líšeň. The similar design of underground smelting furnaces at both regions suggests technological exchange between these centres and their outlying production zones. Exploitation of the *utmark* east of Staré Město near Uherské Hradiště may also have begun in this period, as suggested by clusters of burial mounds in the Bojkovice and Rudimov areas, with the earliest burials dated to the 8th century.

While systematic surveys are still lacking (cf. Pleiner 1955, 42), a settlement feature associated with an iron smelting site in Želechovice suggests that iron production was, from the outset, part of a broader portfolio of seasonal activities. The initial use of underground furnaces – suitable for harsh climatic conditions – supports the theory that smelting may have occurred during the winter months. Even the pottery found at contemporary sites appears to indicate that the iron was produced by populations living elsewhere – likely in villages adjacent to central places or within the centres themselves.

The connection between central places and smelting zones is further illustrated by production dynamics. Smelting activity in the Uničov–Litovel region dwindled along with the decline of the Olomouc-Povel settlement in the early 9th century, while production in the Moravian Karst appears to have intensified in tandem with the rise of Staré Zámky in Brno-Líšeň. Smelters in this period adopted more efficient slag-tapping technology and expanded production around present-day Olomučany. The discovery of thin-walled tuyeres across several parts of Olomučany's built-up area also suggests the presence of seasonal dwellings, which may have evolved into permanent settlement as local environmental changes made year-round habitation more viable.

Following the collapse of Great Moravian centres in the first half of the 10th century, the organisation of iron production in the Moravian Karst underwent significant changes. Smelters favoured a more robust slag-pit technology, and production expanded beyond Olomučany into other areas of the central Moravian Karst. According to current data, most of these sites were small-scale, likely reflecting a transition from surplus-oriented production (driven by market demand) to subsistence-based smelting shaped by the contemporary collapse of the regional market system and perhaps the lifting of customary or legal restrictions on land and resource use.

Iron production in the presumed *utmark* around Uničov and Litovel appears to have recovered after the 9th century, corresponding with the resurgence of Olomouc as a regional political and economic node by the late 9th and early 10th centuries (see Bláha 2001b; Šlézar 2014, 218–219). Archaeological evidence indicates the emergence of permanent settlements, although seasonal exploitation appears to have persisted in some parts of the region.

The Bojkovice and Rudimov areas exhibit similar trends, although the available data remain limited. A single 9th-century settlement feature within

the built-up area of Bojkovice constitutes the only direct evidence of settlement in the area and may have been seasonal. Its location within the modern town's built-up area, as in Olomučany, suggests that seasonal dwellings may have gradually evolved into permanent settlements over time. More substantial evidence of habitation emerges in the post-Great Moravian period, with at least one site dating from this time showing indications of adjacent iron production.

Environmental changes resulting from intensive resource exploitation and deforestation likely facilitated these settlement transitions – but they may not have been the only drivers. In parts of Moravia, where former centres like Staré Zámky and Staré Město depopulated, displaced populations could have contributed additional demographic pressure on peripheral areas, accelerating their development. This pattern, however, does not seem to apply to Olomouc, where the 9th-century centre located on Olomoucký kopec appears to have survived the fall of Great Moravia relatively unscathed.

7. Conclusion

The aim of this paper was to organise the available, yet fragmented, knowledge on early medieval iron production into a more coherent and temporally structured framework. Due to the limitations of current evidence, the conclusions presented here should not be regarded as definitive. Their primary value lies in illustrating how economic indicators, detectable through archaeological research, are closely intertwined with broader economic and political processes that shaped the Moravian region during the Early Middle Ages.

This effort to synthesise existing data also reveals significant gaps that need to be addressed. A more systematic focus is required not only on known iron production areas – particularly those in peripheral regions – but also on conducting comprehensive palaeoecological analyses to improve our understanding of environmental changes during the Early Middle Ages, as these are crucial to establishing the nature and chronology of transformations that led to the permanent settlement of formerly marginal areas (for first results, see Lebsak et al. 2024).

Furthermore, a more detailed engagement with comparative and analogical material – beyond the Scandinavian and English cases, and also including relevant ethnographic data – is essential for advancing our understanding of the early medieval economy, including the Great Moravian period. In the domestic context, the study of medieval transhumance has been largely neglected, resulting in problematic assumptions. For instance, production features, like other isolated features – such as burial mounds or individual huts – are often interpreted as parts of yet undiscovered larger settlements, without sufficiently considering the possibility of seasonal occupation.

As this paper demonstrates, research on the economic relationships between settlement centres and their peripheral areas – the Moravian *utmark* – has the potential not only to refine the tentative model proposed here and situate it more firmly within the broader framework of the Great Moravian economy, but also to clarify the general contours of Moravia's largely unwritten medieval history.

Acknowledgements

This work is primarily dedicated to Lumír Poláček, whose unwavering support for my unorthodox approach to researching the Great Moravian economy has been invaluable. It also constitutes a contribution to the EXPRO Grant GX25-15764X 'Frontiers and Empires: The Case of Moymirid Moravia,' awarded by the Czech Science Foundation (GAČR). I would like to express my sincere thanks to Ondřej Merta, Pavel Šlézar, Rudolf Procházka and Tomáš Chmela for their valuable consultations and generous sharing of unpublished data and knowledge, without which this paper would not have been possible.

Chapter 2

‘Elites’ and iron production: The Carolingian perspective

Michael Lebsak

1. Introduction

In his seminal work *Wirtschaftsentwicklung der Karolingerzeit*, Austrian medievalist Alfons Dopsch (1868–1953) describes the emergence of an iron industry driven by the demand for military and agricultural tools, highlighting its early orientation toward export and the widespread availability of blacksmithing products (Dopsch 1922, 140–142). For Dopsch, the driving force behind the economic developments in the Carolingian era lay primarily in independent craftsmen operating within a market of supply and demand, rather than in royal or ecclesiastical manorial estates, which he considers having played a minimal role in ‘*large-scale planned economic activities*’ (Dopsch 1922, 171–186, esp. 362; also in summary Dopsch 1932, 421–423). Almost 50 years later, post-war historical research adopted a contrasting and rather pessimistic view of the living conditions in the Carolingian world, suggesting that iron was a scarce commodity, tools were of poor quality, and that any iron production beyond the local subsistence level prospered only as a direct result of manorial strategies aimed at generating surplus (Duby 1968, 20–21; Gilles 1968, 97–99; Sprandel 1968, 37–42; Le Goff 1971; Kuchenbuch 1978, 289; Riché 1978, 147; Fossier 2007, 115, 180). The critical reassessment of historical sources, combined with an expanding archaeological record, has produced a more nuanced understanding of Carolingian productivity, with particularly optimistic evaluations of the iron economy (McCormick 2002, 6–12; Verhulst 2002, 77–78; Hägermann, Schneider 2003, 392, 419–420, 434; Leroy 2008, esp. 186–187; Gilomen 2014, 50–51; Devroey, Nissen 2015, 31–43). So, who is ultimately to thank for the iron-economic upswing? Particularly in an epoch in which a consolidation of manorial structures with simultaneous impoverishment and ‘exploitation’ of broad sections of the population (Hägermann, Schneider 2003, 341), a static ‘*peasant mode of production*’ (Wickham 2005) as well as a degradation of urbanity through planned-economic experiments to create town-like monasteries (Henning 2007, esp. 31) is assumed, a top-down impact on the iron production must seem overly realistic: The Carolingian iron economy, just a mere result of clever elite management? The current chapter aims to cursorily explore this guiding question using archaeological and historical case studies with an attempt to loosen up and relativise the narrative of a ‘total’ elite economy during the Carolingian period.

2. Research object and methods

First and foremost, it must be emphasised that a monolithic Carolingian (iron) economy, as a unified system of production, distribution, and consumption, never existed, particularly when considering regional and even ultra-local differences as well as chronological dynamics. Michael Mann (1986, 376–399; for the direct quote, see 397) describes the early medieval European world as socially extremely localised, politically decentralised, weak and indirect, with an economy in which ‘*lords, peasants (free and unfree), and towns were all part-autonomous actors capable of action supported by custom in pursuit of economic goals*.’ The Carolingian realm was indeed no different, as its rulers did not achieve any coherent or concrete economic policy (Verhulst 2002, 126–131; Wickham 2005, 302; Davis 2015, 165–166) and relied heavily on power-sharing with a dispersed body of

ecclesiastical and aristocratic elites (Nelson 1994, 52–53). Economically, the primary objective of a political institution like the Carolingian realm was to meet needs and secure resources for financing political agendas, including the execution of military campaigns (Earle 1997, 105–110). Thus, to understand how Carolingian leaders 'controlled' the economy, it is essential to examine how they delegated power to local elites and how these elites, in turn, influenced the subsistence economies of dependent local populations (Ando 2017, 10–11; Raffensperger 2024, 237–238).

In simplified terms, the defining institutionalised political-economic regime of the Carolingian period was the royal, aristocratic, and ecclesiastical seignory or manorial system, which combined specific forms of serfdom, land ownership, protection, and economic or productive organisation between landlords and dependent peasants (Hägermann, Schneider 2003, 338–345; Schulze 2004, 95–99, 106–115; Kropp, Meier 2010, 97; research historically Rösener 1989b; 2012; Goetz 2001, esp. 85–87). The most notable forms of the manorial system are the classical bipartite and plantation-slave manors, both defined by a central rural estate (*villa, curtes,* or *fiscus*) with arable land divided into demesne and tenant holdings, worked by a labour force of free, semi-free (dependent), or unfree peasants (McCormick 2002, 6–7; Verhulst 2002, 31–49, esp. 33–37; Wickham 2005, 259–265; Kropp, Meier 2010, 98–99; Loveluck 2013, 9–14; for a focus on the Ottonian era, see Rösener 2012, 50–62). Specialised craft production, including iron processing, is recognised as an essential component of such manorial estate economies (Hägermann, Schneider 2003, 342, 431; Schreg 2006, 301–302; Kropp, Meier 2010, 104–110; Rösener 2012, 51; Loveluck 2013, 74), but also other places of elite power such as fortifications, royal courts and especially monasteries (Schwind 1984). However, the implementation of the political-economic apparatus of seigniory was as diverse as the expression of local elites – therefore, 'the' manorial system did not exist, as it was highly dynamic and exhibited different regional and temporal organisational structures (Rösener 1989b, 20; esp. Goetz 2001, 87). The system with large and concentrated landownership originated in the area between the Loire and the Rhine and remained typical for the region west of Rhine (Verhulst 2002, esp. 33). East of the Rhine, classical bi-partite estates were rare and typically lay in ecclesiastical or royal hands (Verhulst 2002, 56). Here, dispersed property, which was mainly held by the nobility, often consisted of smaller manors worked by unfree *mancipia* (slaves) with or without holdings, while free and half-free peasants were less numerous (Rösener 1989a, 175–180; Verhulst 2002, 55). In general, states and possessions of different landlords could also have been dispersed and intertwined, also with independent farms of free peasants (Verhulst 2002, 31; Kropp, Meier 2010, 102; Brather 2019, 55). To extract wealth, Carolingian elites had to adopt a combination of two political-economic finance methods to exploit the manorial system: staple finance and wealth finance (Brumfiel, Earle 1987, 5–9; D'Altroy et al. 1985, 188). Staple finance is characterised by the extraction and redistribution of subsistence surplus in kind, including cereals, livestock, and other commodities, collected through levies, taxes, or corvée labour (D'Altroy et al. 1985, 188). Wealth finance comprises the accumulation of prestige items and valuables of high social status, meaning produced by craft specialists, such as swords and jewellery (D'Altroy et al. 1985, 188; Brumfiel, Earle 1987, 5–9). The control of elites over specialised craft production can be obtained directly through establishing patron-client relations and physical bondage, or partially by the sponsorship with raw materials and periodic dependence, such as annual taxations (Brumfiel, Earle 1987, 5; Costin 1991, 11–13, 25–27; Hirth 1996, 213–214). Methodological frameworks and proxies have been established for the archaeological identification of elite influence on specialised production, and more specifically on production at early medieval manorial estates (Costin 1991; 2001; Kropp, Meier 2010; Brather 2019, 53–55, Tab. 54).

Control and elite sponsorship are often associated with spatial proximity between specialised producers and distinguishable higher-order sites (e.g. fortifications, hillforts, courts, monasteries), sometimes within segregated production facilities or workshops, suggesting a degree of oversight (Costin 1991, 25–27; Kropp, Meier 2010, 104). However, this spatial proximity is often not exactly defined – what is the minimum distance to assume attached production? In individual cases, control zones of 1–2 km are suggested, making the inclusion of supralocal sites, if they are known, unavoidable (Schreg 2006, 301; Kropp, Meier 2010, 104, esp. footnote 183). In the case of manorial possessions, distances of over 100 km can be assumed, as stated between a dutiable workshop in Boissy (France) and the monastery of Saint-Germain-des-Prés (Devroey 2019, 188). Moreover, the presence of artisans in administrative or commercial centres

like towns may indicate less elite sponsorship than purely economic motivations, such as a connection to a regional market (Brumfiel, Earle 1987, 2, 5–6; Costin 1991, 12, 26; Oka, Kusimba 2008, 361–363). An even more challenging task is the archaeological differentiation between an ordinary farmstead and a manorial estate, whose legal status is, of course, archaeologically not definable. Possible proxies may include a distinctive topographical location, specific farmstead size and quality, and the systematic arrangement of internal structures and dwellings, typically including a church and a mill, with large storage facilities and specialised craft production being key criteria (Donat 1980, 106–108; Schreg 2006, 301–303; Kropp, Meier 2010, 113; Brather 2019, 53–55, Tab. 54). High-output production, for instance measured in terms of large waste quantities, is however not a decisive factor for the identification of the elite sponsored economy, which could potentially only have centred on the manufacturing of a few luxury or hypertrophic goods leaving few archaeological traces (Costin 1991, 26–27). The legal status of specialised producers associated with craft workshops is generally not identifiable through archaeological evidence (Brather 2019, 53). Moreover, where a low legal status of producers can be assumed, this does not necessarily correlate with a total deprivation of economic freedom (for slaves in particular, see Wickham 2005; Pinchetti 2021, 108–110). As Alfons Dopsch (1922, 167) already put it for the Carolingian context: '[the] *personal lack of freedom* [of craftsmen; personal comment by the author] *does not also imply full and exclusive economic bondage*.'

In addition to these methodological challenges, the next issue lies in the source character of a conceptual 'archaeology of early medieval ironworking', whose fragmentary nature reflects the general status quo. First, the production and further processing (blacksmithing) of iron are two fundamentally distinct tasks, differing in terms of production processes, the technological knowledge required, and often their spatial location (Gassmann 2004, 72). This results in different archaeological sources. Primary iron smelting is indicated by remnants of bloomery furnaces and related production waste like tap and furnace slag, furnace wall fragments or ceramic tuyeres for bellows protection (Serneels 1993, 108–112; Pleiner 2000, 205–212, 262–263; Hauptmann 2020, 236–237). The processing of iron (refining of blooms, production and repair of iron goods) is not associated with ideal-type objects. Blacksmithing hearths are short-lived, morphologically highly heterogeneous, and can only be definitively identified by the presence of hammerscale, which forms on the surface of iron objects during the oxidation processes at high temperatures (Eschenlohr et al. 2007, 73; Dungworth, Wilkes 2009). Typical blacksmithing waste comprises plano-convex hearth bottom slag (PCBs), slagged silicates from hearth linings and tuyere bricks (Sperl 1980, 15; Serneels, Perret 2003; Pleiner 2006, 112–120, 132–133). In both cases, all types of sources rarely coexist, and the evidence of production is primarily characterised by the absence of clearly interpretable archaeological features, such as hearths or workshops, and the presence of production waste in highly variable quantities. On one hand, the mere presence of individual types of debris, particularly in relatively small numbers, does not serve as direct evidence for identifying craft production. On the other hand, the absence of concrete features does not prove that no craft activities occurred. Although slag quantities, for instance based on the assumption that a PCB represents the result of one work unit (Serneels, Perret 2003, 472–473), can be used as an approximation value of a minimum production volume and to locate production areas, their distribution should be always scrutinised regarding secondary relocation, specific disposal strategies and chronological continuities (Westphalen 1989, 52–53; Costin 1991, 19; 2001, 294–295; Pleiner 2000, 266–267; Röber 2008, 109; Schäfer 2013, 324; Herdick 2015, 330). In summary, the archaeological identification of ironworking is only unequivocally possible if as broad a range of representative proxies (e.g. features, different waste types, micro-residues, and further archaeometric analysis) as possible are included and examined from a comparative-deductive perspective. Only through the critical analysis of the archaeological micro-level and its contextual embedding can specialised craft be categorised within a production system, ultimately enabling the investigation of the political-economic influence of elites.

3. The demand for iron

In the late 8th and especially 9th century, the Carolingian world experienced a slow population rise (Devroey, Nissen Jaubert 2011, 14), the development of new settlement landscapes during the predominantly manorial-organised *Landesausbau* (Gringmuth-Dallmer 1985; 1990; Rösener 1989a, 168–169; Devroey, Nissen Jaubert 2011, 14–15) and an intensification of agricultural production for

subsistence needs of peasants and for supplying manorial institutions (Hägermann, Schneider 2003, 343; Henning 2009, esp. 164; Devroey, Nissen 2015, 28–29, 55). The increasing demand for iron implements, especially for the largest economic sector, agriculture (Fig. 2.1: 1), was likely triggered by such dynamics (esp. Hägermann, Schneider 2003, 427), but can only be approximated quantitatively and qualitatively. The basic agricultural tools of a dependent family holding in Carolingian times were a simple ard, spades, sickles, scythes and billhooks, whereby



Fig. 2.1. Demand for iron in the Carolingian world during war and peace. 1 – depiction of a plough with iron coulter and iron ploughshare (Stuttgart Psalter, 9th century); 2 – battle scene showing a cavalryman and foot soldier armed with iron lances and shields with iron bosses (Stuttgart Psalter, 9th century). Württembergische Digitale Bibliothek. Adapted by M. Lebsak.

heavy draught tillage with a mouldboard plough was practiced simultaneously, not only for farming on manorial estates (Henning 2009, 167–168; Devroey, Nissen 2015, 40, 54). George Duby's misinterpretation of the *Brevium exempla*, according to which the manor of Annapes (France) was in the possession of only six iron farming tools (three pairs of scythes, sickles and spades) and therefore peasants had to work predominantly with wooden implements, or even their bare hands (Duby 1968, 22; also Sprandel 1968, 37), has been refuted by many authors (Delatouche 1977, 78–79; Verhulst 2002, 78; Meier 2011, 286; Devroey, Nissen 2015, 31–32). In fact, peasants had to go to work in the fields with iron tools they had in their possession (Delatouche 1977, 78; Hägermann, Schneider 2003, 391; Henning 2009, 165) and which they therefore acquired independently. Such implements had to be produced and especially maintained by blacksmiths. According to a wear calculation method applied on replicas of late medieval ard shares from Sweden used in a two-course rotation, the annual consumption of iron due to wear amounts to 100 g per hectare (Karlsson 2015, 295; for experiments with a higher iron loss, see Lerche 1994). After the loss of 200 g or 5 cm of material, or 2 ploughed hectares, the experimental 800 g ard share was no longer usable and needed to be repaired or replaced (Karlsson 2015, 273–274). Transferred to a Carolingian *servile mansus* of the Saint-Germain-des-Prés (France) monastery covering around 4.3 ha (Devroey, Nissen 2015, 54), for instance, the iron loss due to light draught tillage would amount to 430 g and consume two shares of the aforementioned type annually, or one share if light ploughing was conducted only once in summer (Henning 2009, 159, 168). For a manorial court in Kissingen (Germany), a property inventory of the Fulda monastery lists ten sickles, two scythes, three axes, two chisels(?), two pans and two iron cauldrons that need to be repaired annually ('[...] *et singulius annis reparari in melius*'; see Fulda Traditions, 127; Verhulst 2002, 78). The remarkably high fine of 15 gold *solidi* for stealing an iron coulter as stated in the *Lex Salica* does not, however, refer to the material cost, but to the loss of working time incurred when a heavy plough operated by two men and six oxen was substantially damaged (Henning 2009, 156). For instance, the register of St Gall Abbey places the value of a ploughshare in the year 827 at four *denarii* (Ludwig 1999, 21), which does not seem disproportionately expensive – as a highly approximate reference, in 794 a cow would cost 14 and in 808 a short coat 120 *denarii* (Riché 1978, 118–119). Those results can paradigmatically be complemented

by examples from modern day Sub-Saharan Africa, where blacksmiths are fundamental for the production and maintenance of primary need goods, specifically iron implements, and therefore for the economic stability of predominantly subsistence-agrarian communities without great access to industrially made commodities (Mothander, Kjærby, Havnevik 1989, 130–136, esp. 144; Poston 1994, 50–51, esp. 31). In rural Tanzania, a household would buy one to two hoes per year up to one hoe every four years, sickles are replaced every fifth year, while axes, shovels and knives have a life span of more than eight years (Mothander, Kjærby, Havnevik 1989, 110–111). Needless to say, these figures can only be used with caution due to the different nature of tool forms, their production, size of ploughed land and forms of agriculture (e.g. recycling of industrial scrap metal, see Mothander, Kjærby, Havnevik 1989, 133–134). With an average forgeable iron output of 4.6 kg from an early medieval bloomery furnace (Schreiner 2020, 258), considerable material loss of at least 3–4% during one heating (Pleiner 2006, 110) and a certainly much broader production range and lower steel quality for the period discussed here, the demand of iron by the agricultural sector appears substantial even if approached by the aforementioned reference values. In other words, it is not a foolhardy business to assume a symbiosis of 'agriculture and blacksmith' in predominantly agrarian societies. On the basis of complementary archaeological evidence, iron was also needed for household equipment (knives, clamps, keys, locks, fittings, fire steels, etc.), specialised craft tools (anvils, hammers, tongues, etc.), horsemanship (horse bits, stirrups, spurs, horseshoes), hunting (fishing hooks, arrowheads) and the construction of infrastructural devices such as bridges and ships (rivets, nails, etc.). The *Capitulare de villis* mentions in an excursive manner iron vessels, pot hooks, chains, firedogs, wedges, axes, chisels, adzes and augers as basic commodities to be stored in the warehouse of a royal manorial estate (Loyn, Percival 1975, 70).

Warfare has been suggested as another possible driver of the Carolingian iron economy (Fig. 2.1: 2), especially in the context of various military expeditions to neighbouring territories, which took place practically every year during the 8th and 9th centuries (Verhulst 2002, 78; Schulze 2004, 60; Devroey, Nissen Jaubert 2011, 14–15). In contrast to the Roman empire, the Carolingians did not command a standing army but had to mobilise forces heterogeneously, relying on the collaboration of local aristocrats bound through vassalage and rewarded with land (Davis 2015, 37, 87–88; generally Schulze 2004, 59–63). Such armies could amount to 5,000, in rare occasions to 10,000 men (Halsall 2003, 132). Weapons, equipment and provisions had to be organised individually (Schulze 2004, 60), which rendered a centralised arms production and distribution already highly unlikely. Foot soldiers had to be equipped with a lance, shield, and bow, while the armament of the numerically lower yet hierarchically superior cavalry was already much more expensive and comprised a sword, lance, short sword, coat of mail and a shield (Ganshof 1968, 65; Halsall 2003, 164–173). A capitulary from 805 states that a vassal with the possession of 12 farmsteads is to carry one coat of mail (Ganshof 1968, 66; Sprandel 1968, 38). For the Carolingian period, the following approximate values of arms yet based on sources with different chronological and spatial foci can be provided (Riché 1978, 118–119): 14 *denarii* for a lance and a buckler, whereas the full equipment of a cavalrymen with a horse, sword with scabbard, helmet, cuirass, lance and a buckler would already amount to around 550 *denarii*. However, it is difficult to assess how large the demand and production volume of arms on a broad scale were. The production of a forge-welded sword was very resource intensive. Experiments have shown that a spatha blade of the 7th-century Weillohe-Untermassing type required 33.5 kg of processed bloomery iron, the production of which in turn consumed 210 kg of iron ore and 420 kg of charcoal (Schreiner 2020, 316). In his *Gesta Karoli Magni*, Notker of St Gall for the year 872 describes a Norman envoy at the court of Louis the German, who, impressed by a sword test by the king himself, is said to have uttered the following eulogy on the importance of iron: '*O utinam, inquiunt, principibus nostris tam vile videretur aurum, et ferrum tam praeciosum*' – '*Oh, if gold seemed so little to our rulers and iron so valuable*' (Ludwig 1999, 21). Perhaps this paradigmatic anecdote should warn us not to overestimate the number of hypertrophic weapons circulating within a thin Carolingian elite stratum.

4. Mining and primary iron production

Throughout protohistory until the Late Middle Ages, iron ore was quarried close to the surface and at shallow depths up to 10 m in open-cast mines (Daveau, Goustard, Bahain 2000, 83–98; Pleiner 2000, 93–95; Straßburger 2019, 751). After procurement, the ore had to be further processed or 'dressed', which meant sorting, crushing

and roasting in open hearths (Stöllner 2014, 142, Fig. 7.5, 7.6). The primary production of iron was carried out in clay-built bloomery furnaces of more less morphological and technical homogeneity. In the territory of the Carolingian realm, predominantly free-standing shaft furnaces with frontal working pits for slag removal were in operation (Pleiner 2000, 75–79; Kempa 2003, esp. 47; Leroy et al. 2019, 128–137). Besides clay and water for the construction of furnaces and the manufacture of nozzles or tuyeres, charcoal was the most essential raw material for the bloomery process, which had to be obtained by carbonising wood in pit-kilns. One furnace campaign for the production of 4.3 kg of bloomery iron required 30 kg of iron ore and 60 kg of charcoal or 300–600 kg of wood (Schreiner 2020, 258, footnote 1453). Topographically, iron smelting was carried out (simplified) in extramural or rural settlement contexts. Extramural production is remote from permanent settlements and situated in areas with easy access to woody (fuel wood for charcoal burning), deposit-bound (iron ores, clay) and fluvial resources (Röber 2008, 98; Zeiler, Garner, Golze 2022, 158). The archaeological evidence thus comprises the whole metallurgical chain, i.e. ore mining, crushing, roasting, charcoal production, iron smelting, but sometimes also blacksmithing. Production of this type is known from areas of varying size in different regions of the Carolingian realm (Fig. 2.2), for instance, the Swabian Jura (Germany; Kempa 2003), the region between the Rhine, Lippe and Lahn rivers (Germany; Zeiler et al. 2022), the Bavarian Danube area (Germany; Schäfer, Gassmann 2013), the Veluwe

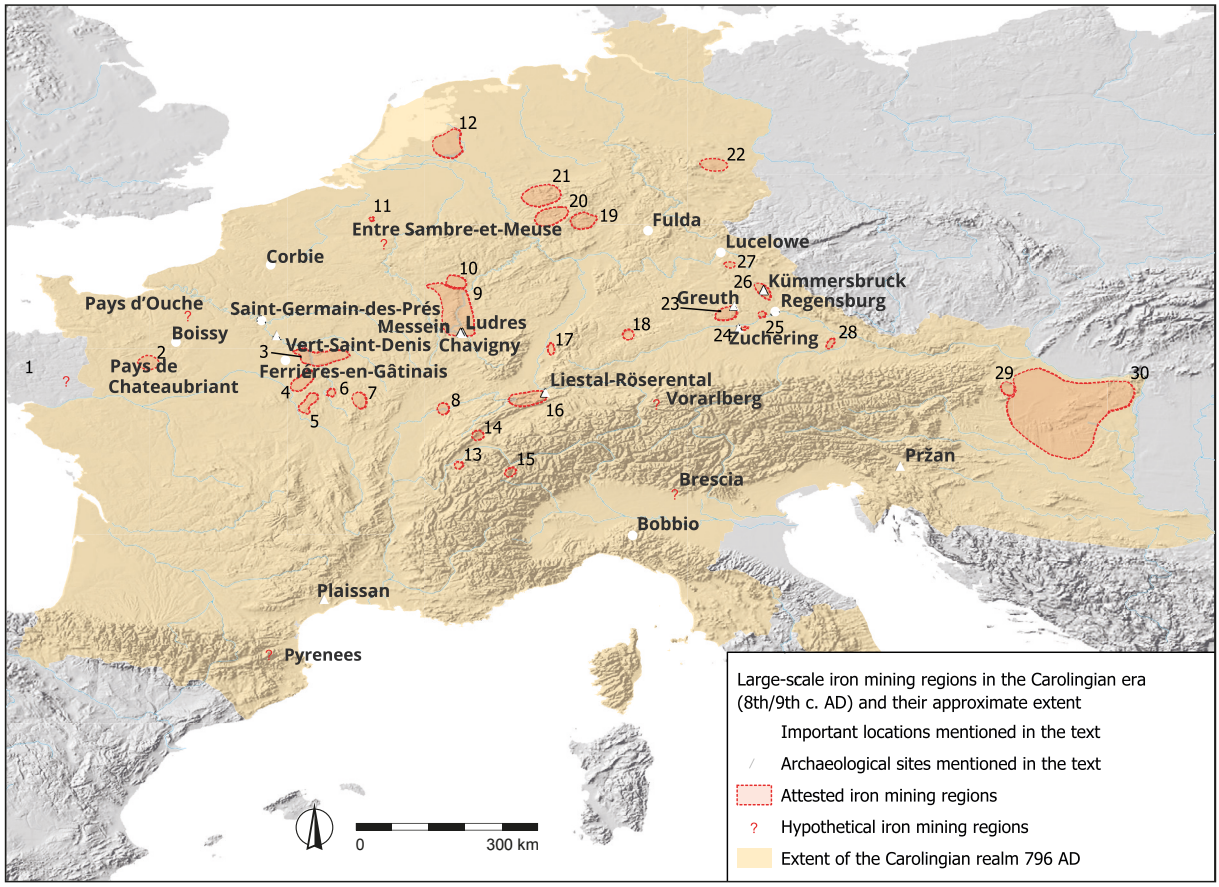


Fig. 2.2. Large-scale iron mining regions in the Carolingian era (8th/9th centuries) and their approximate extent. 1 – Bretagne (France); 2 – Le Mans (Maine/Pays de Loire, France); 3 – Pays d'Othe (Bourgogne, France); 4 – Puisaye (Loiret, France); 5 – Nivernais, Vézelien (Nièvre, Yonne, France); 6 – Avallonais (Yonne, France); 7 – Morvan-Auxois (Côte d'Or, France); 8 – Berthelange (Doubs, France); 9 – Pays-Haut/Plateau de Haye (Lorraine, France); 10 – South Luxemburg; 11 – Forêt de Soignes (Brabant, Belgium); 12 – Veluwe (Gelderland, Netherlands); 13 – Mont-Salève (Haute-Savoie, France); 14 – Jura-Nord vaudois (Vaud, Switzerland); 15 – Mont-Chemin (Valais, Switzerland); 16 – Central Swiss Jura Mountains (Jura, Switzerland); 17 – Oberrhein (Baden-Württemberg, Germany); 18 – Swabian Alps (Baden-Württemberg, Germany); 19 – Lahn-Dill district (Hessia, Germany); 20 – Siegerland (Nordrhein-Westfalen, Germany); 21 – Sauerland (Nordrhein-Westfalen, Germany); 22 – Harz (Thuringia, Saxony-Anhalt, Lower Saxony, Germany); 23 – Altmühltal, Schwarzachtal (Bavaria, Germany); 24 – Karlskron-Donau/Feilenmoos (Bavaria, Germany); 25 – Kelheim region (Bavaria, Germany); 26 – Middle Upper Palatinate (Bavaria, Germany); 27 – North Franconian Jura Uplands (Bavaria, Germany); 28 – Tertiary Hill Country (Germany, Bavaria); 29 – Burgenland (Austria); 30 – West Hungary. Simplified after Pleiner 2000; Leroy 2008; Schäfer, Gassmann 2013; Leroy et al. 2019; Zeiler, Garner, Golze 2022; Berranger, Leroy, Hervé 2023 with additions by the author. Graphics by M. Lebsak.

Hills (Netherlands; Joosten 2004), and within the Bourgogne-Franche-Comté region (France; Berranger, Leroy, Hervé 2023). As a result of partially intensive exploitation in antecedent or subsequent times, palimpsests of difficult to date mining relics like accumulated slag heaps and vast numbers of sinkholes can be found, especially in densely wooded and remote locations. However, such impressive evidence does not necessarily indicate early medieval 'industrial style' production. For instance, only six smelting sites of clearly early medieval date are known from the areas in the Sauerland, the Siegerland and the Lahn-Dill district, with altogether 4,687 documented slag-heap locations (Zeiler, Garner, Golze 2022, 156–161). In general, the existence of genuine mining regions (*Montanregionen*), i.e. according to Thomas Stöllner (Stöllner 2014, 137–139, esp. Fig. 7.2), regions '*whose primary economic structure is focused on the exploitation of mineral sources*' characterised by a permanent industrial mode of production with a significant ecological impact on the landscape, comparable with late medieval or early modern contexts, is not convincingly attested for any region in Carolingian times. However, in individual cases, especially in regions with large ore deposits that later arise as genuine mining landscapes, a comparatively high quantity of production evidence appearing just in Carolingian times stands out in the archaeological record (e.g. the Upper Palatinate in Germany, Hensch 2018a). That this corresponds to an 'initial phase' in which the emergence of intensified surplus production and consolidation of commercial structures took place (Stöllner 2014, 139) seems not unlikely. Iron ore deposits were undoubtedly of strategic economic importance. As they were, in contrast to non-ferrous or precious metal ores, usually not subject to the *Bergregal* (sovereign monopoly rights) in early medieval and later times (Braunstein 1999, 1751; Zotz 1993, 189–190), a potential decentralised monopolisation by local manorial elites can be assumed. In fact, several case studies from northern Bavaria (Germany), for instance, have proven that iron ore is likely to have played a pivotal role in the organised opening of settlement areas (*Landesausbau*) and the establishment of central places such as manorial estates, and must therefore have been in a direct focus of power for the emerging Carolingian elites (Later 2015, 63–66; Hensch 2018a; 2018b, esp. 37; Lebsak 2020, 40–41). Considering the organisation of its production, the modest number of historical sources goes hand in hand with the latter fact: iron mining and smelting were conducted within a decentralised manorial framework by dependent or unfree peasants in small, semi-agrarian enterprises (Sprandel 1968, 38–39; Kuchenbuch 1978, 289; Zotz 1993, 199). 'Large-scale' or 'intensive' surplus production is generally to be defined on a case-by-case basis and appears to be a mere operational term for the differentiation from local subsistence production. Where its existence is assumed, it is interpreted as a direct consequence of resource-driven opportunism ('large-scale production on large-scale deposits', see Sprandel 1985, 21) and top-down organisation and control (e.g. Kempa 2003, 37–38), sometimes even 'surveyed' by nearby fortifications (Straßburger 2019, 755) – which, however, does not mean that every profitable deposit was exploited (Straßburger 2019, 761). It is doubtful whether a command economy was strictly necessary for the even organisationally and technically complex realisation of all stages of the metallurgic *chaîne opératoire*. Its achievement exclusively lay with peasants and specialists, while for the local elites the unimpeded influx and distribution of surplus and its processing was most important. Again, it is questionable whether a total monopolisation of iron ores ever took place – what appears very likely is that supply in the context of self-sufficiency or even local trade was not of interest or concern to the elites.

Who were the iron producers? One famous source that could shed light on this question is the polyptychon of Saint-Germain-des-Prés Abbey describing the heterogenous peasant community of Boissy (France) in the wooded Perche region, whose legally low-ranking members had to deliver, amongst other commodities, 1,400 iron cart implements and a total of 2,550 *librae de ferro* (ca 800 kg, see Polyptychon St-Germain-des-Prés, 112–118; Verhulst 2002, 77–78; Gilomen 2014, 50; Devroey 2019, 192). If we consider this figure to be realistic, the Boissy serfs would have used over 11.2 t of charcoal and 5.5 t of iron ore to operate 186 furnaces, spending 55 full-time working days (1,320 hours) for the bloomery process per year (based on calculations in Schreiner 2020, 258). In contrast to those numbers, no traces of early medieval mining have been identified in the Perche region thus far (Leroy et al. 2019, 126, Fig. 68), which also applies to the famous Chur urbarium records about mining in the Vorarlberg region in Switzerland (Zotz 1993, 191). Is it justified to speak of the Boissy serfs as full-time 'miners and smelters'? It seems unlikely. The overall

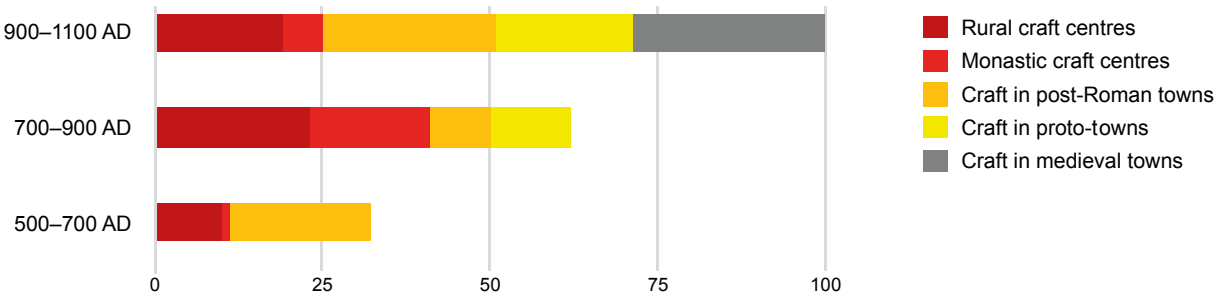
duties of the iron-producing serfs were exceptionally wide-ranging. For instance, one family of three had to provide, besides 100 *librae de ferro*, 50 wooden shingles, 50 small boards, 6 wooden troughs, 2 iron hoops, 2 sextarii of flour, 7 torches, 3 chickens and 15 eggs annually – they also had to perform plough work, cart duties and various other tasks on the manorial estate (Polyptychon Saint-Germain-des-Prés, 112–113). Carolingian sources only rarely provide mentions of 'mining professionals', such as the iron(?) miner (*fossarius*) in the Polyptychon of Prüm Abbey (Kuchenbuch 1978, 290; Verhulst 2002, 76). For other historic regions, for instance the Italian Brescia Alps, the manorial-organised extraction and smelting by full-time 'specialists' for the market demand remains an assumption (Hägermann, Schneider 2003, 433). This gives the impression that the extraction, smelting and processing of iron, and probably also charcoal burning, was probably in the greater part of the Carolingian world carried out seasonally or part-time by predominantly agricultural and multi-craft communities, making it no contradiction to sophisticated 'large-scale' production and the generation of surplus. The dichotomy between primitive 'peasant part-time production' and professional 'mining district industry' is therefore not appropriate and rather reflects an anachronistic and evolutionist perception of a qualitative gradient between inferior subsistence housework and highly specialised artisanal craftsmanship.

The primary product of the bloomery process was the eponymous bloom, which had to be further processed or reheated to remove slag impurities (Pleiner 2000, 215). This could be accomplished on the spot by the smelters directly after breaking out the bloomery furnace, or in remote reheating workshops by specialised blacksmiths (Pleiner 2000, 217). As such, the reheated bloom could already be distributed or traded and used as a blacksmithing stock. The production of iron ingots as standardised commercial products was not prerequisite for convenient exchange or processing, as their production caused a substantial loss of raw material of around 40–80% of the original bloom weight (Pleiner 2000, 245; Sindbæk 2001, 51). In contrast to the Baltic region (e.g. Rösch 2022, 466), there is very little archaeological or reliable written evidence of standardised iron ingots circulating within the Carolingian realm (for an exemption from the North Sea region, see Tulp 2003, 226–227, Fig. 17.4). According to the Chur estate inventory, iron was distributed and levied in form of blooms, the *massa* or pl. *massas* (Ludwig 1999, 24; Pleiner 2000, 230). A similar term appears to be *frustrum* (piece or chunk; Fulda Traditions, 121; Ludwig 1999, 25), perhaps also designating a bloom, for which ger. *Stück* (piece) is a still common synonym. Moreover, iron must have been to some degree circulated in the form of small blankets or billets as an already processed starting stock (e.g. Leroy et al. 2019, 136), simple scrap and in the form of already finished products, since the recycling of metals was a very common behaviour (Pleiner 2006, 23, 59; Schwab, Senn 2008; Disser et al. 2016, 159).

5. Rural iron smelting and blacksmithing

Primary iron production, also including mining, is also documented in or adjacent to rural settlements, not seldom in connection to blacksmithing. In Zuchering (8th–12th centuries, Germany), bloomery furnaces, partially embanked in a *Grubenhaus* or working pit, are situated between dwelling structures (Weid 2000, 14, 66). However, the fine-chronological relationships between the features and the quantity of waste remains unclear. That iron production in settlement contexts is not only connected to low-output subsistence (as proposed by Röber 2008, 98), is shown by the settlement Messein – Les Noires Terres (7th–8th centuries, France), where iron smelting and blacksmithing generated about 40 t of slag (Leroy et al. 2019, 132–136), or by Liestal-Röserental (Switzerland, 8th–12th centuries) with 4.2 t of slag, or 1.5 t of smelting slag, respectively (Serneels 1995; 2003). Large-scale iron smelting measured against waste quantities without a clear settlement context is also known from the Moselle Basin, particularly from Chavigny La Crassiere and Ludres – Hôtel de ville (both 8th–10th centuries, France) south of Nancy, which both yielded slag masses of at least 7,500 (sic!) tonnes (Leroy et al. 2019, 130–132). There is evidence of a spatial and functional division between iron smelting and processing in a passage from the estate inventory of Wissembourg Abbey (France), in which a certain blacksmith called Hugo receives a fief over a *fabrica en colle. et de alia curte* (Wissembourg Traditions, 274), indicating specialists working both in an extramural or secluded smelting location and a farmstead smithy (Ludwig 1999, 24). The above stated examples from Boissy (France) emphasise that certain multi-craft communities certainly had the artisanal skills to provide raw iron in addition to blacksmithing and woodworking products.

In general, the alleged presence of slag suggests that blacksmithing for the repair of production of mundane commodities was carried out in practically every early medieval rural settlement (Janssen 1983, 341–347; Baumhauer 2003, 298; Milo 2014, 67). There are reasons to scrutinise this common-sense assumption. As noted above, the presence of a small quantity of slag, which is usually not described in detail in terms of quality, type and weight, is not a reliable indicator for craft production. Blacksmithing can only be clearly verified in association with archaeological features and, above all, hammerscale – which can certainly only be identified at excavations where the necessary sampling technology (magnet sampling, sieving) is applied. Thus, cases of well-documented rural smithies are comparatively rare, for instance from Messein – Les Noires Terres (7th–8th centuries, France) in the Mosel Basin (Leroy et al. 2019, 135–136) or Plaissan-Hérault (9th–10th centuries, France) in Occitania (Schneider et al. 2016, 108–109). The latter workshop has a modest appearance as a rectangular, slightly sunken post construction covering 9 m² with one laterally arranged, stone-laid ground-level hearth measuring around 1 m in diameter in front of a depression indicating the former presence of a stone-anvil (Schneider et al. 2016, 108–109, Fig. 18, 19). In such simple workshops, agricultural tools could have been repaired and produced by both half-time and full-time blacksmiths. The legal status of those craft producers could vary considerably, from slaves to freemen (Verhulst 2002, 83–84). For example, in the polyptychon of the Saint-Remi Abbey, two persons are recorded with the designation *faber*, *servus* (Polyptychon Saint-Remi, 55). One example of a free blacksmith comes from a deed of property donations between a certain abbot Sigifridus and St Emmeram Abbey dated 820, naming a certain free (*ingenuus*) blacksmith Afbaldus, his unfree wife, and their two unfree children (Regensburg Traditions, 17). Blacksmiths could gain significant economic autonomy, as the aforementioned polyptychon of the Saint-Germain-des-Prés Abbey tells us: Two blacksmiths (*fabri*) are listed for the Boissy (France) estates, one particular Ermenulfus, who holds half a *mansus* for paying six lances, and a Hado, who likewise holds half a *mansus* for providing services from his own workshop (Polyptychon Saint-Germain-des-Prés, 149). This source passage leads Sakae Tange (2012, 348–349; also Kuchenbuch 1978, 292) to suggest that the *fabri* of Boissy were not independent specialists but subsistence farmers with insufficient agricultural production capacity, who practiced crafts out of necessity and to seek more economic autonomy. He concludes: '*If the Carolingian ironworker enjoyed autonomy and independence, it was primarily due to the rarity and usefulness of his craft*' (Tange 2012, 350). However, a recent review states that the Boissy *fabri* indeed seem to be full-time specialists who enjoy an exceptional status, as they are exempt from providing corvée work, in the case of Hado own a workshop outside the domain, and most probably could use the granted half-*mansi* for their own benefits without necessarily working on them themselves (Beaudet 2024, 55–57). With the light duty of supplying just six lances per year, Ermenulfus likely enjoyed significant economic freedom, allowing him to produce according to market demand. The passage moreover emphasises that the specialised production of highly needed lances also took place in rural, even secluded farmsteads. Joachim Henning (2007, 14, 16–17) could prove that intensive rural craft production, in comparison to the Merovingian period, peaked during the Carolingian era triggered by a growing rural autarky and demand for exchange on rural-manorial markets (Graph 1). Indeed, rural-agricultural settlements with intensive ironworking are known from the archaeological record, for instance from Vert-Saint-Denis (8th–9th centuries, France) with 1,266 mining relics and



Graph 1. Development of craft production contexts in medieval Central Europe. Simple rural or village craft production excluded. After Henning 2007.

multiple smelting furnaces (Daveau, Goustard, Bahain 2000). Two sites in the eastern peripheral area of the realm are Kümmersbruck-Bachweg in northern Bavaria (8th–9th centuries, Germany) with a dozen long-oval ironworking facilities or 'workshops' and ca 200 kg of waste types covering the whole metallurgical *chaîne opératoire* (Fig. 2.3–2.5), and Pržan near Ljubljana (mostly 7th–10th centuries, Slovenia) yielding identical long-oval ironworking pits and 230 kg of iron slag (Pavlovič 2023). Even with the methods mentioned above, it is not possible to prove estate-bound production in either case due to the fragmentary character of the excavation areas, which, disregarding the ironworking evidence, yielded generic rural settlement features with no difference to other sites of the specific regions. Hence, is it also not possible that legally and economically independent craft producers outside the domain were at work in Vert-Saint-Denis and Kümmersbruck? While those sites might have predominantly produced mundane commodities for rural-agricultural demand, iron valuables were certainly manufactured at a higher-order site, especially monasteries and their adjacent service settlements. Attached craftsmen with assumed low economic agency and legal status are known to have produced goods for the monastic self-sufficiency but also weapons and armour. Six blacksmiths (*fabri grossarii*), one polisher and three metal founders (*fusarii*) worked for Corbie Abbey in 822 and an undefined number of blacksmiths and shield makers for Bobbio Abbey in 834/836 (Schwind 1984, 112–115). The Fulda and St Gall abbeys, for instance, used the swords from their own attached production as return gifts for land donation of manorial landlords (Schwind 1984, 115). Other potential loci of attached ironworking can be found particularly at fortifications of different sizes, such as the 1 ha lowland fortification of Greuth in northern Bavaria (9th–10th centuries; Germany) with attested blacksmithing(?) production in the form of slag and hearths (Herrmann 2008, 218). How iron was processed in Carolingian urban or proto-urban contexts, which were hardly non-existent or insignificant (Verhulst 2002, 91; contra Pirenne 1936, 8–9; Henning 2007, esp. 15–17), cannot be accurately estimated. Large undefined slag quantities are known from early medieval Regensburg (Germany) on the Danube, yet without any contexts and further investigations (Nießen 2023, 334; for older investigations see Fröhlich, Rose, Endlicher 1987). The comparison with the peripheral regions to the north and east of the Carolingian empire shows that intensive and sophisticated blacksmithing production can be expected in locations with a connection to a dynamic market (e.g. Westphalen 1989; 2002; Lebsak, Kapusta 2024).

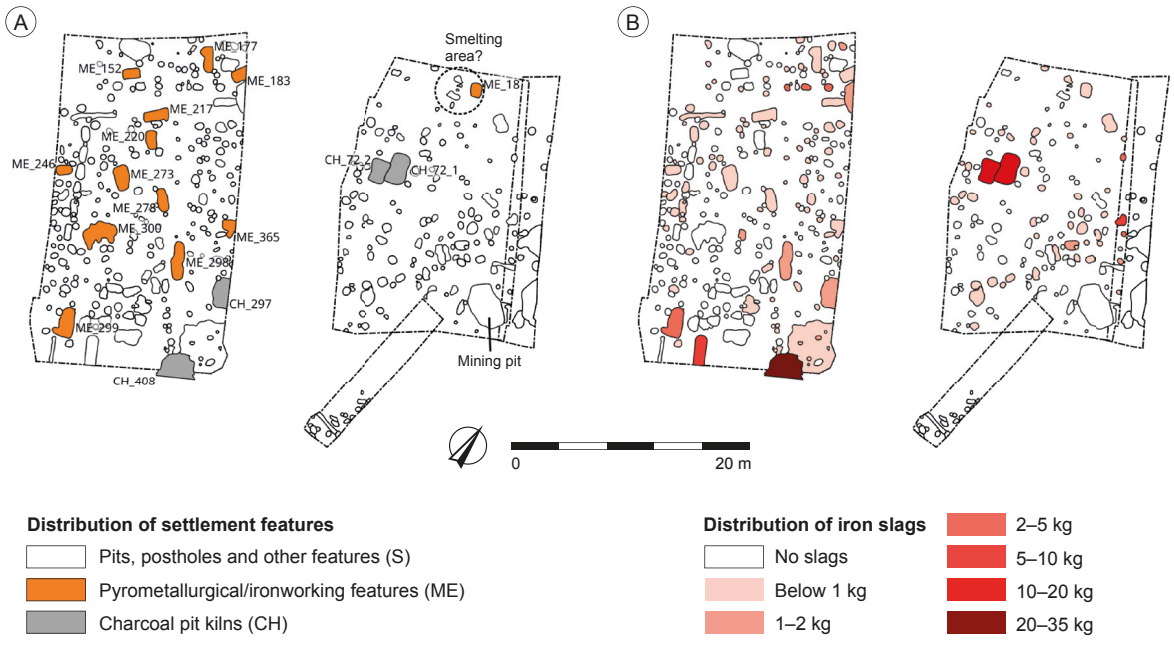


Fig. 2.3. Excavation plan of the 'rural craft centre' of Kümmersbruck-Bachweg (8th/9th centuries, Germany). A – settlement features and ironworking workshops and charcoal pit kilns; B – distribution of iron slag within the settlement features. © Bayerisches Landesamt für Denkmalpflege. Graphics by M. Lebsak.



Fig. 2.4. Long-oval ironworking 'workshop' with central hearth structure from Kümmersbruck-Bachweg (8th/9th centuries, Germany). © Bayerisches Landesamt für Denkmalpflege. Photo by M. Hensch.

6. Iron distribution systems

The 'closed estate economy' of Henri Pirenne (1936, 8–12), which depicts the Carolingian world as predominantly self-sufficient, free of markets and traders, only rarely exhibiting opportunistic traits of primitive exchange out of sheer necessity on the 'lowest possible ebb', is today a topic for the history of science. Nor were the economies of the Early Middle Ages an exclusively socially embedded substantivist dichotomy between elite gift exchange and top-down redistribution, as Karl Polanyi and his ideological successors (Polanyi 1957) once thought. Trade, here defined as the 'material-economic part of exchange' (Oka, Kusimba 2008, 340), has been recognised as a fundamental characteristic of all human societies regardless of their state of social complexity, not necessarily driven by the desperation of need, in which social, political, economic-commercial and self-interested motives mattered as they do today (Servet 1981, 426; Granovetter 1985; Gudeman 2001; Oka, Kusimba 2008, 340–341; Feinman, Garraty 2010, 171). Hence, it is not surprising that trade, ranging from oversea long-distance expeditions by privileged merchants to the everyday transactions on mundane markets, was an integral component of the Carolingian economy (Johanek 1987, 26; Verhulst 2002, 97–98; Loveluck 2013, 210). The manorial system, especially its ecclesiastical-monastic variant, is repeatedly cited as a form of a constitutive superstructure of Carolingian exchange dynamics, as it induced the market resale of its considerable surplus by professional or



Fig. 2.5. Two rectangular charcoal pit kilns from Kümmersbruck-Bachweg (8th/9th centuries, Germany). © Bayerisches Landesamt für Denkmalpflege. Photo by M. Hensch.

semi-professional traders, but also the allocation within its extensive distribution systems by peasants through transport duties, at the same time expediting their mobility and opportunities for individual exchange (Devroey 1979; Johanek 1987, 60–61; Verhulst 2002, 97–98, 112–113; Devroey, Nissen Jaubert 2011, 29). Peter Johanek (1987, 13; esp. 67) summarises pointedly: *'It is fair to speak of the manorial system as the fundamental cornerstone of Carolingian trade.'* For instance, an exceptional example of manorial large-scale redistribution of iron by ship is recorded in a letter from Loup de Ferrières to abbot Odo of Corbie in 859: '*We have postponed the purchase of iron, which was extremely difficult to obtain due to the harvest, ready to take it on board the ship we are building, unless you refuse to pay the freight' – 'Emptionem ferri, quod propter messem erat difficillima, distulimus, parati in navem quam aedificamus recipere, nisi naulum recusetis auferre'* (Correspondance, 138). Abbot Loup of Ferrières appears here as a mere mediator of the transaction (Johanek 1987, 52), even if Ferrières Abbey (Ferrières-en-Gâtinais) seems conclusive as the place of origin for the negotiated iron due to its proximity to the early medieval mining areas in the Bourgogne-Franche-Comté region (Berranger, Leroy, Hervé 2023). Whether the purchase was realised by traders or peasant transport duties remains unknown. Elite exchange was also facilitated in the form of compensation for land grants, or simply within reciprocal 'gift-giving practices'. For instance, in 827 Fulda Abbey 'gave' eight swords, four earrings and garments to various manorial lords, most probably valuables produced by attached specialists at the monastery (Schwind 1984, 115).

While the overall consumption and exchange of hypertrophic valuables by and among elites and their retinues was at best of marginal importance for the overall production volume, it was especially the demand for and production of basic necessities by free and unfree peasants which ultimately propelled the Carolingian economy (Johanek 1987, 60, 66; Kerig 2013, 169). As the supply of everyday necessities was officially one of the major concerns of the Carolingian royalty to be enforced by manorial estate holders (Johanek 1987, 54; Verhulst 2002, 128), it might appear that the rural Carolingian peasantry was simply an economically impotent mass of tax cattle without any inherent potential or will of decision-making outside the subsistence level, kept alive by a top-down 'hand-to-mouth' economy. For instance, Chris Wickham (2005, 536–537) imagines a peasantry economically paralysed by its mode of production, in which exchange is reduced to the desperation of need and intercommunal gift giving, whereas markets were of not more than marginal importance. For Thomas Meier (2011), market exchange east of the Rhine did not exist at all and is replaced by an almost command-economic redistribution or rather allocation system managed by big estates. First of all, it seems unlikely that manorial landowners, who were generally not interested in '*ordinary and worthless*' (Dopsch 1922, 155) household commodities like spades, ploughshares and pots, had the infrastructural possibility and motivation to provide individual households with such equipment. As stated for the aforementioned case of Annapes, peasants had to acquire such goods independently and did so practically on a daily basis. In fact, regional, local and ultra-local, permanent and seasonal rural markets for the purchase of victuals and mundane items certainly existed (Johanek 1987, 26; Verhulst 2002, 97; Loveluck 2013, 210) and were so ubiquitous, that, according to the *Capitulare de villis*, estate stewards were ordered to keep their peasants from hanging around at them so they don't '*waste their time*' (Loyn, Pervical 1975, 71). While some of those rural markets were certainly arranged top-down by the manor (Hägermann, Schneider 2003, 343; Henning 2007, 16–17), others could have been organised acephalically by peasants or non-elite traders (Mogren 2012). Generally, tolls were not collected for the trade with mundane goods on estate markets (Verhulst 2002, 87–90, 97). Iron objects but also raw iron could have been acquired actively on those markets, by both professional merchants or mobile peddlers and peasants themselves vending their own surpluses (Verhulst 2002, 97; Loveluck 2013, 210). Such transactions didn't necessarily include physical money like coins, which were relatively scarce to non-existent in the Carolingian realm, but could be on a large scale operated through credit, meaning the trust-based promise to repay or compensate in the future (Carruthers 2005, 355–356, 362–363; Köhler et al. 2019, 146–149). An institutionalised form of intercommunal obligations or annuity is known from German late medieval and early modern text sources called *Schmiedkorn* ('Blacksmith's grain'). The term may vary locally, such as, e.g. *Schmiedlohn* ('Blacksmiths's payment'), *Dängelkorn* ('Sharpening corn') or *Dängellaib* ('Sharpening loaf'), the latter designating the payment in bread (Duncker 1903, 47–51; Grüninger 1924, 27–32). In this system, peasants

within a legally defined community (village) paid a fixed annual quantum of grain or bread to the local blacksmith, who had to produce and/or maintain their agricultural tools in return without demanding further payments. However, the blacksmith in some cases did not lose his economic independence and could at the same time produce for the market. Such an intercommunal credit system, if it can be applied for Early Middle Ages, is theoretically imaginable where one specialist had to supply farmsteads to which they are socially or economically connected within a closed area.

Of particular interest for such considerations is the so-called Banz urbarium (ca 9th century), as it depicts a probably entire manorial district with 80 settlements around a central estate in northern Bavaria belonging to Fulda Abbey (Puchner 1969; Werther 2010, 253–264). In addition to various economic facilities mentioned in the text, such as mills, vineyards and honey hunter stands, the specialised production at the manorial estate Lucelowe is of major importance. It is the production locus of a shoemaker, several wool skirt tailors, an envoy (*legatus*), and in particular a blacksmith (*faber*), the latter being the only evidenced artisan of this kind within the entire possession (Puchner 1969, 167). The presence of the blacksmith at the estate is perhaps not surprising and may be an indicator of their legal or perhaps economic dependence as an attached producer (Kropp, Meier 2010, 98, 107). However, the blacksmith in Lucelowe probably not only worked for the self-sufficiency of the estate and its securement of surpluses, but most probably also supplied the surrounding farms with agricultural implements and their repair. It is probable that independent production and tool maintenance could also have been carried out in the more distant settlements outside a 20 km radius (a day's walk) in particular; but also, that the Banz urbarium only provides us with fragmentary information about the production organisation of the district, or generally an inconsistent view on the settlement structure, which could have been intertwined with, for instance, royal or aristocratic seigneuries or independent peasant farmsteads. However, if we assume that the surrounding settlements or farmsteads within a 20 km radius were supplied predominantly by the Lucelowe-blacksmith, who certainly did not work alone, the question arises of how this exchange was organised in detail. While estate markets were probably organised seasonally and created opportunities for purchases, a more institutionalised form of inter-community obligations comparable to the '*Schmiedkorn*' appears at least possible. However, testing such a model stretches the limits of both the archaeological and historical sources.

7. Conclusion

What already became clear through the exemplary evaluation of the archaeological and historical sources is the eclectic, fragmentary and heterogeneous character of the operational concept 'Carolingian iron economy'. Local and regional preconditions at the political-economic (manorial) and environmental level make a model-like generalisation impossible. However, it appears that the iron economy was neither centrally controlled by elites nor fundamentally dictated by a manorial framework. Ultimately, however, a handful of distinct socio-economic patterns are discernible; however, they do not exhibit universal applicability:

1. The mining, smelting and processing of iron ore was generally decentralised and organised locally. Given that the extraction of surpluses was a fundamental economic principle, elites and their 'geostrategic' interests, for instance within the systematic land clearance (*Landesausbau*) and the consolidation of manorial structures, in several cases seem to have established a predatory extraction framework to facilitate large-scale production.
2. However, the metallurgical *chaîne opératoire*, regardless of the extent, was organised and realised by peasants. This could also have taken place outside the domain and was possible practically everywhere due to the lack of a universal *Bergregal* on iron ores and the elites' general disinterest in mundane peasant economics.
3. The influence of elites on iron processing is particularly evident where the attached production of valuables was located, particularly in higher-order sites like monasteries, fortifications and manorial estates. The archaeological identification of the latter is in most cases impossible.
4. Ironworkers could be unfree, but that says nothing in general about their economic freedom. Historical and archaeological sources suggest that iron craft producers were able to carry out various qualitative craft activities (e.g. woodworking) in addition to agriculture. Free, highly specialised blacksmiths with great economic independence also existed.

5. The distribution of iron was complex. Within a manorial framework, there were redistribution and exchange networks of large commodity quantities and valuables between landlords, mainly used to sell surplus on markets, maintain inter-elite relations or manage political goals. However, peasants were not dependent on supplies by top-down redistribution, but had their own exchange systems on, for instance, rural markets or inter-communal annuities both driven by credit financing.

Acknowledgements

This work is a contribution to the EXPRO grant GX25-15764X 'Frontiers and Empires: The Case of Moymirid Moravia', awarded by the Czech Science Foundation (GAČR).

Chapter 3

Reges gentium or Carolingian *comites*? The status of a prince on the periphery of the Carolingian Empire – Moravia, Brittany and Catalonia in comparison

David Kalhous

1. Introduction

The death of Svatopluk I, a 9th-century ruler of the Moravians, was commented on in the Annals of Fulda with these words: 'Zwentibald, the dux of the Moravians and the source of all treachery, who had disturbed all the lands around him with tricks and cunning and circled around thirsting for human blood, made an unhappy end, exhorting his men at the last, they should not be lovers of peace but rather continue in enmity with their neighbours.'[1]

These are not, of course, very friendly words, but they show him as an important figure worthy of mention. We do not find necrological records of many of his other contemporaries in this source. The impression of Svatopluk's importance in 9th-century politics (and later imagination) is supported by numerous entries documenting struggles between him and Frankish elites, or their king, even decades after his death, not all of them necessarily negative.[2] Still, it is not very clear what position in the imagination of the empire Frankish authors had assigned to him or how he probably perceived and reacted to it. This question of social and political status is also closely connected with the problem of (self)identification, because it is unclear exactly how Svatopluk and rulers in similar positions in the peripheral areas of the Carolingian Empire identified themselves. It would be a mistake to analyse just one peripheral region, because only comparison enables to see and properly evaluate the differences and similarities between them.[3] I have decided to focus first on Brittany, which is very well-documented not only from the Frankish perspective, but also from the point of view of this region thanks to the rich collection of charters and narrative sources written at Redon Abbey. Even though these documents do not mediate the direct perspective of the ruling dynasty, they still provide us with a useful corrective to the Frankish records. I then briefly move to the Spanish march with its numerous written records, which stayed a bit outside of the scope of the Frankish annalists, but deliver us thanks to the numerous deeds and charters with the view of local comital families. My third test case is Moravia (all discussed areas marked in Fig. 3.1). Morava is mentioned quite often in the *Annales Fuldenses*, yet we almost completely lack any sources written from a Moravian perspective – with two exceptions I discuss below. Therefore, it is necessary to analyse the main Frankish narrative sources written during the 9th century and to compare them with other contemporary evidence. I will focus on the titles that these sources give to different characters, as they reflect the position Frankish authors wanted to provide them with within their *Gedankenwelt*.

The significance of this comparison between Brittany and Moravia is supported by interesting evidence from two nearly contemporary documents, both issued by Frankish bishops. One of them is the protocol of the synod in Savonnières (859), addressed by its participants to the bishops in Brittany. These bishops are reminded of the tribute payments coming from Brittany to the Frankish empire and which may be interpreted as a signal of

1 AF, 894 AD, 125. I used the translation in the Annals of Fulda 1992, 129.

2 Cf. Antapodosis, I. 13, 15. For the interpretation cf. Sutherland 1988; Levine 1991; Kalhous 2018.

3 Cf. similar comparison in Wolfram 2010. For comparative methodology cf. Kocka 2003.

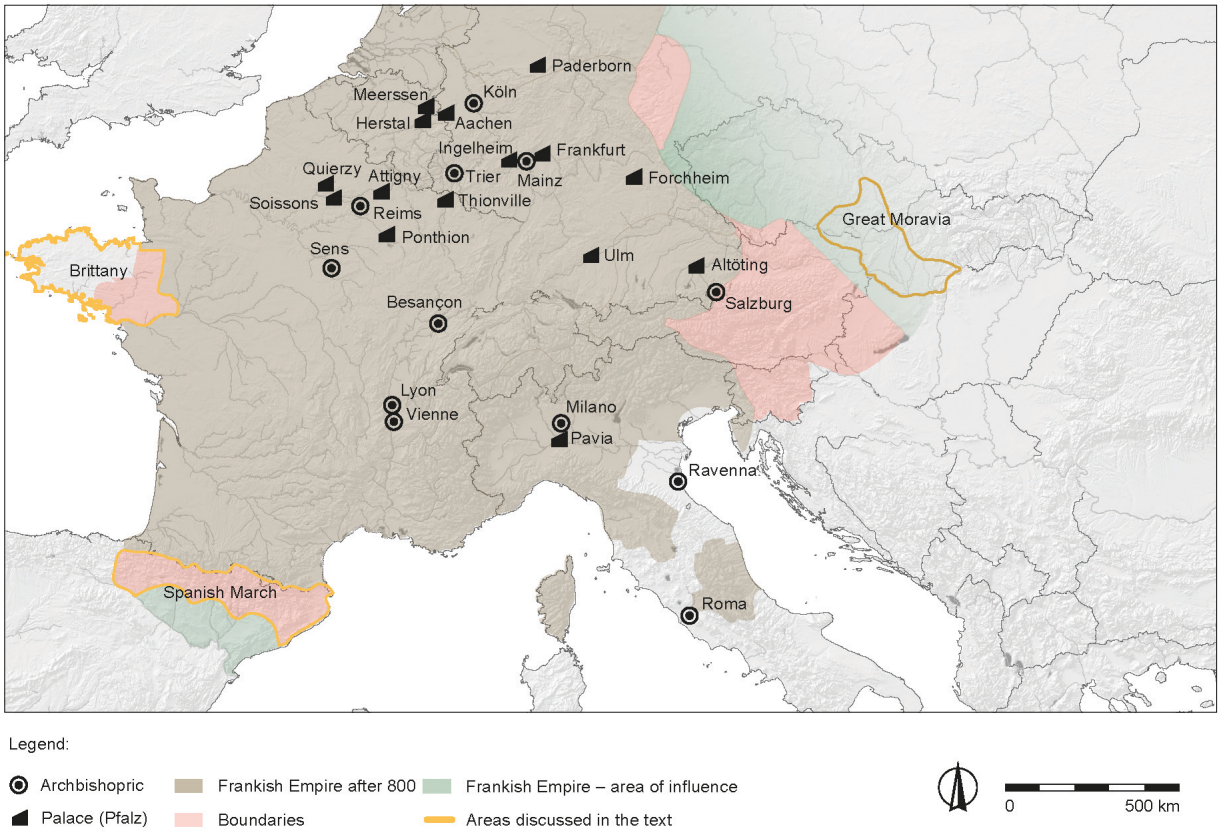


Fig. 3.1. Discussed areas marked in a map of Europe after 800. After Poláček et al. 2020, 24. Graphics by Z. Pavková.

Frankish dominance over Brittany.[4] A clear parallel to this synod chapter can be found in another letter sent in 900 to the pope by Archbishop Theotmar of Salzburg and his suffragan bishops, in which they express similar claims over Moravia.[5] The tribute from Brittany was still remembered in the 11th century, as we can read in the contemporary chronicle of Nantes an alleged letter from Pope Nicholas I reminding Salomon to pay it.[6] It is also significant that Frankish counts and margraves are entitled not only with the *pagi* in the Frankish borderland, but also within Brittany (or Bohemia) itself.[7]

2. Fighting for the freedom of his people? The 9th-century Brittany

The princes in Brittany are mentioned regularly in the *Annales Bertiniani*, mostly as the enemies of King Charles the Bald involved in the crisis of his reign, at the beginning of his reign as the allies of Emperor Lothair (Smith 1992, 94–97, 119),[8] or later as the supporters of his older brother and king of East Francia, Louis the German (Smith 1992, 103–104).[9] They were also part of different aristocratic coteries that struggled for power in western Neustria such as Rorgonids and Widonids. Because of these connections, Nominoe, ruler in Brittany, together with Count Lambert, assaulted and

4 Konzilien der Karolingischen 843–859, § 9, 460–461. Cf. synodal letter of the bishops from Brittany Konzilien der Karolingischen 843–859, § 9, 480–481, 481. Cf. Nicolai I epistolae, No. 107, 619–622.

5 Conversio, 138–156. Towards its authenticity Třeštík 1998.

6 Cf. Chron. Nantes, c. XVI, 51–57. This chronicle is primarily a valuable source for a view of the Carolingian heritage in the 11th century. Based on an analysis of the c. XI, XXVII; Lot 1906, 421–437, it has been proven that the chronist knew *Gesta sanctorum Rotonensium* and *Vita Conwoionis abbatis*, although he judged some princes of Brittany differently.

7 ARF, 799 AD, 108 (cf. note 53).

8 My further thoughts about 9th-century Brittany are based primarily on this monograph. See also Guillotel 1975–1976. Cf. AB, 844 AD, 46–48; Chron. Aquitanicum, 104–121, here 843 AD, 111–112.

9 Cf. AB, 854 AD, 68–70; AB 858 AD, 77–79.

killed their adversary, Rainald, in Nantes in 843 (Smith 1992, 94).[10] Something similar also occurred in 849/850 (Smith 1992, 98).[11]

Traditional narrative looks for the 'mythical origin' of the principality in Roman times and constructs the continuity between the lords in Brittany of the Roman and Merovingian era and the princes of the 9th century.[12] The position of the prince in Brittany was not simple though, as he was not the head of a consolidated realm, but had to face opposition similar to that which other medieval rulers were confronted with. Many of them were killed. When Abbot Lupus of Ferrières was writing about the defeat of Charles the Bald in Ballon on November 22, 845, he also mentioned internal enemies of Prince Nominoe.[13]

Peace did not come for free. After another defeat near Jengland in 851, King Charles preferred to confirm Erispoe's rule over Brittany and provided him with the counties of Rennes and Nantes, and with land near Retz.[14] Five years later, Charles the Bald decided to deepen his alliance with the prince of Brittany and also to improve the position of his son Louis through his marriage with Erispoe's daughter, who, we are told, received the *regnum Neustrie* (!) as her dowry (Smith 1992, 102–103).[15] However, Charles' powerful ally Robert the Strong, who ruled the area between Tours and Angers from 852, and Erispoe's cousin Salomon, who had already received a share of Erispoe's domain, felt threatened by this step (Smith 1992, 101).[16] Therefore, in 857 Salomon killed Erispoe and replaced him as prince;[17] in that rebellion, Duke Robert soon joined him and they both probably participated in the plot against the king, the result of which was the invitation of Charles' brother Louis the German to Western Francia (Smith 1992, 103–104).[18] Prince Louis had to escape from Le Mans (Smith 1992, 103–104),[19] but few years later, he also joined a similar revolt initiated by Rorgonids Gautfried and Gauzfried and supported by Salomon.[20]

We can feel the superiority and distance that these Frankish authors express when they wrote about the princes of Brittany. The biographer of Louis the Pious, so-called Astronomus, argued that the 'proud disobedience of Bretons' together with their attempt to call their ruler 'king' must 'naturally' have been crushed.[21] Even though the struggles between the princes of Brittany and Frankish kings were numerous, we should not understand them through the filter of ethnicity or the optic of a fight for freedom. Ethnicity might have been the result of a long-lasting fight, but not its initiator. The princes of Brittany were not only active participants in the conflicts between members of the Carolingian elite, but were also ready to receive their lands from the hands of the Carolingian kings (with some extra portion of land in the surrounding area) (Smith 1992, 97).[22] When Charles the Bald signed the peace treaty with Salomon in 863, Salomon, who had already received part of Brittany from him in the past and submitted himself to Charles (Smith 1992, 101),[23] received another piece of land from him for making tribute payments.[24]

10 Cf. AB, 843 AD, 44. Chron. Nantes, c. 6, 14–17, 14 – according to note 27 follows here the text, which is also preserved in Angers BM 817, f. 135r–136r; III. 5, 201. See also RI I,2,1 note 364.

11 Fragm. Chron. Fontanellensis, 849–850 AD, 302–303.

12 For the traditional narrative cf. e.g. Cassard 1989. Cf. for fresh look at the written evidence, Brett 2011; 2015; Garault 2011; Guy 2014.

13 Lupi epistolae, No. 31, 39. Cf. Lupi epistolae, No. 83, 74–75; Smith 1992, 96–97; AB, 845 AD, 51; AF, 845 AD, 35; Fragm. Chron. Fontanellensis, 846 AD, 302. Cf. also RI I,2,1 note 503.

14 AB, 851 AD, 63–64. As noted by Smith 1992, 110, n. 92, Prudentius does not mention that defeat at all. Cf. Lupi epistolae, No. 84, 75–77; No. 98, 114.

15 Cf. AB, 856 AD, 72 and PL 106, col. 891–906, here c. XVIII, col. 904. According to Levillain 1904, 302–303 translatio was written between 867 and 877.

16 Cf. AB, 852 AD, 41.

17 AB, 857 AD, 75; Hinkmari epistolae, No. 105, 51.

18 AB, 858 AD, 77–79.

19 AB, 858 AD, 77–79.

20 AB, 861 AD, 85–86. On its beginnings (cf. Smith 1992, 101–102).

21 Vita Hludowici, 386. Differently Thegan, *Gesta Hludowici imperatoris*, in ibid., c. XXV, 214.

22 Cf. note 14, 15, 24.

23 Cf. AB, AD 852, 64–65.

24 AB, 863 AD, 96.

These relations were not only based on gifts, offices or marriage; also of value was the impact of god-parentship and hostages (Smith 1992, 110–111, 111–114; cf. Angenendt 1984). In 856, Charles the Bald called Erispoe *compater* and Julia Smith is probably right in arguing that Charles had become the godfather of his son five years earlier (Smith 1992, 110–111; cf. note 28). Similarly, in 873, Salomon's son Wigo was sent to Charles to take an oath.[25] The interconnectedness of the princes of Brittany with Frankish policy was also reflected in the titles with which they were addressed: in one of the charters preserved in the cartulary of Redon Abbey, Nominoe was called *missus*[26] and he was also count in Vannes, which was part of the march. In 846, Prudentius of Troyes calls Nominoe *dux* for the first time, and it seems that he reflects through that title Charles' acknowledgment of Nominoe's rule in Brittany in exchange for Nominoe's acknowledgment of Charles' supremacy.[27]

Contemporary sources also inform that after Charles had signed the peace treaty with Salomon in 867, he sent him a golden and bejewelled crown with all royal paraments.[28] That set was probably identical to the jewels which Salomon afterwards gave to Redon Abbey.[29] Based on the *Vita Conwoionis*, Julia Smith is of the opinion that Salomon was not promoted, but only received them as a personal gift (cf. Smith 1992, 108–115).[30] Conversely, Pope Nicholas I allegedly addressed Salomon as king in 862.[31] Also, in the preserved charters of Redon Abbey, in their later copies in the monastery's cartulary, he calls himself king.[32] Of course, collected examples do not provide us with 'reality', but they clearly demonstrate that the viewpoints of the princes of Brittany and Frankish kings might have differed and also that they might have changed over time. After all, the charters collected in the Redon cartulary are not uniform; the *intitulatio* differs from charter to charter and might even be different in one charter.[33] Wendy Davies has, however, noticed that since that year, the number of documents issued in Brittany and referring to the Salomon in datum-formula began to grow (Davies 1981).[34]

The basis for thoughts about Nominoe's ambitions consists of a misunderstood chapter of the 9th-century text, in which the later author automatically connected the golden crown with royal dignity. That crown offered by Erispoe to the pope might have been the same one that Charles the Bald most probably sent to Erispoe – Prudentius speaks of *regalibus indumentis*.[35] The *Chronicon Namnetense* (Chronicle of Nantes) provides interesting testimony, not because it is a reliable text, but because it offers a later reflection on 9th-century history. In that chronicle, a negative stand was taken against Nominoe, whom

25 Cf. AB, 873 AD, 193.

26 Cartulaire Redon (= Documents Inedits sur l'Histoire de France), 834 AD, No. 2, 2; as those charters known from the Redon cartulary are not preserved in the original, we have to be careful in their interpretation.

27 AB, 846 AD, 52 (cf. esp. Brunner 1973, 263–272).

28 AB, 868 AD, 151.

29 Cartulaire Redon, No. 89, 67–68, here esp. 67 (871 AD).

30 Brunner 1973, 270–273 is of the opinion that there were different grades of kingship among the Celts. Cf. VC, 243.

31 Nicolai I epistolae, No. 107, 620. Except for a copy in the Chronicle of Nantes, the letter is preserved in ms. BNF 1458, which was copied by the end of the 11th century, cf. Nicolai I epistolae, 261; No. 119, 640 from 26-5-865. Both letters are also preserved in the 12th-century-Turino ms., 903, cf. Nicolai I epistolae, 265. Preserved in the same manuscript is an alleged letter from Pope Nicholas I, cf. Nicolai I epistolae, No. 127, 648. Cf. RI I,4,2 note 566.

32 Cartulaire Redon, No. 21, 18, 11-9-868: '*... ante Salomonem regem tocius Brittanię...*'; No. 243, 194, 1-8-875: '*Salomon rex Britanniae*'; No. 247, 199, 9-7-874: '*...quando voluit rex Salomon Romam ire, sed principes ejus non dimiserunt propter timorem Normannorum.*'; No. 257, 207, 10-2-872: '*Salomon rex*'. Cf. Cartulaire Redon, No. 19, 17, 6-2-860: '*... anno principatus Salomonis in Brittania.*'; No. 241, 189, 17-4-869: '*Salomon, gratia Dei totius Britanniae magneque partis Galliarum princeps, ...*'

33 Cartulaire Redon, No. 240, 187, 29-8-868: '*Salomon, gratia Dei Brittannice provinciae princesp* (sic)...'; No. 240, 188: '*Signum Salomon, regis Brittanniae.*'; No. 240, 189: '*...regnante Karolo rege, anno .xi. dominante Salomone Brittanniam, primo anno apostolalus Adriani apostolici...*'; cf. also a charter for Prüm Abbey published in Urkundenbuch Coblenz und Trier 1, No. 95, 99: '*salomon gratia et beneficio dei dux et princeps Brittonum...*'

34 For different institutions (royal counts and local *machtierns*); cf. Urkundenbuch Coblenz und Trier 1, 103–104.

35 AB, 851 AD, 63–64. Cf. Chron. Nantes, c. XIII, 42–44, esp. 43–44. Cf. ibid., c. XIV, XLV, XLVIII, where we are told that he gave himself the title of *rex Brittanicae*. For the analysis of previously mentioned charter (cf. Giry 1897/1898). Charles himself calls him in the contemporary charter (which is only preserved in 14th century manuscript) as a '*compater et fidelis noster ..., cui siquidem marcam sive comintatum Nanneticum benefiario jure haben*(*s*)' (cf. Giry 1897/1898, 507). See also Recueil Charles II, No. 181, 482.

it accused of conquering Frankish territory and attempting to become king;[36] Pope Leo IV then defends in that text the rights of the Frankish kings.[37] His story is based on the older, and more friendly to Nominoe, 11th-century legend of the *Vita Conwoionis II*, which mentions Nominoe's gift of the golden crown to that pope, though it does not necessarily speak of Nominoe's royal ambitions.[38]

If we consider the *Gesta Sanctorum Rotonensium*, we realise that the monks of Redon paid respect to the princes of Brittany, but they also did not hesitate to ask the Frankish kings for favours.[39] Moreover, it might have been the princes of Brittany who asked them to do so.[40] Last but not the least, the respect offered to the Frankish king is reflected in the dating formulas.[41]

The analysis of the position of the princes of Brittany shows that, on one hand, they created strong bonds with the Frankish aristocracy, including the royal family, whose dominance they respected. On the other hand, they used these connections for their own profit, whether it was in prestigious gifts or in given land. One of the results of this effort was the gifts of the crown, whose importance was probably interpreted in different ways by the West Frankish royal court and in Brittany. Nevertheless, we cannot prove any intentional long-term plan for gaining independence/sovereignty and royal dignity. The intentions in receiving them are probably the result of the re-interpretation of the 9th-century evidence through the perspective of the authors of the 10th and 11th centuries. After all, no 9th-century author ever mentioned the coronation or anointment of the prince of Brittany.

3. Image of Svatopluk I

Even a cursory glance at the evidence reveals an important problem in its representativeness. Great Moravia disappeared after 906,[42] and the historical narratives in which it was mentioned were all written from the perspectives of the Frankish elites, who intended to make Moravia and the struggles with its rulers a thing of the past (Graus 1960, 181–190).[43] But we lack any contemporary narrative written from the perspective of the Moravian elites.[44] Although the contemporary Old Church Slavonic *Vitae* of Byzantine missionaries St Constantine-Cyril and St Methodius are preserved, in later manuscripts, their authors focused on their missionary activities and on a defence of their legitimacy,[45] i.e. the elites were simply not of interest to the *Vitae* authors.

Of course, there is rich evidence provided by Frankish annalists, who were often closely connected with the royal court and with the highest echelons of Frankish society. Although they provide us with the Frankish perspective of the problem, that perspective was not necessarily unanimous; it changed through time and depended on the political affiliation of their authors – and this is also true of the papal correspondence (Betti 2014). Still, none of these sources explain how the princes of Moravia represented themselves and how they wanted to be perceived but only show us how they were perceived and presented by outsiders (cf. Wolfram 1967, 9–13).

To be able to evaluate the evidence properly, I shall start by examining the *Annales Fuldenses*, our most detailed source written predominantly from the perspective of the royal court and widely disseminated within the East Frankish kingdom. These

36 Chron. Nantes, c. XI, 32–33.

37 Chron. Nantes, c. XI, 33–34.

38 VC, c. X. For the legend cf. Pouline 2009, 94–97. The contact between the Pope Leo IV and Nominoe is proven by Lupi epistolae, No. 84, 76. For crown-offerings cf. Reitinger 2019.

39 Cf. e.g. VC, I. 8, 133.

40 VC, I. 10, 139. We mainly depend on the documentes preserved at Redon.

41 Cartulaire Redon, No. 240, 189. Cf. note 33.

42 I prefer the traditional term, based on an incorrect translation of the treatise written by Constantinos Porfyrogennetos. For further discussion, the issue of the localisation of that realm is of no importance, as both sides agree it was a neighbour of the Frankish Empire. Even though the Mojmir Moravian principality as an organised polity disappeared, new archeological excavations confirm that its fall wasn't followed by mass destruction. The elites (and probably also the ecclesiastical organisation) survived the raids led by Magyar princes, but they seem to lose much of their power and wealth.

43 For a comparison of 9th-century Moravia with other Slavic principalities that appear in the written sources since ca 800 AD (cf. Wolfram 1995; Třeštík 2001; Lienhard 2006).

44 There were attempts to (re)construct the 9th-century Moravian chronicle/yearbook, but none of them was very convincing, cf. Havlík 1987, who based his assumptions on the analysis of the Serbian Chronicle of Pop Dukljanin, which was also a very problematic text preserved in a 17th-century manuscript (cf. for critical comments Kalhous 2018, Chapter 5.3.2).

45 For basic information cf. Wood 2001, 173–176.

results will be compared with the *Annales Bertiniani* (cf. Meyer-Gebel 1988; Nelson 1988; 1990b) and the Chronicle of Regino (cf. esp. Löwe 1952; Schleidgen 1977; Airlie 2006; MacLean 2009), or with papal letters. In the next step, I shall make a short stop at the rites de passage of early medieval kingship and shortly summarise their importance for establishing the status of a given person. While this might seem to be a side-step, it enables to better understand on what basis titles, especially royal titles, might have been given at that time. Finally, I compare the evidence for Brittany with the evidence for Moravia, another peripheral principality of the Frankish Empire, to shed light on some general trends.

With respect to the questions I will answer, it makes no sense to follow chronicles written after 900 and which were based on earlier narratives.

The Annals of Fulda were written in the second half of the 9th century by authors who were related to the royal court. Whereas the version of the text written in Mainz includes the years 714–887, the Bavarian redaction describes the fortunes of East Francia in the years 714–901; both versions agree until 882 but then diverge.[46] The narrative up until ca 825 stands under the strong influence of the *Annales regni Francorum*. Even the first records demonstrate the complexity of the terminological analysis: once the annalist mentions Pippin II, he calls him '*son of Ansegis and duke of Franks, who after the death of Duke Wulfoald ruled Austrasia and held the kingdom of Franks for 27 years with the kings Chlodwig, Childebert and Dagobert*.'[47] The author similarly addresses Pippin's grandsons, who should have the Frankish kingdom split among themselves as mayordoms.[48] The situation changed in 751 when Pippin III sent his legates to Pope Zachary to ask him whether the king should be the person who holds power, or the one who is only called king.[49] After that moment, the annalist mostly calls the members of the Carolingian dynasty 'kings',[50] or 'emperors'[51] – with one exception, which was quite untypical, when in the entry for 794 he used the title 'grand prince', which could be interpreted as an 'important ruler'.[52]

A comparison of the titles attributed to the Pippinids and to the other leaders makes the situation more complicated. We can ignore the cases in which Frankish elites are called *duces*, even though the relation between them and the *duces*, whose title is enriched by an ethnonym, might not necessarily be perspicuous.[53]

For our further analysis, it is of greater importance that there are not only the kings of Franks in the *Annales Fuldenses*, but also that there are kings of other ethnicities. The author evidently acknowledged the royal title of the Langobard ruler, as their kingdom had become part of the empire as an independent unit, and the title 'king of Langobards' became part of the title of Charlemagne.[54] Apart from the kings of the Franks and Langobards, the annalist also uses 'king' in reference to the rulers of Persia and Spain, as well as for the Danes, Bulgarians and Northumbrians.[55] The rulers of Aquitania,[56] Bavaria,[57] Alemannia,[58] or different Slavic principalities in the East,[59] (and some other ethnic groups) were, however, systematically entitled as *duces*.

46 Basic summary offered by Levison, Löwe 1990. For an introduction to the *Vorstellungswelt* of the author (cf. Corradini 2006).

47 AF, 1.

48 AF, 741 AD, 4. Towards the continuous redefinition of the Frankish identity cf. Reimitz 2015.

49 AF, 751 AD, 5–6. Cf. AF, 752 AD, 6.

50 AF, 757 AD, 7.

51 AF, 805 AD, 16.

52 AF, 794 AD, 12.

53 Cf. Hasil 2011 about *duces Bohemanorum*.

54 AF, 770 AD, 8: '*Berhta regina filiam Desiderii, regis Langobardorum, Carlo filio suo cuniugio sociandum de Italia adduxit*.' (cf. Wolfram 1967, 220–224).

55 AF, 725 AD, 2; 798 AD, 13; 802 AD, 15; 808 AD, 17; 824 AD, 23.

56 AF, 728 AD, 3; 760 AD, 7.

57 AF, 743 AD, 4.

58 AF, 742 AD, 4.

59 AF, 798 AD, 14; 817 AD, 20; 823 AD, 23; 845 AD, 35; 846 AD, 36; 849 AD, 38; 855 AD, 45; 857 AD, 45; 858 AD, 51; 863 AD, 56; 884 AD, 110; 884 AD, 111; 892 AD, 121.

There seems then to be a certain pattern among the titles given to the rulers of different provinces and people. Whereas *duces* represent those areas and communities that were claimed by Carolingians as a part of their realm,[60] the *reges* ruled the areas that remained outside of the scope of the Carolingian kings and should never have been conquered. However, to accept that assumption means to oversimplify the situation, as can be proved with a few examples – the authors of *Annales Fuldenses* call Ratbod, the ruler of the Frisians, 'king', even though his realm was absorbed by the Frankish kingdom 150 years before the annals were compiled, and it had not remained as an independent administrative unit.[61] Moreover, the entitlement of the rulers also need not have been consistent. If we consider the Obodrits, while their ruler is mostly called *dux*, they might also, however, be titled as *rex* on occasion.[62] Naturally, the *dux* might have been governing the *regnum*, as *regnum* was not synonymous with 'kingdom',[63] but rather with a clearly recognisable land (Goetz 1987; cf. Voss 1987). Finally, it was also possible to omit titles,[64] and one can only speculate about the person's position within the worldly hierarchy based on the preceding or following records. All previously mentioned cases demonstrate that the terminology did not follow any simple rule, though the tendency to suppress the dependence, or highlight it through the given titles, seems to be clear (cf. Graus 1960; Brunner 1973).

The titles were hardly the only tool used by the annalists and chroniclers to express their ideas of the right social hierarchy and proper social relations. They also tried to express their image of the right social order through the specific structure of the narrative, or through the carefully selected terminology that guided their readers to the expected 'right' conclusion. The clash between King Louis the German and Prince Rastislav of the Moravians was described as a 'conspiracy' (cf. Graus 1960; Brunner 1973)[65] – the employed terminology implied not only Rastislav's (and also Svatopluk's) subordination to the king, but also gave the king the right to be his judge.[66] The annalist also used the useful stereotype of the 'treacherous barbarian',[67] who at the end asked through his envoys for peace, and promised tribute payments and his loyalty.[68]

The description of the negotiations between Svatopluk I and Louis II the German that took place in 874 also provide us with a new and interesting ceremonial perspective. It seems that Svatopluk I himself did not attend that assembly, where the relationship between the Moravians and Franks was discussed, and yet, he was still able to achieve his political goals.[69] In the records for the years 884 and 890, a different author described Svatopluk's negotiations with the Frankish kings in border areas – with Charles the Fat in Monte Comiano[70] and with Arnulf in Omuntesperch.[71] It seems that Svatopluk's position had changed since the trial in 870/871, when he was jailed and his uncle Rastislav was blinded[72] – the choice of the place between the principalities signals the more equal position of the political parties (cf. Voss 1987).

The Moravians and their princes are less represented in *Annales Bertiniani,* whose authors were

60 Ordinatio imperii, No. 136, 270–273, here esp. 271 (cf. Hägermann 1975).

61 AF, 715 AD, 1.

62 AF, 844 AD, 35.

63 I agree with Lysý 2014, 247 (and Hans-Werner Goetz) that *regnum* does not necessarily mean 'a kingdom'. In contrast, Marsina 2015, 14, note 72 (cf. Smith 1992, 98; Fragm. Chron. Fontanellensis, 849–850 AD, 302–303).

64 AF, 869 AD, 69; 869 AD, 71 (cf. note 65, 68).

65 AF, 866 AD, 65.

66 AF, 870 AD, 72.

67 AF, 870 AD, 73–74; 892 AD, 121 (cf. also note 1).

68 AF, 874 AD, 82.

69 Cf. note 68.

70 AF, 884 AD, 111. Cf. AF, 884 AD according to the Mainz-version, 101. On its localisation, cf. Měřínský 2011, 522–523 summarises the possible localisations, where the most popular solution is to identify *Mons Comianus* with a region, not with a certain place. Cf. MacLean 2003, 140–142; on its interpretation: Lysý 2014, 210–221.

71 AF, 890 AD, 118. *Omuntesperch* is in general situated near Wienerwald (cf. Bretholz 1896, 50). Koller 1963 identifies *Cumeoberg*, Comianus as the whole foothills of the Alps from Wienerwald to Rosaliengebirge.

72 AF, 870–871 AD, 70–73.

focused on the West Frankish kingdom. Records written by Hinkmar in the 860s, 870s and 880s do not speak of them very often and in detail, with one exception, when they describe Rostislav's defeat in 870.[73] Typically, the authors called the princes 'barbarians', *reguli*, a title I discuss below.[74] Whereas Prudentius of Troyes and his predecessor assumed the stereotype of treacherous Slavic barbarians from the *Annales regni Francorum*,[75] Hinkmar's perspective seems to be less unambiguous – once the empire split, the Slavs were no longer seen as common enemies. Even though Hinkmar did not omit the enmities between Rastislav and Louis the German, he was not as critical of the Moravians as his contemporaries in Mainz had been.[76]

Traditionally, *regulus* was interpreted as being a diminutive; however, Hans-Henning Kortüm proposes another explanation of the term (Kortüm 2002). When he was rethinking the record of the *Annales Fuldenses* and its commentary on the situation after the death of Charles the Fat, [77] he made us aware of Josiah 14:28–31, where *regulus* meant viper or basilisk.[78] His interpretation, however, is based on the assumption that Charles' contemporaries had necessarily understood the affairs of the years 887/888 as a decisive break in Frankish history, which is not the case (cf. the doubts in MacLean 2003). Moreover, it cannot be sure that Kortüm's interpretation of the Annals of Fulda is transferable to the *Annales Bertiniani*.

Regino of Prüm mentioned the Moravians and their prince on three different occasions. Whereas he called Rostislav *princeps* (prince),[79] he addressed Svatopluk as 'king' not only in his short obituary,[80] but also in a short story about Svatopluk's enfeoffment with Bohemia.[81] In that chapter, Regino also mentioned the royal anointment, although it is not completely clear whether the anointed king he was talking about was Svatopluk or Arnulf.[82] Because we know from other contemporary sources that Arnulf was elected in November, 887,[83] it seems more probable that Regino had Arnulf in mind.

If we consider the papal correspondence, our uncertainty regarding Svatopluk's status rises. There are just three letters preserved. In the oldest one, issued June 6, 879, by John VIII and now preserved in the papal registra, the inscription reads *Zuentapu… de Maravna*.[84] In another letter *Industrię tuę* of the same issuer from June 880 that is also preserved in papal registra, Svatopluk is addressed as *gloriosus comes* and placed under papal protection.[85] The wording of that title seems to have been taken over from the imperial administrative language, and was used to strengthen papal authority (Betti 2014, 188 based on Havlík 1983). At the same time, that title might also have been used as evidence of Svatopluk's importance in papal policy, as he is also referred to as *unicus filius* in the letter and receives the privilege to found bishoprics.[86] This assumption is confirmed by the last letter, in which in 885 Stephen V refers to Svatopluk as *rex Sclavorum*.[87] Even though it may seem suspicious that that letter is now only preserved in the late-tenth-century manuscript, Heiligenkreuz 217, the existence of an authentic model underlying it is acknowledged. It is also not very probable that once the letter was forged, the forger would have then changed the inscription (Laehr 1928).[88]

73 AB, 870 AD, 109.

74 Cf. note 79–81.

75 AB, 853 AD, 67.

76 AB, 861 AD, 85; 862 AD, 95; 870 AD, 175–176.

77 AF, 888 AD, 116.

78 Isaias (Isaiah) 14:28–30.

79 Regino, 860 AD, 78.

80 Regino, 894 AD, 143.

81 Regino, 890 AD, 134.

82 Cf. MMFH NS I, 122–123, note 751.

83 RI I, No. 1765l.

84 Ep. Karol. V (Ioh. VIII), 160, No. 200.

85 Ep. Karol. V (Ioh. VIII), 222, No. 255.

86 Ep. Karol. V (Ioh. VIII), 223, No. 255 (cf. Betti 2014, 189–192).

87 Ep. Karol. V (Steph. V), 335, No. 1.

88 That manuscript was preserved and used in Prague since the 990s (cf. Havel, Kalhous 2019).

In 10th, 11th and 12th centuries, Svatopluk I also underwent substantial transformation and reinterpretation in the chronicles. Whereas for most authors in today's Germany and Italy (Liutprand, Widukind, Thietmar of Merseburg) Svatopluk was a symbol of pride, a man who provoked Emperor Arnulf to open the gates to the Hunes-Magyars and caused the terrible destruction of Christianity in the following decades, for Christianus, the author of the ecclesiastical history of Bohemia, who wrote by the end of the 10th century, Svatopluk was only responsible for the fall of his principality due to the insufficient support of Christian faith and tolerance of paganism.[89] Christianus also introduced Bohemian Přemyslid princes as natural heirs to that 'king', whose lands were administered by Methodius and seven bishops. Similarly to his Breton contemporaries, for most of the later authors, a ruler of such renown had to be a king.

The chronicles and legends written in the Czech lands during the rule of King John the Blind (1310–1346) and his son, later Emperor Charles IV (1344/1346–1378), were created primarily to strengthen the legitimacy of the kings of Bohemia. They presented them as heirs of 'powerful and well-known' Moravian King Svatopluk I, whose alleged crown had also been transferred from Moravia to Bohemia. It is nearly certain that their authors – particularly so called Dalimil (ca 1310) and Přibík Pulkava of Radenín (†1380) – did not have at their disposal any 9th-century texts that are unknown to modern historians and were written from the perspective of the high medieval Bohemian aristocracy or based on the needs of Emperor Charles IV's court (Bláhová 1993; Kalhous 2012, 193–208; 2018, Chapter 5.3.1).

4. Loyal hereditary counts in Frankish March

Whereas Moravia, or Brittany, the status of which was merely problematic, often found their way into the annals of Frankish kingdoms, those remain silent about the affairs of the Hispanic march. However, it was an undisputable part of the (West-) Frankish kingdom since ca 790. The history of the area of later Catalonia in the 9th century and the beginnings of the comital dynasty are only mentioned in *Gesta comitum Barcinonensium*, which was written in Rippol between 1162 and 1184 (so-called *la redaccio primitive*).[90] However, from the perspective of this Catalonian chronicler, Carolingians no longer played any role.[91] At the same time, it is possible to spot the beginnings of Catalonian identity (Bisson 1984; d'Abadal i de Vinyals 1991[3], 219–342)[92] or first encounter the name 'Catalonia' (Engels 1989, 16–17).[93] The West Frankish (or later French) lordship over Catalonia was, however, formally cancelled in 1258 (Engels 1989, 48–49).

Yet, the situation from the contemporary perspective was different – with clear testimony of local loyalty towards the West Frankish kings providing us local deeds that date the documents with their regnal years until the end of the Carolingian dynasty in West Francia (Zimmermann 1981, 345–359). The voice of independence might have been initiated by the renewed and short-lived interest of Lothar III in the counties behind the Pyrenees and might also have ignited competition among the counts (Jarrett 2011a), but still, the royal charters were regularly issued for Catalonian recipients at that time, though since the reign of Odo (888–898), they only included confirmations, or grants of immunity (Zimmermann 1999, 428). Moreover, the inhabitants of Trans-Pyrenean counties had to invest and still invested in efforts to cross the Pyrenees and visit the royal court in Francia, because since Louis the Pious all Carolingian kings visited Catalonia – we have more than 150 confirmations of Trans-Pyrenean beneficiaries issued by the West Frankish kings (Udina Martorell 1974, 237; Collins 1981, 174–175). The formulary from the end of the 10th century collected in the princely Monastery of the

89 Legenda Christiani 1–2, 12–20.

90 Gesta Comitum Barcinonensium, 5–10 (cf. Aurell 2005, 241).

91 For the perspective of that narrative (cf. Taylor 2005). For possible sources of new Catalonian identity (cf. Sabaté 2017; cf. note 93).

92 For the development of the structures of power and property (cf. Jarrett 2010b; Chandler 2018).

93 For the high and late medieval interpretation of the establishment of Catalonia (cf. Freedman 1991, for a contemporary perspective, see Jarrett 2011a).

Virgin Mary in Rippoll still emphasises in the regnal years in datum-formula (Zimmermann 1982, 78),[94] which remained in use until the 1180s.

The beginnings of the comital dynasty, whose members still ruled that area in the 12th century, are largely disputed.[95] The Capitulary of Quierzy from 877 established the hereditary rights of the newly promoted count Wilfred/Guifred (870/878/886–897), and guaranteed him and his heirs those rights even in the case of an underage heir.[96] Roger Collins pointed out that Wilfred/Guifred might have been the son and heir of Count Sunifred I of Barcelona and as such, he was a member of indigenous elites (Collins 1981, 177). Year later at the Council of Troyes in 878, presided over by Pope John VIII and King Louis II the Stammerer, Wilfred was formally invested as Count of Urgell and Cerdanya, and his brothers Miró as Count of Conflent, Sunyer as Count of Empúries, and Oliba II as Count of Carcassonne. He called himself 'count and margrave from God's grace',[97] later, in 887, we also find another formula *vir inlustri* (*sic*) *Wifredus comes* (cf. Udina Martorell 1974; Zimmermann 1991, 213). Wilfred Borrel, Miró, Sunifred and Sunyfred, sons of Wilfred and Guinidilda of Toulouse, governed their father's counties jointly, recognising the eldest Wilfred Borrel, as *primus inter pares*.

An important basis of their power became the abbacy of Santa Maria in Ripoll,[98] the re-established bishopric in Vic (Freedman 1983, 14–37; Jarrett 2010a), and the Monastery Sant Joan de les Abadesses (d'Abadal i de Vinyals 1991, 130–147).[99] Guifred's counties also included other Trans-Pyrenean bishoprics of Barcelona, Girona and Urgel; the only see that remained outside of his control was Elna.

Later during the 10th century, one of Guifred's successors, Borell II, supported the unsuccessful claims of Áto of Vic (957–971) to restore the metropolitan see of Tarragona and move it to Vic, which again would bring large territories under Borell's firmer control and would strengthen its unity (Jarrett 2010a).[100] It was also Borell II, who, being under strong pressure of Al-Mansur, called himself 'duke of Gothia' since 972 just to highlight his precedence over other counts in the area, not to replace the comital title, which seemed to remain the main source of his legitimacy (Zimmermann 1991, 239–241 with examples).[101] He started to date his documents according to his years in the office (Zimmermann 1991, 239–241).

Surprisingly, whereas the lords of future Navarra gained the royal title in the 9th century, the members of the dynasty of the counts of Barcelona with strong local roots remained loyal to their Carolingian lords (Collins 1981, 178–179). A possible explanation of their loyalty was offered by R. Collins, who pointed out external pressures that counts in Catalonia had to face in the 9th and 10th centuries combined with the 'good rule' guaranteed, at least formally, by the authority of Frankish kings (Collins 1981, 182–187). The link between counts and kings in Paris also strengthen their legitimacy against the holders of *aprisiones* (Collins 1981, 182–187).[102] However, this hypothesis would not explain why the counts in previous decades rebelled, when the external threat might have been lower, but still existed. Based on two previous cases from Brittany and Moravia, it is worth considering if mere personalised strategies did not exist, where individual actors just reacted in a different way to similar inputs. In the case of future Catalonia, the combination of distance that on the one hand reduced possible friction within the social pyramid, while, on the other hand, guaranteed an acknowledged source of authority might too have been decisive for retaining loyalty to the kings of West Francia. '*Catalonia drifted into independence rather than seeking it.*' (Zimmermann 1999, 430).

94 *Facto testamento sub die illo, anno illo, rege illo.*

95 For the aristocracy in Trans-Pyrenean counties (cf. Aurell 1998, 467–480).

96 Capitulare Quierzy, No. 281, § 9, 358, 14-7-877; for later practice cf. Taylor 2005, 136–144.

97 Colecció Besalú 15, No. 2016, 15–18, here esp. 15 (donation for San Juan de las Abadesas, 875): *Wilfredus misericordia Dei comes et marchio, et Winiedildes cometissa*. See also *Viage literario*, 66–67.

98 Fons. Cathal., No. 105; *Viage literario*, 31 for a grave inscription (d'Abadal i de Vinyals 1962; Junyent 1975). For Wilfred's charters in general see Valls i Taberner 1936, 11–31.

99 For the founding charter of St Juan (cf. Collins 1981, 177).

100 For the previous attempt in the 960s (cf. Jarrett 2010a, 13–16).

101 For contemporary parallels and for the reaction of the kingship (cf. Zimmermann 1991, 250–255, 257–258).

102 For *aprisiones* cf. Bowman 2004, 48–56.

5. The problem of princely succession and of the rituals connected with it in the Early Middle Ages

Were Svatopluk I and his contemporaries from Brittany kings? On the one hand, even his predecessor was called 'king' in the *Annales Xantenses*,[103] on the other hand there is no evidence for the rituals traditionally connected with royal succession. But are we right in our expectations? From our perspective, it is noteworthy that while the authors of *Vitae* of Constantine-Cyril and Methodius call the princes of the Moravians *knjaz*,[104] they address the Frankish kings as *korol*[105] and the Byzantine emperors as *tsar*.[106] This means that they distinguished differences in the status of these rulers.

In Frankish sources, the position in the social hierarchy and entitlement were always related. Fredegar described the attempt by the duke of Thuringia to call himself king as a manifestation of his pride[107] also, a much later protocol of the Parisian synod (829) proclaims that the dukes and counts should be subordinated to the king.[108]

Power, Church and ecclesiastical rituals and ideas were always closely connected (cf. Erkens 2006).[109] The Church provided rulers with their special protection, even before the rituals of crowning and anointing were introduced. Therefore, the ecclesiastical authorities, along with others, compared traitors with Judas,[110] or acknowledged the responsibility of kings and secular elites for the salvation of their subjects.[111]

Although the sacrality of the Merovingian kings was widely acknowledged and they also undermined their legitimacy through the connection with the Church and supernatural (cf. Hen 2004; Le Jan 2006), it does not seem to be probable that their installation in the office had been organised by the Church. The first known case of royal anointing occurred in the Visigothic kingdom in the 670s,[112] but later European tradition was obviously connected with Pippin III. However, we only know his story from sources written during the reign of his son Charlemagne, ca 800. Therefore, Pippin's alleged anointing is now interpreted merely as a *Firmsalbung*, confirmation, and not as an anointing;[113] from that perspective it seems probable that the anointing became part of the ritual of royal instalment much later (cf. Brühl 1982, 15, 17–18).

The crowning also seems to be problematic. The first case mentioned is in sources from the reign of Charlemagne (Brühl 1962, 313–320). In East Francia, the first crowning to occur was the enthronement of Louis the Child (899–911) at the very end of the 9th century.[114] Carlrichard Brühl seems to be too optimistic when he assumes that Arnulf must have been crowned, when his son Zventibold was crowned (Brühl 1962, 296–299).[115] Therefore, J. L. Nelson, who

103 Ann. Xant., 871 AD, 86.

104 ŽK, c. XIV, 98: *moravskyi knяzь*. In a similar situation, the author of *Vita Climenti cum translatione,* ed. J. Ludvíkovský, ŽK, c. VII, 127 calls Rostislav 'princeps Moravie'. In ŽM, c. V, 143 *knяzъ slovjansky*, or c. X, 154: *Svatoplukъ knяzь* and *moravьska oblastь*. The term *knяzь* is probably akin to the word *kuning-az* (cf. Vykypěl 2011², 128–133). However, this etymology does not fully explain its meaning in the 9th century.

105 ŽM, c. XVI, 160: *koroljo ugъrьskomu*. 'Hungarian' is often interpreted as a later interpolation, Vavřínek (1964) identifies him as Charles III the Fat; some, however, think the author is speaking about the khan of the Bulgars, but others do not rule out a prince of the Magyars (Diettrich 1962, 256–257).

106 ŽM, c. XIII, 158–159: *cъsarь*.

107 Fredegar, IV. 87, 165.

108 Concilia 2.2, 654: '*His, quae praemissa sunt, declarantur, quod hi, qui post regem populum Dei regere debent, id est duces et comites…*' For tension between the terms *rex*, *princeps* and *dux* in the biblical story of Saul (cf. Brunner 1973, 181–191). For an assumption that the title dux lost its legitimacy ca 800 (cf. Betti 2014, 187–188 based on Werner 1980, 216 and note 96, 216–217). Personally, I am rather sceptical of that assumption, as K.-F. Werner omits any argument for his statement.

109 To the definition of *Sakralkönigtum* e.g. Dartmann 2010, 42–43, recognises four aspects of sacrality that should define fully developed sacral kingship.

110 Cf. PLS, 38; Concilia Saxonica 6.1, § 19, 28.

111 Cf. e.g. lament of the prince of Moravians Svatopluk for allowing 'the light to live with the darkness' and thus causing the fall of Moravia in Legenda Christiani c. I, 18.

112 Hist. Wambae, c. IV, 503–504. Apart from Julian's chronicle, the royal consecration is mentioned in the protocol of the Twelfth Council of Toledo, cf. Conc. Tol. XII, § 1, 454–455 (cf. Enright 1985, 81–84; Dartmann 2010).

113 ARF, 751 AD, 5–6 (cf. Semmler 2003; Diesenberger, Reimitz 2005).

114 For an overview of the coronations cf. Brühl 1962, 321–326.

115 He is also of the opinion that January 6, called *dies consecrationis* in the charter issued by Charles III the Fat (DK III, 132), signals the date of his coronation as king of Alemannia.

also took West Francia into consideration, does not take the rituals of crowning and anointing as being a *condition sine qua non* for being a king in the 9th century, but rather as a useful tool for bolstering legitimacy during moments of crisis (Nelson 1986a, 292–294).[116]

The limited role of these rituals in 9th-century Europe seems to be evident, if we also take the Anglo-Saxon milieu into consideration. The so-called Anglo-Saxon chronicle in its version A (Cambridge, Corpus Christi College MS 173) describes the anointing of King Alfred the Great in Rome, but here, again, we do not hear the voice of a contemporary author, but its later interpretation written from the perspective of the 10th century, when, again, anointing started to play a more important role than it did a century earlier (Nelson 1986b, 319–324). The first anointed Anglo-Saxon king was most probably Alfred's son Æthelward, who was anointed in 900.[117] Whereas, on the one hand, this evidence confirms the growing importance of royal anointing as a part of the enthronement rituals in England by the end of the 9th century, on the other hand, it also proves that the status of the Anglo-Saxon kings was not previously based on that ritual and later authors felt the need to transform the instalment narratives from this new perspective.

Eleventh- and twelfth-century chronicles and other written sources only confirm the trend towards the strengthened role of the Church in different rituals connected with the assumption of the office – according to Gerhard, author of the *Vita Udalrici*, his central focus, the bishop of Augsburg, does not fully acknowledge the kingship of Henry I the Fowler (919–936) due to the missing anointment.[118] Yet again, Gerhard wrote his legend from the perspective of the late-tenth century. There is also much evidence for this trend not only from the principalities in West Francia, but also from southern Italy and Poland (Hoffmann 1962; Dalewski 2004). Between the 8th and 11th centuries, the Church became, with growing intensity and frequency, involved in many important *rites de passage* (esp. births, marriages and funerals),[119] and started to guarantee their correctness (and legitimacy); instalment in office, then, seems to be just one ritual among many others. The success of the Church was partially based on the efforts of local princes, who were seeking to establish their own legitimacy, but who also struggled with their lords, or subjects.[120]

Even though it is rather improbable that Svatopluk I or his Breton contemporaries were anointed and crowned, these rituals were of limited importance in their age. If we consider the description of their negotiations with the emperors, their status was comparable with the status of the rulers called in contemporary sources 'kings'.

6. Being a prince on the periphery of the empire

In the last few decades, historians have intensely discussed the status of the Moravian prince Svatopluk I (871–894). These motivated discussions have led to different results, yet all historians have shared the idea that there was a clearly recognisable kingship in the 9th century with anointed and crowned kings. But the Frankish annalists called the Scandinavian princes kings, even though they were neither anointed nor crowned.[121] Although it is possible to identify Frankish bearers of different titles in the contemporary sources, it has not been sufficiently taken into consideration that we are only informed by sources written in Francia, and that we lack any evidence of the self-presentation of the Moravian prince. To believe Frankish sources, however, means to accept their perspective that Mojmirid Moravia or Brittany were part of the Frankish kingdom, where there was only a place for a Carolingian kings and where other princes were only obliged to obey them.[122] Yet in reality, the princes of the people from Moravia

116 First ordo was written 869 for the coronation of Charles the Bald as king of Lotharingia (cf. Nelson 1990a).

117 ASC, 853, 64 based on its Winchester Ms. On the 'Christianisation' of the inaugurational rituals (or rather on the growing control of the Church over it) (cf. Brühl 1962, 313–320, or Nelson 1986b, 324–327).

118 Vita Uodalrici, I. 3, 389: '*Dic regi Heinrico, ille ensis qui est sine capulo significat regem qui sine benedictione.*' (cf. Bloch 1973, 39, 270–271; Karpf 1984, 8; Giese 1993, 160; Schulmeyer-Ahl 2009, 68–69, 344–365).

119 The term 'rites of passage' was introduced and systematicaly analysed by Arnold van Gennep (1960). For the growing control of the Church over entering into marriage (e.g. Duby 1993). We can follow similar trends in burial rituals.

120 That dichotomy is nothing given; it is constructed within a conflict or communication through symbolic dominance, where one side receives, the other 'inspires', is used as a source of legitimacy.

121 AF, 854 AD, 44–45; 857 AD, 47.

122 A comparable case might also be Bavaria in the second half of the 8th century (cf. Depreux 2006).

and Brittany often followed their own interests and independent policy, even while being respected partners of the Frankish kings. Surprisingly, the counts in future Catalonia remained loyal to the Frankish kings until the end of the Carolingian dynasty and documents issued in this region convinced their readers of the royal authority, although (or maybe because of) the level of control over those areas was probably much lower compared to Moravia or Brittany.

In the first decades of the 9th century, however, the princes in Brittany, or counts in Catalonia were probably the lords of a specific area, rather than of an ethnic group. In the beginning, Brittany was just a region (*regio*), not a homeland (*patria*) (Smith 1992, 119); no name for future Catalonia existed until the 12th century. Their Moravian counterparts in the East were a similar case – although 'Moravians' are automatically understood as an ethnonym, we should not forget that it originally means people living near the River Morava. That suggests their 'Moravian ethnicity' before the establishment of the Mojmirid principality probably differed from that later one, or maybe did not exist at all. In the 870s, however, Moravians profiled as a polity whose important source of identification came to be subjection to the Mojmirid dynasty and its principality. The important institutional backbone of that loosely defined principality, administrative, or local structures of which we do not know at all, was probably an archbishopric of Methodius for its entire existence under the strong criticism of the Bavarian episcopacy. The principality in Brittany followed a similar pattern, but thanks to the Redon cartulary, much more is known about its administration and social structure, where an important role was played by local assemblies with an influential group of local notables, *machtierns*, complemented by princely deputies (cf. Davies 1981, 105–114).[123] In the 840s, princes in Brittany also started to build up an ecclesiastical organisation with the see in Dol and faced strong pressure from the archbishop of Tours.[124] Future Catalonia, on the other hand, lacked – as far as we know – any shared identity and was, since the end of the 8th century, divided among Frankish counts. Its inhabitants – and it seems, it was only the part of the elites – are called *Gothi* (Jarrett 2011b). Nevertheless, it inherited some Visigothic and Roman institutions and the level of literacy highly exceeded the contemporary European standard (Bowman 2004, 33–117; Davies 2007). Compared to Brittany or Moravia, which became victims of Vikings or Magyars by the end of the 9th century, but struggled for their whole existence with the Frankish kings, Catalonian counties were since their establishment a real war zone endangered by Muslim *taifas*, or the emirate of Cordoba. The distant Frankish king, however, remained for the inhabitants of those counties the final guarantee of the legal order and a possible source of support. By the second half of the 10th century, it is possible to observe an attempt to promote the local bishop to archbishop. Although the inhabitants of Trans-Pyrenean counties followed a different code of law and the role of pragmatic literacy was much more intense in that area compared to Moravia or even Brittany, these differences became a motor of ethnicity with substantial delay. This signals that the strategy of peripheral lords differed from case to case and it will require a large comparative analysis that also includes examples outside of Europe (Armenia), or at least outside of the scope of the Frankish empire (Scotland).[125]

Culturally and socially, however, the worlds of the Frankish, Bavarian, Brittanian and Moravian, or Catalonian leaders were closely connected (e.g. Ungerman 2011) – Moravian princes married noble women from Bavaria (or become their godparents) (cf. Löwe 1952; Mitterauer 1960, 701–708; Dopsch 1971, 108–110, 121; Schleidgen 1977; Airlie 2006; MacLean 2009; Wihoda 2016),[126] supported their partners from the Eastern March, or received their support. (The same is true for their contemporaries from Brittany or Catalonia.) Even the fact that Bavarian noblemen were also members of the Frankish aristocracy confirms the complexity of the identity and identifications of the early medieval elite. Therefore, Svatopluk I or Salomon might have been in one moment, especially in the conflict with the Frankish kingdom, an independent leader of the people from around the River Morava, Moravians, or from Brittany, whereas in other situations, they might have presented themselves as members of the Frankish elite.[127]

123 For the slow penetration of local communities through the princely administration in early medieval societies cf. Modzelewski 2015, 285–347.

124 Cf. note 4.

125 For loyalty to the emperor as a strategy and source of identification in Přemyslid Bohemia (cf. Kalhous 2018, Chapter 3.2).

126 Cf. note 83–84.

127 For the political potential of ethnicity (cf. Geary 2012). On identifications in Brittany (cf. Gendry 2022).

7. Conclusion

The chapter has demonstrated that the political status and titulature of rulers on the periphery of the Carolingian Empire cannot be assessed through rigid, anachronistic criteria derived from later medieval kingship. By comparing Moravia, Brittany, and the Hispanic March, it has shown that Frankish narrative sources employed titles and narrative strategies not as neutral descriptors, but as tools to articulate imperial hierarchies, claims of dominance, and expectations of subordination. The variability and inconsistency of titulature – *dux, rex, regulus*, or the complete omission of titles – reflect not only changing political circumstances but also the authors' ideological frameworks and intended audiences. In this context, Svatopluk I appears neither as a marginal barbarian ruler nor as a fully sovereign king in the later medieval sense, but rather as a political actor whose status was situational, negotiable, and dependent on the perspective from which it was recorded.

The comparative approach further reveals that peripheral elites pursued distinct strategies in their interaction with Carolingian power. While the princes of Brittany and Moravia alternated between confrontation and cooperation, leveraging tribute, marriage alliances, and ecclesiastical patronage to strengthen their position, the counts of the Hispanic March largely maintained formal loyalty to the Frankish kings, even as effective royal control weakened. These differences suggest that the development of political identity and authority in the early Middle Ages was shaped less by ethnicity or linear progress toward sovereignty than by local conditions, external pressures, and the availability of legitimising frameworks. Ultimately, this analysis underscores the need to move beyond binary categories of dependence and independence and to recognise early medieval rulership on the imperial periphery as a fluid and relational phenomenon, embedded in overlapping political, social, and cultural networks.

Acknowledgement

I am grateful to Magali Coumert, Irmgard Fees, Thom Gobbitt, Helmut Reimitz, Herwig Wolfram and Bernhard Zeller for their critical comments on my text. This study was written thanks to the project 'Frontiers and Empires'. The Case of Moymirid Moravia (GX25-15764X).

II Centres

Chapter 4

Pitfalls of archaeological interpretation of cultural phenomena: The influence of church in the lives of the residents of early medieval Stará Boleslav (Czech Republic)

Ivana Boháčová

1. Introduction

Historical sources paint Stará Boleslav as an important centre of the Přemyslid dynasty from the beginning of the 10th century and from the end of the first half of the 11th century as the seat of the earliest collegiate chapter in Bohemia. The long-term archaeological excavation of the town's historical core has fleshed out the story of this centre, adding interesting and even surprising details, despite the fact that this work was a rescue excavation prompted by numerous reconstruction projects, the intensity and schedule of which were difficult to reconcile with the standard needs of archaeological study.[1]

To a large extent, the construction work also took place on an area that is now a Czech national cultural heritage site (Fig. 4.1). This area is home to two early medieval sacred buildings – the Basilica of St Wenceslas [sv. Václav] founded by Prince Břetislav together with the collegiate chapter house before the middle of the 11th century, and the Church of St Clement [sv. Kliment], roughly a century younger (Fig. 4.2), both of which rank among the most important preserved monuments of their kind in Bohemia.

2. Changes in Stará Boleslav in the 10th–12th centuries in light of the results of archaeological excavation

The gradual systematic processing of the extensive collection of obtained archaeological sources has brought new knowledge about the origins of the site and especially about the form and gradual development of the early Romanesque basilica. According to archaeological testimony, Stará Boleslav was founded and fortified many decades earlier than stated by the chronicler Cosmas. The unexpected findings concern both the basilica, which surprisingly preserves much of the original construction from 1039–1046, and the entire chapter house area that surrounded the basilica (Boháčová 2003a; 2003b; 2023). Another early medieval church stood nearby (less than 50 metres to the southeast), the existence of which was unknown prior to the excavations in 1991–1992. The first evidence of the possible presence of a sacred building was definitively confirmed in 1992, when the apse of the church was discovered during the digging of a trench for a gas line. It is difficult to determine the date it was founded, and we only know that the church was built sometime between the mid-10th and the end of the 11th centuries, which can be deduced from the fact that it was founded in an area settled in the first half of the 10th century and from the fact that the scant remains of the layers associated with its construction contain no pottery dated later than to the end of the 11th century. And while a cemetery surrounds the church, there is also evidence of burials prior to the construction of this church.

1 The excavation was performed in 1988–2019, initially as a joint project organised by the Čelákovice Museum in cooperation with the Institute of Archaeology of the Czech Academy of Sciences in Prague. After 2005, the individual activities were undertaken separately by these institutions.

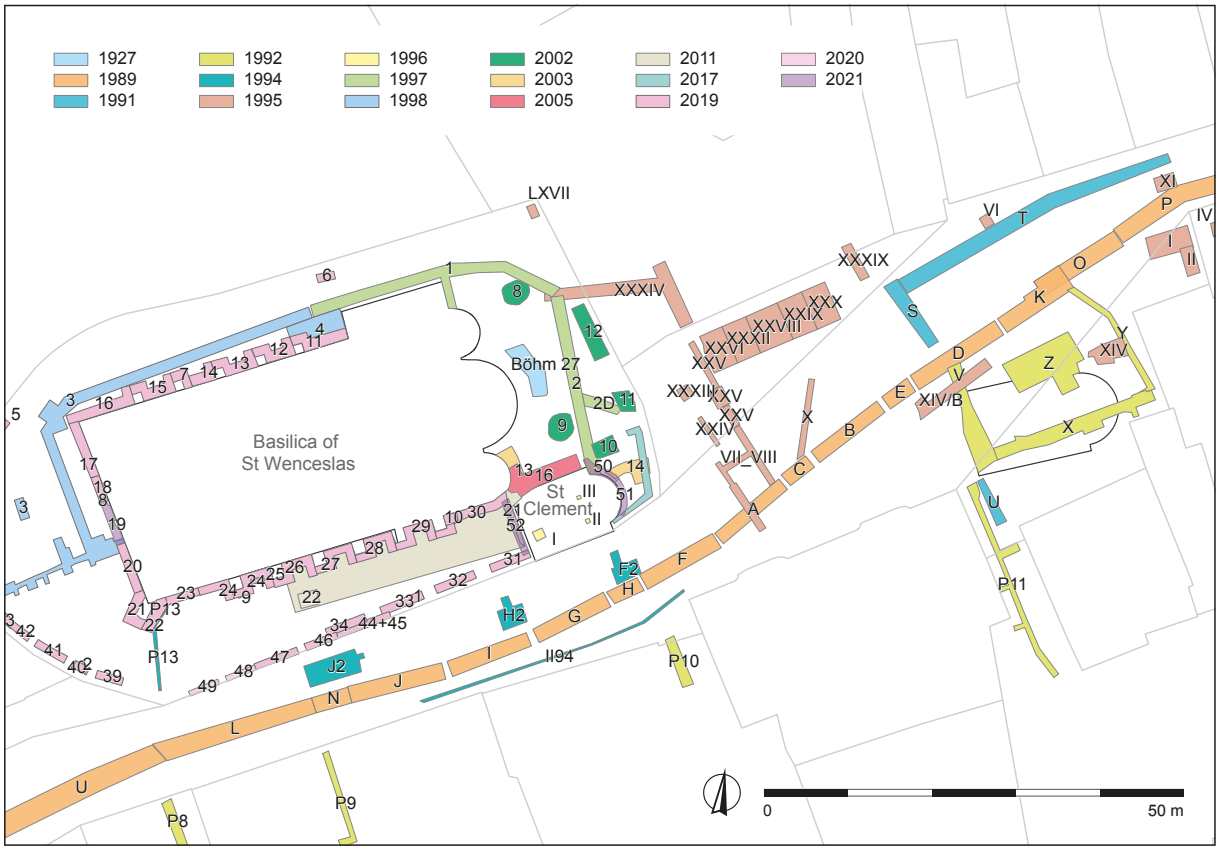


Fig. 4.1. Stará Boleslav (central Bohemia). Trenches from archaeological rescue excavations in 1927, 1988–2021 in the historical centre of the site. The National Cultural Monument complex with two early medieval sacred buildings is demarcated by a wall that more or less respects the early medieval division of the space of the former Přemyslid castle and the seat of the first collegiate chapter in Bohemia. After Boháčová, Hrušková 2025.



Fig. 4.2. Stará Boleslav. Central part of the site with the Basilica of St Wenceslas and the Church of St Clement from the line of the former fortifications between the acropolis and the bailey in 2013. Photo by Z. Kačerová.

The excavation documented the striking transformation of the historical core of Boleslav following the establishment of the chapter. The space, which at the beginning of the 10th century was occupied by the residence of members of the ruling family, acquired a completely new function. Originally, there were several larger above-ground buildings here of a timbered or grooved construction (Boháčová 1993; 2003c), other residential buildings and the Church of St Cosmas and Damian [sv. Kosma and Damián], where written sources indicate that Prince Wenceslas died († 935). After the establishment of the chapter, the area was divided into several sections, perhaps based on the diverse needs of the chapter. The aforementioned sacred buildings were gradually founded here, dominated by the large three-nave classical capitular basilica with a partially sunken crypt. The churches were surrounded by cemeteries (Fig. 4.3: A). Although we encounter graves in this area as early as the 10th century, from the mid-12th century at the latest, burials were concentrated in the vicinity of the basilica and the newly built nearby Church of St Clement (Boháčová, Hrušková 2025). Already in connection with the construction of the basilica, large parts of the open spaces and paths were covered with cobblestones or quarry stones, or at least covered with loose stones. Although settlement in this part completely disappears after the founding of the chapter, a long-standing craft



Fig. 4.3. Stará Boleslav. A – schematic representation of archaeologically recorded burials in the vicinity of three early medieval sacred buildings: the Basilica of St Wenceslas (1039–1046), a church with an unknown patron (ca first half of the 11th century?) and the Church of St Clement (1160s?), with marked graves dated by radiocarbon analysis. 1 – burials before 1039: a – graves in their primary position; b – secondarily deposited remains – H238; 2 – burials after 1039. The three size categories of schematised grave pits correspond to the categories *infans I–II, infans III* and *juvenis + adultus*. B – schematic representation of archaeologically recorded burials showing the positions of tombstones, the distribution of temple ring finds, and the approximate location of the earlier finds of two vessels in the vicinity of three early medieval sacred buildings: the Basilica of St Wenceslas, a church with an unknown patron, and the Church of St Clement. 1 – graves; 2 – tombstones; 3 – intentional cluster of bones in a secondary position; 4 – isolated skull finds; 5 – unlocalised vessel finds from 1940; 6 – temple ring finds. After Boháčová, Hrušková 2025.



Fig. 4.4. Stará Boleslav. Digital reconstruction of the appearance of the central part of the former Přemyslid stronghold after the establishment of the first collegiate chapter in Bohemia, based on the evaluation of the results of archaeological excavations; detail. Author M. Štaffl (detail).

complex where iron was processed operated immediately to the east of the basilica (Fig. 4.4). Apparently in connection with the Church of St Clement, the basilica was rebuilt and a system of masonry structures was erected adjacent to it to the south and west. Both the Church of St Clement and these walls are built from large and artfully worked sandstone blocks, with the identical construction technique suggesting that this system of walls belongs to a previously unanticipated large-scale construction project, the form of which we are not able to reconstruct from the fragmented situations that have been uncovered. Nevertheless, everything is clearly subordinated to the operation of the chapter and the activities associated with it, an essential part of which is the latter church, astonishing both in terms of the massiveness of its masonry and the unusual depth of the foundation (Boháčová 2010, 253–254). It was directly connected to the basilica by a bridge leading from the church's tribune to the apse of the southern chapel, in the masonry of which the entrance to its second floor can still be seen. The southern chapel of the basilica gradually underwent major changes. It was first enclosed by a wall extending from the outer wall of the south nave, equipped with a double portal and another modest entrance in its vicinity; later, the part of it that deviated from this line was completely demolished (Boháčová 2023).[2]

In the immediate vicinity of the basilica and the Church of St Clement, a paved road ran in the SW–NE direction in the places of earlier settlement, forming the arterial path through the site from half of the 11th century to this day. Apparently, even in the Middle Ages the paved area southeast and east of the end of the basilica and the Church of St Clement formed a larger area. After the construction of the Church of St Clement, this apparently brought to an end to further burials at the aforementioned church without a known patron (Boháčová, Hrušková 2025). The area reserved exclusively for graves is next to the basilica and in its eastern vicinity, probably already separated from the surroundings by a partially respected enclosure wall.

From the seat of members of the Přemyslid dynasty, which in the beginning of its existence probably did not deviate in any way from the standard appearance of similar sites of the first order, Boleslav above all became, thanks to the establishment of the first collegiate chapter in Bohemia, a prestigious and apparently primary church centre. Its significance was probably enhanced by its relationship to the personality of Prince Wenceslas, who was murdered here and whose cult as the patron and protector of the Czech lands grew stronger during the 11th and 12th centuries. The importance of the site is emphasised by the concentration of three sacred buildings in a small area, a path covered with stones and some other masonry buildings, remnants of which are found in the early medieval context, mainly in the central part of the site and also in its western spur.

2 A study by the authors I. Boháčová and M. Semerád prepared within the framework of the ongoing Czech Science Foundation project will be devoted to a comprehensive evaluation of new knowledge about the basilica and the structures in its immediate vicinity (manuscript).

The original lavishly furnished residence of the provost most likely stood at this location until the Hussite Wars.[3] However, due to the low density of rescue excavation trenches and their minimal surface area, we lack more detailed information about the structure and appearance of these stone buildings.

3. Finds of small material culture and the testimony of skeletal remains. Proof or no more than indication?

The gradual processing of the rich source material has yielded new information and insights, shedding light on the site's development in the Early Middle Ages, the lifestyle of its inhabitants, and the diversity and specifics of their cultural expressions. While archaeology has produced a great deal of unambiguous and important knowledge about the topography of the site, the character and types of construction, its development and the fundamental change in the life of Boleslav after the establishment of the chapter, many unexplained questions surround small artefacts and other movable finds. Given the historically documented importance of the site, the remarkably small number of luxury items and objects directly related to the ecclesiastical environment seemed surprising. This can be explained by several circumstances, one of which is the aforementioned scope of rescue excavation trenches, or rather the nature of this excavation, as in the vast majority of cases it was carried out only in the tracks of the intended utility lines, which had a very negative impact, especially when these lines cut through burial grounds. Instead of large-scale excavation and the detailed investigation of the entire endangered part of the cemetery along the utility lines, including the pious removal of the remains, parts of the graves were destroyed by trenches. As a result, it was not possible to obtain comprehensive information about the burial rite or the buried population, while also complicating the overall evaluation of the research results. Yet another factor could be the intensive development of the site during the Early Middle Ages (10th–12th centuries), which resulted in the repeated displacement of layers, either by terrain modifications or damage to older situations by later construction or burials. Artefacts, intentionally deposited or lost, are thus completely removed from their original context, e.g. in the destruction layers of features. In the case of exceptional but chronologically insignificant finds (stylus, fragments of bells, etc.), these material objects lose their informative and therefore historical value. The aforementioned consequence of the intensive development of the cultural layer is also evident in the burial grounds – most finds of typical small women's jewellery – temple rings, do not come from *in situ* positions in graves, but from the cemetery horizon, within which there are up to tenfold superpositions of burials at the basilica, and fivefold superpositions at the church outside the chapter house complex. However, the lower occurrence of grave inventory items was already quite evident during the excavation, especially in comparison with contemporary sites, e.g. the cemetery on Loretánské náměstí in Prague-Hradčany and the early medieval burial grounds in Žatec.

Post-depositional processes also resulted in damage to or even the destruction of artefacts. The systematic lack of financial resources for the basic treatment and conservation of the extensive collection of recovered artefacts also played a role in learning about the material culture of the site under the conditions of rescue excavation in the 1990s. Institutional resources were not sufficient to cover the demands, and subsidies from public sources were not secured despite repeated efforts. This often led not only to the loss of the testimonial value of the finds, but also to their total disintegration in the case of iron artefacts, including objects from the oldest early medieval contexts, in this case dating to the beginning of the 10th century. By an unfortunate coincidence, a smaller collection of the most valuable objects made of precious metals or their fragments, which was handed over for treatment to the laboratories of the Institute of Archaeology of the Czech Academy of Sciences in Prague (Letenská Street), was destroyed in the August flooding of 2002. From the exceptional or less common artefacts, only a larger fragment has been preserved among the recovered finds dating back to the early medieval period.

Small material culture in earlier horizons, i.e. before the mid-11th century, is represented primarily by common objects of everyday life – bone artefacts, whorls, iron or stone tools (Boháčová 2003d), even in large-scale above-ground structures that we associate with a higher social environment. Among the small number of exceptional finds that have

3 The building was captured in the excavation conducted by the Čelákovice Museum in 2008 (J. Špaček). The find has not been published and an evaluation of the acquired sources is ongoing.

survived, we can mention, for instance, a double iron buckle, a cruciform fitting (unpublished) and luxurious pattern-welded knives (Boháčová, Hošek 2009). In the later horizon related to the change in the function of the site, finds of valuable objects are more numerous. We can recall, for instance, the collection of early medieval coins (Lukas, Boháčová 2024), and the small jewellery scattered about the site, to date published only in brief form. However, the origin of some of these items clearly falls into older historical periods. This includes, e.g. a segment of a gilded fibula with a zoomorphic motif in the Nordic style, fittings of Avar origin, and a fragment of a La Tène bracelet (Boháčová, Profantová, Špaček 1998; Boháčová 2003a, 475; 2006, 716). Many other artefacts – such as a Romanesque circular buckle with a bird motif from the bailey or small dragonflies from the band of fortifications – have not yet been evaluated. Silver processing is evidenced indirectly through the plating of small nozzles and traces of assaying in the form of drops of molten glass on ceramic fragments (Boháčová 2006, 715). Extraordinary finds include fragments of early medieval plate glass (Špaček 2000) and sporadic finds of small fragments of imported hollow glass, which are also awaiting publication.

If we want to address the question of the character of small material culture and cultural patterns in general, we encounter numerous interpretative issues. This is especially true for evidence of the possible influence of the presence of a significant church institution on the local population in one of the leading centres of the earliest Přemyslids. Despite the limitations described above, certain indications, if not explicit evidence, of the presence of higher social classes can be found in the collected sources. Some of these manifestations may be related to the influence of the church environment on local society.

The profound change in the furnishing of graves and the decline in the later phase of the Early Middle Ages in Bohemia (i.e. especially from the 11th century) are often interpreted as a consequence of the process of Christianisation. However, this issue linked to the topic of non-church and church cemeteries and the demonstrability of sacred buildings of the given period has not yet been studied in general. In Great Moravian church cemeteries (9th and early 10th centuries), both furnished and unfurnished graves are recorded. There is a clear change in the grave inventory, but not always a clear decrease in grave goods (Galuška 1996, 76–109; Hanuliak 2014, 96–97).

One of the topics of the current study was therefore to verify the share of early medieval burials with grave goods in cemeteries near churches. The representation of graves, whether with the occurrence of temple rings *in situ* or graves hypothetically furnished in this manner (as suggested by temple rings without a clear connection to skeletal remains originating from the cemetery horizon) (Fig. 4.3: B), is very low. This phenomenon could be explained by the early decline in grave goods influenced by the chapter's activities. In the case of the cemetery outside the chapter complex, the number of graves with temple rings does not even reach 4% of the total number of graves. In the cemetery at the basilica, the share is difficult to determine due to the unknown number of graves belonging to an earlier phase of burial. Given the findings from trench 16 located in the intensively used part of the cemetery near the Church of St Clement (Boháčová, Koštová 2024), the number of early medieval graves may be close to 50% of the total number of 310 recorded burials. But even if we only counted a third of these, the number of graves with temple rings would be around 5%, i.e. significantly fewer than, e.g. in contemporary Prague cemeteries of the same age, but also elsewhere in Bohemia.[4] The low number of furnished graves at both Boleslav sites clearly supports the thesis of I. Štefan (2010, 188) on the lower representation of graves with inventory in cemeteries with sacred buildings, i.e. in an environment influenced by the process of Christianisation. It should also be noted that in the central part of the site, grave goods are not found in many burials, not even in graves preceding the founding of the basilica, as indicated by radiocarbon analysis (Boháčová, Hrušková 2025, obr. 3a). This is a clear difference from the Middle Hillfort period cemetery discovered at the beginning of the 20th century in the bailey (Prokop 1911; Sláma 1977a, 153, tab. XL; Špaček 2003).

Another question was directed at possible differences in dietary standards at individual burial grounds and their developmental stages. An analysis of skeletal remains from both burial grounds provided clear evidence of different dietary habits or standards in the form of a higher share of proteins in the diet of the inhabitants. This was only

4 The share of graves furnished with goods in Late Hillfort period cemeteries is in the range of ca 10–35% of the total number of graves; e.g. Klápště 1994, 139–140; Nechvátal 1999. At larger early medieval cemeteries in Prague, this share reaches 10% or higher, which can be deduced from published data on cemeteries in the garden of the Vratislav Palace, around the Church of St Benedict and on Loretánské náměstí (Boháčová 2011; Havrda, Tryml 2021).

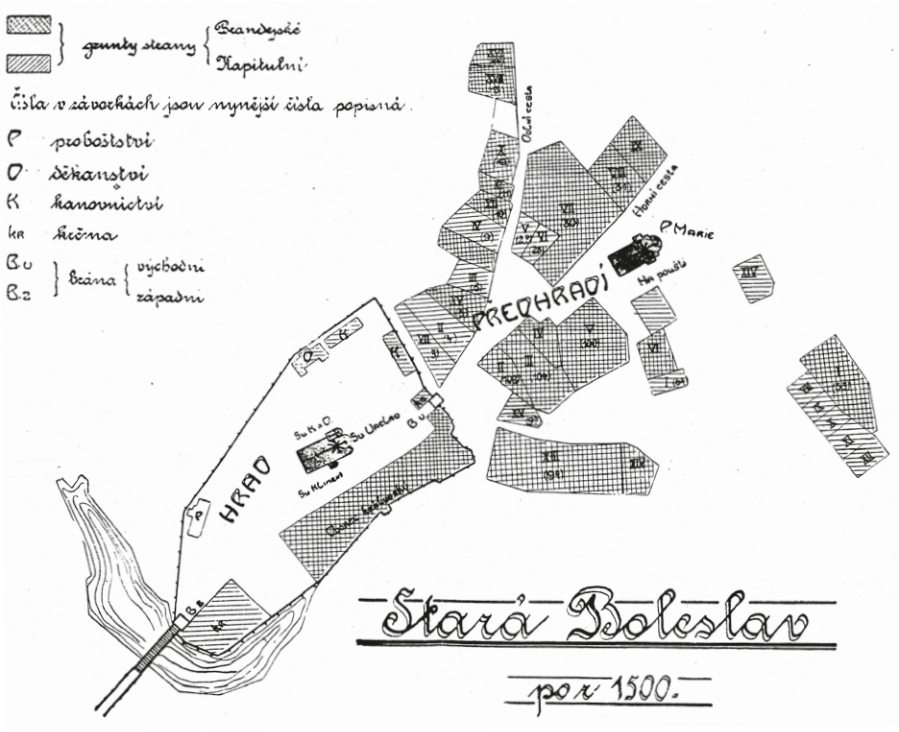


Fig. 4.5. Reconstruction of Stará Boleslav topography as of 1500. P – the provostship; D – the deanery; C – the canonry; B – the gate. After J. V. Prášek 1913.

evident in the later phase of burials at the Basilica of St Wenceslas and the Church of St Clement and indicates the consumption of animal proteins, most likely even freshwater fish (Drtikolová Kaupová et al. 2025). This phenomenon, documented in the Boleslav population only in the later period after the founding of the chapter, or rather in the phase of its development at the end of the Early Middle Ages, may also be related to its presence and influence on local society.

An extraordinary find unit that provides an image of the early medieval lifestyle of the period elite in Stará Boleslav and hence the power of its influence on its surroundings is the discovery of a remnant of a building from marl and sandstone and the assemblage of related finds. The building, whose western and better preserved part was described as compact masonry,[5] was discovered by J. Špaček in the western part of the promontory at its northern edge (parcel No. 1665) during the rescue excavation along the route of the gas line to isolated object No. 370 and 371. Justin Václav Prášek (1913, appendix V) connects this plot with the chapter's property and locates the provostship in these spaces around the year 1500 (Fig. 4.5). Potsherds from the fill date the destruction of the building to the High Middle Ages. A number of exceptional finds were recovered from the base of the feature and from the lower part of its destruction horizon, the unusual accumulation of which clearly demonstrates the connection with a higher social environment. The assemblage consists of two early medieval silver coins – a denarius (Fig. 4.6: 1; Lukas, Boháčová 2024, 89–90) and a fragment of an unspecified coin from the 12th century, several deformed temple rings and also a crescent-shaped lead pendant/fitting (Fig. 4.6: 4). Also striking among the potsherds is the discovery of fragments of at least eight bottles, which are scattered both inside the building and in its surroundings (Fig. 4.7). Although evidence of early medieval bottles is present in the Stará Boleslav find inventory, these are always individual finds, and their accumulation here is undoubtedly unusual. A small 2–3-cm-thick fragment of a flat architectural element decorated in relief on both sides also comes from the vicinity of the feature, from the fill of a pit from the interface of the Early and High Middle Ages, attesting to the subtle decoration of the unknown building.

Evidence of the exceptional environment also comes from other artefacts, both from the object's

5 The character of the bonding material was not described and it is not clear from the documentation whether it was a clay binder or mortar. The occurrence of mortar is not mentioned in the descriptions of the deposits. However, according to photo documentation, the bonding material has a light reddish-brown colour, i.e. a colour characteristic of local clay sediments, which had been used at the site for a long time both in construction and for the production of ceramics. As such, it can be assumed that the construction utilised a clay binder.

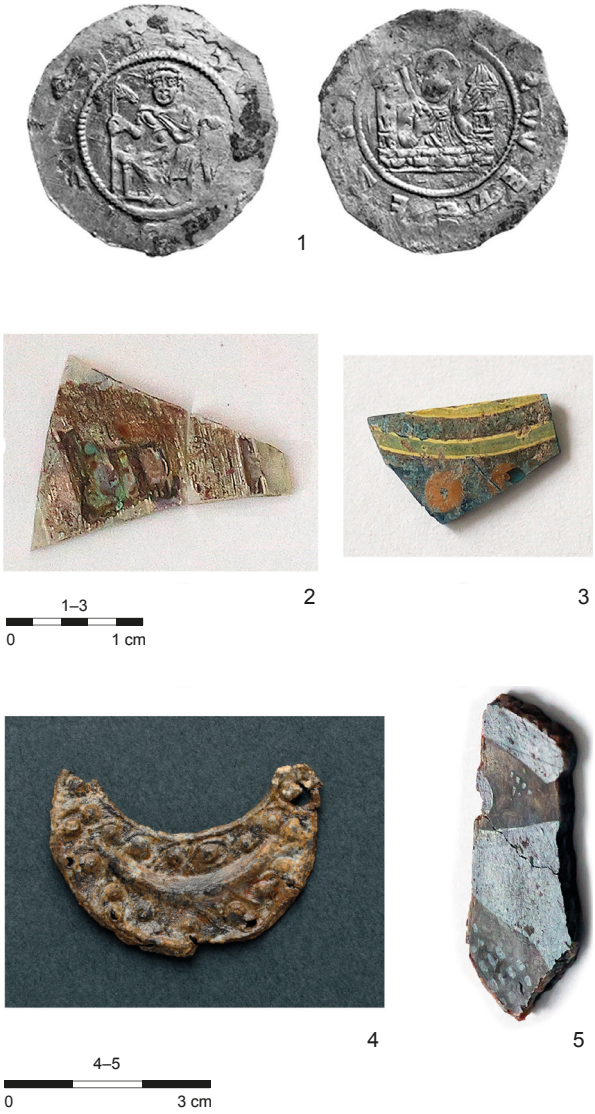


Fig. 4.6. Stará Boleslav, trench 101/2008. 1 – denarius of Vladislav II, coin from 1140–1158 (after Lukas, Boháčová 2024, 89; Čelákovice Museum accession No. 2432, trench 101/2008, context 14340); 2 – fragment of painted flat potash-lime glass from a context with early and high medieval pottery (Čelákovice Museum accession No., trench 101/2008, context 14356; photo by Š. Křížová); 3 – fragment of painted soda-lime glass from the destruction horizon of an early medieval masonry building (Čelákovice Museum accession No. 11939, trench 101/2008, context 14315; photo by Š. Křížová); 4 – crescent-shaped pendant/fitting (Čelákovice Museum accession No. 11632, trench 101/2008, context 14237; photo by Z. Kačerová) from the destruction horizon of an early medieval masonry building; 5 – fragment of decorated and corroded plate glass (stained glass?) without analysis from a modern period context (Čelákovice Museum accession No. 12144, trench 101/2008, context 14207; photo by Š. Křížová).

destruction horizon and its overlying layer. Several small fragments of hollow and plate glass are particularly noteworthy, especially a small, thin-walled fragment of a vessel made of blue soda-lime glass, perhaps with an admixture of cobalt, which was retrieved from the base of the building's fill. The glass shard is from a painted vessel decorated with gold with an admixture of silver (Fig. 4.6: 3; Křížová 2024).[6] This type of glass is generally associated with advanced production centres in the Middle East or Western Europe, but especially with workshops in the Levant (Černá, Tomková, Hulínský 2015, 96), whose products travelled further north through Southern Europe. Evidence of such a luxury imported vessel decorated in this manner is among the few finds of its kind in Bohemia, which appear (mostly only in the form of small fragments) at the turn of the Early and High Middle Ages and are associated exclusively with the highest social, often ecclesiastical, environment. Although cups are regarded as the most common vessels (Černá, Podliska 2008, 237–240), it is not possible in our case to speculate about the type of vessel due to the small dimensions of the shard. In all likelihood, the find dates to the second half of the 12th century, i.e. a period linked to the local construction boom and, hence, the founding of the chapter. It can therefore be assumed that this unique find is related to the church (not secular) community.

The fact that the studied area was extremely important even in more recent historical periods is also supported by other exceptional finds, mostly recovered from the upper layers of the stratified situation, the contents of which are difficult to date due to the high share of residual ceramics. Given the composition of the ceramic inventory of the layers, it cannot be ruled out that even finds in later stratigraphic positions may belong to older historical stages. Two of the fragments of sheet glass belong to the group of potash-lime glasses, one of which, bearing traces of painting, can be attributed to the medieval period (Fig. 4.6: 2). This is consistent with the expected appearance of crown glass or window plates during the 14th century (Černá, Tomková, Hulínský 2015, 100). Belonging to the same group of glasses is a small shard of a Bohemian-type cup and, surprisingly, a fragment of a glass ring (accession No. 12240; diameter 11–12 mm) that was found in the layer of high medieval ceramics closing the early medieval horizon. A fragment of a glass ring/applique(?) made of potash-lead glass was also recovered from the layer dating to the early phase of the High Middle Ages. The artefact, originally with an uncertain determination of the type of find, can be assigned after analysis to rings (accession No. 12230, diameter 13 mm), which are known for

6 A basic analysis of the assemblage was conducted in 2024, but it has not yet been professionally evaluated.

the given period from numerous sites in Bohemia (Černá, Tomková, Hulínský 2015, 86, 99), Moravia, and especially in Poland or Kievan Rus' (Sedláčková, Zapletalová 2012; Vaďurová 2019; both with additional refs.). Glass rings are mainly (though not exclusively) associated with the higher social environment, but they are still rare in the context of church buildings (Havrda, Tomková 2020, 276). We mention them here also with regard to their different material composition to illustrate the character of the find assemblage. Documenting the fact that the investigated area was exceptional in Boleslav are other fragments of flat glass – perhaps decorated stained glass (Fig. 4.6: 5) from a sandy gap between rocky layers in the upper part of the stratigraphy, which already falls into the late medieval or modern period. Unfortunately, an analysis of the composition of this glass was prevented by severe corrosion.

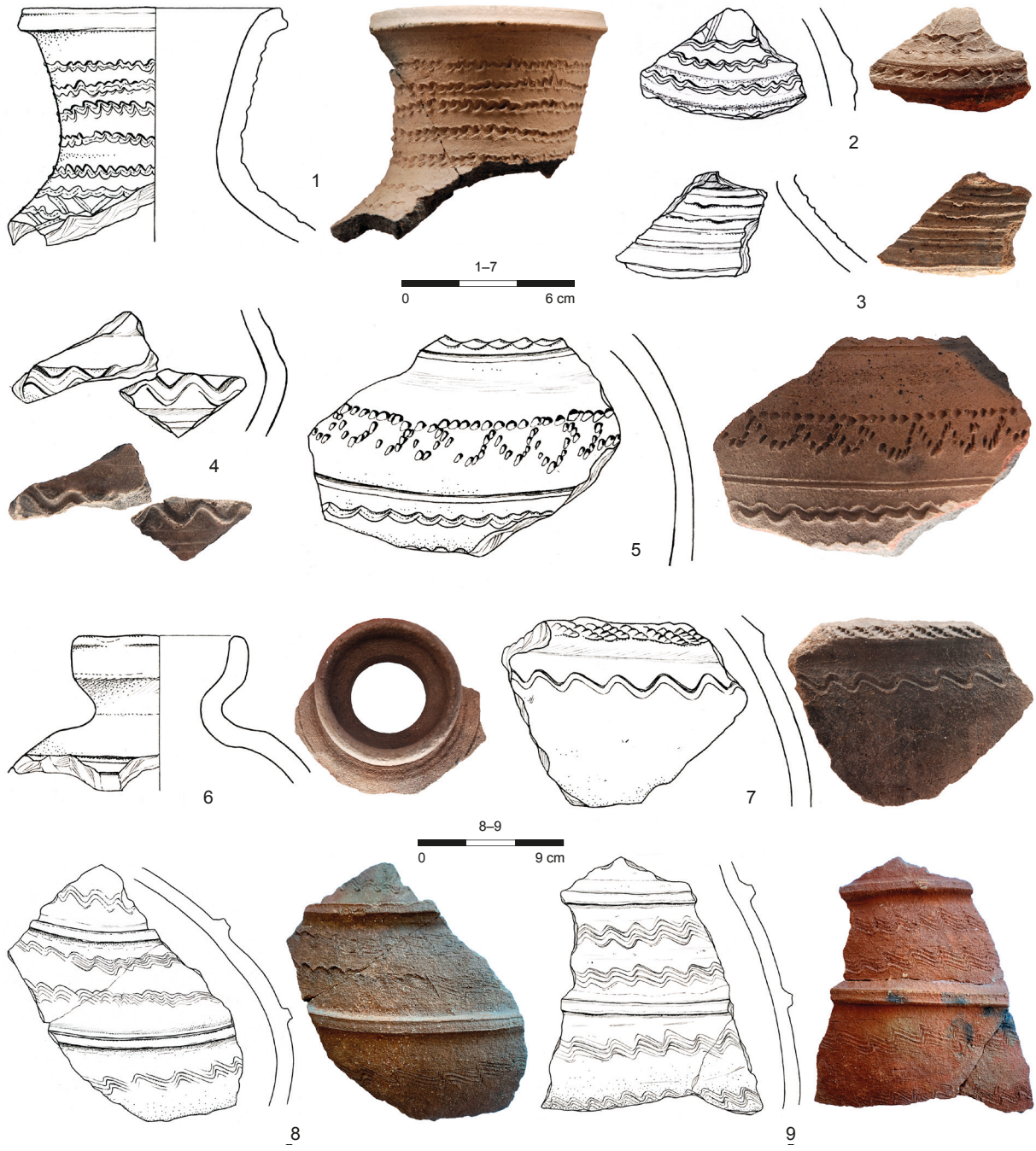


Fig. 4.7. Fragments of early medieval ceramic bottles from various positions in the vicinity of the early medieval masonry building captured in trench 101/2008. Photo by K. Almassy, drawings by L. Raslová.

Quite unusual (yet unfortunately undateable) finds include a larger fragment of a small, polished, thin-walled (wall thickness 3–4.5 mm) light grey to brownish-red vessel (max. measurable body diameter 120–130 mm). It was turned from sedimentary rock containing fossil fragments of marine animals – from bioclastic carbonate breccia (Fig. 4.8). This is a luxury item made using sophisticated technology from a rare raw material extracted in the Mediterranean, used already in ancient Egypt, but also in the Middle Ages (Zavřel 2023), i.e. an imported and definitely highly valued item. Although it cannot be dated, it is presented here as further evidence of the highly elite environment in the studied area.

Taken together, the acquired archaeological sources, some of which have not yet undergone detailed evaluation, clearly demonstrate the extraordinary position of Stará Boleslav in Bohemia at the end of the Early Middle Ages. At the same time, given the close proximity to the chapter house and Prášek's conclusions, the connection between the investigated site and the acquired find unit with the church environment must be considered highly probable. Mostly sporadic finds of comparable quality are known from Bohemia only from contexts linked to the top levels of period society. However, it is also worth remembering that the finds from the upper parts of the stratified situation may not be related to the defunct building. They may also come from the nearby basilica, which, after high medieval reconstructions and the devastation documented in written sources during the Hussite Wars, underwent a number of structural modifications.



Fig. 4.8. Fragment of breccia vessel (Čelákovice Museum, accession No. 12191, context 14202). Photo by J. Zavřel.

4. Liturgy or folk creativity? The mystery of a single bone

Among the exceptional finds retrieved from the early medieval context in the central part of the castle is an object that does not belong to the category of luxury artefacts, but whose significance lies in its specificity, if not its extraordinary nature. It was cursorily published among bone artefacts from finds until 2001 (Bartošková 2003) as an artefact with no functionally determined purpose, perhaps a case/container for small objects, and it was not given much attention. It is a bone split lengthwise into two halves, which was zoologically determined to be the metacarpus of a newborn or foetal bovine. The extraordinary nature of this find lies in the fact that the inner surface of the distal ends of both parts of the split bone bear a letter, one the letter I, the other the letter C (Fig. 4.9: 1, 2). The presence of the letters was pointed out by J. Mlíkovský (2000) during the osteological analysis of animal skeletal remains. Outside the circle of the chapter or other members of the highest social classes, we cannot assume that the general population living in Stará Boleslav in the 11th–12th centuries was literate.

What can be said about this particular find? It was a bone that was intentionally split lengthwise, but its surface was not treated in any other way. The metacarpal bones of adult large animals such as cattle or horses were mostly used to make so-called skates/sledges, or awls or braiding tools; for the latter categories, the metacarpal bone of a sheep or goat was more commonly used. Using a bone from a premature or newborn animal is an exception. The placement of the letters is chosen so that when the two halves of the bone are put together in their original position (Fig. 4.9: 3), the letters are not visible. Of course, this position is not in any way stable. If the object was used as a container (Bartošková 2003), both parts would have to be firmly fixed to each other somehow, e.g. wrapped with some kind of thread, bast, etc. The letters are not engraved in the middle of the bone, but rather asymmetrically to the right, while the hint of a letter I is also visible on the left side of the bone, which is marked with the letter C (Fig. 4.9: 5), in such a position that if we place both parts of the bone on top of each other, the letter I and its opposing trace lie on top of each other. However, it is not possible to determine with certainty that this faint 'I' is also a deliberately created letter. The letters are engraved or carved with a very small, round tool, the traces of which are especially visible on the letter C. The upper case letters



Fig. 4.9. Bovine metacarpus split lengthwise with the letters I and C on the inner side of the distal end of the bone (Čelákovice Museum, accession No. 201, context 35, trench B); 1, 2 – the inner part of the bones with the letters; 3 – composite bone; 4, 5 – detail of distal parts with letters. Photo by I. Hrušková.

about 5 mm high do not have completely smooth lines, which is not surprising given the line width of about 1 mm. A more thorough analysis of the letters (see Mařík, Roháček 2013, 323–324) would not be meaningful, given that these are only two clearly identifiable, isolated and not very artfully created characters.

The find comes from trench B located in the historical centre of the site on the route of today's Max Švabinský Street (Fig. 4.1, 4.10). The trench lies between two early medieval sacred buildings – between the apse of the Church of St Clement and the facade of a church with an unknown patron, from which it is less than 20 m away. The graves belonging to it do not extend into this space. The artefact was recovered from layer 35 overlying a sunken square feature with a hearth interpreted as a pit-house. Small layer 35 lies between two levels of loose stone (34, 37) forming the surface of a road running through the site from the half of the 11th century in the SW–NE direction. The layer contains early medieval ceramics, dominated by fragments of vessels from the latest phase of the Early Middle Ages, roughly dateable to the second half of the 11th to the 12th centuries. The assemblage is inhomogeneous. In addition to calyx-like rims tied to the grey ware associated with the Prague pottery circle, especially of the second half of the 10th century and the first half of the 11th century, there are sporadic potsherds of both earlier (10th-century) and later ceramics, such as the rim of a technological bowl or the rim somewhere between the thicketed type and ather morphological elements that develop after the mid-11th century. Evidently, the inventory of the loose stone layers consists of displaced inhomogeneous assemblages, in which later elements are found in a stratigraphically earlier position than the ceramics of earlier horizons. Also represented in the earlier part of the stratified situation is brick-coloured ceramics with the admixture of larger mica flakes, i.e. signs characteristic of the later phase and the end of the Late Hillfort period, generally the 12th century. In any case, the studied part of the stratigraphy belongs to the period after the establishment of the chapter. However, it cannot be ruled out that the artefact dates to an earlier period. What is striking, however, is the fact that two parts of one bone were found at the same time, suggesting that the artefact was recovered not too far from its original location. In any case, this artefact was made and lettered in the early medieval period and given that the general population in Bohemia during this period was not literate, we can consider the relationship of this artefact to the church environment. Its marking with letters must have occurred under the influence of the church. Current knowledge holds that literacy didn't begin to spread in medieval society until the end of the 13th century. At that time, apart from manuscript works created in monasteries, we only encounter the use of writing in inscriptions, mostly in connection with architectural elements, on tombstones (the only find of this type in Bohemia is the 'Libice stelae'; the

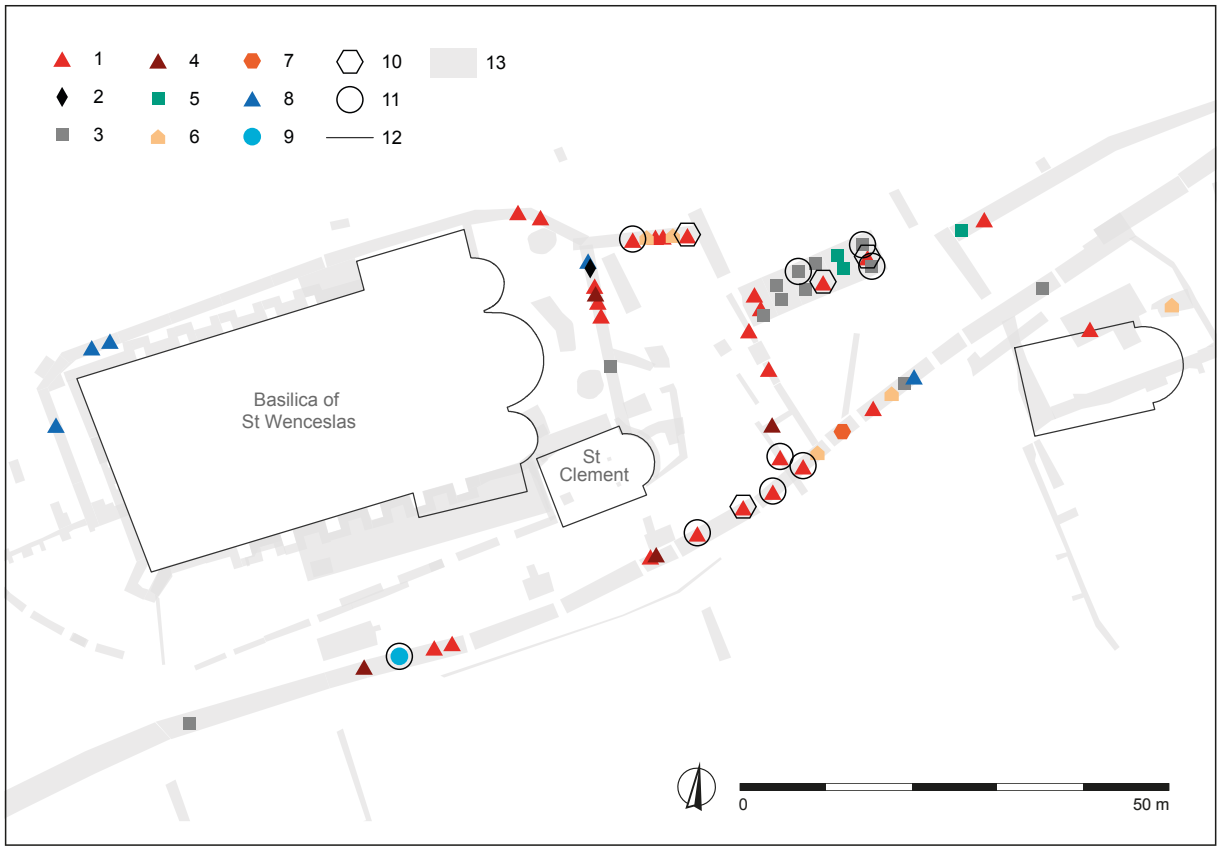


Fig. 4.10. Stará Boleslav. Central part of the site with trenches from the archaeological rescue excavation and distribution of bone artefacts. 1 – awls, braiding tools; 2 – pin; 3 – skate, runner; 4 – comb; 5 – lining; 6 – antler tine; 7 – artefact-antler; 8 – small artefacts – varia; 9 – finger ring; 10 – quality raw material; 11 – chisel with surface treatment; 12 – reconstruction of the original layout of sacred buildings; 13 – rescue excavation trenches. After Boháčová 2003d; edited by M. Šťaffl.

significance of the find from an epigraphic perspective is assessed by Mařík, Roháček 2013, 318–323), on coins or on imported objects. The actual letters inscribed on the bone also lead us to a possible connection between the find and the church environment. The letters I and C, which represent the name Jesus (ΙΗΣΟΥΣ)[7] in Greek, are used in connection with liturgical ceremonies.

The combination of two letters used on one, albeit halved, object is striking for the fact that these are letters used to designate the holy oils used in the anointing ceremony. These oils were stored in liturgical vessels or cases kept in a specially designated place. The letter C denotes the oil of catechumens or those to be baptised (*Oleum catechumenorum*), while the letter I denotes the oil for anointing the sick (*Oleum infirmorum*), or for last rites. The container for the most important oil, the Chrism, used after baptism, during confirmation, the ordination of priests, and for the consecration of altars, bells, and liturgical objects, can be marked by several letters in the combinations S.C. (*Sanctum chrisma*) or C.I.S. (Frencl 1857, 103; Schaller 1933, 134–135, 157–159, 164–165; Němec 2014, 26). Glass ampoules, special ceramic bottles or cases, or cylindrical boxes made from various metals, equipped with stoppers, were used to store oils. However, this evidence dates to a much later period and holy oil containers are not known from the Early Middle Ages. The first mentions of special cases for holy oils appear from the end of the 12th century (more recently on the topic of cases used in religious ceremonies Bláha et al. 2021, 120 with refs.).

Remnants of organic matter were detected under a microscope on the inside of the split bone and the bones were therefore subjected to spectral

7 Jesus (ΙΗΣΟΥΣ) is part of the abbreviation for the name Jesus Christ – the Christogram IC XC.

analysis (Lapčák 2022),[8] which, however, did not detect any traces of substances that would indicate the artefact's use in connection with resins or oily products. Only slight traces of charred wood were detected, but these, like the identified remains of inorganic matter, could be related to the external environment in which the object was deposited for several centuries. We have no evidence for its connection with the liturgy. Given that the artefact consists of two parts, the letters of which are hidden when assembled, and the fact that the bone comes from a premature or newborn animal, which is not a common practice in bone processing, it is possible to consider a relationship to ritual practices or magic, though this would be mere speculation. An object with engraved letters could also have had a protective function in Christian society, regardless of whether it served as a container or not; the mere presence of letters relating to Jesus Christ could have provided protection for the owner.[9]

Another possible use can be found in bone processing, where halved bones were used, for example, in the production of combs or handles. However, a connection with such objects is not very likely, since no waste from a bone workshop was found in the immediate or more distant vicinity of the find. A bone of the given size would not be suitable for making a comb, and if it was a handle, the object would have been very small. However, using letters on the inner side of the bone would have been meaningless in this case. The finds of bone artefacts in the area of trench B do not differ in their type or quantity from the situation in other trenches that contained early medieval settlement situations (Fig. 4.10).

However, we can state that the use of letters on an artefact that was only split and not further modified in any way is completely exceptional for the given period. Although we cannot identify the function of the artefact marked with the letters I and C clearly connected in later periods to church activities, this find at least demonstrates the influence of the presence of a church institution and the education of its members on the wider population, regardless of the purpose for which the object was produced. However, contemporary analogies are missing to establish a direct connection of the artefact with the liturgy.

5. Conclusion

The former Přemyslid centre and, in its later phase, the primary church centre in Stará Boleslav, is a site with exceptional cultural immovable heritage from the Early Middle Ages. All the more surprising was the fact that the large collection of movable archaeological sources obtained during many stages of rescue excavation included only very few that document the presence of social elites. A detailed analysis of various types of sources has shown that this fact is related not only to the limits inherent to rescue archaeological excavation and the complexity and intensity of the stratigraphic development of the site during the Early Middle Ages, but most likely also to the otherwise difficult-to-prove influence of the church and the process of Christianisation on society at the time.

The extraordinary social position of the highest social classes operating here in the later phase of the Early Middle Ages, which represented a community tied to the presence of the earliest collegiate chapter in Bohemia, was reflected in the general population in the realm of cultural patterns. The influence of the church community, perhaps strengthened, in addition to the splendour and concentration of sacred architecture, by the high living standard of representatives of primary church institutions, can be seen in the obvious decline in grave goods, the transformation of eating habits and in the unusual manifestation of the emergence of literacy, whatever the reasons for inscribing the letters on the bone artefact may have been. The weight of this argument is supported by the fact that this is no longer mere circumstantial evidence, but an interconnected complex of phenomena dating to the period of the latest phase of the Early Middle Ages.

Acknowledgement

The text is an output of another phase in the processing of acquired sources and was supported by Czech Science Foundation (GAČR) 2023–2025 project No. 23-07198S 'Early Medieval Centre – Topography, Function, Transformation: Přemyslid Boleslav and Its Transformation into the Seat of the Collegiate Chapter (900–1200)'.

8 The collection of assessments of the interdisciplinary study of archaeological sources from the currently ongoing processing of excavations in Stará Boleslav (2023–2025) will be handed over to the archives of the Institute of Archaeology of the Czech Academy of Sciences in Prague after the project is completed.

9 According to T. Petráček, this possibility can be considered. I thank this author for his valuable comments on the text.

Chapter 5

The hinterland of the Kouřim centres in the Early Middle Ages

Daniel Dvořáček, Soňa Dvořáčková

1. Introduction

Today's small town of Kouřim is situated in an old settlement area on the border between the fertile and flat Elbe River region and the less fertile and hilly Sázava River region. Prior to the founding of the royal town, there were two central sites here in close proximity to one other in the Early Middle Ages: Stará Kouřim ([Old Kouřim] – second half of the 9th to mid-10th centuries), which chronologically preceded the younger Kouřim – St George [Sv. Jiří] – 11th to mid-13th centuries), and an interesting phenomenon involving the transfer of central sites can be observed (Sláma 1988, 80–84).

The subject of this article is the hinterland of both Kouřim centres in a radius of 5.5 km from Kouřim. With respect to these strongholds, we chronologically study 1) the hinterland of Stará Kouřim: horizon 1 – Middle Hillfort (9th–10th centuries) and 2) the hinterland of Kouřim – St George: horizon 2 – Late Hillfort (11th–mid-13th centuries). Given the origin of both centres in the Early Hillfort period, settlement in the 8th century is also briefly addressed. The study of the hinterland ends in the mid-13th century, when the royal town of Kouřim[1] was founded and the settlement network was stabilised.

The hinterlands of early medieval centres have been a popular issue in archaeology. The proceedings of conferences in Bytom Odrzański, Poland, which dealt with central sites and their hinterlands in early medieval Central Europe (Moździoch ed. 1999), are central to this topic. The subject was also addressed at international conferences in Mikulčice, south Moravia, which produced two conference anthologies (Poláček Hrsg. 2008; Poláček, Boháčová Hrsg. 2008). The hinterlands of the centres in Libice nad Cidlinou (Mařík 2009), in Břeclav-Pohansko (Dresler 2016) and in Mikulčice (Hladík 2014; 2020) have also been published in monograph form.

2. Environment conditions in the Kouřim region

In geomorphological terms, Kouřim is part of the Kouřim Plateau in the Central Bohemian Tableland. The Kouřim Plateau was formed on lower turonian marlstone, sandy marlstone and claystone covering mica-schist, mica-schist gneiss, orthogneiss and amphibolite (Demek ed. a kol. eds. 1987, 287–288). A significant terrain break to the west of the town and a dominant landscape feature is Lipský Ridge with the 366-meter-high Lipská Mountain, which creates a natural border between the Kouřim Plateau and the Černokostelecká Uplands. Ostrý Hill with an elevation of 400 m is also part of the ridge. Čertova brázda [Devil's Furrow] runs through the ridge and is probably a man-made barrier which, according to folk legend, St Procopius [sv. Prokop] had the devil dig from Sázava Monastery to Procopius' native village of Chotouň (Bernat, Štědra 2003; most recently Nový, Štuka 2021). Southwards towards Ždánice, the landscape gradually rises towards the Sázava River region, while towards the north it slowly transitions into the plains of the Middle Elbe region. Kouřim itself is 267 m A.S.L. and the Stará Kouřim Hill is 294 m high. The soil type in the Kouřim region is brown earth, with degraded chernozem only occurring in some places (Tomášek 2003).

1 The high medieval town safely existed as early as 1261, when it is considered a model for Přelouč and Jaroměřice (Šolle 1981, 130). It was founded somewhat earlier, probably during the reign of King Wenceslas I (1230–1253; Šolle 2000, 109) and is thus one of the oldest medieval 'lokator' towns in Bohemia.

The Výrovka Stream, known locally as the Kouřimka (in its upper reaches as the Vavřinecký Stream), flows through Kouřim. Its headwater is south of Uhlířské Janovice at an altitude of 487 m A.S.L. and the stream flows into the Elbe west of Nymburk at an altitude of 178 m A.S.L. The Výrovka has a total length of 60.3 km (Vlček ed. 1984, 302). The Bečvárský Stream is a tributary, as is the Šembera shortly before the Výrovka Stream spills into the Elbe. In the vicinity of Kouřim, the Výrovka Stream has a deep riverbed that separates Stará Kouřim on the right bank and Kouřim – St George on the left bank. At the same time, Kouřim – St George and the town of Kouřim are separated by the Ždánický Stream (also known as the Střebovka), which flows into the Výrovka below the town. Numerous other small streams flow through Kouřim region, including the Běšínovský Stream. The original vegetation here was made up of oak-hornbeam groves, acidophilous oak forests and, near watercourses, also meadows and alder forests, which are still preserved today mainly in the deep valleys around the Výrovka (Mikyška a kol. 1972). Today, the area around Kouřim is farmed intensively, and the current landscape is shaped by large fields and orchards. This is a moderately warm region, slightly dry, and mostly with mild winters. The average annual air temperature is around 8–9°C, average annual precipitation is 550–600 mm, and the average seasonal number of days with snowfall does not exceed 50 (Tolasz et al. 2007).

3. Central sites in the Kouřim cadastral area

3.1 Stará Kouřim

Stará Kouřim is spread over a large hill, the highest point of which is at an altitude of 294 m A.S.L. On the northern and eastern sides, the terrain gradually descends into the surrounding slightly undulating landscape, while to the south and west it falls sharply into the valley of the Výrovka Stream. Due to its favourable position, the hill was used for settlement and burials from the Late Neolithic up to the Early Middle Ages. However, the oldest early medieval finds are known from a secondary position and are already linked to the Prague-type pottery culture. Roughly from the beginning of the 9th century, Stará Kouřim gradually began to take shape as a fortified entity: a new fortification was built on the remains of the fortifications of a small Řivnáč culture hillfort and the inner area (acropolis) was sectioned off. Sometime in the second half of the 9th century, the fortified structure was expanded to include the first ward with a central wall and, subsequently, the second ward with an outer wall with an area of up to 44 ha, becoming the residence of the regional elite, as is also documented by finds from a rich cemetery near Libušino jezírko [Pond] (Šolle 1959; Profantová 2006). Stará Kouřim was to have been plundered at the turn of the 10th century, when the wood and earth central wall was to have been destroyed by fire. At the beginning of the 10th century, a new central fortification with a front stone wall was built (for the revision processing of the central wall, see Dvořáček 2020b). The site is one of the few known by name as early as the 10th century, when the Legend of Kristián mentions the duel between St Wenceslas [sv. Václav] and the ruler of Kouřim (*Legenda Christiani*, No. 10, 100–103). Stará Kouřim probably disappeared violently in the second quarter to the middle of the 10th century, probably in connection with the conquest of previously independent territories after Boleslav I ascended to the princely throne.

From 1948 to 1958, extensive systematic archaeological excavations were focused on this stronghold under the direction of M. Šolle from the former Prague Institute of Archaeology of Czechoslovak Academy of Sciences (Dvořáček 2020a). The results of the research were published in the monograph *Stará Kouřim a projevy velkomoravské hmotné kultury v Čechách* [Stará Kouřim and Manifestations of Great Moravian Material Culture in Bohemia] (Šolle 1966).

3.2 Kouřim – St George

After the demise of Stará Kouřim, a later early medieval castle was founded on the opposite promontory at the beginning of the 11th century at the latest, on partially populated land, and was named after the local church – Kouřim – St George. The settlement of this promontory is documented as early as the 8th century by numerous finds of pottery in the form of residues in later features (Šolle 1969, 6–7; 1993, 268) and finds of Avar belt fittings and one earring (Profantová 2010, 216, 219, obr. 13: 8–11; 28: 2, 3; tab. 3). The promontory was also inhabited in the Middle Hillfort period; Šolle assumed an unfortified settlement here (Šolle 1993, 268–269).

Since the 11th century, Kouřim – St George was a castellan-type castle, which fulfilled the top administrative function in the so-called castle system

(Žemlička 1978). The castle was probably fortified by a perimeter wood-earth rampart with a front stone wall as early as the beginning of the 11th century. In the 12th century, the fortifications were supplemented with a transverse rampart separating the acropolis and the outer ward to the north. The aforementioned Church of St George[2] was probably built at the acropolis at the end of the 10th or beginning of the 11th centuries, and there was a courtyard near the church. The second church, consecrated to St Clement [sv. Kliment], was probably built in the northern ward sometime in the Late Hillfort period, though its exact site is unknown despite efforts to identify it. In the first half of the 11th century, the existence of a mint is considered in Kouřim in connection with finds of denarii with the inscription CVRIM (most recently Mašek, Polanský 2005). Kouřim was the seat of an archdeaconry, with a probable beginning in the 12th century. Most likely, from the second half of the 12th to the first quarter of the 13th centuries, Kouřim belonged to a junior branch of the Přemyslids – the Děpoltic family (Šolle 2000, 69). The Dalimil Chronicle mentions the conquest of Kouřim by the army of Přemysl Otakar I in 1223, during which a member of the Přemyslid family, Děpolt III, was killed (Dalimil, Chapter 77, 140). Sometime in the first half of the 13th century, this castle was abandoned and replaced by a high medieval town on the opposite terrace, which is separated from the promontory by the Ždánický Stream.

Kouřim – St George was investigated in a small test pit in 1955 and then systematically in 1961–1962 and 1967–1977, again under the direction of M. Šolle (1969; 1993). In 2011 and 2012, the site was subjected to a non-destructive research in the form of surface survey and geophysical prospecting. Contemporary settlement was also identified in the forefield of the southern wall, a space referred to as the 'southern outer area', where a artisan's workshop likely stood (Tomanová 2012, 108). It is reasonable to assume that this area was also fortified and would thus be the second – southern – ward.

4. Hinterland of Kouřim centres

Knowledge of early medieval settlement in the area surrounding the Kouřim strongholds dates back to the late 19th century and continued throughout the 20th century (Píč 1909; Dvořák 1936) and was partially summarised by M. Šolle in his monograph on Stará Kouřim (Šolle 1966, 276–280). But in recent years, knowledge of the hinterland has been expanded, thanks primarily to rescue archaeological excavations, non-destructive investigations and cooperation with ethical amateur searchers (Pecinovská, Likovský 2010; Dvořáček 2015; 2021; 2023; Profantová, Dvořáček, Kmječ 2024). The following subchapter presents burial grounds, settlements and sacred buildings within a radius of 5.5 km around Kouřim. Among churches, all buildings were selected that have medieval origins and whose beginnings are not fully understood. In addition to churches in the Kouřim cadastral area, these include the Church of St Gall [sv. Havel] in Ždánice, the Church of St Matthew [sv. Matouš] in Malotice, the Church of St Wenceslas [sv. Václav] in Svojšice, the Church of St Wenceslas in Žabonosy, the Church of St Wenceslas in Vrbčany, the Church of St Bartholomew [sv. Bartoloměj] in Třebovle, the Church of St Simon and Jude [sv. Šimon and Juda] in Vitice and All Saints Church in [Všech svatých] Oleška. In the designated area, other medieval buildings include the now-defunct Cistercian monastery in Klášterní Skalice, founded in the mid-14th century (Vlček, Sommer, Foltýn 1998, 300–302) and the late Gothic cemetery Church of the Holy Trinity on the northern edge of Kouřim from 1591 (Poche 1978a, 123). These last two buildings will not be addressed in this work. Subchapter 5 is devoted to an evaluation of sites and their classification in the Middle Hillfort or Late Hillfort horizon.

4.1 Cemeteries

Possible cemeteries are indicated by finds of whole vessels. One was apparently located in the town centre on Dubová Street, where an early medieval vessel with ashes and a chicken egg was recorded.[3] Another vessel was uncovered during

2 St George was one of the most popular church patrons at early medieval castles in the 10th and 11th centuries in Bohemia (Sláma 1977b).

3 Eggshells or whole eggs are found in inhumation burials and are encountered in Bohemia from the second half of the 9th century to the beginning of the 12th century, but more frequently in the late 9th–10th centuries. Their occurrence is dominated by cemeteries in the central part of central Bohemia, while their appreciable decrease is evident at cemeteries in the eastern part of central Bohemia. The find from Dubová Street is unique among the Kouřim cemeteries. Eggs predominate in children's graves, in which they are placed near the lower limbs or near the head (Smetánka 2003, 17–24; Tomková et al. 2020, 305–314).

the construction of a canal opposite the hotel (Píč 1908, 528).[4] František Dvořák mentioned that inhumation graves or hillfort period vessels were found at various sites within the town (Dvořák 1936, 137).[5] A rare bottle-shaped middle hillfort period vessel was found on the road between Kouřim and Toušice (Šolle 1966, 279). An entire vessel dating back to the 10th century, was recovered in 2011 from an excavation in Komenského Street (Dvořáček 2023, obr. 7: 15). Given that settlement features were discovered just 16 m from this find (see below in Subchapter 4.2), it is possible that the vessel also belonged to this settlement.

At the end of the 19th century, a probable inhumation cemetery was discovered at the U Bukačovského mlýna site under the St Adalbert [sv. Vojtěch] terrace, from which four vessels dating to the Middle Hillfort period came (Píč 1909, 338; Šolle 1966, 277).

In 1894, in connection with the elimination of certain parts of the town fortifications, a late hillfort period cemetery called Pod Hradbami was discovered.[6] S- shaped temple rings, perforated bead, the frame of a buckle and a stone spindle whorl were saved from the graves (Píč 1909, 337; Tůma 1915, 319; Dvořák 1936, 137; Batelka 1941; Šolle 1959, obr. 83: 1).

An additional cemetery was discovered during the construction of a now-defunct sugar factory near the railway station and also at the crossroads towards Svojšice and Bošice on plot No. 603/2 (hereinafter the U Cukrovaru cemetery). The Kouřim sugar factory was built at the end of the 19th century, and the graves at this cemetery were also discovered in 1932 and were investigated by Antonín Knor in 1948. Miloš Šolle's further attempt to explore the peripheral parts of the cemetery in 1958 brought no new information. It is clear from Knor's investigation that the graves were oriented in standard fashion with the head to the west and feet to the east. The finds of small one-centimetre-sized and medium two-centimetre-sized S-shaped earrings come from this cemetery, for which, unfortunately, no layout is known (Šolle 1966, 276–277). The U Cukrovaru cemetery probably also included a 'warrior's grave' found in the courtyard of the agricultural cooperative and furnished with a bottle, an axe, a fragment of an iron spear, an iron buckle and two incomplete spurs (Šolle 1966, 84, 276).[7] The most recent discovery of two graves, probably related to this cemetery, was made at house No. 491 in Kolínská Street. The heads of both individuals were facing west to southwest and the graves were unfurnished (Pecinovská, Likovský 2010, 435–437).

Another cemetery was discovered in 1998, when nine skeletal graves were discovered beneath the demolished house No. 44 on Mírové náměstí [Square]. The deceased were laid out in a stretched supine position, mainly in a southwest-northeast orientation, and none of the graves were furnished. Wooden coffins were documented in two cases, and one grave contained a wooden panel on which the deceased was apparently laid. The graves were disturbed by features related to the founding of the town in the 13th century. The cemetery is dated to around 1100 (Brzobohatá, Mazač, Tvrdík 1999).

In 2022, another previously unknown cemetery was discovered just behind the southern bailey of Kouřim – St George, i.e. outside the early medieval castle grounds. In a small test pit measuring 250 × 150 cm, four inhumation graves, disturbed to varying degrees, were identified, which were oriented in the west-east direction. In addition to these skeletons, there were also numerous loose bones and groups of bones of other individuals. The test pit captured only part of the larger cemetery. The fact that the skeletons disturbed one another and that there were also numerous loose bones suggests that this was a multi-layered burial ground. That these cemeteries are commonly found near churches provides indirect evidence that a previously unknown church stood here in the Middle Ages (Dvořáček, Burešová 2024).

4 The former Vácha Hotel in the U Bílého lva house on the square at No. 121 was apparently mentioned as a hotel. We thank Vladimír Rišlink for his assistance in localising the historical names in this article.

5 František Dvořák named the sites Pod Starou Kouřimí, Na Vojtěchu (U Sv. Vojtěcha), Na Klimentě, U Bukačovského mlýna, V Cihelně, U Hřbitova, U Cukrovaru, Při Úpravě dobytčího tržiště, and Pod Bývalými hradbami. The mentioned cattle market was probably located in the New Town or on the walls of the town fortifications opposite the Za Střelnicí cemetery.

6 This could perhaps be the southwestern side of the town fortifications, where, at the end of the 19th century, the rampart between the Olešecká and Malotická gates was removed and the ditch was partially filled. Around the town, the outer curtain wall itself has remained in very good condition to this day.

7 X-ray images showed that the two spurs differ in shape, as one has a 29-mm-long spike segmented by ribs, while the other is 31-mm long, circular in cross-section with a conical terminal. The grave probably dates from the second half of the 9th century (Profantová 1994, 76, obr. 12: 5–6).

The occurrence of inhumation graves was recorded in the Ždánice cadastral area, and one of these burials contained a middle hillfort period vessel (Dvořák 1936, 153; Šolle 1966, 280).

North of Svojšice, near the former Karlov sugar factory, five inhumation graves were discovered at the Na Zabitém site, in a stretched position and oriented with their heads to the west and their feet to the east. These were to have been two adults buried side by side, with three children in the second row at their feet. Eight bronze S-shaped temple rings[8] were found in the grave of an adult woman, four by each ear (Píč 1909, 347–348; Šolle 1966, 279).

In Přebozy, four inhumation graves were dug up at the court of Prince Liechtenstein[9] in 1891, which were '*covered with thick slabs*', i.e. tombstones. Three graves were in close proximity to one another, while one was located on its own; the graves were unfurnished (Píč 1892, 715).

In 1893, J. Waněk excavated the late hillfort cemetery in Žabonosy. It contained more than 100 graves and was located east of the church on the opposite side of the road linking Žabonosy and Přebozy (summarised in Hendrychová, Frolík 2016, 230). The graves were '*laid closely together*' (Píč 1893b, 437–438), the skeletons laid on their backs, oriented west–east, and were accompanied by only '*a few grave goods*'. Only a few finds were made – three S-shaped earrings, three rings, two '*with S-shaped terminals at both ends*', four rings with an s-shaped ending, '*which were worn on the hands like bracelets*', a bronze ring with a smooth round plate, a bronze strip and fragments of iron, which the finders believed could have come from a spur (Píč 1893b, 437–438).

A unique inhumation grave discovered in Miškovice in the direction of Třebovle contained two middle hillfort period vessels – a pot and a flask (Dvořák 1936, 140; Šolle 1966, 279).

A cemetery located in Třebovle at the Za Sázavskou zahradou site produced S-shaped earrings with a diameter of 17–20 mm (Dvořák 1936, 149; Šolle 1966, 279–280).

In 1876, 12 skeletons lying next to each other were discovered in Lipany during the construction of a road on the site of a former brickyard. They had S-shaped temple rings by their heads (one skull even had even five temple rings) and deeply grooved glass beads (Píč 1909, 340). Three more temple rings of small to medium diameter between 18 and 21 mm were found during metal detector prospecting of the Lipany battlefield from 1434. This late hillfort period cemetery from the late 10th to 11th centuries was located in the western vicinity of the town (Profantová, Militká, Šámal 2022, especially 372–373).

An S-shaped temple ring made of silver wire with a diameter of 25 mm, a bone comb and an iron arrowhead come from the Třebovle-Broučkov cemetery (Dvořák 1936, 149; Šolle 1966, 279).

4.2 Settlements[10]

Roughly 200 m southeast of the southern outer Kouřim – St George ward, the Nad Dolnicí settlement was identified on a small promontory by surface surveys. Based on pottery finds, this settlement is dated to the second half of the 10th to the first half of the 13th centuries. The occurrence of slag indicates artisanal activity at this site (Dvořáček 2021). Metal finds come from the Nad Dolnicí site, though west of the Kouřim–Toušice road, perhaps related to jewellery production at this site. This is a die for making kaptorgas with a griffon motif dating back to the 10th century, a goldsmith's chisel, and a preform for an S-shaped earring. Avar fitting from the second half of the 8th century also comes from the site (Profantová, Dvořáček, Kmječ 2024).

The pre-urban settlement on Komenského Street in the historic core of the town of Kouřim, which is documented by sunken features, was situated above the valley of the Ždánický Stream opposite the early medieval Kouřim – St George castle (from which it is only about 250 m in a straight line). Based on finds of pottery fragments, we can date it to somewhere between the 12th and mid-13th centuries, when it was replaced by a high medieval town. The settlement in Komenského Street was probably already located in the Early Middle Ages on the road from the Elbe River region to Kouřim – St George and further to Sázava Monastery, 15 km away (Dvořáček 2023).

A stratified situation with numerous early medieval ceramics was discovered in a trench dug for a cable in the valley in Ouličky Street in front of No. 205 near the bank of the Výrovka Stream (Dufek 2018).

8 Judging by the number of temple rings, the deceased was likely a teenage girl. Small and adolescent girls were usually furnished with a larger number of temple rings (Štefan 2010, 191–192).

9 The former princely court in Přebozy is currently building No. 1 on the southern edge of the village.

10 Settlement sites that are not more closely dated within the Hillfort period and for which we have only minimal information (e.g. '*a settlement of the Hillfort period at a site above the pond*') are not mentioned in this text. As a rule, these are sites mentioned in work about prehistory of Kolín and Kouřim regions (Dvořák 1936).

In these places, on the way to Kolín ('Kolín suburb'), A. Hejna already assumed the Kouřim – St George extramural settlement (Hejna 1961, 568). A settlement from the Late and partly Middle Hillfort period, which may be related to the situation in Ouličky, was investigated in 2024 at the Na Salabce site on a hill above the Výrovka valley and ca 500 km north of Kouřim – St George.[11]

The settlement site called Běšínov is located on the left bank of the Běšínovský Stream near the Běšínov farmstead, south of Kouřim – St George. Finds from this site have been known since the first half of the 20th century, when J. Tůma reported finds of '*urns and potsherds of the hillfort type with bronze temple rings and potsherds of graphite vessels 2.5 cm thick*' (Tůma 1915, 250). The settlement was also mentioned by F. Dvořák in his work on the Kolín and Kouřim regions (Dvořák 1936, 126). A square (probably unique) cast strap-end from the 8th century was published from the site (Profantová, Vích 2008). In 2013, analytical surface surveys found potsherds dating mainly to the 11th and 12th centuries. However, some potsherds document older settlement already from the 8th century (Dvořáček 2013). In 1927, a coin hoard was found in a field near Běšínov. The hoard of more than 1,000 denarii was deposited sometime after 1125 and contained coins of Bořivoj II (1100–1107, 1117–1120), Vladislav I (1100–1107, 1117–1120), and Soběslav I (1125–1140; Šolle 1966, 277–278).

Named after the Broučkov farmstead, the settlement lies on a gentle hill that slopes down to an unnamed stream. The Broučkov farmstead is situated ca 400 m northwest from the mentioned site, to the north of Kouřim – St George. Broučkov is known for the occurrence of five ironmaking furnaces from the Hillfort period, which were discovered by J. L. Píč and J. Waněk in the 1890s (Píč 1893a, 336–338; Pleiner 1958). Similar to the case at the aforementioned Běšínov, analytical surface surveys were carried out here in 2013 and finds of pottery from Broučkov also allow us to date settlement to the 11th and 12th centuries and to the 8th century (Dvořáček 2013). The Broučkov farmstead also produced a find of a strap-end decorated with a circular tendril from the 8th century (Profantová, Vích 2008, 621, obr. 4), a lead disc with a hole in the centre, a bimetallic weight, and three other ornaments from the Avar period (Profantová et al. 2020, 224, 252; Šámal, Lukas 2024, 60).

The Ždánice hillfort is located on a promontory at the top of a terrain break (400 m A.S.L.) separating the lower-lying Kouřim region and the Kostelec nad Černými lesy region at a higher elevation. It was probably a single-part hillfort with an irregular ground plan and an area of nearly 10 ha. The hillfort was heavily damaged during road construction in the 1840s (Kremla 1903, 400–401) and in the early 21st century, when the area was landscaped as a motocross track. The destruction of the fortifications in two lines was preserved only on the forested southern and southwestern slopes. The defunct transverse line of fortifications was discovered during geophysical investigation (Křivánek 2000, 496, obr. 1). The dating of this feature to the Early Middle Ages is only hypothetical, but probable (Čtverák et al. 2003, 365).

The Doubravčany – Na Šancích hillfort is situated on a promontory above the valley of the Výrovka, into which the Malotický Stream flows. The southernmost part of the promontory with the probable acropolis was disturbed by a stone quarry at the end of the 19th century (Kremla 1903, 403). Originally, it was at least a two-part hillfort with an area of ca 4.6 ha. The promontory was fortified with two fortification lines guarding the approach from the flat northern side. Of the fortifications, only a 3-metre-high ruin of the rampart with the remains of a ditch has survived to this day (Čtverák et al. 2003, 72). Jan Kremla also mentioned and drew the rest of the western part of the outer destruction of the fortifications (Kremla 1903, 403, tab. LXIII), which unfortunately is no longer visible today. Josef L. Píč investigated the 'western preserved bank' of the hillfort, uncovering an ashy layer with burnt stones and ceramics from the Final Bronze Age; he found hillfort-period pottery in the upper layer (Píč 1891, 374).

The second Doubravčany hillfort at the Na Hradišťatech site is located directly above the town on a promontory above the Výrovka Stream. The eastern side towards the plain is bordered by the already significantly reduced transverse destruction of the fortifications. It is apparently a single-part fortified structure with an area of 2.6 ha, but there are no finds from the area of the hillfort that could at least roughly date it (Čtverák et al. 2003, 73).

11 Features from the Early Middle Ages were mainly represented by storage pits, iron furnaces (at least four) and two pit houses. Intensive iron production in this area is documented by a relatively large amount of slag and two probable pieces of iron bloom. A preliminary dating of the pottery indicates that most features fall into the 11th–12th centuries. At least one feature is older (9th–10th centuries; Dufek 2025b).

In Žabonosy, surface surveys yielded finds of pottery of a 'late hillfort character' and with vertically extended rims, which document settlement near the church in the 12th to the first half of the 13th centuries (summarised with refs. in Hendrychová, Frolík 2016, 231).

The hilltop settlement of Třebovle – Na Havraníku is situated between a small stream and the valley floodplain of the Výrovka Stream. The site became known through the research of J. L. Píč and J. Waněk, who discovered at least three features here, at least two of which were the remains of sunken floor houses with a stone oven in the corner. The fill of the features contained middle hillfort period pottery, including imitations of Carolingian-type storage vessels with relief decoration (Píč 1897, 693, tab. 81; Profantová 2000). The site is also thought to be fortified, but the fortifications have still not been convincingly documented. The Na Havraníku hilltop settlement had at least two development phases, the first from the 8th century and the second from the 9th century. In the settlement structure, it could have formed a kind of intermediate link between hillforts and rural settlements (Profantová 2000, 649).

In the spring basin on the eastern edge of the town of Třebovle, 250 m west of the Church of St Bartholomew, four settlement features with pottery were documented in 2013 datable to the 12th or early 13th centuries (Dvořáček 2015).

Traces of early medieval settlement were also discovered in 2024 in the area of the defunct Gothic monastery in Klášterní Skalice. A cultural layer with pottery from the Early, Middle and Late Hillfort periods was found in a 160 × 100 cm pit (Dufek 2025a).

4.3 Sacral buildings

The Church of St Adalbert [sv. Vojtěch] was located on a smaller oval terrace (1.49 ha), on the banks of the Výrovka Stream, between Stará Kouřim, Kouřim – St George and the Nad Dolnicí site. Archaeological excavations were carried out here at the beginning of the 20th century by J. L. Píč, who discovered graves covered with stone slabs (Píč 1909, 338), and in 1962 and 1978–1981 by M. Šolle (1989). The excavation by M. Šolle uncovered a cemetery in the southeastern part of the terrace with 166 burials. The burials contained medium and large S-shaped temple rings from the 12th and 13th centuries. As mentioned above, some graves were covered with stone slabs – tombstones.[12] The stone church stood on a site where burials were already made in the past. Only the remains of the foundations, rubble and an architectural element – a vault – have been preserved; other architectural elements are walled up in the Bukačov mill (Šolle 1981, Fig. 15). A contemporary settlement was also discovered on the St Adalbert terrace, and the site was apparently weakly fortified. We can probably speak of a proprietary church with the seat of a princely official, similar to the Mstiš church mentioned for the year 1061 by the chronicler Cosmas of Prague (*Chronica Boemorum*) in the extramural settlement of Bílina (Klápště 2011, 62). These types of churches were intended to express the prestige of their builders, especially stone structures (Klápště 2005, 48–50). The Church of St Adalbert was abolished during Joseph II's reforms and later demolished.

The indirectly documented church located in close proximity to the southern ward of Kouřim – St George was already discussed in Subchapter 4.1. If it was really a church, it could have been privately owned, like the Church of St Adalbert, and may also have belonged to a princely official.

Built primarily from quarry stone, the Church of St Stephen [sv. Štěpán] is a three-nave early Gothic basilica from the second half of the 13th century, the front side of which is integrated into the southern part of the Kouřim main square. The use of blocks is notable, and these are best visible on the side wall of the polygonal end of the northern nave. Furthermore, the church has semicircular window lintels in the side ends and in the southern wall of the nave. Based on these building elements, it is hypothesised that an earlier Romanesque church was demolished on the site of the early Gothic basilica, or in its vicinity, and its hewn stones were used in the masonry of the new building (Radová-Štiková 1975). The basilica stylistically incorporates late Romanesque features with early Gothic: it has an elongated chancel with buttresses and simple polygonal ends of the side aisles. Two massive prismatic towers rise above the side choirs. Beneath the chancel is the early Gothic crypt of St Catherine [sv. Kateřina] with an octagonal plan, with a star vault on a central column. Based

12 Early medieval tombstones in Bohemia were recently studied by J. Podhorský and P. Drnovský (2017). The study contains a catalogue of 63 sites from 60 cadastral areas in Bohemia and also includes tombstones from Kouřim – Sv. Jiří and Kouřim – Sv. Vojtěch [Kouřim – St Adalbert]. It can be cautiously accepted that these stones had some connection to power centres. At the same time, the placement of these stones may have prevented the disturbance of older graves, and they are most often encountered in burial horizons of the 11th and 12th centuries (Podhorský, Drnovský 2017, 378–379).

on its early Gothic elements, the construction of the basilica dates to the 1270s. However, based on the late Romanesque features, it can be assumed that construction began at the time of the founding of the royal town, perhaps before the middle of the 13th century (Radová-Štiková 1975). The basilica was renovated in the neo-Gothic style in the second half of the 19th and early 20th centuries.

The Cistercian provostry with the Church of St Martin [sv. Martin] stood near the walls in the northwest corner of the town. It was founded probably soon after or before the establishment of the royal city, which is also indicated by the preserved early Gothic building elements, which allow us to consider the construction of the monastery as early as the first half of the 13th century. According to written sources, it is documented as far back as 1345 under Provost Hartmann (Kuča 1998, 114). The builders came from the Sedlec construction workshop and were apparently also involved in the construction of the Church of St Stephen in the town. The provostry ceased to exist during the Hussite Wars in 1421, when Kouřim surrendered to Prague troops. These forces burnt the church down and then burnt five captured monks in barrels in front of the upper gate (Kurka 1915, 5). After the destruction of the provost's office, its stone blocks were most likely used in the construction of the bailey wall in the town fortifications, where they are set together with the predominant ashlar masonry. The presence of a Cistercian monastery is quite unique in Czech royal towns, and the establishment of a mendicant monastery would have been more likely. This may have occurred due to older property and legal claims of the Sedlec Abbey in the space of the newly located town. The uncertainties regarding the time of its founding and the presence of Cistercians in the city lead to the assumption that the monastery could not have been founded before the town, i.e. at a time when the administration from the Kouřim – St George Castle was still in operation. Alternatively, it could have initially stood outside the town walls (Kuča 1998, 116; Foltýn, Kovář 2006, 7).

The church with the Hospital of St Mary Magdalene [sv. Máří Magdaléna] stood on the Kolín road on the right bank of the Výrovka Stream in the Kolín suburb. It is first documented in 1299, when the burgher Lev and his wife became its administrator, while the Kouřim priest assumed the leading oversight role. In 1338, John of Luxembourg entrusted the administration of the hospital to the Prague Order of the Knights of the Cross with the Red Star. The building was destroyed during the Hussite Wars. It was subsequently restored several times until finally being abolished in 1784 and dismantled in the first half of the 19th century (Kurka 1915, 5; Rišlink 2010, 46–47). The Church of St Mary Magdalene was probably built during the 13th century. However, it was located in the area of the supposed late hillfort period Kouřim – St George extra-mural settlement[13] and it cannot be ruled out that an older sacred building once stood in this place.

The Church of St Gall [sv. Havel] in Ždánice is located on the side of the village in a dominant position on the east-facing slope of the terrain break separating the lower-lying Kouřim region and the Kostelec nad Černými lesy region at a higher elevation. It is located three hundred metres from the aforementioned Ždánice hillfort. The church itself is not mentioned until 1358. While the nave and chancel are from the Baroque and 19th-century construction phases, the tower has been proven to be medieval in age. Due to the absence of any construction details, the ashlar marlstone masonry cannot be dated with greater precision. The bricked-up portal in the southern wall indicates a connection, probably with the tribune of an older (medieval) church (Kroupa 1993, 96–97).

The Church of St Matthew [sv. Matouš] in Malotice may also have medieval origins; according to E. Poche, it was originally a Romanesque church, mentioned in 1309. However, there is no other evidence of its Romanesque architectural form. The oldest preserved masonry is the Gothic wall of the chancel with a late Gothic rectangular portal from the chancel to the sacristy. The church was radically rebuilt in the 19th century in a pseudo-Romanesque style (Poche 1978a, 346).

The Church of St Wenceslas [sv. Václav] in Svojšice also dates back to the Gothic period, though its current architectural appearance is based on Baroque (1678) and Rococo (1773) reconstructions (Poche 1978b, 490). The church is first mentioned in 1352, but it was probably not a new building at that time. It is the type of church with a rectangular chancel, which in this region is usually dated to the last third of the 13th century or the beginning of the 14th century. The Gothic construction phase of the church is most apparent in the tower, which was mapped in detail by the historic building survey of

13 See the Ouličky site on the left bank of the Výrovka mentioned in Subchapter 4.2.

K. Kibic Jr. (Kibic ml. 2015). The Kouřim teacher J. Kremla mentioned a rampart around the church, which was still partially visible in the cemetery at the beginning of the 20th century (Kremla 1903, 406).

The Church of St Wenceslas in Žabonosy is located on the edge of the village on a hill above the Bečvárka Stream. While the present-day appearance of the church reflects its Gothic and Baroque reconstruction, a significant part of the building, including the western tribune, is Romanesque, dated by A. Merhautová to the first quarter of the 13th century (Merhautová 1971, 368). The church is first mentioned in written sources in 1352. However, as early as 1937, an archaeological excavation was carried out in the interior of the church, proving that the Romanesque church had an older predecessor: F. Dvořák and V. Budaváry discovered and documented a remnant of the apse of the older church under the tribune. However, J. Frolík's research from 2009 to 2010 brought new insights that are absolutely essential for understanding the development of this church building. The first phase of construction was a single-nave church ending in the east with an apse, which was discovered in 1937. The church was at least 9.5 m long (including the apse), the nave 5 m wide (internal width 2.5 m). However, in addition to uncovering the remains of the nave of the original church, the excavation from 2009 to 2010 documented the existence of another construction phase, i.e. it uncovered the two eastern apses of the side naves, which were 4 m wide. The church was a small three-nave basilica in its second phase. This building was then replaced by a new Romanesque church moved to the east (Hendrychová, Frolík 2016). There was intensive burial activity around the church and one of the graves, the oldest documented at the site, helped date the first two building phases of the church. Radiocarbon dating places it between 992 and 1194. Given that the grave was disturbed by the apse of the side nave, it must have belonged to the first phase of the church. This suggests that the first phase of the church is older than this grave, the addition of the side naves relatively younger. It can therefore be assumed that the first church in Žabonosy was built as early as the 11th century (Frolík, Dvořáčková Hendrychová 2021). The church was also to have been surrounded by a rampart in the past, but by the beginning of the 20th century it had all but disappeared (Kremla 1903, 406).

Another sacred building that can be associated with the early medieval period is the Church of St Wenceslas in Vrbčany. While the first mention of the church is related to the year 1088, the source itself is from the 12th century. The Canon of Vyšehrad mentions in 1126 that the standard of St Adalbert is kept in the church. The church's current appearance is the result of reconstruction in the 15th and 17th centuries, when a Gothic pentagonal chancel was first added to the original Romanesque nave, followed by a Baroque facade. However, the masonry of the nave is Romanesque in its core – it is built of ashlar masonry and fragments of Romanesque windows are visible beneath the plaster (Poche 1978c, 272). The Romanesque church with a triforium supported by two columns, of which only the bases with square corner claws have survived, was originally dated to the mid-12th century, but A. Merhautová dates the church to the beginning of the 13th century. The Romanesque church had a single nave, with an apse that was round on the inside and polygonal on the outside (Merhautová 1971, 355–356). However, archaeological excavation from 1935 to 1936 documented the existence of an older small single-nave church ending in the east with a round apse. The foundation was built of marl slabs, the above-ground masonry was built using the ashlar technique. However, during the construction of the Romanesque church, this masonry was in places removed down to the foundations (Merhautová 1971, 355–356). The foundations of the original church were dated by V. Wagner to the end of the 10th century and St Adalbert was identified as the founder. The church was subsequently treated as a representative of 'Slavník architecture', the existence of which was, however, questioned by P. Sommer and V. Vaněk (2007, 20–34). Based on excavation from the 1930s, it is not possible to say anything more about the dating than that the original small church is older than the building from the early 13th century. However, it is not yet possible to designate the amount of time between the two phases. The church is fortified by a rampart up to 1.5 m high demarcating an area of 50 × 60 m.[14] This fortified area was connected to another fortification to the east, but nothing can be said about its exact dating or original form (Čtverák et al. 2003, 347).

The church in Třebovle, first mentioned in 1352, is a Gothic single-nave building with a rectangular chancel. The sacristy was located north of

14 When dating the fortification, the connection with the fortification of churches in the 1280s, recorded in written sources, is also considered. However, as J. Klápště pointed out, urgent reasons for building fortifications around churches certainly arose at various times (Klápště 2005, 96–97).

the presbytery, and there was probably a tribune on the western side. The church is dated to the second half of the 13th century. There are obvious links to the Kouřim construction workshop, and current research suggests that the builder may have been a Kouřim burgher (Kovář et al. 2010).

The Church of St Simon and Jude [sv. Šimon a Juda] in Vitice is located in a prominent position above the valley of the Bylanka Stream. Based on the discovery of a Romanesque capital in a secondary position as a pedestal for a cross in the cemetery and the ashlar masonry technique, A. Merhautová concluded that it was originally a single-nave Romanesque church with a western tribune, from which the capital was to have come (Merhautová 1971, 352). Although her conclusions are probably highly hypothetical, part of the nave masonry may indeed be of late Romanesque origin (Sommer 1987, 66). The original church was probably a lengthwise single-nave church, perhaps with a western tower, but nothing can be said about its dating. The church underwent a Gothic reconstruction in the 1360s and 1370s. The Chapel of St Catherine was soon added and is mentioned in connection with the year 1388. The west tower was rebuilt in the 16th or early 17th centuries. The Chapel of St Catherine was subsequently demolished and a noteworthy fact is that despite its proximity to the town of Kouřim (5.5 km in a straight line), in our opinion the church is located outside the Kouřim microregion, as it is separated by the prominent Lipský Ridge (Na Hrádku, 369 m A.S.L.) and therefore probably does not belong to the innermost hinterland of the Kouřim early medieval castles.

The same applies to the last of the churches in the studied area, namely All Saints Church in Oleška. The village of Oleška also lies beyond a significant terrain break with the highest peak Ostrý (401 m A.S.L.) and geographically belongs to the higher-lying Kostelec nad Černými lesy region. Oleška and the church are first mentioned in 1352. The current appearance of the church is the result of reconstruction in 1888, though the church is Gothic in its core (Poche 1978a, 528). While D. Líbal dated it to the third quarter of the 13th century (Líbal 2001, 291), M. Kovář and V. Vaněk consider that if the newly-found early Gothic portal in a secondary position was already part of the first phase of construction, the church could have been built somewhat later, at the end of the 13th century (Kovář, Vaněk 2021).

5. Reconstruction of the hinterland in the Middle and Late Hillfort periods

In the 8th century, Stará Kouřim was an open settlement, and settlement is also recorded at Kouřim – St George. The Na Havraníku hilltop settlement was occupied in this same period. From the sites of Běšínov and Broučkov, finds of pottery and non-ferrous metals are known from the Early Hillfort period. There was probably a hiatus in occupation in the following Middle Hillfort period and the sites were used again beginning in the Late Hillfort period.

Horizon 1 (Fig. 5.1: The Middle Hillfort period (9th to the mid-10th centuries) is associated with the centre at early medieval Stará Kouřim Castle, which was the fortified seat of the regional elite (the Kouřim princes) beginning in the mid-9th century at the latest. There was also an apparently unfortified settlement in this period at Kouřim – St George, where the population probably reached its highpoint in the first half of the 10th century. The cemetery was located in the u Bukačovského mlýna site the Bukačov mill in the valley below Stará Kouřim. The 'warrior grave' probably also dates from this time and was likely part of the larger U Cukrovaru cemetery, in all likelihood from the Late Hillfort period. As such, the mentioned grave ranks among the oldest burials at this cemetery. The small settlement at the elevated Na Salabce site is, for now, the only documented sunken feature. The inhumation cemetery in Ždánice and a grave in Miškovice are recorded at a distance of more than 2 km from the centre, primarily by the occurrence of whole middle hillfort period vessels. Traces of settlement have been observed in the monastery area in Klášterní Skalice. The second development phase of the Na Havraníku hilltop settlement in Třebovle dates to the 9th century. However, it is likely that this settlement was abandoned during the first half of the 9th century, and hence it is rather unlikely that it belonged to the hinterland of Stará Kouřim. With a certain degree of probability, the hillforts in Ždánice and in Doubravčany – Na Šancích could belong to horizon 1. It is also worth mentioning that outside the studied radius of 5.5 km, there are other early medieval hillforts on the Výrovka Stream – in Radim (7.5 km north of Kouřim) and in Hryzely (8 km south of Kouřim). The Hryzely, Doubravčany – Na Šancích, Stará Kouřim and Radim hillforts are located at

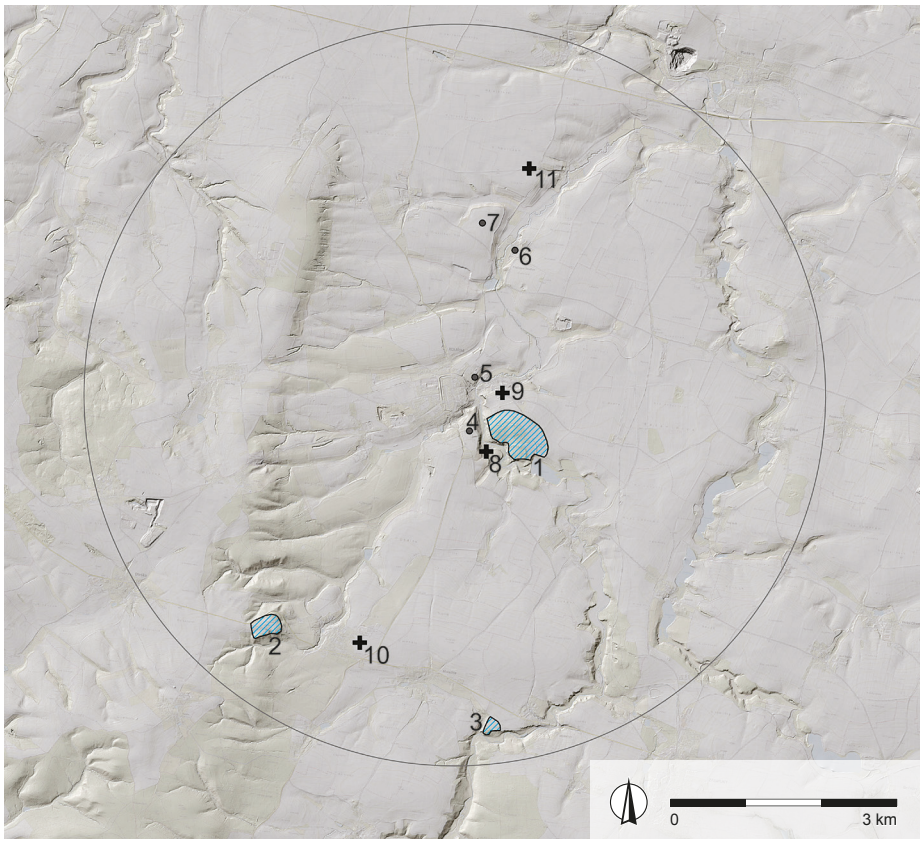


Fig. 5.1. The hinterland of Kouřim in horizon 1. Blue hatching – hillforts: 1 – Stará Kouřim; 2 – Ždánice; 3 – Doubravčany – Na Šancích. Solid circles – settlements: 4 – Kouřim – St George; 5 – Na Salabce; 6 – Klášterní Skalice; 7 – Třebovle – Na Havraníku. Black crosses – cemeteries: 8 – Bukačovský mlýn; 9 – U Cukrovaru 'warrior's grave'; 10 – estimated site near Ždánice; 11 – estimated site near Miškovice. Authors D. Dvořáček, S. Dvořáčková.

hilltop positions above the valley of the Výrovka and form a specific group of fortified points. Ždánice probably also belonged to this group of hillforts on the Výrovka, but it is located at the top of the terrain break separating the fertile Kouřim region from the almost uninhabited Kostelec nad Černými lesy region and is 3.5 km from the stream. This group of castles could have formed a kind of 'domain' of the Kouřim princes in the Middle Hillfort period. Stará Kouřim was definitively abandoned around the middle of the 10th century.

Horizon 2 (Fig. 5.2A): The Late Hillfort period (second half of the 10th to mid-13th centuries) is linked to the Přemyslid administrative castle of Kouřim – St George, founded sometime at the beginning of the 11th century. In the Late Hillfort period, a gradual increase in the density of settlement and burial is evident within a radius of 1 km from the St George promontory (Fig. 5.2B). The sites are located near the centre, and a settlement agglomeration[15] forms around Kouřim – St George. In the immediate vicinity, the U Cukrovaru cemetery was located northeast of the promontory and another cemetery – Pod Hradbami – was identified among the removed demolished parts of the town fortifications. Part of an inhumation cemetery was investigated beneath plot No. 44 at the site of today's square. A pre-urban settlement localised for now in Komenského Street was situated in part of the later royal town. Another settlement was located at the Na Salabce site in an elevated position with a very good view of the St George promontory and Stará Kouřim. Preliminary information indicates that intensive iron production took place here. Below this site in the valley of the Výrovka Stream in the Kolín suburb was apparently a thus far little-known extra-mural settlement. Another intensively settled area with possible iron production and perhaps even a jewellery workshop is known at the Nad Dolnicí site south of the later early medieval castle. The Church of St Adalbert on the terrace above a meander in the Výrovka Stream was probably a proprietary

15 According to J. Mařík, who studied the settlement agglomeration of the early medieval Libice nad Cidlinou hillfort, we can define the settlement agglomeration '*primarily spatially. When comparing the spatial arrangement of early towns and urban agglomerations, we find that they do not differ significantly by either structure or size. Open settlements and cemeteries are concentrated around the central part, usually fortified, and their distance from the fortifications is between one and two kilometers*' (Mařík 2009, 14).

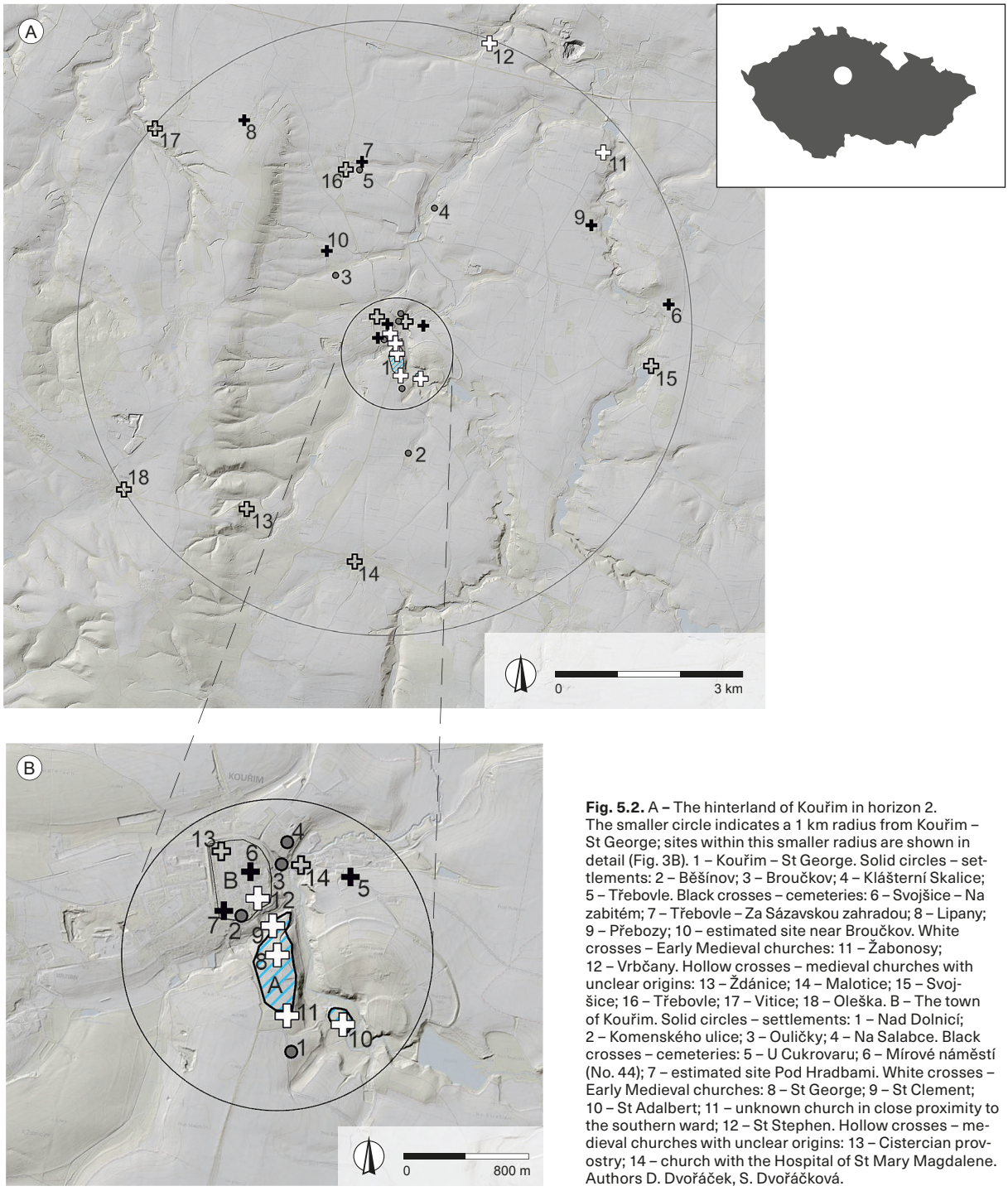


Fig. 5.2. A – The hinterland of Kouřim in horizon 2. The smaller circle indicates a 1 km radius from Kouřim – St George; sites within this smaller radius are shown in detail (Fig. 3B). 1 – Kouřim – St George. Solid circles – settlements: 2 – Běšínov; 3 – Broučkov; 4 – Klášterní Skalice; 5 – Třebovle. Black crosses – cemeteries: 6 – Svojšice – Na zabitém; 7 – Třebovle – Za Sázavskou zahradou; 8 – Lipany; 9 – Přebozy; 10 – estimated site near Broučkov. White crosses – Early Medieval churches: 11 – Žabonosy; 12 – Vrbčany. Hollow crosses – medieval churches with unclear origins: 13 – Ždánice; 14 – Malotice; 15 – Svojšice; 16 – Třebovle; 17 – Vitice; 18 – Oleška. B – The town of Kouřim. Solid circles – settlements: 1 – Nad Dolnicí; 2 – Komenského ulice; 3 – Ouličky; 4 – Na Salabce. Black crosses – cemeteries: 5 – U Cukrovaru; 6 – Mírové náměstí (No. 44); 7 – estimated site Pod Hradbami. White crosses – Early Medieval churches: 8 – St George; 9 – St Clement; 10 – St Adalbert; 11 – unknown church in close proximity to the southern ward; 12 – St Stephen. Hollow crosses – medieval churches with unclear origins: 13 – Cistercian provostry; 14 – church with the Hospital of St Mary Magdalene. Authors D. Dvořáček, S. Dvořáčková.

church with the seat of a princely official, perhaps the castle administrator. Another (albeit indirectly documented) church with an investigated burial ground was adjacent to the southern ward of the St George promontory. This could also have been a proprietary church. In the case of the Basilica of St Stephen on the Kouřim square, the aforementioned evidence suggests that the church may have had an early medieval predecessor. A question mark hangs over the establishment of a Cistercian provostry at the Church of St Martin in the royal town remains uncertain. If the monastery was founded in the first half of the 13th century, i.e. earlier than the town, it would overlap with the late Kouřim – St George phase.

At a distance of about 2 km from the promontory, the sites of Běšínov and Broučkov were settled after a certain hiatus. Judging by the number of pottery finds from surface surveys, it is evident that

there is more settlement activity in both of these sites than in the Early Hillfort period. The as yet unpublished bimetallic weights from Broučkov document trade activities. A hoard of denarii from the first half of the 12th century is known from Běšínov. Both of these settlements were probably located on some trade route leading to the centre in Kouřim. At the same time, finds documenting a burial site come from an unspecified site near Broučkov. Similar to the previous Middle Hillfort period, evidence of late hillfort settlement was found in the area of the monastery in Klášterní Skalice.

Other cemeteries and settlements were found at a distance of more than 2 km from the centre. Late Hillfort cemeteries were located in the Na Zabitém sites north of Svojšice, in Třebovle Za Sázavskou zahradou, and in a former brickyard in Lipany. In Přebozy near the princely court, graves were covered with tombstones, similar to the cemeteries at the Church of St George on the St George promontory and at the Church of St Adalbert on the St Adalbert terrace. The cemetery in Žabonosy was located east of the church, probably not far from the cemetery area. Perhaps the short distance of the cemetery from the church could be related to the larger size of the church cemetery before the stabilisation of its perimeter in the High Middle Ages.[16] A settlement with sunken features from the 12th or early 13th centuries was discovered near the eastern edge of the town of Třebovle. This settlement in the spring basin could have been the predecessor of the later high medieval village of Třebovle with a church. Church buildings of medieval origin were studied in this defined radius of 5.5 km around Kouřim. We must assume that most of them were built in the High Middle Ages, when the parish network was completed and land ownership was stabilised. However, using the example of Žabonosy, it is possible to state that an archaeological research of any church can bring groundbreaking information and document older construction phases, the existence of which had been previously unknown. Of particular interest for horizon 2 are the churches in Žabonosy and Vrbčany, located in the northern part of the microregion. Both churches have evidence of an older construction phase, in the case of Žabonosy it can be dated to the 11th century with a high degree of probability, while for Vrbčany it is not very well supported and is traditionally dated to the end of the 10th century. In the case of both buildings, it is necessary to ask who their builders were. Written sources do not provide many possibilities for explanation. We believe that it is possible to hypothesise that their emergence may be related to the dynamics of the central site Kouřim – St George and the local emerging elites connected to the service of the monarch. Similar to the churches in the Kouřim settlement agglomeration, in these two cases we can to some extent consider their emergence as proprietary churches in the hinterland of a significant centre (similarly in Hendrychová, Frolík 2020).

6. Conclusion

The hinterland of the early medieval castles of Stará Kouřim and Kouřim – St George was studied in a radius of 5.5 km around Kouřim and its development was divided into two horizons. Horizon 1 includes the Middle Hillfort period (9th to mid-10th centuries) and is connected to the centre of Stará Kouřim. Horizon 2 corresponds to the Late Hillfort period (second half of the 10th to the mid-13th centuries), when the regional centre was the Přemyslid administrative castle of Kouřim – St George. A comparison of the two horizons reveals certain differences in the density and distribution of settlement structures.

In horizon 1, the list of settlements and cemeteries in the hinterland of the princely centre is noticeably short. However, it should be noted that some of these are finds from cemeteries with little informative value discovered in the first half of the 20th century. Given the large central site of Stará Kouřim and the virtual lack of evidence of settlements within the defined area, one explanation that emerges is that perhaps the inhabitants of the castle were in some way participants in the agricultural activities necessary to ensure their own subsistence.[17] It can be hypothesised that after the demise of Stará Kouřim, some of the inhabitants may have founded agricultural settlements in the surrounding area. Following the abandonment of Stará Kouřim, some of the former inhabitants could have spread out in the defined hinterland to establish settlements. The settlement of the later administrative castle

16 Similar to the example of the church in Vrbno, which was located in the hinterland 3.5 km from the early medieval castle in Mělník. In this case, the extent of the early medieval cemetery significantly exceeded its later perimeter, apparently marked out during the stabilisation of the village layout in the High Middle Ages (Štefan, Varadzin 2007).

17 Similar to what is considered in the case of Great Moravian Břeclav-Pohansko (Dresler 2016).

on the St George promontory is interesting, as it is already documented in this horizon. There are other early medieval hillforts in the vicinity of Kouřim that could have formed a kind of 'domain' of the Kouřim princes in the Middle Hillford period. The low incidence of settlements and cemeteries in this period may also be related to the current state of knowledge, or the hinterland of Stará Kouřim could have been significantly larger and included the other mentioned hillforts.

In terms of archaeological sites, horizon 2 is considerably richer, with their highest density observed within 1 km of Kouřim – St George, where a settlement agglomeration was forming. In addition to settlements and cemeteries, work with iron and probably non-ferrous metals is also documented in the settlement agglomeration. Certain evidence could even suggest the presence of a jewellery workshop. At least two sacred buildings (the church of St Adalbert and a probable church identified based on the discovery of disturbed graves) could be proprietary churches built by members of the emerging local elites connected to the administrative apparatus of Kouřim – St George. Settlement also occurred in the space of the future town, which was not founded on a 'green field'. At the end of this horizon, there was another (second) transfer of the centre from the St George promontory to the terrace above the Výrovka, where the royal town was founded. Of the churches located within 5.5 km of Kouřim, Žabonosy and Vrbčany are certainly of early medieval origin. The builders of these churches were probably in a similar position as in the case of the church of St Adalbert and the supposed church located in close proximity to the southern ward of Kouřim – St George.

Information on the subject of the Kouřim hinterland remains scant, for the most part old 'discoveries' with a minimum of information from the first half of the 20th century. So far, only a small number of sites investigated by rescue archaeological excavation are known. We also have knowledge from surface surveys and are gradually collecting metal finds from amateur collaborators. In the near future, an increase in the number of surveyed sites can be expected with the anticipated expansion of development in Kouřim and the construction of a high-speed railway that will run in the northern and northeastern parts of the area studied in this work.

Chapter 6

Power centre from the Avar Khaganate period at the confluence of the Danube and the Váh

Jozef Zábojník

1. Introduction

The region at the confluence of the Danube and the Váh rivers is more or less triangle-shaped. The city of Komárno is situated in its southeastern vertex, in an altitude of 108–115 m A.S.L.

Komárno is one of the oldest settlements in the Carpathian Basin and a city with rich history. Its territory has been continuously settled since the Early Bronze Age. Celtic occupation was replaced by the Romans, who built a military camp and the town of Brigetio nearby, on the right bank of the Danube, and a fortified bridgehead called Celemantia on the opposite, northern bank of the river. The Avars, nomads from Central and Inner Asia, who controlled the Carpathian Basin for almost 250 years from 568, lived in Komárno's territory for a longer time during the Early Middle Ages.

Several years after the dissolution of the Avar Khaganate, the strengthening Moravian Slavic tribes attempted to subjugate the Avar territory that was not occupied by the Franks. Ancient Hungarian warrior groups that came to Central Europe in the late 9th century formed a fortified, enclosed place at the confluence of the Danube and the Váh, which became the centre of the county (*comitatus*) of Komárom at the time of the formation of the Hungarian state. A settlement, known under multiple names (*Camarum, Kamarn, Camarun, Kamar, Camaron*) in written sources, grew near Komárno Castle, the seat of the county situated at the crossroads of important land and river routes. King Béla IV elevated the settlement in 13th century to a town. A Renaissance palace was built at Komárno Castle during the reign of King Matthias Corvinus.

The Turkish expansion in the 16th century put Komárno on the border between the Habsburg and Ottoman Empires, which is why the medieval castle was rebuilt into the well-defensible Old Fortress in the mid-16th century during the reign of Ferdinand I, to which the New Fortress was added at the time of yet more battles with the Turks in the 1660s and 70s. The construction of the extensive Komárno fortification system commenced during the Napoleonic Wars. After its completion in the 1870s, Komárno became a strategic military base for Austria-Hungary, but the city itself lost its previous economic significance, as well as its leading position among the country's cities and towns. Its renewed development only followed in the late 19th and early 20th centuries, when iron bridges spanned the Danube and the Váh, the first railways connected Komárno with more distant regions of the country and the Újszőny settlement on the right bank of the Danube was added to Komárno (1896), providing space for the city's expansion.

In terms of modern history, it is worth mentioning that following the founding of Czechoslovakia in 1918, the city was divided along the Danube into Czechoslovak (Komárno) and Hungarian (Komárom) parts. The most important structure in Komárno's territory was undoubtedly the fortress. The Soviet occupational forces, which were stationed in it after 1968, left the fortress in catastrophic condition after their withdrawal in the early 1990s (Komárno_City).

2. The Avar Khaganate and archaeological evidence

There is no doubt that in the Early Middle Ages, part of present-day Slovakia was incorporated into the Avar Khaganate, a polity that determined the history of central Europe for nearly two and a half centuries. The process of inclusion, especially of the southern parts of Slovakia, which were mostly of a steppe character, was rather dynamic and conditioned by the development of the power-political situation in central Europe. At the time of its maximum territorial extent (Zábojník 2009, Fig. 1), around the middle of the 8th century, the Khaganate incorporated ca 7,200 km^2, or less than 15% of the area of present-day Slovakia (Zábojník 1999, 190). Nevertheless, ca 180 sites[1] (mostly graves and cemeteries) are known from this smallish territory, with the number of uncovered graves near 6,400. A probably large part of the extensive Bratislava-Podunajské Biskupice cemetery was examined during a motorway bypass construction in 2017. To this day, 485 graves have been uncovered there (Horňák, Stehlíková 2017, 5), considerably enriching the figure stated above. In comparison with other prehistoric, protohistoric and medieval periods, we come to the conclusion that no other phase in the development of occupation in this country's territory left as many graves and finds, as well as information provided by both of these categories (Fig. 6.1).

Perhaps the most significant occupation of the territory of the city of Komárno and its immediate vicinity falls into the Early Middle Ages, specifically the period of the Avar Khaganate. An equestrian grave containing an allegedly gold belt fitting was discovered already during sewage construction in the early 20th century (Alapy 1933, 38). The cemetery is denoted Komárno I in the find and site list (Zábojník 2009, 96). Multiple cemeteries in various locations within the Komárno cadastral area were discovered in the second half of the 20th century, specifically in the 1970s. A feature they have in common is a great number of richly equipped equestrian graves. The Komárno IV necropolis was discovered in the area of Rožná Street (at that time, Váradiho Street). Altogether, 28 graves were examined during a rescue excavation by Z. Čilinská (Institute of Archaeology, Slovak Academy of Sciences); however, this only represents part of the cemetery (Čilinská 1982, 347). The number included as many as 21 equestrian graves, some of which were determined by anthropological analysis as female graves or possibly female graves (Jakab, Vondráková 1982; Čilinská 1982, 348, 349, 354, 356).

In 1977, groundworks at a Doprastav construction site (Hadovská cesta) revealed a disturbed cemetery denoted as Komárno VIII. A research excavation by the Institute of Archaeology of the Slovak Academy of Sciences (Z. Čilinská) uncovered a total of 25 graves, including 11 equestrian burials (Čilinská 1982, 356). Most bear traces of secondary interventions. Like Komárno VI, this necropolis also included female equestrian graves (Čilinská 1990, 135; 1991, 24).

Perhaps the most important cemetery from the time of the Avar Khaganate in the studied area is Komárno IX (Lodenica field). A total of 153 graves, including 63 equestrian burials, were examined in it during multiple campaigns (Trugly 2008, 13). In addition to being rich in objects of material culture, the cemetery is also the largest in the territory of Komárno.

One of the important phenomena of the Avar Khaganate period is the occurrence in many cemeteries of so-called equestrian graves, in which a human was buried together with a horse. Complete horse skeletons were deposited in the graves in most cases, but partial co-burials of the animals also occurred to a smaller extent. As in so-called ancient Hungarian cemeteries, the skull and distal parts of the extremities were usually placed in the grave. In terms of the mutual positions of the human individual and the animal, we can distinguish between the same and opposite orientations. However, there are also necropolises where no equestrian graves have been found (e.g. the cemetery in Želovce). Male individuals were interred in a great majority of equestrian graves, but there were female equestrians as well; the author is currently aware of 27 such cases (Zábojník 2009, 38). The occurrence of female equestrian graves is basically limited to two smaller regions. The first of them is Komárno and its surrounding area. Three female equestrian graves were identified at Holiare cemetery, based on the grave goods or the size of the skeletons (Čilinská 1991, 24). It should be noted that the straight-line distance between the centres of Holiare and Komárno is ca 24 km. Female equestrian graves were also discovered in two cemeteries in eastern Slovakia – Košice-Šebastovce and Valaliky-Všechsvätých (Zábojník 2009, 100, 118).[2]

1 Throughout the text, I use site denominations along with an index in the sense of the list in Zábojník 2009, 77–122.

2 On female equestrians in the time of the Avar Khaganate from other territories of the Khaganate (cf. Bühler, Kirchengast 2022).

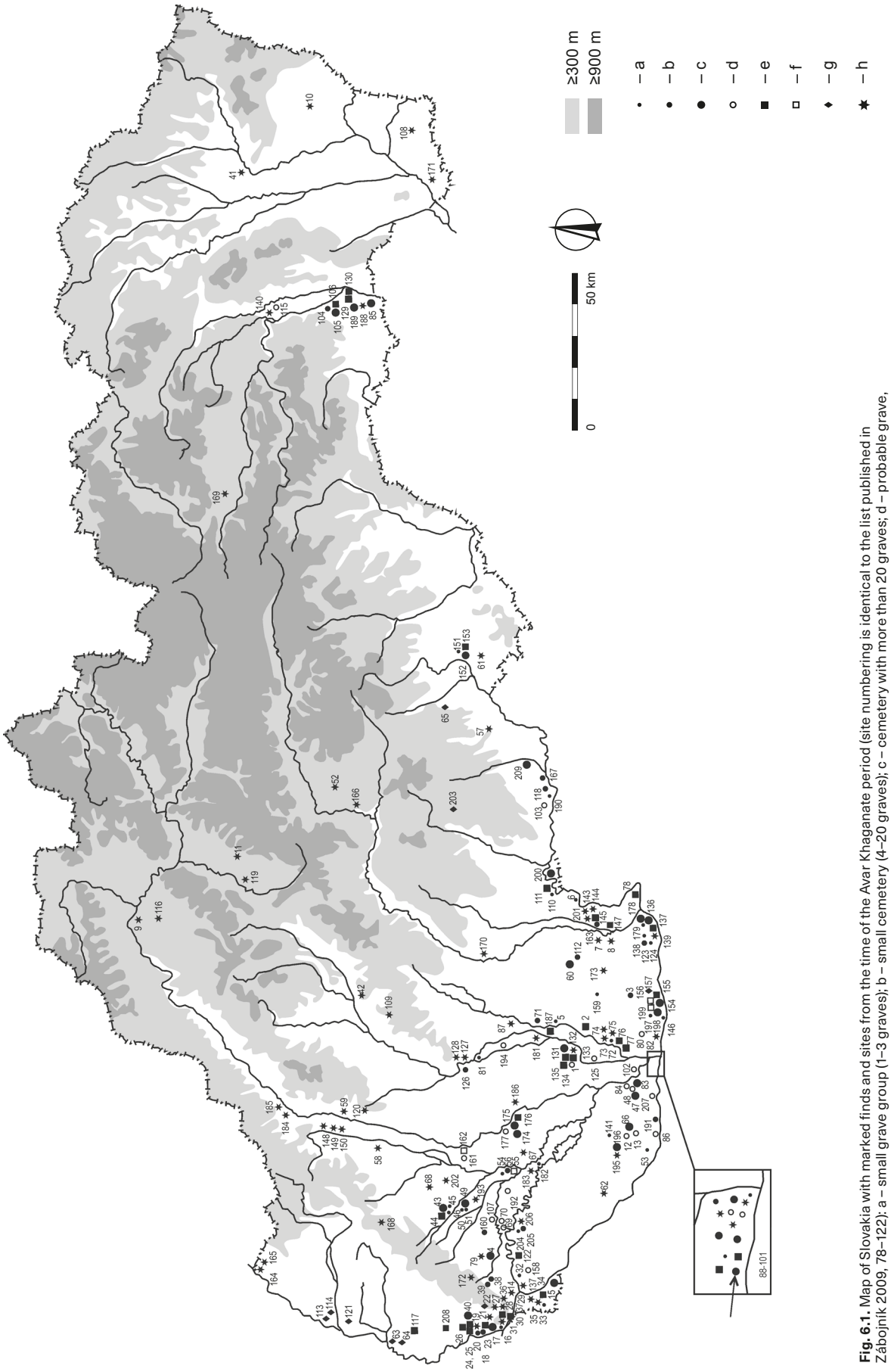


Fig. 6.1. Map of Slovakia with marked finds and sites from the time of the Avar Khaganate period (site numbering is identical to the list published in Zábojník 2009, 78–122): a – small grave group (1–3 graves); b – small cemetery (4–20 graves); c – cemetery with more than 20 graves; d – probable grave, uncertain cemetery; e – examined settlement; f – probable settlement discovered by examination; g – hoard; h – isolated find. Author J. Zábojník.

Site	Site abbreviation	No. of graves	No. of equestrian graves	No. of disturbed ('looted') equestrian graves	No. of recently disturbed equestrian graves
Komárno, Rožná Street (formerly Váradi Street)	KOM IV	28	21	14	6
Komárno (Doprastav building site / Hadovská Road)	KOM VIII	25	11	9	?
Komárno Lodenica	KOM IX	153	61	51	9

Tab. 6.1. Comparison of the most important cemeteries from the time of the Avar Khaganate in Komárno from the perspective of the occurrence of equestrian graves.

In addition to numerous equestrian graves, another phenomenon that is shared by multiple richly furnished cemeteries in the area of the Komárno 'triangle' is a high number of secondary interventions. They had different causes (Zábojník 2012). Robbing of richly furnished graves can be assumed above all in the case of the Komárno IV, VIII and IX cemeteries (Tab. 6.1). The aim undoubtedly was to retrieve the extraordinarily valuable grave goods they contained, above all belt fittings and richly decorated, often gilded, parts of horse harnesses. The grave robbers presumably stole many precious and valuable objects. Grave 78 at Komárno IX cemetery represents a somewhat peculiar case. A not very large secondary intervention was situated (as usual) in the area of the upper part of the human skeleton (Trugly 1987, Abb. 8: 4). Despite that, the grave yielded a more or less complete assemblage of belt fittings. The explanation is that the set was not located in the so-called functional position, in the area of the deceased's waist, but on the side and, therefore, remained untouched by the secondary intervention. On the contrary, the intervention in grave 149 was totally devastating (Trugly 1993, Abb. 44).

The importance of the extraordinarily rich graves at cemeteries in Komárno's cadastral area is amplified by finds from the cemetery in Radvaň nad Dunajom – Žitava I, where the graves yielded above all magnificent belt fittings and luxury horse harness decorations (Budinský-Krička 1956; Čilinská 1963). We only need to add that the straight-line distance between the cemeteries in Komárno and Radvaň nad Dunajom is ca 16 km.

Compared to the quantity of graves and cemeteries, the number of settlements that can be linked to the Avar Khaganate is relatively low. Several settlement features datable to the period of the Avar Khaganate have been uncovered in the city of Komárno, in the immediate vicinity of Komárno IX cemetery. They contained not only pottery vessels and shards but, sporadically, also several metal objects (Trugly 1996). Whole manually made vessels similar to finds from the Dunaújváros site and shards from the circle of so-called grey pottery are important from a dating perspective.

The Avar Khaganate presumably went through a certain 'federalization' of its power structures, especially in the late Avar period. Besides the ruler, the khagan, written sources originating in the Frankish milieu also mention other high dignitaries. Based on a detailed analysis of written sources, Slovak historian J. Steinhübel (2003, 16) assumes the existence of the 'tudunate', a unit headed by the tudun,[3] in the western part of the Avar Khaganate, i.e. the territory of the former Roman province of Pannonia. Another high-positioned dignitary of the Avar Khaganate was undoubtedly the kaphkan, and it is to this figure that Czech historian D. Třeštík (2001, 112) links the power centre in the Komárno area. He assumes its decline during the reign of Kaphkan Theodor, and it cannot be ruled out that this is reflected in the absence of equestrian graves and militaria in the two eastern parts of the Komárno IX cemetery (Zábojník 1995, Abb. 7).

Despite the massive quantity of secondary interventions in the graves (robbery), disturbance or even destruction of some units due to groundworks, an extraordinary assemblage of finds comes from Komárno IX cemetery. An analysis of the catalogue of the published graves and finds (Trugly 2008) has yielded the following figures: rich or even extraordinary belt fittings were found in 15 graves of the mentioned cemetery. Valuable or even unique metal parts of horse harnesses, many gilded, were part of

3 For more information on the term tudunate see Pohl 2018, 217, 271, 357, 360–362, 384, 386–389, 530–532, 542–545.

21 find complexes. Cutting weapons (usually single-edged direct-blade cutting weapons) were found in seven graves. Grave 78 yielded a seax, and the find complex of grave 142 contained a cutting weapon with a curved blade (sabre), among other finds. Bone or antler (no analyses have been carried out) parts of composite bows come from eight graves.

Most prestigious finds from the Komárno IX cemetery come from male graves. However, some luxury objects (fasteners and necklaces consisting of a large number of beads), as well as the occurrence of female equestrian graves, indicate that women did not have a subordinate status in this society. A selection of perhaps the most prestigious objects that have been discovered in cemeteries in the territory of Slovakia is presented in this paper (Fig. 6.2–6.6). They include belt fittings, luxury parts of horse harnesses, as well as especially efficient militaria (cutting weapons, composite reflex bow reinforcement plates).

The concentration of cemeteries and finds (mostly grave finds) in the area of the Komárno 'triangle' evokes the impression of an important power centre and persons of high social status. Based on the number of luxury objects, it might have indeed been the seat of the kaphkan, and the graves or cemeteries are the final resting places of his magnates.

From a chronological perspective, it is important that monuments datable to all phases of the Avar Khaganate period have been found in the cadastral area of Komárno. The only grave finds for which the period's early phase can be documented in Slovak territory were discovered at the Komárno VI – Robotnícka štvrť / Akasztódomb site (Trugly 1982). Monuments representing the middle phase occurred in several cemeteries: Komárno I, V, IX, XII and XIV (Zábojník 2009, 96–99). A vessel, part of a human skull and an animal bone were found at the Komárno site, Kava part, during construction work

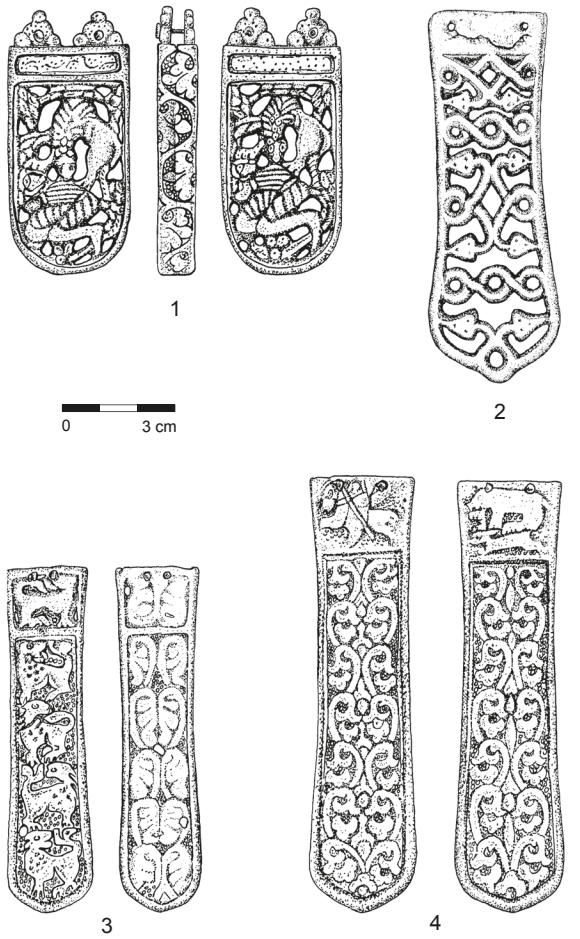


Fig. 6.2. Komárno IX (Lodenica). Large belt ends. 1 – grave 12; 2 – grave 107; 3 – grave 72; 4 – grave 71. After Trugly 2008, 16, tábla 3: 8a; tábla I: 2; 28, tábla 16: 14 a, b; tábla I: 3, tábla 42: 9, tábla I: 4; 27, tábla 15: 8 a, b.

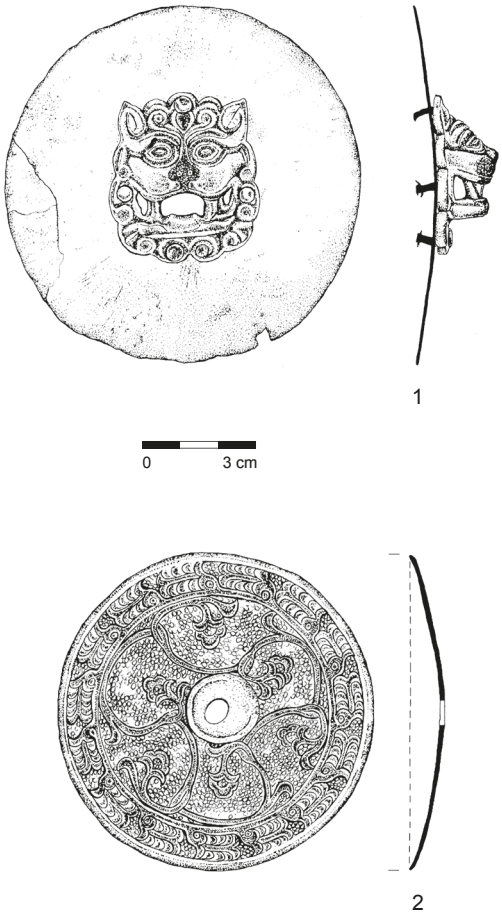


Fig. 6.3. Komárno IX (Lodenica). Phaleras. 1 – grave 103; 2 – grave 149. After Trugly 2008, 81, tábla. 38: 1, tábla II: 2; 56, tábla 84: 1.

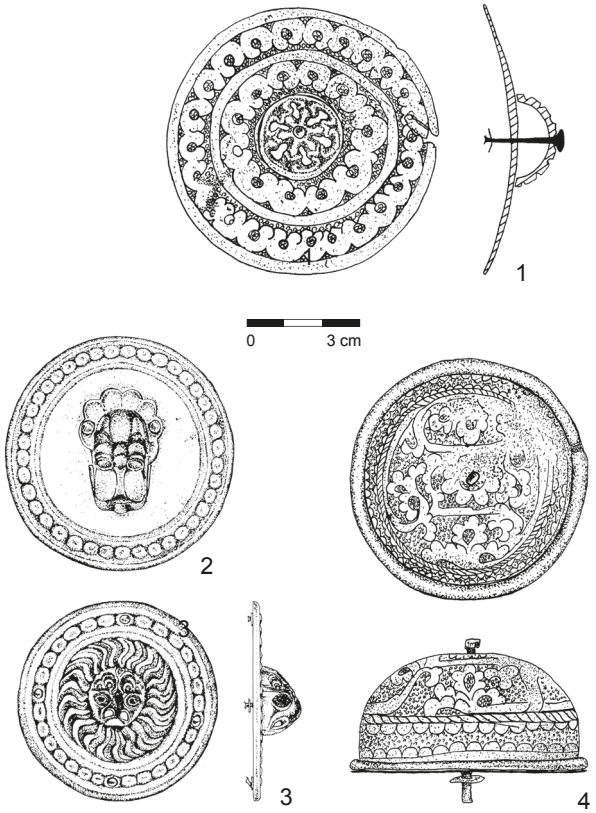


Fig. 6.4. Komárno IX (Lodenica). Phaleras. 1 – grave 78; 2 – grave 130; 3 – grave 114; 4 – grave 85. After Trugly 2008, 30, tábla 20. 4; 2; 49, tábla 68: 5; 3; 43, tábla 51: 1; 4; 32, tábla 27: 1 a, b.

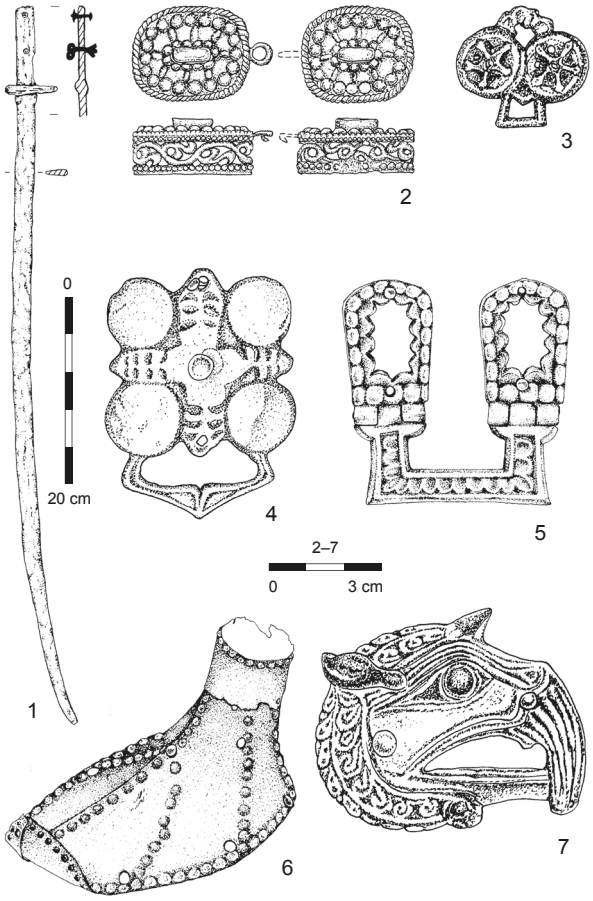


Fig. 6.5. Komárno IX (Lodenica). Weapon, fibula and horse harness decorations. 1 – sabre from grave 142; 2 – fibula from grave 81; 3 – horse harness fitting from grave 63; 4 – horse harness fitting from grave 80; 5 – horse harness fitting from grave 121; 6 – crest fitting from grave 142; 7 – griffin-shaped horse harness fitting from grave 36. After Trugly 2008, 54, tábla 81: 4; 82, tábla 24: 10; 25, tábla 12: 23; 31, tábla 23: 12; 46, tábla 59: 13; 54, tábla 89: 19; 21, tábla 8: 10.

(Alapy 1933, 41). A simple undecorated S-profiled pot can be classified as Prague Culture pottery (Fusek 1994, 204). However, the highest number of finds from sites in the territory of present-day Komárno fall into the late phase of the period.

As I have mentioned, an extraordinarily important centre of power presumably existed in the area of the present-day city of Komárno, based on unusually rich grave goods. The existence of similar power centres can be expected in multiple areas of the Avar Khaganate, especially in the later period of the polity's existence. One of them was apparently the north-east Tisza region, where the exceptionally rich Hortobágy-Árkus cemetery has been investigated (Szenthe, Gáll 2022). A huge cemetery with extraordinary finds in the cadastral area of the town of Zamárdi on the southern bank of Lake Balaton indicates that one such centre might have existed in that part of the former province of Pannonia (Bárdos, Garam 2009; 2014). In view of rich finds from other sites, however, other power centres cannot be ruled out within the Khaganate's territory.

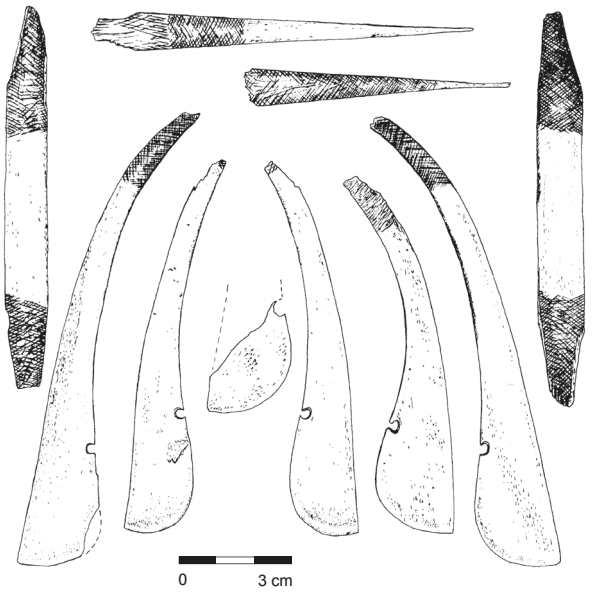


Fig. 6.6. Komárno IX (Lodenica). Bone/antler composite reflex bow reinforcement plates – grave 114. After Trugly 2008, 43, tábla 53: 4–13.

3. Conclusion

The Komárno 'triangle' at the confluence of the Danube and Váh rivers represents an exceptional cultural and historical landscape. From continuous prehistoric settlement, through the Roman period and the power of the Avar Khaganate, to the Habsburg fortifications and modern political changes, Komárno illustrates the dynamic development of Central Europe. The extraordinary density of richly furnished Avar graves, including rare female equestrian burials, underlines the region's role as a significant power centre of its time and a key site for understanding the cultural and political history of the Carpathian Basin.

Chapter 7

Hinterland of early medieval Veľký vrch hillfort in Divinka

Gabriel Fusek

1. Introduction

The paper describes current knowledge concerning the occupation of the hinterland of the early medieval hillfort situated on Veľký vrch [Big Hill] in the territory of the municipality of Divinka in northwestern Slovakia (Fig. 7.1). It is a region characteristic of Slovakia's mountainous areas with elevated highlands, closed basins, mountain valleys and relatively unfavourable natural conditions including, above all, the high altitude, steep changes of terrain relief and gradient, low fertility of the soil and less favourable climatic conditions. Compared to lowland regions, the rougher natural environment requires different settlement strategies and use of the landscape – adaptation to its less favourable character (for more information on this theme, see Fecko 2016).

In the Great Moravian period, the Divinka hillfort has traditionally been regarded as the main local territorial-administrative centre of a rather large region of northwestern Slovakia, albeit with an unspecified territorial extent. This theory works with archaeological sources of varying quality, creating arbitrary historical constructs according to the preferences of the individual authors (e.g. Petrovský-Šichman 1964a; 1964b, 98; Čaplovič 1998, 165–166; Hulínek 2008, 211). From the available written sources, however, it is not clear at all whether the northern parts of Slovakia were an integral part of the Principality of Nitra and, if they were, when and how they were incorporated into the principality (Turčan 2013, 11). The organisational structure they belonged to after the fall of Great Moravia is likewise unknown – whether they were autonomous within certain limits, or belonged under the dominion of one of the neighbouring powers. The region was incorporated into Hungary in the late 11th century (Beňko 1996, 36).

When discussing the issue of the position of the hillfort in Divinka in the system of contemporary fortifications, we encounter a fundamental problem in the form of insufficient field research. This renders the comparison of qualitative and quantitative data in fact impossible, and the interpretations of the insufficiently known archaeological sources tend to be based on subjective, rather than objective perception. Only very fragmentary information is available on known potential smaller and larger sites; several strongholds may still remain undiscovered, and none of the known strongholds have yet been excavated. An excellent example of this problem is the large hillfort in Pružina, Mesciská site, situated above the southern end of the Domaniža Basin. Its early medieval horizon was not identified until the late 20th century and was confirmed only ten years ago. The results of a geophysical survey have not yet been verified by excavation, even though the site has yielded extraordinary finds (Kováčová, Kovár, Milo 2015). The fact that Divinka in the Považie region and Vyšný Kubín in the Orava region (Čaplovič 1987, 213–232) are the only two more thoroughly examined early medieval strongholds in northwest Slovakia may be the reason they are regarded as local administrative centres. There have even been considerations of an exchange of the functions of the main stronghold between them and a change of their position in the social system during the

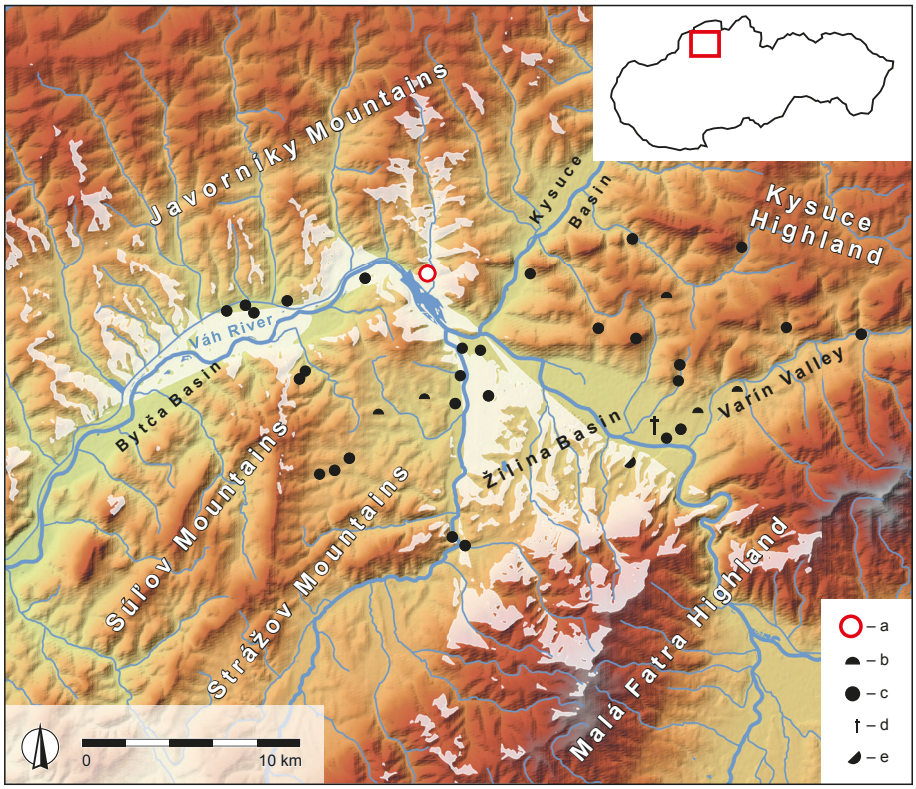


Fig. 7.1. Map of Slovakia with the working area, the position of the Veľký vrch hillfort in Divinka, the areas visible from it and early medieval sites in its hinterland are marked: a – Veľký vrch; b – barrow/barrow cemetery; c – settlement; d – sword; e – sickle hoard. Author G. Fusek, modified by M. Filip.

9th century (Hulínek 2008, 211, with lit.). A more rational view of the theme is offered by P. Šalkovský. Of the ca 100 strongholds in Slovakia that have traditionally been considered early medieval based on more plausible dating, he has earmarked 24 sites that are meaningful to analyse and interpret the results. At least 20 more strongholds can be added to them based on present knowledge, though none in the region and category we are studying (Šalkovský 2015, 12–16, obr. 6).

In contrast to theories of a large territory controlled from Divinka, J. Moravčík recently voiced a more modest opinion, according to which it was the central stronghold of the Žilina and Bytča basins (Moravčík 2015, 72–73). Sites in the Považské podolie valley and adjacent mountain ranges close to Považská Bystrica and Púchov, which are also thought to have potentially fallen under the administration of the Divinka hillfort (Paráčová, Majerčíková 2013, 20, 21), already belong in a different and separate geographic unit. Naturally, the role of a stronghold as an administrative centre is completely different from the issue of its immediate hinterland in the microregion or mesoregion with boundaries reachable in a reasonable time, corresponding to the term functional region (Šalkovský 2015, 105). The mountain ranges close to Divinka structure the space to such an extent that we cannot use models based on which various levels of the hinterland of strongholds have been determined in lowland regions. For example, the method of determination of the first occupation zone used in Mikulčice (at a distance of 700 m from the centre of the acropolis; Poláček 2008a, 257) cannot be used in our conditions. The geomorphology of the landscape is so determining that even an economic hinterland in a radius of 6–10 km from the hillfort (cf. Dresler, Macháček 2008, 314; Galuška 2008, 254; Poláček 2008a, 266; Hladík 2014, 171) need not have corresponded to the needs of the hillfort's inhabitants. The calculation would also have to take into account the number of its inhabitants, which cannot be calculated at present. Another important factor is the low productivity and quality of the soil. For these reasons, we have focused our attention on basins, lowland geographical units enclosed by mountains, above which the Vel'ký vrch hillfort was built.

Vel'ký vrch rises over the Váh Valley on the north end of the Bytča Basin, where it is adjacent to the Žilina Basin and over the dell of the Divina Stream (Fig. 7.1). The River Váh changes direction there, flowing in from the southeast and continuing to the southwest. The River Kysuca empties into the Váh in the bend, and the distance between their confluence and the hillfort is ca 3.5 km. The hillfort itself is situated in the Javorníky Mountains on the eastern, right bank of the Váh. The Javorníky Mountains form the

boundary of the entire Bytča Basin on this side, with the Súľov Mountains stretching to the east of it. They also form the western boundary of the Žilina Basin, which is delimited from the south by the Strážov Mountains, from the east by the Malá Fatra and from the north by the Kysuce Highlands. Its central part is formed by the Žilina Hills, with the River Váh as its axis. The southern subunits of the Žilina Basin include the Rajec Basin, wedged between the Súľov Mountains and the Malá Fatra, and the Domaniža Basin between the Súľov and the Strážov Mountains. In the east, the Žilina Hills connect to the narrow Varín Valley between the Malá Fatra and the Kysuca Highlands. The valley system is made complete in the north by the Kysuce Basin, a geomorphological part of the Javorníky Mountains neighbouring the territory of Divinka. Their mountain range, which separates the Kysuce region from the Váh Valley, is only 2.5 km distant from Veľký vrch.

Since the Veľký vrch hillfort is situated on the boundary of two or three basins, it has been somewhat automatically assumed that it was the centre of these regions. However, an alternative hypothesis cannot be ruled out altogether, namely that it protected the population of the Bytča Basin from attacks from the north (Kysuce Basin) and east (the Žilina Basin), where there was an as-yet unknown fortified centre. If it did control all three basins, it is not very likely that within the Žilina Basin, it also included its subunit, the Rajec Basin, with a closure on their boundary in the area of the municipality of Turie (Petrovský-Šichman 1964b, figure on p. 78) and the even more southerly situated Domaniža Basin. Therefore, taking into account the geomorphological structure of the territory and geographic distances, the present work attempts to characterise the occupation in the Bytča Basin and, within the Žilina Basin, in the Žilina Hills, the Varín Valley and the adjacent Kysucké bradlá. No early medieval sites are known from the Kysuce Basin. Therefore, the territory delimited by J. Moravčík represents a mesoregion that has its boundaries within sight of the hillfort (Fig. 7.1), which might have been important for visual control and the signalisation of various events. The distance between Veľký vrch and the end of the Bytča Basin is 20 km, while the boundary hills of the Žilina Basin are 15 km distant in a straight line.

The extensive early medieval complex at Veľký vrch consists of the acropolis, the peak area and the suburbium. Fortress walls, the entrance gate and the inhabited area they protected have been investigated archaeologically. The construction of wooden above-ground houses on stone foundations is characteristic of the local settlement. The excavations yielded objects of everyday use made of various materials, as well as parts of warrior equipment and arms. Many agricultural and craft tools come from several hoards of iron artefacts (Fusek, Slaná 2020).

2. History of research

A key work used to this day as the basis for all studies discussing the settlement of northwest Slovakia is the list of Slavic sites made by A. Petrovský-Šichman (1964b). His catalogue features 251 entries situated in a vast territory stretching from Liptov to Turiec, Kysuce, the Žilina and Bytča basins and as far as the area of Dubnica nad Váhom in the Považské podolie Valley (Petrovský-Šichman 1964b, figure on p. 90). Chronologically, they range from the 8th to the 14th centuries. The work is burdened by the contemporary view of chronology. The finds are of different characters; some are drawn, some only briefly described. The publication also includes the author's rather peculiar interpretation, which is reflected not only in the assessment of the sources but also in their description. Therefore, it needs to be approached cautiously and critically (Rejholcová 1971, 98; Kopták 2015, 41) – which has not always been the case.

Various articles and studies by J. Moravčík have contributed greatly to knowledge of the early medieval occupation of the area under study, and he has also published many archaeological sources and field observations in these works. Ondrej Šedo, who also worked in the region for some time, likewise deserves much credit for the advancement of our knowledge. From the younger generation of researchers, we need to point out the activity of A. Slaná and Z. Staneková.

The aforementioned site list by A. Petrovský-Šichman features 70 sites from our working area, including 21 barrow cemeteries and standalone barrows. However, we need to add that excavations have only safely proved an early medieval origin for three or four of them: Krasňany[1] [32], Žilina-Bánová [33] and Bitarová [29]. A barrow from Kotrčiná Lúčka [31] listed by Petrovský-Šichman may be identical to a barrow whose remnants were investigated by

1 For sites included in my catalogue, I only add references to the literature when quoting particular pages or illustrations. The sites are followed in square brackets by the order numbers under which they are presented both in the catalogue and on the maps.

O. Šedo and dated to the 9th century.[2] Excavations at other barrow cemeteries have not confirmed an early medieval dating or have shown that they were mere heaps of stones collected from fields, sometimes on a cultural layer.[3] Most barrow cemeteries have not been excavated, however, and their prospective inclusion in the studied period cannot be ruled out *a priori* without excavation. Of another 49 sites, the author dates ten to the Great Moravian period. However, he had no finds available for some of them and based their dating on free reflections or toponyms. He described 11 settlements, strongholds and isolated finds as Slavic. Their early medieval dating can be problematic, however, because he basically regarded all finds from a large territory and a period covering 600–700 years as Slavic. Most of the sites have yielded surface finds of potsherds, often isolated. When making her list of Slavic sites in the central Slovakia region, M. Rejholcová only accepted nine sites from this extensive set, and regarded only two of them as Great Moravian (Rejholcová 1971, 101–126). The situation is different when some fields yielded even later finds that enabled dating of the sites. Much information about finds and primary literature that may serve as a starting point in research is also included in the corpus of sources on the history of settlement in Slovakia. Despite the lack of a critical apparatus, we cannot say that all information from earlier literature has been adopted uncritically (Hanuliak 1992; Ruttkay 1992).

In an effort to verify the dating of the finds, K. Škorvánková and the present author processed and documented all finds from fieldwalking surveys available in the Považské múzeum in 2019–2020. The thesis my colleague later wrote based on the results of this effort (Škorvánková 2020) includes photographs of selected finds and drawings of their sections.

3. Pottery and dating of the finds

A fundamental problem encountered when studying finds from the region is the lack of a means of dating. Most sites are dated using sherds from fieldwalking surveys, whose determination is often subjective. Not even the cemeteries have provided inventories that would help date settlement finds. In fact, the only regular archaeological excavation at a settlement took place at the Frambor site in Žilina [23], where a sunken-featured building from the Early Slavic period and four Great Moravian settlement pits were examined. The local extensive pottery assemblage was also dated based on typological features, as the accompanying metal material did not provide a basis for its more precise chronological determination.

In fact, the only dated pottery in the studied region comes from the Veľký vrch hillfort. In archaeological contexts, it was accompanied by metal objects typical of the later phase of the Great Moravian period whose use culminated in the second half of the 9th century. The hillfort ceased to exist during the first half of the 10th century (Fusek, Holeščák 2019, 162, 164, Abb. 2). Absolute dating is based on the radiocarbon analysis of 12 carbonised wood samples taken from fortification structures. Based on current knowledge, the hillfort was built, with a low level of probability, after 893, but most probably only after 917.[4] The fact that the soil from the defensive structures did not contain early medieval pottery means that their construction had not been preceded by the existence of an unfortified hilltop settlement. Based on the combination of dating by minor objects and radiocarbon dating, the acquired pottery comes approximately from the first half of the 10th century. A comparison of archaeological and natural science dating has also established the continuity of survival of Great Moravian monuments up to the middle of the 10th century at other sites (Macháček, Dresler, Přichystalová 2018, 343).

2 By mistake, he localised it at the boundary of the cadastral territories of the municipalities of Gbeľany, Kotrčiná Lúčka and Dolný Vadičov in the chapter title. But Gbeľany does not neighbour the other two municipalities. According to the description of the archaeological situation, there is no doubt that the barrow was situated in the cadastral territory of Kotrčiná Lúčka (Šedo 1983, 236).

3 At the Žilina-Chrasť site, for example, the 'barrows' did not bear any traces of graves, and the stones were heaped on a settlement layer of the Lusatian culture; the situation was also similar at the Hôrky site (Budinský-Krička 1948–1949, 273). When examining two 'barrows' in Krásno nad Kysucou, A. Petrovský-Šichman found charcoals and a naturally-formed stone, which he interpreted as a Slavic idol (Petrovský-Šichman 1961, 126–130). Later excavations at the site also did not lead to positive discoveries; the heaps of stones lay on a prehistoric, probably Eneolithic settlement (Šedo 1980a; 1981b, 283). According to a note archived in the Institute of Archaeology of the Slovak Academy of Sciences, V. Budinský-Krička visited the site in 1960. He says in it that the stone heaps could only be regarded as barrows with much reservation (Budinský-Krička 1960).

4 The difference between the dating published to date (e.g. Fusek, Holeščák 2019, 169) and the one listed in the present paper is due to the update of the OxCal calibration programme to version 4.4.2, which uses a new atmospheric curve to calibrate raw ^{14}C data.

The large assemblage of finds from Veľký vrch represents suitable comparative material for the dating of finds from the working area. To date, the excavations have provided data on 549 pots. Their analysis has enabled the characterisation of their typical features.

Morphologically, most pots are of heavy and bulbous shapes, with a small difference between the height and the width of the vessel. Slim pots are rarely preserved. The profile of the upper part of the vessel is more or less significantly S-shaped, depending on the level of curving of the mouth. Their rims are rounded or flat; the occurrence of groove-profiled rims is marginal. Marks created by the potter's wheel axis on vessel base are often visible on bottom sherds, but other marks only occur in rare cases.

Pottery with a body decorated using two kinds of tools – a comb and a single-point tool – was found at the site (Fig. 7.2). However, comb decoration heavily predominates over the use of the single-point tool. The principles of decoration can be schematically outlined in the following points: 1) the upper parts of the vessels, the mouth and the neck, are undecorated; 2) the main decorative elements on the convex parts of the pots are waves, accompanied by straight lines; 3) the decoration of the lower parts of the vessels is rarer, where horizontal lines dominate here, wave decoration is less frequent; 4) decoration only exceptionally reaches to the lowest part of the vessels close to the bottom; 5) very few vessels are decorated only in the upper parts of the body; 6) wave decoration carved by a comb occurs most frequently.

What is lacking altogether is the application of decorative elements to a static vessel and poked decoration – its heyday in the southern parts of the country falls into the pre-Great Moravian horizon, but this does not mean that it ceased to exist completely in the 9th century. The custom of decorating vessels with a single-point tool developed in parallel with the decline in the aforementioned method of decoration (for more information, see Fusek 2008, 31–33, with literature). Among decorative elements from the later horizon of the Great Moravian period or their arrangement in ornaments, we do not encounter at Divinka uniformly distributed simple orbital lines stretching into the lower parts of vessels, densely engraved lines or helices, short slanting or folded incisions by a graver under the neck and on

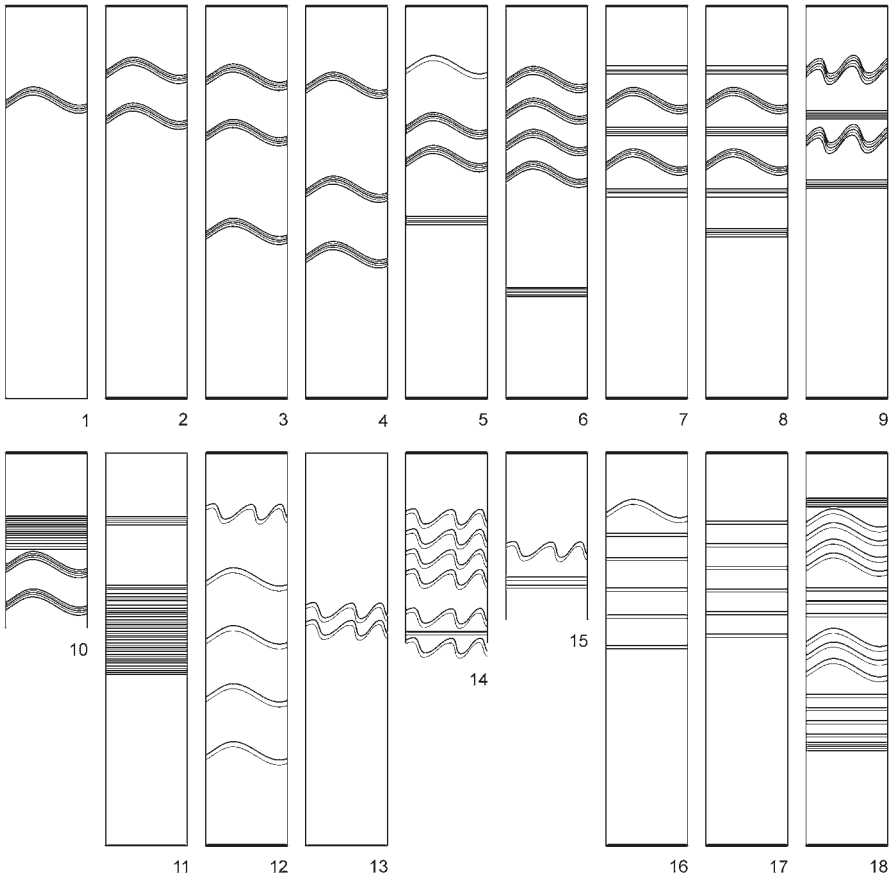


Fig. 7.2. Divinka. Schematic depiction of ornaments on the pots from Veľký vrch. Author G. Fusek.

the shoulders, high wavy lines on the bodies, etc. Particularly conspicuous is the absence of neck decoration with a wavy line, a characteristic feature that is encountered in southwest Slovakia from the later Great Moravian horizon and, according to grave finds, throughout the 10th and in the early 11th centuries (Fusek, Samuel 2013, 57–58; Hanuliak 2015, 132).

The possibilities to compare information gained by analysis of the properties of pottery are limited in the region of the Bytča and Žilina basins due to the insufficient state of field research. Finds from three pits in the single examined settlement, Žilina-Frambor [23], are described in general in the literature; a selection of sherds have also been partially quantified and published (Vangľová 2010, 94, 99, 106–107, tabela 1, 3; tab. XIV–XVI). Data on vessels found in graves from three barrow cemeteries are also available for comparison, but due to the method of publication, they can only be used for certain comparative analyses.

With one exception, simple morphology is typical for the mouths and their rims at Frambor, and this fully corresponds to finds from Veľký vrch. As pottery from barrow cemeteries in the region has only been published in photographs, it is impossible to seek analogies in mouth shapes and details. Fieldwalking finds of bottoms with imprints of the wheel's axle are not known from the Bytča and Žilina basins, but in the examined barrow cemeteries in the Žilina Basin – Bánová [33], Bitarová [29] and, above all, Krasňany [32], imprints of the wheel's axle are present on the bottoms of most discovered vessels. These technical imprints are also the only ones recorded at the Žilina-Frambor [23] settlement. They evidently need to be considered a regional specific, and vessels with relief marks on the bottom are of foreign origin.

Comb poked decoration occurs on the bodies of pots from Frambor (Vangľová 2010, tab. XII: 8, 9; XIII: 4, 10; XIV: 8; XV: 5, 9; XVI: 7). The absence of this traditional decorative element at Veľký vrch might indicate that the finds from Divinka are somewhat later, but no support for absolute dating is available from Frambor to corroborate such an assessment.

In comparative studies, we rely on analogies from more distant areas, which is not an optimal situation, especially when working with pottery material. On the other hand, supra-regional comparison makes it possible to distinguish local specifics in pottery production. For understandable reasons, the solution of these specific problems cannot be part of the present study. In the territory of the Bytča and Žilina Basins, we do not yet have enough information about the character of local pottery production in the Great Moravian period. Based on the present state of knowledge of the not very numerous sources, we can generally state that it was influenced only to a small extent by trends from the central regions of Great Moravia; this is especially true of the application of vessel decoration using single-point tools with all its nuances, and of the creation of more complex rims; marks on the bottoms are also missing.

Due to the fragmentary character of fieldwalking finds and their very low numbers from individual sites, it has been impossible to work out a more detailed typological scheme of the development of pottery. Over time, prospective technological changes in its production and innovations in decorative methods were smooth, rather than abrupt, which is why it is difficult, if not impossible, to chronologically fix any turning points more precisely. Our chronological categorisation of the finds has proceeded from the real preservation condition of the sources and employed a two-phase framework dating. The chronological horizons do not follow each other because the centuries that delimit them overlap. The procedure of categorisation into typologically 'older' finds from the 9th–10th centuries and 'younger' ones from the 10th–11th centuries reflects the tendency of developmental changes without determining the absolute dating of the time they took place. Such a pragmatic approach to chronological issues is certainly not ideal, but it makes it possible, to some extent, to study changes in the development of occupation in the investigated area. In many cases, however, it was necessary to abandon even this coarse classification and record the finds only as early medieval. Even such recording is useful, however, as it represents the positions of prospective settlements and thus has the potential to provide a more credible testimony to the knowledge of the history of occupation of the region. Their informative value is limited today, but the dating can be made more precise by prospective future fieldwalking surveys or excavations. For the purposes of this work, the early medieval period as a whole is delimited by the 9th and 11th centuries.

Virtually all works, including contemporary ones, discussing the history of the region traditionally put the beginnings of early medieval occupation to the 8th century, more precisely to the pre-Great

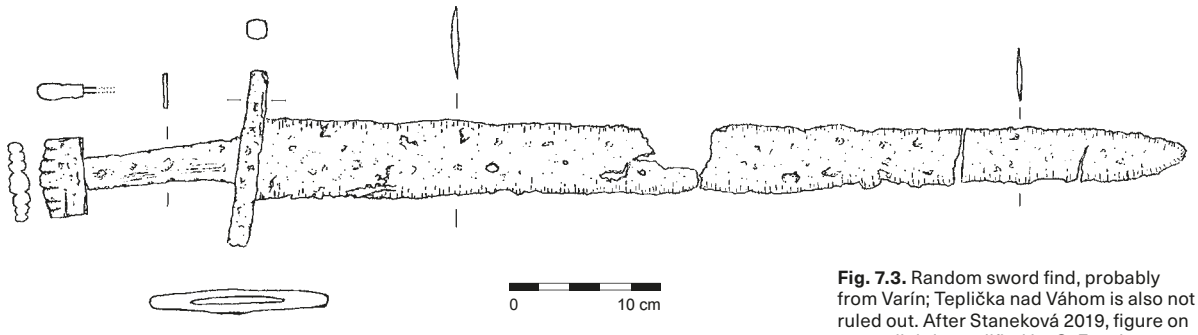


Fig. 7.3. Random sword find, probably from Varín; Teplička nad Váhom is also not ruled out. After Staneková 2019, figure on p. 14, slightly modified by G. Fusek.

Moravian period,[5] non-critically taking over dating from an earlier past, based on publications by A. Petrovský-Šichman. So far, however, no argument that would corroborate such an early chronological position has been presented, not even within material from barrow cemeteries. This information is not new – it was pointed out by M. Rejholcová (1971, 98) more than a half a century ago and also recently by V. Turčan (2013, 8–9).

Chronologically more sensitive finds that undoubtedly document 9th-century occupation of the Žilina Basin include a spur of the 4b type (Ruttkay 1976, Abb. 72) from barrow XXXI in Krasňany [32] (Budaváry 1938–1939, 94, tab. X: 6, 7, 9) and a K-type sword probably from Varín [35] (Fig. 7.3). Pottery finds from Divinka – Veľký vrch are dated to the first half of the 10th century. Distinguishing 11th-century finds from 10th-century artefacts is problematic. From a formal perspective, the beginning of the High Middle Ages in Slovakia is dated with the formation of the Kingdom of Hungary in 1000 (Hrubec 1980, 231). However, pottery production in the 11th century continued in the traditions of the previous period. The chronological boundary between the early medieval production tradition and the beginning of the production of characteristic high medieval pottery (variously profiled edges, simplification of ornaments, less frequent comb decoration, slanting incisions under the neck, use of the tool creating wider grooves, occurrence of container shapes) remains unclear in Slovakia; even in the south of the country, it did not occur before the second half of the 11th century (e.g. Hanuliak, Mináč, Pavúk 2008, 128). The transition was smooth rather than sharp, and earlier production and decorative procedures manifest themselves to a certain extent even in the 12th century. This creates a naming discrepancy, as our younger early medieval pottery horizon, which is supposed to formally end at the turn of the 10th/11th centuries, in fact overlaps into the following, high medieval period.

Despite these rather unclear circumstances, we have attempted to date fieldwalking settlement finds deposited in the Museum of the Považie Region in Žilina. First, it was necessary to exclude those that are dated in the accession books and publications by various authors to the 8th–10th centuries, the Great Moravian period (9th century) or the post-Great Moravian period (10th century) but are actually later or not datable at all. A regularly repeating finding was that a pottery assemblage dated to the 9–10th centuries was in fact high medieval. In extreme (but not rare) cases, there were even late medieval and modern finds. Following a review of the sources, we eliminated finds from 25 sites deposited in the museum's collections. Finds from 28 settlements remained catalogued; of them, finds from 24 could be studied, but, as we learned, some sherds were misplaced in a small number of cases. Finds from the Horný Hričov [6], Horný Vadičov [7], Lopušné Pažite [12] and Žilina-Bánová [25] sites are not deposited in the museum. For those, we have accepted the dating by the authors of the finds, but our negative experience with the dating of nearly half of the compared sites urges caution, which is why they are only recorded as early medieval sites, without the originally published century specification. We should also point out that fragments of later, undoubtedly high medieval vessels were found at multiple sites with sherds of an early medieval character. However, we have no criteria based on which we could exclude these settlements from the list. There are also cases of sites that could be dated to our older horizon for subjective reasons, but since no indisputable evidence corroborating it is available, they are only recorded as early medieval. The

5 From the pan-Slovak rather than regional chronological perspective.

quality of the assessed fieldwalking sources is not the only problem; the number of sherds that have been preserved to this day in the museum's collections also has a negative impact. The losses are minimal and the numbers usually correspond to the inventories. The reality is, however, that as many as nine sites are datable by a single sherd, four ones by two sherds and one by three sherds. Only two settlements known from fieldwalking surveys yielded a greater number of sherds (24 and 25) datable to the Early Middle Ages.

As for barrows, even after ruling out an 8th-century dating, there is more or less agreement that they are Great Moravian, with an unspecified overlap into the 10th century. In this context, however, we need to add that no row cemeteries from the 10th–12th centuries are known from the region as yet; burials at churchyards are registered after this period. As finds from settlements document that there was no discontinuity in occupation, the hiatus may indicate that either the local population buried their dead in a manner that is not yet documented by archaeological methods, or burials under barrows continued later than is traditionally assumed; the latter option would indicate a mistake in the dating. At present, we have no satisfactory explanation for the problem. J. Moravčík dated one of the barrows from Gbeľany to the 10th–11th centuries, but without providing his reasoning (Moravčík 2000, 135). In this case, the possibilities of dating based on the collected finds could be overestimated.

4. Characteristics of occupation

A map of the studied region with marked early medieval sites (Fig. 7.1) gives the impression of a rather densely populated territory dominated by the Veľký vrch hillfort, despite the fact that, following the review of archaeological sources, the presented list only contains about a third of those listed in the literature. We get a different image, however, when taking into account the temporal aspect and the information value of the individual sources (Fig. 7.4, 7.5).

No early medieval sites are known from the Kysuce Basin. The upper, northern part of Kysuce was not settled until the 16th century; in the lower part, continuous occupation is confirmed from the 13th century (Šedo, Hajnalová 2005, 264). In the previous period, according to the present knowledge, the southern part of Kysuce was a marginal zone of the occupation of the Žilina Basin. Published fieldwalking surveys have indicated high medieval human activity above all in the territory of the municipality of Radoľa. Early medieval, or potentially early medieval sites only come from the Vadičov Valley (southern part of Kysuca Basin). As the author of the report has not published illustrations of the finds, the dating cannot be verified or commented on. It is an assemblage of finds from a settlement layer at a small hillfort of the Púchov culture at Malá Ostrá Hill in Lopušné Pažite [12] and sherds of fieldwalking origin in Horný Vadičov [7]. The only early medieval feature that does not raise doubts is a barrow with examined remnants of a grave in Kotrčiná Lúčka [31], which we categorise in our older early medieval horizon. The grave might hypothetically have been contemporary with the existence of the Veľký vrch hillfort.

The Kotrčiná Lúčka barrow [31] is spatially related to two barrow cemeteries examined in the Varín Valley in the eastern part of the Žilina Basin, in Gbeľany [30] and Krasňany [32]. A second group of two barrow cemeteries is situated in the southwest of the Žilina Hills, in Bitarová [29] and Žilina-Bánová [33] (Fig. 7.4). Barrow burials represent the only manifestation of burial practices in the region from the period of our first early medieval horizon. True, as explained above, barrow burials cannot be ruled out in the later period, either. The barrow cemeteries indicate the existence of nearby communities that buried their dead there. The nearest (and the only known) contemporary settlement to the eastern group is the relatively distant Prostredný lán field in Gbeľany [5]. Presumably, therefore, more traces of occupation may be found in their neighbourhood in the future. This assumption is corroborated by an isolated sword find from nearby Varín [35]. The barrows in Žilina-Bánová [33] are situated in a hilly territory above the valley where occupation that cannot be dated more precisely so far has been discovered on a river terrace. No settlement is known near Bitarová [29]; more precisely, a settlement in Podhorie, Vaščanské field [16] is ca 2.5 km distant, but the terrain there is hilly. A settlement in Porúbka [17] is situated in the southern gate, in a natural closure of the basin; excavations have been carried out there, but no settlement features have been found. The last settlement of the older horizon in the Žilina Basin, the most important in terms of finds, is situated at the confluence of the Váh and the Rajčianka, at the Frambor site in Žilina [23]. In the Bytča Basin, only the sherds collected at the Kľuky field [2] in Bytča – Hliník nad Váhom can be chronologically matched with it without fundamental objections.

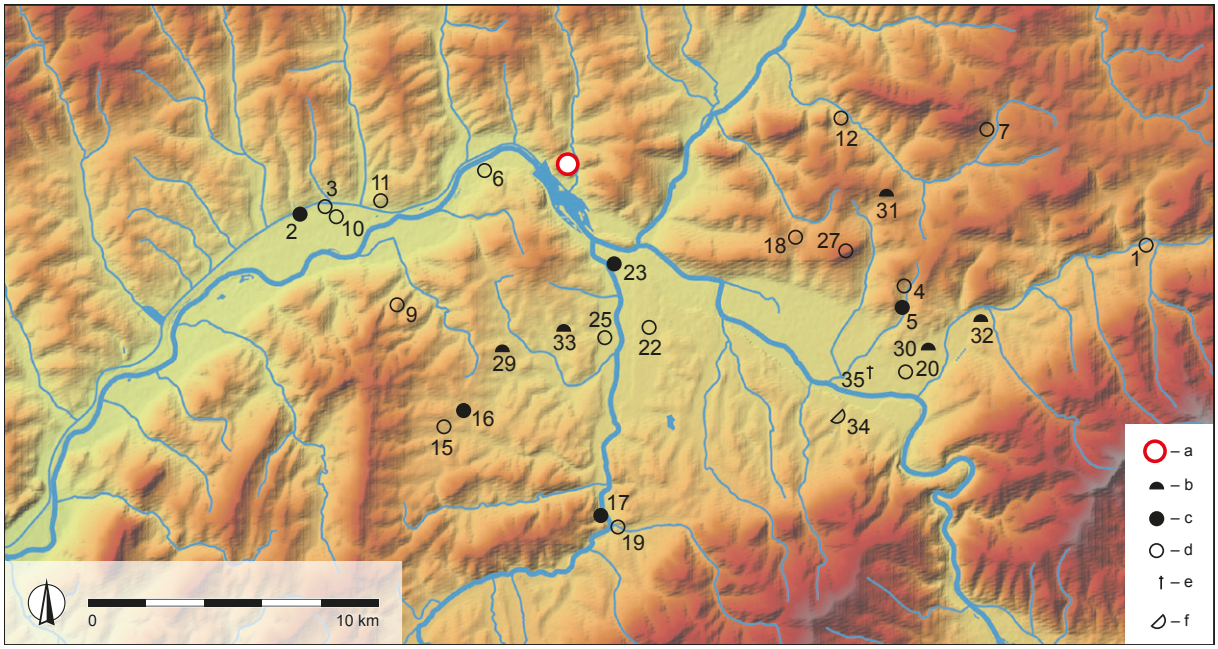


Fig. 7.4. Surrounding area of the Veľký vrch hillfort in Divinka in the older early medieval horizon: a – Veľký vrch; b – barrow, barrow cemetery; c – settlement; d – early medieval, without more refined dating; e – sword; f – sickle hoard. Site numbers correspond to catalogue numbers. Author G. Fusek, modified by M. Filip.

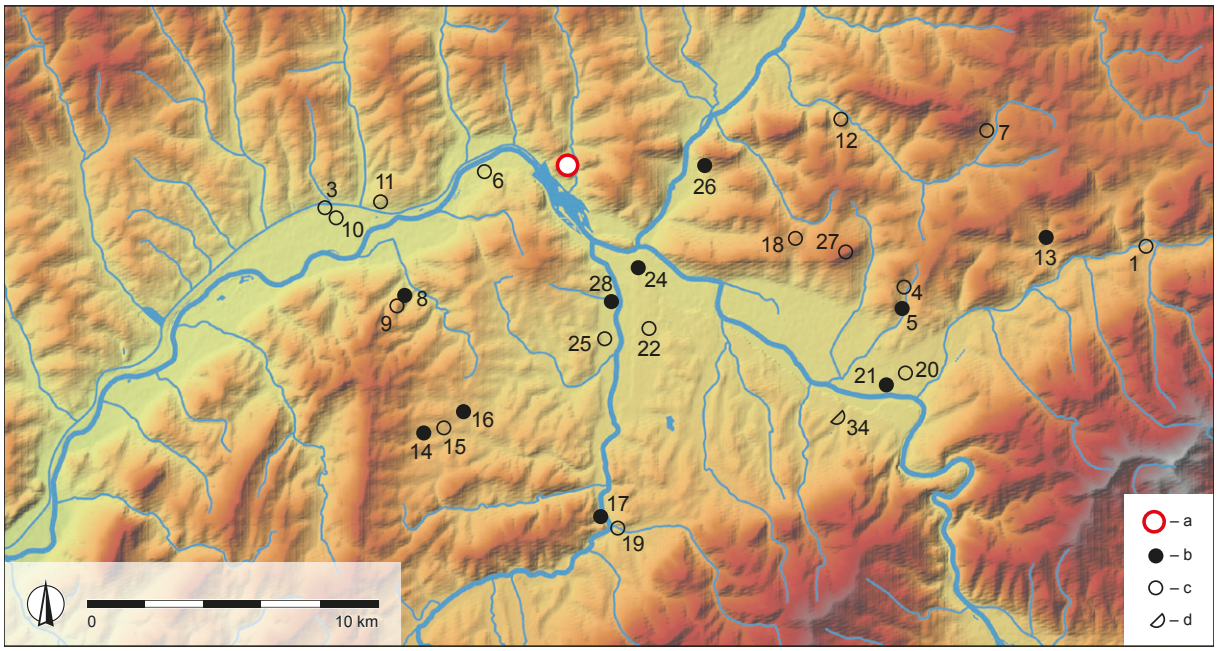


Fig. 7.5. Hinterland of the Veľký vrch hillfort in Divinka in the younger early medieval horizon: a – Veľký vrch; b – settlement; c – early medieval, without more refined dating; d – sickle hoard. Site numbers correspond to catalogue numbers. Author G. Fusek, modified by M. Filip.

No sepulchral monuments are preserved from the younger horizon, but the number of datable settlements is more than double (Fig. 7.5). Of them, only the Porúbka settlement [17] has been investigated, but, once again, without any settlement features found; the sherds come from a layer. In the eastern part of the area, a settlement has been added in Varín, Zátepličie field [21] on a Váh terrace. It is represented by a single sherd, as is a settlement in Lysica [13], which is situated in the mountains. The occupation in Gbeľany, Prostredný lán field [5] continued from the previous period. Another known enclave is registered in the territory of Podhorie, Vaščanské field [16], where the continuity

of occupation has been detected once again, and a new settlement has been added near the football pitch [14]. In Žilina itself, there are settlements at Šefranica [24] on a Váh terrace and in the Závodie quarter [28] above the River Rajčianka. The Brodno quarter [26] is situated eccentrically in the water basin of the Kysuca, in the area where the river passes between the Brodnianka and Rochovica Mountains. Sherds have been found in multiple places [8, 9] on a hill between the Bytča and Žilina basins, where the ruins of Hričov Castle are situated today, documenting its use already in the given period. No contemporary sites are known from the Bytča Basin.

5. Development of occupation

The earliest Slavic occupation in Slovakia is related to the Migration Period; in its later phase, the territory was occupied by bearers of the Prague culture. In our working area, it is represented by a sunken-featured building excavated at Frambor [23] with pottery belonging to the earlier horizon of the earlier phase of the Prague culture, roughly from the first two-thirds of the 6th century (Fusek 1994, 121). Since it was the only Early Slavic site from Slovakia's mountain regions at the time of discovery, certain academic circles expressed doubts about the correctness of its cultural determination. In the meantime, as sites were found on both the Slovak and Polish sides of the Carpathians (Madyda-Legutko, Tunia 1991; Kučerová et al. 2012; Jędrzejewska 2022, ryc. 4), the categorisation to the Prague culture became undisputed. A surprise came when during the study of the finds from Šefranica [24], a site ca 830 m distant from Frambor, we found a torso of a vessel which, from my point of view, certainly belonged to the circle of Prague-type pottery, even though its upper part is missing (Fig. 7.6). Pottery of the Prague type is distinguished by certain characteristic features that are not found on prehistoric, protohistoric or medieval pots. The clay from which the pot from Frambor was made was grainy; it contained small stones and organic substances which, after firing, left small cavities. These are also visible on the rough surface. The vessel base bears an impression of a cereal grain. The method of modelling is also typical, with traces of hand strokes from the bottom up on both internal and external surfaces. The steep change of the profile above a part of the circumference of the bottom is not an intentional indentation, but rather a deformation caused by the sinking of the still soft vessel under its own weight.



Fig. 7.6. Žilina-Šefranica. Find of an incomplete Prague-type pot. Author G. Fusek.

The literature concurs that the Early Slavic period was followed by a termination of occupation and that the region was resettled by the Slavs only after a longer hiatus. A collection of sherds gathered at the Vaščanské field [16] in the municipality of Podhorie is remarkable in this context. One of the sherds resembles the Prague type (Škorvánková 2020, tab. IX: 5). The sporadic, potentially accidental find of a fragment of the mouth is not to be overestimated, but two more sherds come from hand-modelled vessels with a long, bent mouth, which is a rather ancient feature (Škorvánková 2020, tab. IX: 4, 7). The field-walking finds may indicate the existence of rather early occupation which, however, we are unable to specify. In any case, the site deserves attention in future research.

Ten sites are registered in the wider hinterland of the Veľký Vrch hillfort, including four settlements dated to the local older early medieval horizon (Fig. 7.4). Earlier ones include a sword probably from Varín [35] and perhaps also some of the graves deposited in the barrows of five barrow cemeteries. The settlements to which the barrow cemeteries might have belonged have not been found yet. However, the site enclave in the eastern part of the Žilina Basin indicates the existence of denser occupation there. The situation is similar in the western and southern parts of the region. The central part of the territory, with no finds known at present, seems to have been unsettled. We do not know whether this image reflects the

reality or the lower level of field archaeological activities. A single settlement is known from the Bytča Basin, but the existence of more closely undated early medieval sites indicates more intensive occupation in the area from Bytča to Kotešová.

Ten settlements belong to the younger early medieval horizon. The map shows a certain shift of occupation to the mountains between the Žilina Basin and Kysuce; otherwise, the image of settlement activities in the Žilina Basin has not changed considerably compared to the previous period (Fig. 7.5). Finds from the Hričov Castle hill [8, 9] above the two basins have been added, however. The Bytča Basin does not feature any settlements of an undoubted younger early medieval character.

As for elevated and well-defendable positions, there are certain indications that the Hrádok hillock in the municipality of Turie [19] in the south of the studied area was fortified in the early medieval period, as was Malé Ostré Hill in Lopušné Pažite [12] on the southern edge of Kysuce. Given the present state of the source base, no more precise stance can be taken on this statement. From A. Petrovský-Šichman's time, the literature traditionally mentions the use of the prehistoric Straník hillfort in the Žilina-Zástranie cadastral territory [27] in the early medieval period. Only two sherds come from it; we have not found the one mentioned by A. Petrovský-Šichman (1964b, 73) in the museum collections. The other sherd, coming from a fieldwalking survey carried out by O. Šedo in 2015, is from a pot body decorated with circular lines and, therefore, impossible to date more precisely. According to the aforementioned information, there was no hillfort there in the studied historical period.

The sites that are recorded generally as early medieval densify the image of occupation in the areas with more precisely dated finds, partially extending our knowledge of the extent of occupation only in the northern direction of the Kysuce Highlands.

6. Conclusion

The analysis of archaeological finds demonstrates that our current understanding of the occupation of the hinterland surrounding the Veľký vrch hillfort in Divinka remains highly fragmentary. The available sources do not provide a sufficient basis for addressing broader questions concerning the structure of this hinterland. Although the region has seen relatively intensive archaeological investigation in the past, targeted research specifically addressing early medieval monuments has been lacking. This limitation is particularly evident, as discussed in this paper, in the absence of reliable criteria for dating moveable finds – particularly pottery – which reflect the specifics of local development. To prevent the interpretation of archaeological evidence from remaining at its current, often highly subjective or even romanticising level, it will be necessary to devote significant attention – and undoubtedly also considerable financial means – to systematic modern field research. It is essential for building a high-quality source base that can underpin and enrich future interpretations of the region's occupational history.

Catalogue of sites and finds

Settlements

1. Belá, Žilina District, Hanikovie field, fieldwalking, 4 sherds. Škorvánková 2020, 51–52, 66–67.
2. Bytča-Hliník nad Váhom, Bytča District, Kľuky field, fieldwalking, 25 sherds, 2 indeterminable fragments of iron objects, whetstone. Petrovský-Šichman 1964b, 70, tab. VI: 7–15; Škorvánková 2020, tab. II: 1–4, 6–10, 12–16, 18–22, 24–25; XIV: 4.
3. Bytča-Hliník nad Váhom, Bytča District, Podemlynčie field, fieldwalking, 6 sherds, knife, razor. Petrovský-Šichman 1964b, 70, tab. VI: 1, 2, 5; Škorvánková 2020, tab. II: 5, 11, 17, 23, 26; XIV: 1, 3.
4. Gbeľany, Žilina District, Pod Dielcom field, fieldwalking, 1 sherd. Moravčík 2000, 135.
5. Gbeľany, Žilina District, Prostredný lán field, fieldwalking, 24 sherds. Moravčík 2000, 135; Škorvánková 2020, tab. VII: 5–17.
6. Horný Hričov, Žilina District, Prizlatnie site. Settlement layer in a trench profile. Zachar, Mácelová, Furman 2011.
7. Horný Vadičov, Kysucké Nové Mesto District, Závodie field. Šedo 1987, 100.
8. Hričov Castle (cadastral territories of Hričovské Podhradie and Paština Závada, Žilina District), fieldwalking on castle hill and Mikov Hill, 9 sherds. Petrovský-Šichman 1964b, 70; Škorvánková 2020, tab. I: 15, 16; VIII: 1, 3–5, 10, 13.
9. Hričovské Podhradie, Žilina District, cave on castle hill, fieldwalking, 1 sherd. Šedo 1977a; Škorvánková 2020, tab. VIII: 2.
10. Kotešová, Bytča District, Lán field, construction inspection, 2 sherds. Škorvánková 2020, 70.
11. Kotešová, Bytča District, clay pit under the Jewish cemetery, fieldwalking, 1 sherd. Škorvánková 2020, 70, tab. VIII: 9.

12. Lopušné Pažite, Kysucké Nové Mesto District, Malé Ostré hill, excavation, settlement layer. Šedo 1980b; 1981a.
13. Lysica, Žilina District, Hôrka hill, fieldwalking, 1 sherd. Škorvánková 2020, tab. I: 13.
14. Podhorie, Žilina District, Pri futbalovom ihrisku field, fieldwalking, 1 sherd, 2 fragments of a rectangular pan (*pražnica*). Škorvánková 2020, tab. IX: 1, 2, 10.
15. Podhorie, Žilina District, Na Dolinu field, 2 sherds. Probably Petrovský-Šichman 1964b, 76.
16. Podhorie, Žilina District, Vaščanské field, fieldwalking, 6 sherds, 1 knife. Škorvánková 2020, tab. IX: 3, 5, 8, 11–13; XIV: 2.
17. Porúbka, Žilina District, field unspecified, settlement layer, 8 sherds. Moravčík 1980, 145, obr. 75, 1–4; 1981, 178; Škorvánková 2020, tab. IX: 4, 6, 7, 9, 14–16.
18. Teplička nad Váhom, Žilina District, Kolianske site, fieldwalking, 2 sherds. Petrovský-Šichman 1964b, 73, tab. VII: 3, 4; Škorvánková 2020, tab. X: 11.
19. Turie, Žilina District, Hrádok hill, fieldwalking, 1 sherd. Petrovský-Šichman 1964b, 76, 78, tab. VIII: 11, 12.
20. Varín, Žilina District, Lúčiny field, parish garden, fieldwalking, 2 sherds. Petrovský-Šichman 1964a, 176; Škorvánková 2020, tab. X: 12, 14.
21. Varín, Žilina District, Zátepličie field, fieldwalking, 1 sherd. Moravčík 2000, 137; Škorvánková 2020, tab. X: 15.
22. Žilina, Žilina District, Bôrik site, fieldwalking during cottage construction, 3 sherds. Petrovský-Šichman 1964b, 75, tab. VII: 7, 9–11.
23. Žilina, Žilina District, Frambor site, excavation, 5 settlement features. Moravčík 1978, 264–265, 267; Fusek 1994, 266–267, tab. LXIX; Vangľová 2010, 94; Slaná 2017, 45, tab. V: 4.
24. Žilina, Žilina District, Šefranica site, corner of Murgašova and Žižkova (present-day Na Šefranici) Streets, groundworks near a cottage, fragments of 2 vessels. Petrovský-Šichman 1964b, 73; Moravčík 1978, 262; Škorvánková 2020, tab. XII: 1.
25. Žilina-Bánová, Žilina District, location unspecified, fieldwalking. Šedo 1977b.
26. Žilina-Brodno, Žilina District, Sedlište field, fieldwalking, settlement layer in trench profiles, 7 sherds. Moravčík 1982, 193, obr. 112: 6, 8; 1983, 170; Škorvánková 2020, tab. X: 6.
27. Žilina-Zástranie, Žilina District, Straník hill, fieldwalking, 1 sherd. Petrovský-Šichman 1964b, 73.
28. Žilina-Závodie, Žilina District, Pod vinicou site, fieldwalking, 1 sherd. Šedo 1995, 126, obr. 99: 9–11; Škorvánková 2020, tab. X: 13.

Barrows, barrow cemeteries

29. Bitarová, Žilina District, Kopence-Dubiny field. Budinský-Krička 1957; Petrovský-Šichman 1970, 194–202.
30. Gbeľany, Žilina District. Road to Krasňany, barrow cemetery. Moravčík 2000, 135–136, tab. II: B; III: 1.
31. Kotrčiná Lúčka, Žilina District, barrow, excavation. Šedo 1983, 237.
32. Krasňany, Žilina District, Háj field, barrow cemetery. Budaváry 1938–1939.
33. Žilina-Bánová, Žilina District, Dúbravy-Kalinové field, barrow cemetery. Petrovský-Šichman 1970, 202–206.

Hoard

34. Stráňavy, Žilina District, Kubický vŕšok hill, amateur find, 10 sickles. Slaná 2017, 44–45, tab. II; III: 1, 2.

Random find

35. Varín, Žilina District, presumed localisation, Teplička nad Váhom is also not ruled out, amateur find, sword. Moravčík 2000, 136, tab. III: 3; Staneková 2019, 14–15.

Acknowledgement

This chapter was supported by project 2/0023/24 of the VEGA agency ‘Znovuobjavené staré nálezy. Prínos archívnych materiálov pre poznanie našich starších stredovekých dejín’ [Rediscovered ancient finds. The contribution of archival materials to the knowledge of our older medieval history].

Chapter 8

Three turning points in the early medieval history of Ingelheim

Matylda Gierszewska-Noszczyńska, Piotr Noszczyński

1. Introduction and research history

The Ingelheim palace was one of the most significant places in the early medieval settlement topography of this area. Its construction represents a tangible turning point in the history of this site. Charlemagne's residence was not only an important regional contact place but also a strategic location along long-distance routes, such as the road connecting Mainz via Koblenz and the Rhineland. This advantageous location played a crucial role in its founding. The palatium changed both the topography, character, and the outward appearance of the entire place. However, the construction of this complex does not mark the beginning of significant transformations. The development of Ingelheim during the Merovingian period, along with the existing infrastructure already established in the Roman imperial period and Late Antiquity, is considered an essential factor in this process. They are also regarded as the foundation or impetus for the establishment of the new power centre.

The research history of Ingelheim dates to the late 19th century. The earliest archaeological investigations focused mainly on Charlemagne's residence, its architectural and spatial development (selected reports: von Cohausen 1853; Strigler 1883; Clemen 1890). At the beginning of the 20th century, several systematic excavation campaigns were conducted under the direction of Christian Rauch in the Ingelheim Imperial Palace. Based on these results, the comprehensive ground plan of the palace complex was reconstructed (Rauch, Jacobi 1976). As early as the 1960s, the first evidence of Merovingian buildings in the area of the Carolingian palace was recorded by Walter Sage and Hermann Ament (Ament, Sage, Weimann 1968, 293–296; Wengenroth-Weimann 1973, 11–12). Under the foundations of the high medieval sacred complex (*Saalkirche*), they uncovered remains of several wooden structures and a dry-stone wall from this period (Ament, Sage, Weimann 1968; Wengenroth-Weimann 1973). However, the interpretation of this site as a part of a royal court only emerged after the discovery of a massive ditch to the south of these remains in 2008–2009 (Gierszewska-Noszczyńska 2018). A new phase in the research history began with excavations in 1993. Initially, the focus of this research was on the palace interior, specifically the northern wing and the *aula regia*, the assembly hall. Over the following decades, several areas of the palace underwent thorough investigation. Many phenomena can be explained and newly defined based on these results, starting with the features of the complex, the construction of individual buildings, and fundamental conclusions about the sacred topography of this site (selected publications: Grewe 1998; 2006; 2010; Gierszewska-Noszczyńska, Peisker 2020). The 1994 investigation in the vicinity of the palace marked the beginning of research into early medieval settlements in Ingelheim. Over the subsequent excavation campaigns, remains of several settlements and burial grounds were recorded during several archaeological excavations. These studies introduced new perspectives in the early medieval settlement topography of this area, leading to a deeper understanding of its dynamics and individual changes throughout the entire Middle Ages (summary reports and publications: Gierszewska-Noszczyńska 2019; 2020b; 2021; 2022).

2. Location of the Roman and medieval sites

The topography of the Ingelheim area consists of several natural landscape units. The Rhine Valley and its lowlands form the northern boundary of this region. The southern periphery is marked by Mainzer Berg [Hill], which forms the northern edge of the Rheinhessisches Hügelland / Rheinhessisches Plateau [Rhenish-Hessian Hills]. The Selz Valley runs from south to north, dividing this plateau into the two ridges of two hills – the Mainzer Berg and the Westerberg, whose slopes characterise the landscape of Ober-Ingelheim.

The location of settlements depended on the specific needs of their inhabitants in different periods. The early medieval settlements and burial grounds were predominantly located on the middle terrace of the Rhine and in the Selz Valley at the foot of the Mainzer Berg, at absolute elevations of about 100–140 m (Fig. 8.2). Thus far, most of the excavated settlement sites have been only in Nieder-Ingelheim, whereas the burial grounds and individual graves are also in Ober-Ingelheim. The necropolises were primarily located in the area between Ober- and Nieder-Ingelheim and near the two sacred complexes of the St Remigius and St Wigbert churches.

In contrast, the Roman and Late Antique sites were widely scattered. Both individual settlements and burial grounds were also located on the Rhine's lower terrace between Nieder-Ingelheim and Frei-Weinheim. Some remains of buildings from this period were also found along the ancient road connections between Mainz and Bingen, along with several graves and individual *villae rusticae* in the Selz Valley. In general, these were also concentrated at lower elevations, roughly 80–120 m A.S.L. (Fig. 8.1). Numerous archaeological finds were discovered even at higher locations, pointing to the possible wider spatial expansion of ancient settlements.

3. Ingelheim in the Roman imperial period and the transition from Late Antiquity to the Early Middle Ages

There are only a few regularly excavated Roman and Late Antique find sites in Ingelheim. Nevertheless, some remains from these periods have been reported and documented through accidental discoveries or field surveys in this area including scattered finds of various material groups such as pottery, tiles, slate plates, painted wall plaster, and coins. More than 20 of these sites were even interpreted as *villae rusticae* and at least four of them can be dated to the 4th century (Fig. 8.1; Haupt 1996, 53–55; 2019, 22–23, Abb. 3; 2021b, 219, Abb. 3). The high quality and quantity of these artefacts indicate the existence of larger complexes with multiple buildings in these periods. All of these finds were dated up to the first decade of the 5th century, which implies a settlement gap at the very latest in the second half of this century.

The latest archaeological investigations at the Am gebrannten Hof and Am Zuckerberg sites in the northern part of Ingelheim yielded some complex results and general conclusions regarding this period. They indicate the extensive development of the settlement in the first four centuries AD.

The rescue excavations at the Am gebrannten Hof site were conducted in 2017–2020 by Forschungsstelle Kaiserpfalz Ingelheim and Johannes Gutenberg-Universität Mainz. Finds from these investigations include the remains of a Roman sanctuary and a burial ground. All of the features and finds date to the period between the 1st century BC (the oldest coin dates back to 87 BC, quinarius, obv.: [DOS] SEN, Neptune with head on the right, trident behind the head; rev.: L.]RVBR[I and Victoria with head on the right at the altar, weight: 1.56 g – evaluation Haupt 2021a) and the end of the 4th century AD (the most recent coin dates back to 388–402, AE4, obv.: diadem on the right; rev.: V]ICTORI[A and Victoria l, weight: 0.81 g – evaluation Haupt 2021a; see also a diagram of coins by Haupt 2021b, 220, Abb. 4). The archaeological objects from this period were located on an area of ca 100 × 70 m. Over 130 Roman and Late Antique coins, and almost 140 lead coins, as well as additional lead fragments, were found in the eastern part of this complex (see below Fig. 8.5). On the western side, the remains of two burial gardens (No. 9024, 9058), in the form of square discolouration, were documented. One of them measured about 15.7 × 15.3 m. The second was not completely preserved; its north-western ditch was ca 12.5 m long, and the north-eastern one was about 7 m long (Fig. 8.5). The widths of the ditches, probably for the wooden construction, a kind of fence, measured 1.15–1.40 m. They could be interpreted as family burials (cf. interpretation: Sörries 2003, 20, a reconstruction of this type of complex in Mainz-Weisenau is shown in Fig. 1–7). However, no remains of human bones were found inside these constructions in Ingelheim. In the profile, the features appeared as a V-shaped ditch with a remaining depth of about 0.6 m.

About 12 m west of the burial garden (No. 9024), a cremation burial or a kind of cenotaph (No. 9025, 9012) from the Roman period was also found (Fig. 8.5).

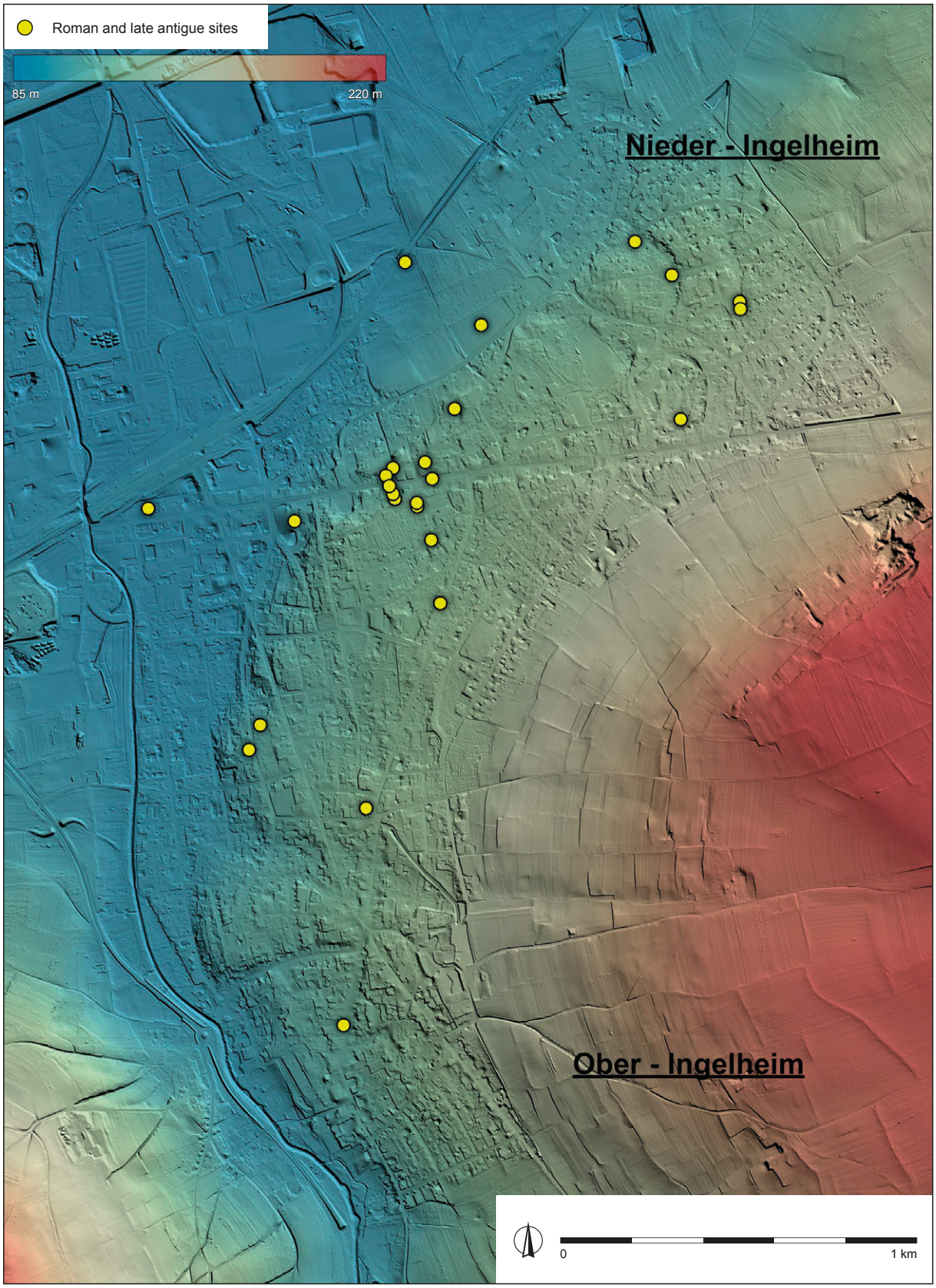


Fig. 8.1. Ingelheim settlement topography in the Roman imperial period and Late Antiquity. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Haupt 1996; 2019; Gierszewska-Noszczyńska 2022; documentation of the excavation of 1993–2023: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; LiDAR data: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.de, http://www.lvermgeo.rlp.de, (May 2025).

The main stone structure had a roughly square shape, with original dimensions of 3.35 and 3.15 m, and an interior area of ca 3.6 m^2. It also had almost the same orientation as the burial gardens. The preserved masonry was about 0.55 and 0.75 m wide, and they were enlarged to about 0.95 m and 1.1 m, as well as the entire construction to 4.05 m. This foundation was built from local quarried limestone. There was no mortar between the stones in the lowest layer of this construction. However, some chunks of mortar were found on top of the masonry. The upper part of this presumed monument could be constructed from stone or wood. There was not enough evidence to make any further interpretation of this building. A burnt layer (ca 2 × 3 m) was directly under a sand layer of about 0.2 to 0.5 m thickness and the masonry; the foundation had to be built after the burning and backfilling of the pit. No human bones were found, whereas some animal bones were identified.[1] Some of the high-quality archaeological finds, such as terra sigillata (Dragendorff 18, 27, 30, from the production at La Graufesenque), glass, and bronze fragments, likely from a chest, suggest a connection to a wealthy person or family. Many of the finds were also burnt and their form cannot be reconstructed. Based on ceramics, this feature dates to 65–95 (dating and description after Bitterwolf 2020, 7–9, 11–14, 25–30 and Slowikow 2017, unpublished; a complex evaluation and interpretation of this feature and finds also presented in Bitterwolf 2020). The lack of human bones indicates a probable interpretation as a cenotaph for someone who could not be buried in this place.

From the eastern side, ca 5 m from feature No. 9024, a cremation burial pit or an ash pit containing human bones (No. 9075) was discovered; it was found without any construction above. Additional cremation burial pits (No. 9116, 9134, 9151) were also identified at this find site (Fig. 8.5). They were located ca 30–40 m apart. The pit No. 9075 had an oval shape and was oriented northwest-southeast. It was about 1.25 m long, 0.65 m wide, and 0.43 m deep. Burning traces were also visible on other archaeological finds, such as ceramics and metals, from the backfill of this feature. However, the walls of the pit were not covered with burnt soil. The human bones were not in an urn, and the entire material was diffusely mixed. This led Stefan Krämer to interpret it as an ash pit with the remains of human cremation, rather than a burial grave in situ. The small metal nails indicate the presence of a chest or case, which is typically associated with female burials. Larger iron nails were interpreted as the remains of a pyre. Based on ceramics, this archaeological feature was dated to the period of 130–145 (Krämer 2018, 41–43, 61–63; a complex evaluation and interpretation of this feature and its finds are also provided by Krämer 2018).

The other interesting feature from the Roman period in this area was a water channel (No. 9006). Only one section in the length of ca 56 m and 32 m was documented during the excavations. The pipeline looped from southeast to northwest, and in the southern section, it curved eastward by almost 90 degrees (Fig. 8.5). It consisted of ca 0.6-m-long conical ceramic pipes and clay sheathing. It was also sealed with some clay (Slowikow 2017). The complex evaluation of these finds is still pending. According to the preliminary examination, this channel dates to the Roman imperial period (Haupt 2021b, 219). The pipeline was also destroyed by the remains of the Merovingian settlement from the 7th century, which provided a *terminus ante quem* for the dating of this feature (Slowikow 2017).

Some additional discoveries from Ingelheim could also indicate the settlement of this area in Late Antiquity. For instance, the stone sarcophagi can be dated to the 4th or 5th centuries. They were found in the area of the cemetery of Nieder-Ingelheim and during the construction of the railway line between Mainz and Bingen, as well as in Ober-Ingelheim in Mühl St. and a property of the Neus Winery in the 19th century and at the beginning of the 20th century (Behrens 1949, 34–35; 1984, 42–44; Böhner 1964, 44–45; 1974, 29, 33; Haupt 1996, 43–45).

The remains of the building from the Zuckerberg 5 found during excavations in 2007 confirm the Late Antique settlement in the area of the southern and extended part of the palatium (Gierszewska-Noszczyńska 2022, 196–197). Under the medieval layers, the remains of a construction dating back to the beginning of the 4th century were found. Although this building could not be completely excavated and documented, some construction details were clarified. It was deepened into the natural clay to a depth of about 0.5 m. On the south side of the construction, a rectangular clay packing was exposed (0.7 × 0.75 m), which formed a kind of low wall or lining of a pit. At the southern end of the central axis, outside of this feature, a round posthole (Ø 0.2 m) was also discovered. The pit likely belonged to a larger stone building, as a high number of quarried limestone

1 An anthropologist, Christiane Slowikow, examined the bone material.

blocks were found in the backfill of this feature. Based on artefacts from the backfill and demolition layers of this construction, it dates to the first half of the 4th century. This includes late Roman coarse ware (e.g. a pot with an everted rim and a lid groove, type 105 and 106 according to Pirling 1966, Teil 1, 85–87; Teil 2, Taf. 102, grave 1215; Taf. 105, grave 1245; Redknap 1999, 152, 153, Abb. 12, type R1.7, R1.38; Giljohann 2021, Taf. 19: 40), ceramics of Urmitz origin (Friedrich 2015, 34; for the origin determination see Gierszewska-Noszczyńska, Wilke 2021), unglazed wares (e.g. a plate with an everted rim and light reddish-brown coating, type 69 according to Pirling 1966, Teil 1, 73; Teil 2, Taf. 100, grave 1213) and with black polished coating (e.g. rounded beaker with conical neck, reddish-brown sherd, type 60 according to Pirling 1966, Teil 1, 70–71, Teil 2, Taf. 21, grave 227; Redknap 1999, 166, 169, Abb. 20, type R30.1.) as well as a coin of Constantine I from 309/310.[2]

In general, the latest evidence on Roman settlement in Ingelheim suggests the large spatial extent of the vicus between the 1st century and the beginning of the 5th century. Peter Haupt postulates that the centre of this settlement was on the west side of the early medieval Church of St Remigius. The entire vicus was located along the ancient road between Mainz and Bingen (today Mainzer and Binger streets) and additional routes of this period, from the area of the Im Saal (the area of the palatium, also Zuckerberg 5), approximately 1,000 m to the west. It also included the area of the aforementioned sanctuary at the Am gebrannten Hof site (Haupt 2019, 25–26). However, there is a settlement gap in the 5th century that cannot be fully explained. As mentioned before, the lack of archaeological features and finds for the period from about 410 can indicate significant shrinkage of the settlement or even the temporary desertion (*Wüstung*) of this area.

4. Ingelheim settlement topography around 700

From the 5th century onwards, settlement in Ingelheim underwent gradual changes, reaching a developed form of regional significance shortly before 700. The changes of the late 7th century had a slightly different character – they were introduced more rapidly and intensively in both secular and sacred spheres, as illustrated by the following examples. During these two centuries, settlements, burial grounds, and two sacred precincts were established within Nieder- and Ober-Ingelheim. The founding of a central royal courtyard in Nieder-Ingelheim is also assumed for the late 7th century (Fig. 8.2).

The remains of four settlements have been archaeologically documented only in the Nieder-Ingelheim area; however, their existence is also assumed for Ober-Ingelheim, based on the presence of several burial grounds and individual grave finds. These include settlement 1 Im Saal, 2 An der Ottonenstraße, 3 Park de Roock, and 4 Am gebrannten Hof.

As mentioned before, the central settlement, probably the ruler's seat, was established only in the late 7th century in the Im Saal area. About a hundred years later, it was converted into the palace complex (Fig. 8.3). The settlement, which was surrounded by a V-shaped ditch (No. 799, 1710, 9394a), has thus far only been archaeologically identified beneath the former floors of the high medieval church (*Saalkirche*), based on the remains of individual buildings. For example, several postholes of a large building (No. 7121) could be documented in the eastern area. Based on these, the dimensions of this two-aisled construction, oriented from the northwest to southeast, could be reconstructed at ca 4 × 8 m. A fireplace uncovered inside this structure indicates its function as a residential building. Moreover, a foundation trench with individual stone slabs and a dry-stone wall (width 0.4–0.7 m, preserved length ca 11 m) had a nearly identical orientation (No. 6010). It is not possible to reconstruct these remains precisely; presumably, they belonged to a larger building whose walls were probably constructed in a mixed technique of stone and wood. North of this feature, remains of a rectangular pit house (No. 6060) measuring ca 3.5 × 3.1 m and 0.45 m deep were identified. This archaeological feature can be interpreted as a six-post pit house, with three posts on each short side (Ament, Sage, Weimann 1968, 295–296; Wengenroth-Weimann 1973, 11–12; Sage 1976, 148; Gierszewska-Noszczyńska 2019; 2020b; 2021; 2022).

The V-shaped ditch surrounding the settlement was constructed to a depth of ca 2–2.5 m and a width of 5–6 m. A reconstruction of the ditch was made based on excavation results and a historical plan from the 17th century (*Grundrissplan*; ©Europäisches Burgeninstitut in Braubach; Geißler 2018,

2 We would like to thank Lutz Grunwald for information on the identification of the ceramics from this complex. Identification of the coin: Burger, Haupt, Klenner 2013, catalogue.

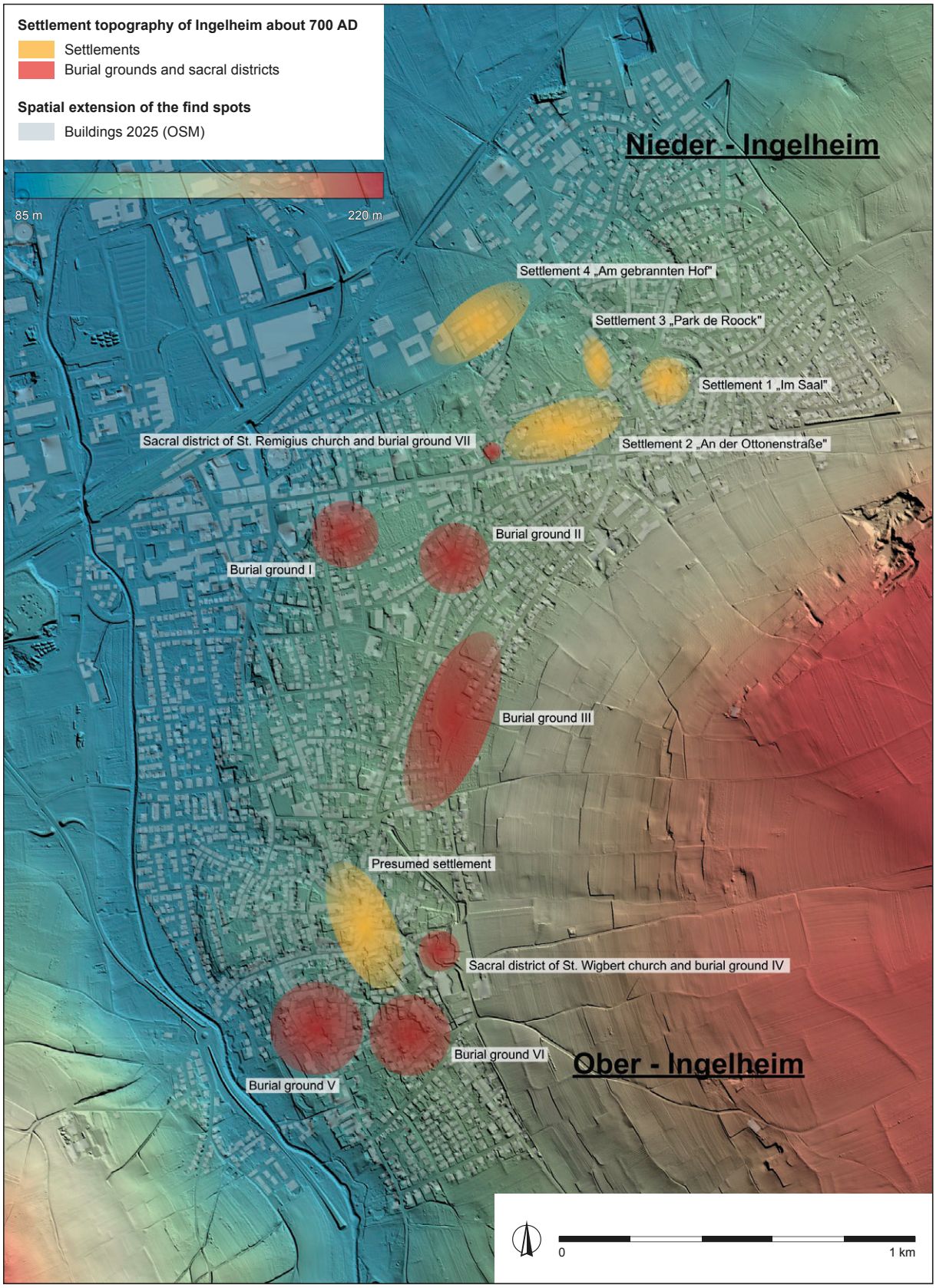


Fig. 8.2. Ingelheim settlement topography around 700. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Böhner 1964; Sage 1964, Wenzel 1997; Gierszewska-Noszczyńska 2019; 2020b; 2021; 2022; in preparation; documentation of the excavation of 1993–2023: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; LiDAR data: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.rlp.de, http://www.lvermgeo.rlp.de, (May 2025); Buildings 2025 (OSM): Map data from © OpenStreetMap contributors. Retrieved (via QGIS) from openstreetmap.org/copyright (May 2025).

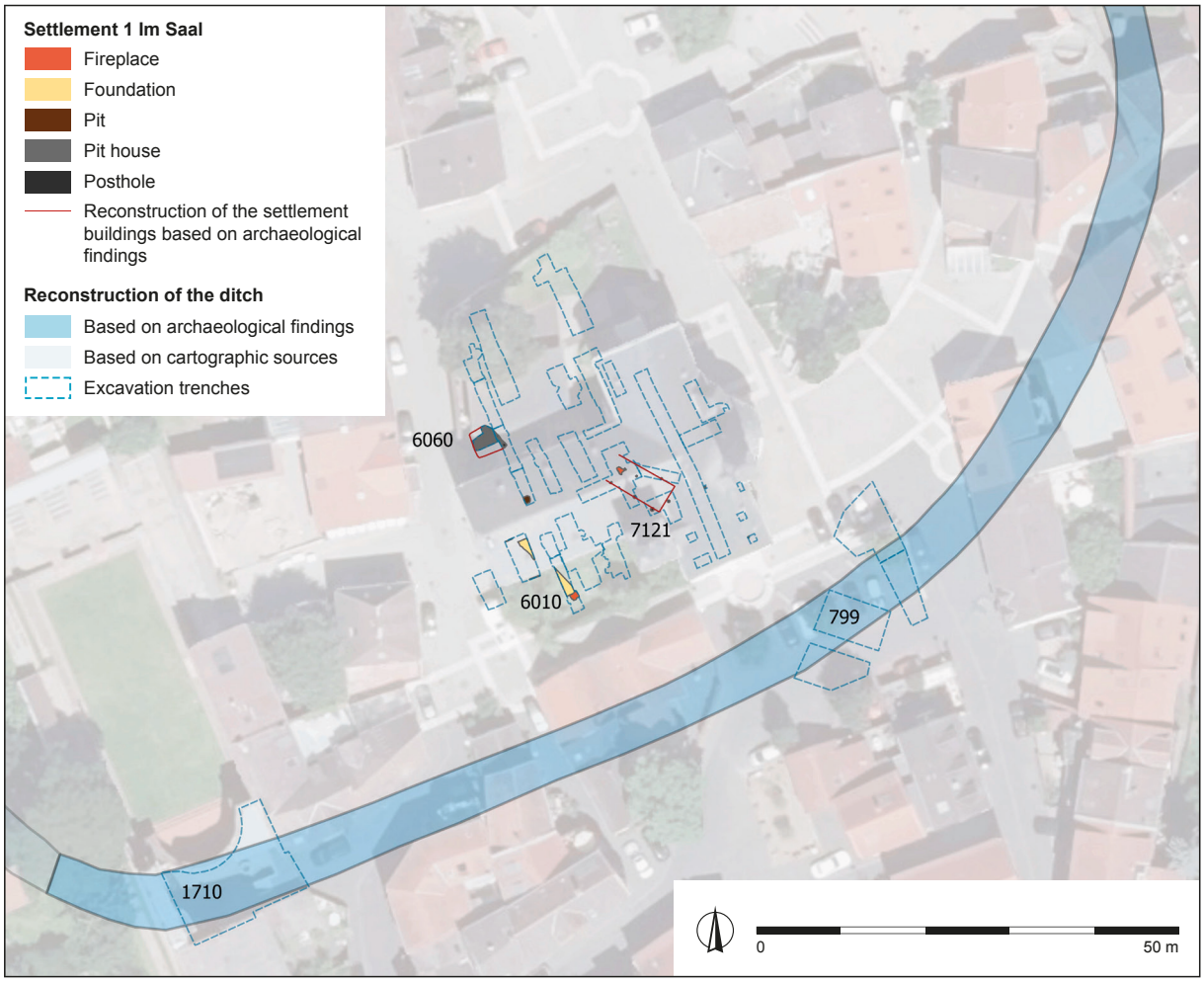


Fig. 8.3. Settlement 1 Im Saal around 700. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Sage 1964; Gierszewska-Noszczyńska 2019; 2020; 2021; 2022; in print; Sage 1960, 1961, 1963: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; Buildings 2025 (OSM): Map data from © OpenStreetMap contributors. Retrieved (via QGIS) from openstreetmap.org/copyright (May 2025); Cadastral map from 2013: City of Ingelheim am Rhein.

49–54; Gierszewska-Noszczyńska, Noszczyński 2018, 160–161). Ceramics from the deepest fill layers of the ditch date the earliest phase of use of this feature to the second half of the 7th century. During the late 7th and the first half of the 8th century, the ditch was partially filled and subsequently levelled with the remains of the settlement during the construction of the Carolingian palace complex in the second half of the 8th century. Most of the ceramic fragments excavated from the lowest fill layers of the ditch and from settlement features were assigned to various early medieval ware types, such as coarse, smoothed, and red-slipped wares (a detailed description of the ceramic material from the individual areas of the ditch in Gierszewska-Noszczyńska 2018, 237–247). For the lowest section of the ditch, a ^{14}C date of 605–775 is also available.[3]

Various theoretical proposals have been made in the past regarding the possible location of the original central courtyard (*Haupthof/Königshof*) of the rulers' seat in Ingelheim (Böhner 1964, 50–51; Sage 1964, 75; Schmitz 1974, 93–94). However, this has not yet been archaeologically proven for the time before the founding of the palatium. An area fortified by a massive ditch on which the palace was built seems to have been predestined for such a complex. However, reliable evidence for that is missing due to the later construction and demolition in this area. Nevertheless, this place could be considered as a possible site for the central courtyard from the late 7th century

3 MAMS-Ingelheim 10/10-4, Erl-16010, cal AD, 2σ, 95.4%, AMS Laboratory Erlangen, Friedrich-Alexander-Universität Erlangen-Nürnberg, 19/04/2011, newly calibrated on 31/05/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).

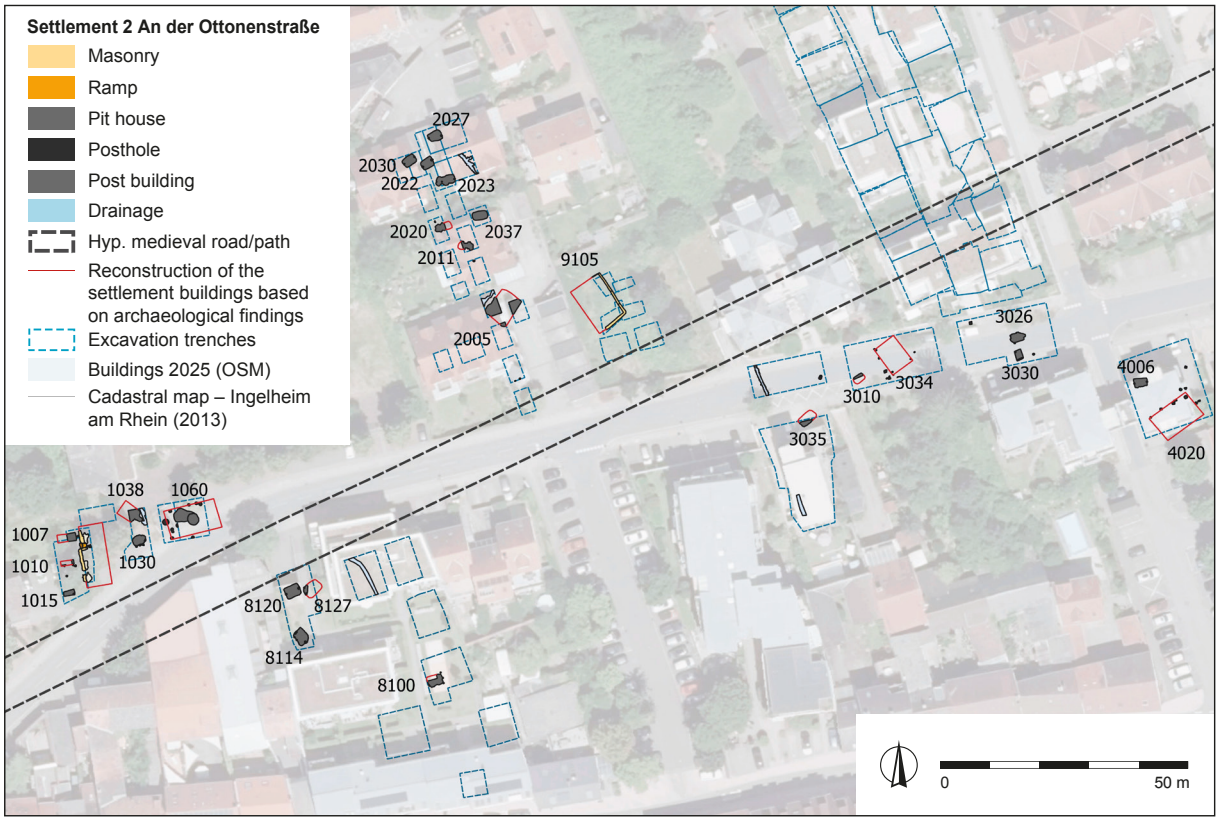


Fig. 8.4. Settlement 2 An der Ottonenstraße around 700. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Gierszewska-Noszczyńska 2019; 2020; 2021; 2022; in print; documentation of the excavation of 1994–2018: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; Aerial image: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.rlp.de, http://www.lvermgeo.rlp.de (May 2025); Buildings 2025 (OSM): Map data from © OpenStreetMap contributors. Retrieved (via QGIS) from openstreetmap.org/copyright (May 2025); cadastral map from 2013: City of Ingelheim am Rhein.

onwards. A detailed analysis of the archaeological investigations in the area of the palace complex, particularly of the sacred buildings in the inner yard, is currently being conducted by Katharina Peisker, which will provide several approaches for interpreting the residence and its earlier settlement. The application of scientific methods, such as ^{14}C analyses, already indicates a broader dating spectrum between the 7th and 9th centuries for the oldest church at this site, the Trikonchos. An assignment to the Merovingian period complex is being considered.

The existence of a medieval settlement An der Ottonenstraße can be proven based on the archaeological material for the period between shortly before 600 and the 13th century (Fig. 8.4; Gierszewska 2009; Gierszewska-Noszczyńska 2019, 39–42; 2020b, 246–253; 2021, 232–235; 2022, 199–200). The 22 small buildings that have been excavated in this complex so far are interpreted as pit houses, possibly earth cellars, or large pits. In addition to these buildings, three large and one small post buildings, as well as buildings with stone foundations, could be reconstructed on the site. Six settlement phases in total were differentiated for the excavated areas of this complex, although not all constructions could be assigned to a single phase. The first phase began in the second half of the 6th century, and the sixth phase is already dated to the turn to the Late Middle Ages. The first three phases fall into the period approximately up to the middle of the 8th century or the late 8th century.

This settlement generally developed from west to east until the end of the third phase, until the middle of the 8th century. After that, the settlement was concentrated in the western area until it was probably moved to the existing street areas, probably in the second half of the 13th century. After that, the deserted area was further used for agricultural purposes.

The pit houses, earth cellars, or large pits belong to five main types, which were differentiated by the occurrence and number of posts. These include 2-, 4-, and 6-post pit houses, special forms, and construction without any posts. Within these types,

further variants were also distinguished, characterised by slight differences in construction, such as the presence of additional small posts or the displacement of individual posts. In general, almost all of the pit houses were oriented from east-northeast to west-southwest. The area of small buildings varied from 2 m^2 to a maximum of 8.5 m^2. The preserved depth in the existing soil ranged from 20 to 65 cm. Their functions can only be roughly determined based on a few indications and comparisons. No remains of ovens or other workshop equipment were found in these constructions. In general, pit houses were mostly used as workshops or outbuildings, such as storage or cooking space (Donat 1980, 83; Geisler 1996, 771–772) and were arranged individually or in groups of two to four buildings, such as the finds in the northern area of zone O2 of the settlement 2 (assuming they belong to one period). In addition to numerous bone and ceramic fragments, individual spindle whorls were discovered in these constructions, which may indicate the production of textiles. However, no loom weights or traces of a loom were found in the backfills of the pit houses. The high number of bones in two of the features (No. 2022, 2027) is particularly interesting for determining their function. The use of these buildings for processing bones and producing bone objects could also not be definitively proven (archaeozoological determination of the animal bone material: Mohrwinkel in preparation). Individual slag fragments from this area indicate the processing of metals and glass. However, it was not confirmed with any features, such as the remains of a melting furnace.

Other features uncovered in this investigated area include four presumed post buildings, some of which were assigned to a later period after 800. The earliest post buildings from the eastern area of settlement 2 are two reconstructed constructions (No. 3034, 4020), which may have already been built in the 7th century or the late 7th century. For both buildings, only individual posts of two walls each were documented, which makes interpreting the actual size of both constructions quite difficult. Presumably, both constructions had an area of at least 40 m^2 and 60 m^2. Further details on the construction cannot be reconstructed from the preserved remains.

The dating of the individual archaeological features of settlement 2 of the first to third phase was based on ceramic material, coin finds, and ^{14}C dating. The oldest dated building (No. 8127) was in the western area and most likely originated in the second half of the 6th century (the dating was based on the ceramics and two ^{14}C samples).[4] The other twelve pit houses date from the 7th to the middle of the 8th centuries. Many buildings were estimated to have been in use until 700, while others may have still existed in the first half of the 8th century.

Another settlement – settlement 3 referred to as Park de Roock, which was already dated for the pre-palace period – was recorded north of settlement 1 Im Saal. For this complex, only the remains of one building or a pit (No. 7008) have been archaeologically proven for this period. Presumably, this feature belonged to a courtyard, which was investigated only in a very limited area. This settlement continued to develop spatially after 800 (Gierszewska-Noszczyńska 2019, 42).

During the archaeological investigations in the area known as Am gebrannten Hof, apart from several aforementioned features from the Roman imperial period and Late Antiquity (Krämer 2018; Haupt 2019, 26–28; 2021b, 220–221; Bitterwolf 2020; Gierszewska-Noszczyńska 2022, 197), the remains of about 25 pit houses and at least two posthole buildings from the Middle Ages were also found there (Gierszewska-Noszczyńska 2019, 42–43; 2021, 235–238; 2022, 197–199) (Fig. 8.5). Due to the archaeological investigations, they were located in an area of ca 180 × 80 m. The medieval settlement was situated approximately 15 m from the Roman remains, including burial gardens, which may still have been visible at that time. The former underground finds were not taken into consideration by this process.

Early medieval settlement 4 can be dated to the second quarter of the 6th century. The dating is based on the finds from one of the pit houses (No. 9001) and radiocarbon analyses (a double-row bone comb with iron rivets, according to Koch 2011, Type B, 510–620); several fragments of folded-wall pots with straight upper walls (after 525/530); radiocarbon sample.[5] This area was settled over the following centuries, as documented by archaeological finds of individual buildings, pits, and other features.

4 2-σ cal 95.4%, MAMS-29907: 444–639 cal AD, 2 σ; MAMS- 29908: 432–580 cal AD, 2 σ, CEZ Archäometrie, 22/03/2017, newly calibrated on 14062024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20) carried out.

5 MAMS-34829: 436–596 cal AD, 2σ, Klaus-Tschira Archaeometry Center at the University of Heidelberg, Institute of CEZ Archaeometry gGmbH – further CEZ Archaeometry, 06/04/2018, newly calibrated on 17/06/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).

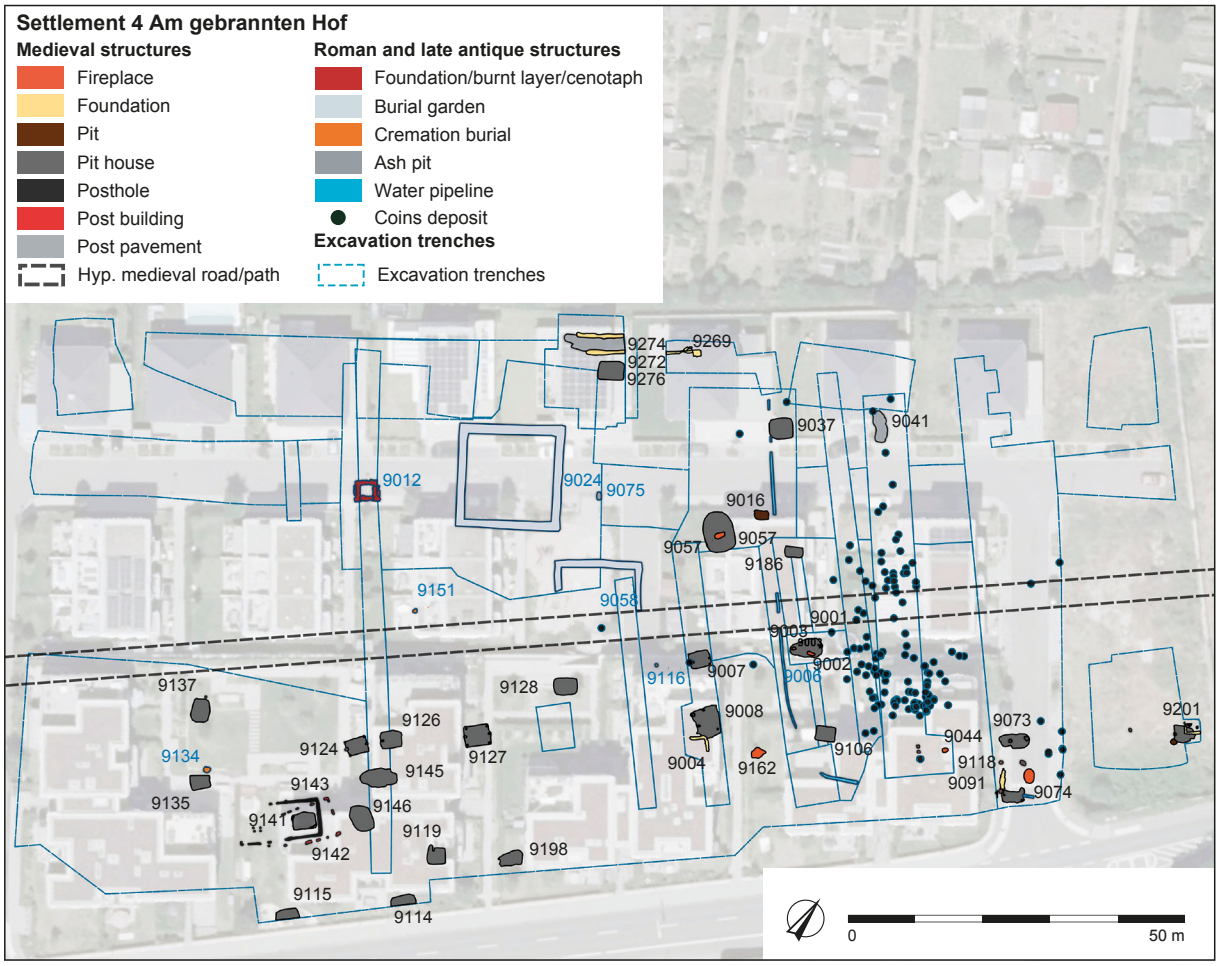


Fig. 8.5. Settlement 4 Am gebrannten Hof around 700. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Gierszewska-Noszczyńska 2021; 2022; in print, documentation of the excavation of 2017–2020: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; Aerial image: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.rlp.de, http://www.lvermgeo.rlp.de, (May 2025).

In general, there are two separate parts with individual farmyards. There was probably a road or path between them (a hypothetical projection of this path in the Fig. 8.5). A spatial gap in the form of a land stripe of about 5 to 10 m is visible in the middle of the area. This long path could be projected there, but only for the Middle Ages. For the Roman period and Late Antiquity, this road cannot be reconstructed due to the presence of other facilities within the sanctuary. It would be very similar to settlement 2, An der Ottonenstraße, with courtyards located in two rows along the pathway. It is not possible at this stage of evaluation to define the number of courtyards; it depends on the dating of individual features. The borders between the courtyards cannot be determined; there are no such finds documented for that site. However, the high number of pit houses and other buildings suggests the existence of several facilities like this. After reconstructing the spatial distribution of settlement 2, eight courtyards could be conditionally projected for settlement 4.

Certain parallels between archaeological features can be observed at both sites. For instance, the pit houses had the same NE–SW orientation. The following types of pit houses can be distinguished: 2- and 6-post-pit houses (e.g. No. 9007, 9127) and features without any posts (e.g. No. 9145). In some cases, masonry was used to build inside the pits of these buildings (e.g. No. 9201). The pit houses had an oval, rectangular or irregular form. Their dimensions varied significantly, ranging from small buildings, approximately 3 × 2.25 m to 2.3–2.6 m, to larger ones, such as 4.85 × 2.8 m and 6 × 4.5 m. One example of a pit house with two postholes on the gable sides of the pit is feature No. 9001. To date, this is the oldest medieval building from this settlement and Ingelheim. It also distinguishes the beginning of the settlement process in this area, as mentioned

before. Eight heavily fragmented loom weights of unfired clay with perforations uncovered directly on the floor of this building indicate its possible function as a small workshop for textile production.

Some of the pit houses could also be interpreted as a cellar inside larger post buildings. Archaeological feature No. 9143 was documented as part of a complex (No. 9141–9143 and 9179). The pit house or cellar (No. 9143), with a depth of 0.9 m and dimensions of 3.5 × 2.5 m, from the later Merovingian period, was excavated within the two post buildings (No. 9141 and 9142). It was interpreted as a pit house rather than a cellar, due to the presence of postholes found in the middle of the gable wall and in the corners. They could have been used to stabilise the roof or as part of the construction of a cellar. It had the same orientation as one of the post buildings. The depth of the pit could also indicate an interpretation as a kind of cellar of this house (see also the indicators for distinguishing pit houses and earth cellars by Baumhauer 2001).

In addition to the pit houses, some post buildings were also found on this site, for example, feature No. 9142 and No. 9141. The first construction could be traced over a length of 7.5 m, with only the eastern half preserved. The width of this structure was about 6 m. In contrast, the dimensions of the second building (No. 9141) could be completely reconstructed. It measured ca 12.4 metres in length and 5.7 metres in width, covering an area of nearly 71 m^2. It is most likely that both represent different constructions, as indicated by the prints of the wooden beam. In the first building, separate postholes are documented. They suggest a one-aisle construction with individual posts along the walls. In the second building, long traces of the wooden material were documented, with round, slightly darker discolorations. They can be interpreted as a construction with sill beams and posts or only with individual posts and a thin ditch for the foundation of this building (compare Schoenenberg 2014, 67). There was also a gap between two postholes placed about 25 to 40 cm from the traces of the south wall of this building, which could be interpreted as an entrance (compare with house 14 from the medieval settlement of Neuwied-Gladbach, after Sage 1969, 16–19; Mylius 1938, Appendix 3).

Several necropolises and individual graves have also been documented within the boundaries of Nieder- and Ober-Ingelheim. The areas between these two settlement zones, as well as the areas near the later established St Remigius and St Wigbert churches, were used for additional burial grounds (IV, VII, Fig. 8.2).

The most intensively examined and largest early medieval necropolis is burial ground III An der Rotweinstraße (Fig. 8.6). The first report of a find at this site dates to 1934 (Wenzel 1997, 98). The spatial development of the city and new construction in this area led to the discovery of additional graves (Böhner 1964, 52; Stümpel 1975, 230–231, Abb. 26; Wenzel 1997, 98–99) and to the decision to carry out systematic archaeological investigations in 1978/1979 (Stümpel 1981, 179, Taf. 22–24; 1982/83, 204–206, Abb. 6, 7e; Zeller 1990; Wenzel 1997). These were conducted by the Landesarchäologie GDKE RLP [former: Archaeological Heritage Preservation Office] under the direction of Gudula Zeller and continued in 1990 (Zeller 2008). Nearly 170 burials were recorded in three large excavation areas. Between 2015 and 2023, archaeological investigations at the cemetery were continued by the Forschungsstelle Kaiserpfalz der Stadt Ingelheim (Gierszewska-Noszczyńska 2019, 43–45; 2020b, 254–257; 2022, 204–205). During this period, over 150 new burials were discovered and documented in 24 trenches.

The investigations of the burial ground allow several conclusions to be drawn regarding burial customs and the dating of this findspot. Individuals were buried in a W-E orientation, in grave pits arranged in rows. The surface area of the grave pits was in the range of 0.5–6 m^2, except for a double burial with 9 m^2. In the northwestern area, several grave pits were equipped with walled chambers, stone settings, or single stones. In contrast, such constructions were only sporadically found in the southern area, where individuals were instead buried in simple earth pits, with no preserved remains of wooden coffins.

Zeller dated this cemetery to phases III and IV (525–700) according to Böhner's chronology (Böhner 1958). A finer dating of the individual graves and a further chronological approach were not undertaken after the excavation in the 1970s (for a detailed description of the particular material groups with a selection of dated specimens, see Zeller 1990, 305–318). The latest investigation and evaluation of this site make it possible to date some of the graves with greater precision. On the basis of a francisca axe with an almost evenly curved lower edge (type A) (discovered in 1957), biconical polished vessels with concave upper walls as well as a bowl with a beaded rim, the beginning of this necropolis can be dated to ca 500 (Böhner 1958, 166; 1964, 51–54; Gierszewska-Noszczyńska 2020a, 12). A silver ring with volutes and an engraved gem with a roast goose and a carving knife, with an oval decorative surface, a beaded circle and

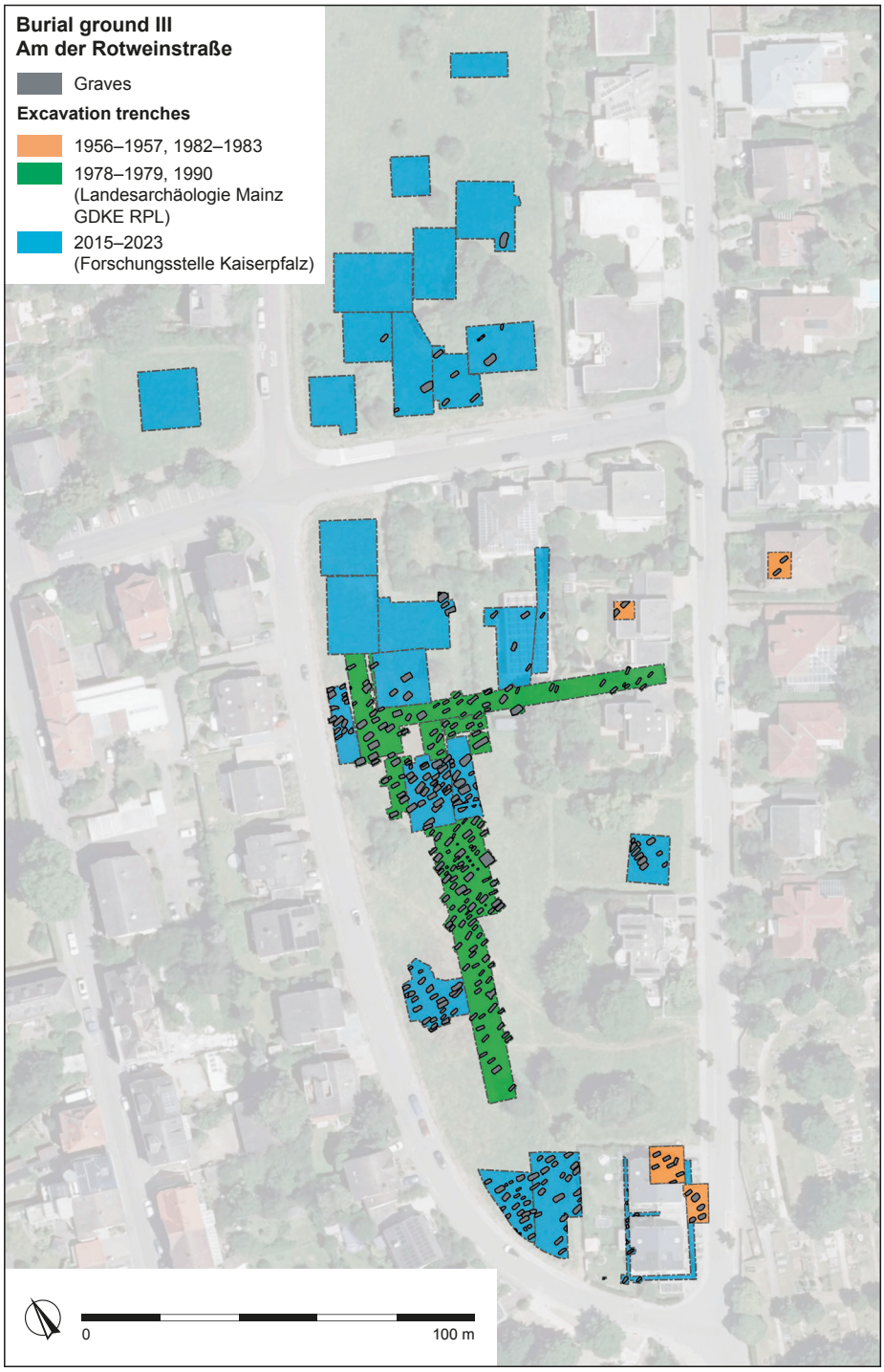


Fig. 8.6. Burial ground III An der Rotweinstraße. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Wenzel 1997; Zeller 1990; 2007; documentation of the excavation of 2015–2023: Stadt Ingelheim, Forschungsstelle Kaiserpfalz, Finding files: GDKE RLP; aerial image: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.rlp.de, http://www.lvermgeo.rlp.de, (May 2025).

groups of three pellets from grave 169 indicate the end of burials at this burial ground in the first half of the 8th century (Gierszewska-Noszczyńska 2019, 43–45; 2020b, 255–256; Kaiser 2021, 259–260). Typologically, the ring can be assigned to group IV of Merovingian finger-rings with gems and triple knots, dated to the 7th century (Ristow, Roth 1995, 59–65). Some of the examples from other sites can also be dated to the 7th century or even to the first half of the 8th century (Halsdorf, grave 1: Böhner 1958, Teil 1, 122; Teil 2, Taf. 22: 27; Mertloch, Künzerhof: Ament 1993, 62, Abb. 49/8, ring FG 92; Gondorf I: Schulze-Dörrlamm 1990, Teil 2, 104–105, Taf. 38: 25–27, 92: 11; Gondorf II: Schulze-Dörrlamm 1990, Teil 2, 267, Taf. 72: 3a, b, Taf. 76: 18, Taf. 113: 11; Sprendlingen: Zeller 1992, Teil 1, 147; Teil 2, Taf. 53: 15; Kruft: Jost 2011, 362, 374,

Abb. 14/10). Radiocarbon dating of the bone remains from grave 169 gave a period of 675–825.[6]

Other early medieval burial sites were located at four places in the Nieder- and Ober-Ingelheim area, and they were discovered accidentally during construction work, where only individual finds could be documented (Böhner 1974, 34; Zeller 1992, Teil 2, 95; Wenzel 1997, 95–96; Gierszewska-Noszczyńska 2019, 45–46).

Due to the lack of documentation and finds, only individual graves can be dated for all these necropolises. In one of the burials, which was found on the corner of Obere Sohl- and Grund Street (burial ground II), a bronze earring with a polyhedral end and a slipped-on bead, with a diameter of about 3.5 cm, was found (Wolf 1970; Stümpel 1970, 181; Böhner 1974, 34; Zeller 1992, Teil 2, 95, Taf. 48: 9, 86: 8; local files, Landesarchäologie Mainz, find report from 05/12/1967; Zeller 1992, 95). It dates back to the time between 640/650 and 670/680 (Saal 2014, 240, Abb. 35). Additionally, the grave ensemble consisted of six bronze strap ends, two of which had notched sides and double circle decor in the centre. They were 6.7 cm and 6.8 cm long and could be directly compared with strap ends from grave 47 at Mainz-Hechtsheim from phase 10, which is dated to around 650–670/675 (Koch 2011, 226, Taf. 15: 25; also, Ament 1993, 86, Abb. 75/6, 7). The ensemble was complemented by a silver- and brass-inlaid brooch of the Ober-Olm type with a concentric arrangement of the decorative surface and a diameter of 6.6 cm (local files, Landesarchäologie Mainz, find report from 05/12/1967; Zeller 1992, Teil 2, 95, Taf. 86: 1). The brooch is divided into three analogous areas by three peripheral rivets, which are decorated with a stepped or zigzag pattern. A ladder band surrounds the fourth rivet in the centre. An additional band with a honeycomb pattern was applied as decoration at the edge of the brooch (compare Krautheim: Koch 1967, 32). The brooch from Nieder-Ingelheim dates to the second half of the 7th century (Gierszewska-Noszczyńska 2019, 45; Kaiser 2021, 248–249).

The Church of St Remigius with its adjacent burial ground was built ca 500 m west of Merovingian settlement 1, known as Im Saal. According to the current state of research, based on archaeological investigations conducted between 2010 and 2018, the earliest confirmed sacred building at this location dates to the late 7th century. The present form of the nave comes from the years 1739 (Dehio 1985, 401). The last major modifications to the tower were likely carried out in the 13th century (Fig. 8.7; Dehio 1985, 326; Gierszewska-Noszczyńska, Noszczyński 2019, 74–75).

The early existence of this church is also attested in a document from 822, issued by Louis the Pious. This source confirmed Karlmann's donation of the *ecclesia in Villa Hengilonheim in honore sancti Remigii* in 741/742 to the newly founded bishopric of Würzburg (RI I: n. 768; Schmitz 1974, 308). Recent studies have produced new results regarding the dating and construction of this sacred complex, as well as further details about the occupation phases of the nearby necropolis. The oldest burials were discovered directly at the outer foundation of an annex building or a transept, adjacent to the baptismal font, which is now the church tower. The remains of two individuals, damaged during the construction of the church, date the beginning of this burial ground to the middle of the 7th century.[7] Two high medieval sarcophagi with two



Fig. 8.7. The Church of St Remigius. Drone photography by P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

6 Sample 29920: 2-σ cal 95.4%, CEZ Archäometrie, 22/03/2017, recalibrated on 14/06/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).

7 ^{14}C dating: 644–798 cal AD, 2σ, MAMS-Ingelheim 10/10-1, Erl-16007, AMS Laboratory Erlangen 19/04/2011; recalibrated on 31/05/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).



Fig. 8.8. Remains of the baptismal font in the Church of St Remigius. Photo by P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

isolated human bones dated to 415–636 and 431–587 were also found.[8] However, their association with this burial site was not conclusively proven. These bones may belong to individuals already buried around this complex. This could also indicate an earlier beginning of this necropolis and the possible existence of a smaller wooden or stone church on this site before the middle of the 7th century.

Later burials were found directly at the southern foundation of the oldest church. They represent a further phase of this cemetery and designate a *terminus ante quem* for the construction of the early medieval sacred building. In one of the burials, an iron chain hanger (also Böhner 1958, Teil 1, 125; Teil 2, Taf. 24: 3; Koch 1982, 67; Taf. 36: grave 57; Schulze-Dörrlamm 1990, 215–216, Taf. 43: 1–4; Ament 1993, 63–64, Abb. 52; Wenzel 1997, 51–52, Taf. 16: 1; Grunwald 1998, 68, Taf. 27: 1; Jost 2011, 363–365, 376, Abb. 16/1; Saal 2014, 261–262, Abb. 8.44), a strap end (also Koch 1982, 67; Taf. 23: grave 44) and an iron knife were found. These finds can be dated no earlier than the second half of the 7th century or the first half of the 8th century (in grave 4 in Kruft, a chain hanger was found with a high bell-shaped tumbler from around 710/720–750/760; Jost 2011, 377, Abb. 17; Saal 2014, for the typochronology: 388, 477, Taf. 21). Radiocarbon analysis of the bone material gave a dating of 674–889.[9] Another contemporaneously constructed grave contained two wire earrings with a diameter of 6.8 cm, which confirms the late dating of this phase of the burial ground to ca 710/20–730/40 (for dating and typochronology: Grunwald 1998, 58; Saal 2014, 250).

A central feature of this site was the so-called piscina (baptismal font), uncovered inside the church tower, or at the time of using, the annex building or transept (Fig. 8.8). The construction of this structure consisted of clay-bound, 0.3-m-wide, ring-shaped masonry, built mainly from limestone rubble and some brick fragments, rising about 0.5 m high against an earthen shell. Inside the font, to the extent to which it has been preserved, the walls and the bottom were completely coated with a two-layer, finely smoothed clay slip. Outside, at a depth of about 0.1 m below the preserved upper edge of the piscina, the remains of contemporaneous stone stitching and screed were uncovered (Ehlers, Grewe, Ristow 2013, 287; Noszczyński 2013; Grewe 2016, 61–62). The internal diameter of this construction measured approximately 1.3 m. The existence of a ciborium at this location has also been proposed as a reconstruction (Ristow 2019, 20). In the 10th century, a masonry chamber for human remains was installed in place of the baptismal font, followed shortly thereafter by two sarcophagi[10] – a wood fragment in the lower part of the bone chamber beneath the sarcophagi; 1025–1160 cal AD[11] – wooden base for the sarcophagi; according to the anthropological examination by Katja Zipp, the chamber contained the remains of eleven individuals; Zipp 2014). Therefore, it can be assumed that the structure was used in its primary function until this time.

The early medieval origins of the Church of St Wigbert, located in Ober-Ingelheim (Fig. 8.9), have not been confirmed through systematic archaeological investigations to date. However, individual finds from the years 1904 and 1932 suggest that this site was already used as a burial ground during the Merovingian period (Schumacher 1908, 34–35; Behrens 1949, 40; Krämer 1960, 5; Böhner 1964, 53;

8 ^{14}C dating: MAMS-Ingelheim 08/12-11, Erl-17696, cal AD, 2σ, 95.4%, AMS Laboratory Erlangen, 14/12/2012; MAMS-KIA49810, cal AD, 2σ, 95.4%, Leibniz Laboratory for Dating and Isotope Research, Christian-Albrechts-University Kiel – further Leibniz Laboratory Kiel, 13/12/2013, recalibrated on 31/05/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).

9 MAMS-Ingelheim 10/10-2, Erl-16008, cal AD, 2σ, 95.4%, AMS Laboratory Erlangen, 19/04/2011, recalibrated on 31/05/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).

10 ^{14}C dating: 891–991 cal AD, MAMS-KIA50992, 2σ cal, 95.4%, Leibniz Laboratory Kiel, 17/09/2015.

11 MAMS-KIA50988, 2σ cal, 95.4%, Leibniz Laboratory Kiel, 17/09/2015, recalibrated on 31/05/2024 with OxCal v4.4.4 Bronk Ramsey (2021); Atmospheric data from Reimer et al. (2020) (IntCal20).



Fig. 8.9. The Church of St Wigbert, today Burgkirche. Photo by P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

1974, 35; Zeller 1992, Teil 2, 96; Wenzel 1997, 141). The construction of the church is documented in written sources shortly before the year 814. The first section of the *Brevarium sanctii Lulli* (Urk Her I, 1, No. 38, 68), which lists all donations made by Charlemagne to the Hersfeld monastery, was written in 802–815. The donations also included a chapel in Inglinheim, which is associated with the Church of St Wigbert. Later written sources confirm this ownership. The name of St Wigbert, who was the patron of the Hersfeld monastery and the church in Ober-Ingelheim, clearly attests to this relationship (after Schmitz 1974, 319; further information is available in Böhner 1958, Teil 1, 329; 1964, 53).

5. Ingelheim settlement topography around 800

Another tangible turning point in the settlement history of Ingelheim is the construction of the imperial palace complex around 800 on the middle terrace of the Rhine and the northern slope of the Rhenish-Hessian Plateau near the ancient route between Mogontiacum and Bingium. This location was determined based on its topography and favourable position along the route, as well as its earlier settlement and its character (Fig. 8.10).

Early written sources already documented the first few stays of Charlemagne in Ingelheim for the late 8th century. The so-called Frankish Royal Annals (ARF: 78–82) reported on Ingelheim, still non-specifically referred to as locus, which was visited by Charlemagne in 774. In the same source in 787, the Ingelheim complex was called a villa. However, the first designation as palatium is known from the Lorsch Annales Nazariani (Ann. Naz. 43), which reports on events taking place in Ingelheim from 788 to 790 (according to Schmitz 1974, 128; Ehlers 2014, 21–27; Geißler 2023, 15–25).

During the archaeological and architectural investigations of the last 100 years, both the details and the overall floor plan of the Ingelheim palace complex were determined (Fig. 8.10, for detailed description of the palace complex: Grewe 1999; 2001; 2007; 2014; Gierszewska-Noszczyńska, Noszczyński 2019; Gierszewska-Noszczyńska, Peisker 2020). The symmetrical floor plan of the palatium (residential part) consisted of two simple geometric shapes, a square and a semicircle (Fig. 8.11). The sides of the square were formed by interconnected buildings that enclosed the partially built-over inner courtyard of this residence. The dimensions of the seemingly enclosed palace architecture in the Carolingian phase were approximately 150 × 115 m, with the length of this complex corresponding to the E-W axis.

The 16.5-m-wide and 40.5-m-long rectangular building (the length of the interior hall was 38.3 m), aula regia – a meeting hall (Fig. 8.12), formed the southwest end of the palace complex. The eaves height of the hall can be reconstructed based on the architectural remains at a height of ca 13–13.5 m; the ridge height of the building is assumed to be 18.7 m. From the south, this hall was closed off by a slightly recessed semicircular apse with a diameter

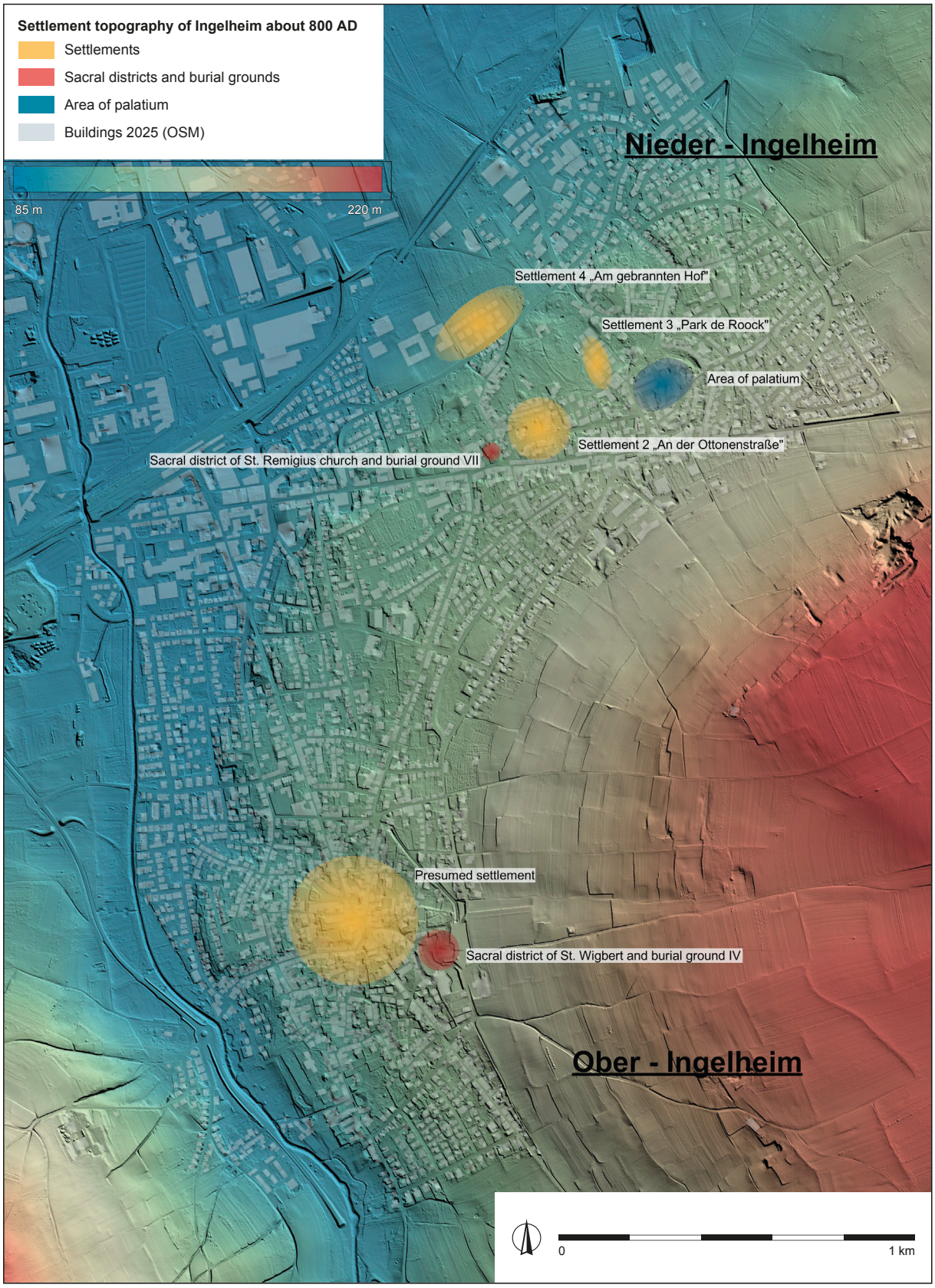


Fig. 8.10. Ingelheim settlement topography around 800. Digital execution and content: M. Gierszewska-Noszczyńska / P. Noszczyński, Stadt Ingelheim, Forschungsstelle Kaiserpfalz, after Gierszewska-Noszczyńska 2019; 2020; 2021; 2022; in print, documentation of the excavation of 1993–2023: Stadt Ingelheim, Forschungsstelle Kaiserpfalz; LiDAR data: ©GeoBasis-DE / LVermGeoRP (2024), dl-de/by-2-0, www.lvermgeo.rlp.de, http://www.lvermgeo.rlp.de (May 2025); Buildings 2025 (OSM): Map data from © OpenStreetMap contributors. Retrieved (via QGIS) from openstreetmap.org/copyright (May 2025).

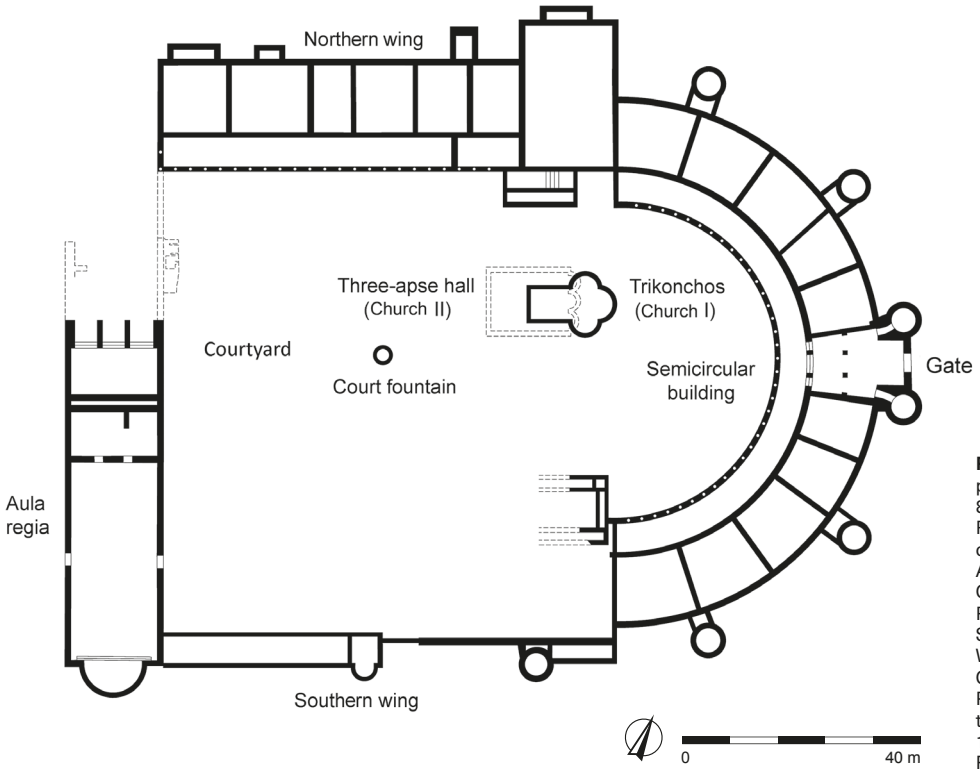


Fig. 8.11. Ground plan of the palatium in Ingelheim around 800. Digital execution by R. Myszka, ArchaioGraphos; content by R. Myszka, Archaio Graphos / H. Grewe, after Rauch, Jacobi 1976; Ament, Sage, Weimann 1968; Wengenroth-Weimann 1973; Gierszewska-Noszczyńska, Peisker 2020, documentation of the excavation of 1993–2023: Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

of ca 9.6 m, which slightly dominated over the nave. According to the finds, the transition from the hall to the apse consisted of three steps, each 0.25 m high. Several windows were built into both the walls of the nave and the apse. Door jambs made of sandstone spolia were uncovered and documented in the east and west walls of the aula regia. The width of these side portals was set at 2.2 m (Ament, Sage, Weimann 1968, 305–311, Abb. 8, 9; Grewe 2014a, 34–36; 2014b, 195–196; Peisker 2016, 114). The main entrance to the aula regia was located on its north side. Two 1.7 m-wide entrances provided a connection to the roofed vestibule or an open forecourt. This construction was completed with a three-aisled portal with arches from the north (Strigler 1883, sheet 2).

The northern side of the palace complex was enclosed by the so-called northern wing, which consisted of a 60-m-long building and a spacious hall measuring 14 × 23.5 m. The entire long building was divided into six verifiable rooms, each with varying widths ranging from 8 to 13 m and a uniform depth of ca 11.5 m. They were presumably accessed by a colonnade from the side of the inner courtyard (Rauch, Jacobi 1976, 11; Gierszewska-Noszczyńska, Noszczyński 2019, 60–61). The dominant architecture of the northern exterior façade likely provided an excellent long-distance effect, serving as a significant landmark at that time. The location on the north slope of the Mainzer Berg also ensured good visibility over the Rhine and the Rheingau.

The northern end of the semicircular building, known as an exedra with the colonnade, formed the entire eastern side of the residence and was directly connected to the northern and southern wings (Fig. 8.13, 8.14). From the colonnade visible from the inner courtyard, one could enter ten radially arranged rooms of varying widths. The discovery of a column



Fig. 8.12. Digital reconstruction of the aula regia of the palatium in Ingelheim around 800, view from the southwest. Digital execution by Archimedix GbR; reconstruction by Archimedix GbR / Holger Grewe, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.



Fig. 8.13. Model of the palatium in Ingelheim around 800, view from the east. Photo by B. May, Stadt Ingelheim, Forschungsstelle Kaiserpfalz; reconstruction by H. Grewe, Stadt Ingelheim, Forschungsstelle Kaiserpfalz; execution of the model ConstruVISION, St. Wendel.



Fig. 8.14. Digital reconstruction of the porticus of the palatium in Ingelheim around 800, view from the west. Digital execution by Archimedix GbR; reconstruction by Archimedix GbR / Holger Grewe, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

base *in situ* delivered proof of the existence of the colonnade, probably with 36 columns. The central axis of this construction was dominated by the trapezoidal pillar hall and the gate, which presumably formed the main entrance to the palace. The floor level of the gate and the pillar hall were higher than the colonnade, and they had to be reached by three steps. A 3.2-m-wide gate opening was only discovered during the 2006–2007 investigation. Six round towers, which were connected to the exedra via narrow corridors, were added to the semicircular building from the outside. The interior spaces of these constructions had diameters of ca 4 m. They were built at irregular intervals, ranging from ca 15 m at the apex of the semicircular building to ca 30 m at the head ends (Rauch, Jacobi 1976, Abb. 113; Gierszewska-Noszczyńska, Peisker 2020, 109–110).

In the centre of the inner courtyard, three churches were sequentially built on the same place starting in the 8th century (Fig. 8.15). The oldest sacred building, the so-called *Trikonchos*, was archaeologically documented only in 2004, but its dating could not be precisely determined. The latest radiocarbon dating of a charcoal sample from the mortar of this church indicates a period of 671–874[12] (further analyses of the find material and stratigraphic relationships between the features, as well as the reconstruction of all church buildings in the central tract, are part of ongoing research). The oldest church (church I) within the palace complex had three apses, each with a width of 4.5 m. During the investigation, the lower layers of the mortar-bound foundation were discovered in the northern and eastern apses. Evidence for the southern apse consisted of a foundation pit and a fallen mortar edge. The western part of this building could not be reconstructed due to severe destruction.

Another church (church II) in the central part of the palace complex is characterised by three apses arranged in a row and oriented to the east (Radosław Myszka proposed the first reconstruction of this building's ground plan). The internal width of the church was approximately 9.8 m, and the width of each apse was about 2.7 m. Stratigraphic relationships indicate a younger dating for this building, as one of the apses cuts through the construction of church I (Gierszewska-Noszczyńska, Peisker 2020, 112–114). A possible interpretation and dating of the two churches suggest that they may belong to different settlement phases: the Merovingian royal estate and the Carolingian palace complex.

12 Sample: 29918, investigations conducted by the Klaus-Tschira Archaeometry Center at the University of Heidelberg, an institute of CEZ Archaeometry gGmbH, recalibrated on 14/06/2024 with OxCal v4.4.4 Bronk Ramsey (2021); atmospheric data from Reimer et al. (2020) (IntCal20).



Fig. 8.15. Digital reconstruction of the trikonchos of the palatium in Ingelheim around 800, view from the southwest. Digital execution by Archimedix GbR; reconstruction by Archimedix GbR / Holger Grewe, Stadt Ingelheim, Forschungsstelle Kaiserpfalz.

The construction of the Ingelheim palace complex significantly altered both the character and external appearance of this location. The early medieval structures in this place, such as pit houses and post buildings, were replaced by the planned palace complex. The foundation of this residence should be understood not as a single moment but as a long-term process. It can be dated to the late 8th century but also extends into the 9th century (Fig. 8.15) and the following centuries due to further rebuilding.

The palace's periphery, after its construction, did not retain the same spatial structure but continued to evolve and change (Fig. 8.10). Whether additional sites were newly settled cannot be confirmed by archaeological sources. Based on the finds, the settlement of the 9th and following centuries can be demonstrated for three sites: settlement 2, 3, and 4. There were also noticeable individual changes within these areas. For example, settlement 2 An der Ottonenstraße reached its greatest extent at the end of the third phase, in the middle of the 8th century. Around 800, the settlement area shifted westward again, closer to the Church of St Remigius. For this time only, fewer, smaller pit houses are attested. Instead, in the fourth phase, large square pit houses up to 30 m^2 presumably remains of earth cellars (No. 1038, 2005), oriented northwest-southeast and southwest-northeast, were recorded.

From the 9th century onwards, additional structures were built within this settlement. A post building and two buildings with stone foundations have been identified from that time. The fully wooden construction (No. 1060) had a ridge beam in the middle of the western wall and smaller posts along the two longitudinal walls to the north and south. The preserved dimensions of this likely two-aisled building were approximately 6 m wide and 7 m long, with a reconstructed area exceeding 60 m^2. Inside this building, further objects were discovered, i.e. probably an oval cellar pit replaced by a circular deeper pit (Gierszewska-Noszczyńska 2021, 235; 2022, 199).

One of the two largest and most impressive buildings revealed in this area was a structure with a masonry foundation (No. 1085) (Gierszewska-Noszczyńska, Noszczyński 2019, 75–77; Gierszewska-Noszczyńska 2022, 199–200; Gierszewska-Noszczyńska, Peisker 2023, 54–55). Access to this building was via a stone ramp that led to a level approximately 40 cm below the surrounding ground. Above the stone foundation, a wooden construction with posts was probably built. Many discovered brick and slate fragments indicate a solid type of roofing. The finds in the fill layers did not provide enough evidence for a specific function of this building. It could have been a large residential building or a storage facility. Based on the ceramic material, it is assumed that this building was constructed no earlier than the late 9th century and filled by the end of the 10th century. A radiocarbon sample from the fill of this masonry building dates to 776– 993.[13]

In 2019, another building with a stone foundation (No. 9105) was discovered in the O2 excavation zone. Floor tiles, found in the oldest fill layer of this feature, confirm the dating of this house to the middle of the 13th century (Landgraf 1993, 272–273, 275, 316–317; floor tiles: Types H230, H236, H244r).

Settlements 3 Park de Roock and 4 Am gebrannten Hof were also developed after 800. However, due to ongoing evaluation, spatial changes can currently be confirmed only for settlement 3, where an additional courtyard was initially built to the south of the aforementioned older building in this area. In the High Middle Ages, settlement was concentrated in the northern part of the settlement. The evaluation of the site Am gebrannten Hof is not yet complete; spatial changes for this place cannot be specified in detail at this time. However, individual archaeological features and finds can confirm the continuation of settlement in this area.

From the middle of the 8th century onwards, only the burial grounds directly at the church complexes were still in use. This is confirmed by archaeological evidence for burial ground VII at the Church of St Remigius. This scenario is also assumed for the area around the Church of St Wigbert, as late

13 MAMS-29898: cal AD, 2σ, 95.4%, CEZ Archaeometry, 22/03/2017, recalibrated on 14/06/2024 with OxCal v4.4.4 Bronk Ramsey (2021); Atmospheric data from Reimer et al. (2020) (IntCal20).

medieval graves were also located in the immediate vicinity and within the sacred building itself, in addition to Frankish burials.

6. Conclusion

Recent archaeological investigations have yielded significant new results and conclusions regarding the Late Antique and medieval settlement topography of the Ingelheim area. Although the overall picture can still be supplemented with individual details, the spatial and temporal changes can already be outlined quite well.

The remains of buildings and graves from the 4th century indicate a settlement in both Nieder- and Ober-Ingelheim for this time. Several stone sarcophagi from Mühl Street or the building on Zuckerberg can be mentioned as examples. The northern territory of Ingelheim was probably also settled at this time; for example, the area between Brückweg and Badweg with the remains of a villa rustica. Apart from individual finds for which the dates are not precise, the settlement of the 5th century has not been archaeologically confirmed. This gap is evident in the archaeological record, despite evidence of general settlement continuity at some sites. Even if the Roman sanctuary in the Am gebrannten Hof area was most likely still used for these purposes at the beginning of the 5th century, early medieval pit houses and post buildings were only founded at this place some decades later.

In the Early Middle Ages, the Ingelheim settlement consisted of several individual settlement areas in Nieder- and Ober-Ingelheim. According to the current research, the beginning of the early medieval settlement can already be dated to ca 500. However, this approach is initially based solely on the grave finds from burial ground III, An der Rotweinstraße. The oldest early medieval pit house was discovered in the settlement 4 Am gebrannten Hof and can only be dated between 525/530 and 580. The beginning of the settlement between the Church of St Remigius and the Saal area can be dated to around 600 or shortly before. Settlement 1, known as Im Saal, most likely played a central role from the second half of the 7th century onwards. The buildings there were located in an area protected by a massive ditch. This find and its location as an exposed place on a hillside to the Rhine and at the site of the younger palace complex suggest the outstanding role of this settlement and allow an interpretation as the original central courtyard of the Ingelheim royal estate. At the same time, the settlement site and the Church of St Remigius, along with its baptismal font, were also constructed. Shortly before, the first burials were made at the necropolis in this area.

The continuity of all recorded settlement sites has been archaeologically proven until the Late Middle Ages; the remains of high- and late-medieval buildings have been recorded in all areas. Settlement 1, Im Saal, was almost completely destroyed and levelled in the late 8th century and covered with the palace complex. The palatium itself was rebuilt several times and finally significantly enlarged to the south around 1200.

Several burial grounds have been used in Ingelheim from around 500 to the first half of the 8th century. However, according to current research, the earliest medieval graves can be confirmed only for burial ground III. Furthermore, continuity into the High Middle Ages has only been demonstrated for the cemetery at the Church of St Remigius and can also be assumed for the surroundings of the Church of St Wigbert.

Chapter 9

Early life histories of the inhabitants of medieval Mikulčice-Valy (Czech Republic): Estimate of weaning age and onset of puberty in elite and non-elite population groups

† Jaroslav Brůžek, Sylva Drtikolová Kaupová, Jana Velemínská, Petr Velemínský

1. Introduction

The testimonial value of archaeological source material does not provide a relatively complete picture of human lives and their stages, especially before reaching adulthood. It is noteworthy that death and everything related to it is the main explanatory factor. However, archaeology is part of the complex of sciences dealing with the human past; it is not and cannot be just a game with artefacts, however intelligent and sophisticated (Smetánka 2003). For these reasons, a knowledge of human life stages provides archaeology with many important insights that help to reconstruct the past, understand the development of human society and shed light on the daily life of our forebears (Velemínský et al. 2020). The analysis of life stages helps in roughly estimating the average life expectancy, birth rates, mortality rates and composition of a population, as well as yielding information on the age, sex, health, nutrition and physical activity of individuals (Larsen 2002). Studying the different stages of life (childhood, adolescence, adulthood, old age) is helpful in understanding how the roles of individuals were perceived in different cultures depending on their age, and makes it possible to express opinions on how individuals were buried at different stages of life (Agarwal 2016). Thus, it allows archaeologists to look beyond mere artefacts and better understand people, their everyday life, their social relationships and the ways in which they perceived the world around them. This contributes to a larger picture of human history linking the past to the present.

2. Knowledge of life cycles in archaeology

The length of childhood, the transition to adulthood, perceptions of old age and the way the elderly are cared for are influenced by cultural norms. Anthropology describes life stages on the basis of variations in biological characteristics that change over time. In the past (and often today), an individual's biological age played a key role in determining their social status, because in most societies, an individual's roles, responsibilities, and rights were aligned with their ages and abilities without knowledge of calendar age. With advancing age brought new responsibilities but also rights and prestige – from childhood and dependence on the protection of the family, through adulthood associated with maximum responsibility and productivity, to old age, which was either associated with decline or, conversely, with wisdom and respect. Cultural norms and traditions played a key role in how society perceived and valued these age categories. Thus, in the past, the relationship between biological age (i.e. the state of physical and mental maturity of an individual) and calendar age (the number of years since birth) was markedly different from the modern concept. In most societies, age was perceived primarily through biological, social and functional indicators, while the counting of calendar age itself was not a normal part of everyday life in the past, especially for the ordinary population. Life cycle theory is a conceptual framework used in various disciplines of biology and the social sciences. Studies focusing on the different stages of life and the analysis of the bone morphology of past populations make it possible to understand the impact

of growth, diet, physical activity, physiological or physical stress and aging on the human skeleton. Although aging is often viewed as a universal process, people grow and age under different cultural and natural conditions. The length of life attained in different social groups is thus a key factor shaping society. Different cultures divide the life cycle into different phases, assigning certain social attributes and expectations to each (Agarwal 2016).

The medieval division of human life into stages was already based on a concept formulated by Isidore of Seville in the 7th century (Nodl 1996). In his work *Differentiae*, he distinguished six stages: *infantia* up to seven years, *pueritia* to fourteen years, *adolescentia* to twenty-eight years, *iuventus* to forty-nine years, *senescence* to seventy-seven years, and *senium* until death. Later, during the High Middle Ages, there was a shifting of the age thresholds for each stage and/or a reduction in the number of stages. The minimum age of maturity for participation in legal proceedings was generally considered to be twelve years for girls and fourteen years for boys; it is therefore clear that it was related to the onset of biological adulthood (Nodl 1996). The age cut-offs for life stages today are derived largely from studies focusing on 'healthy' contemporary Western populations that have access to appropriate nutrition and health care, and are given in units of calendar age. Nevertheless, they are approximate and may have varied in past populations. Five life stages corresponding to the ontogenetic development of an individual are defined before reaching adulthood. These life cycle phases are also characterised by specific skeletal milestones that provide information on skeletal growth, maturation and the timing of puberty. According to the classifications of these studies, they include the prenatal period (from conception to birth), the infant period (from birth to weaning, at approximately 2–3 years of age), childhood (from 2–3 years to roughly 6 years), the juvenile period (from approximately 6–10 years for girls and up to 12 years for boys), and adolescence (from 10 years for girls and 12 years for boys up to 20 years) before reaching adulthood (Corron et al. 2025). The ages of child weaning and the onset of puberty in particular, and thus the age of skeletal maturity, are typically earlier in current populations with access to sufficient calories and medical care when compared to past populations that were often exposed to chronic nutritional and immune stresses.

Archaeology is primarily oriented towards the study of artefacts and abstract socio-cultural processes. It is necessary to realise that age is a social construct related to, but not identical with, a person's biological age. '*Modern archaeology, like other disciplines, has matured to an interest in the personal history of the individual, and it also takes into account the presumably different experiencing of time by men, women and children*' (Vélová 2018). The aim of this paper is to zero in on the age of weaning and the end of breastfeeding in the early medieval European context, and in the Great Moravian population in particular. Weaning, i.e. the transition from breastfeeding to solid food, is a key biological, social and psychological milestone in human development. This process has a profound impact on growth, the immune system, cognitive development, and the social adaptation of the child (Kendall, Millard, Beaumont 2021). The second key moment in the development of the individual and society is the age of the onset of puberty. Puberty impacted further life cycles in different historical periods and populations, with implications for reproductive strategy, social status, state of health, and overall life expectancy. For these reasons, we will attempt to estimate the age at which Great Moravian children entered puberty.

2. Patterns of breastfeeding and weaning in historical populations

Knowledge of population growth rates is one of the objectives of bioarchaeology and utilises data from human skeletal and cultural remains (Katzenberg 2008). In this area, Buikstra, Konigsberg, Bullington (1986) put forward an interesting hypothesis that links the adoption of agriculture and the development of ceramic vessels for the preparation of cereal porridge as food at weaning. The result would be earlier weaning, leading to shorter intervals between births, with a consequent increase in population growth and larger population sizes. This assumption stems from the fact that breastfeeding suppresses ovulation, so that supplementing breast milk with cereal porridge leads to a shortening of the interval between deliveries. Breastfeeding and weaning vary across cultures and over time and have significant implications for child health, mortality and maturation (Dittmann, Grupe 2000; Mays et al. 2017; Tomori, Palmquist, Quinn eds. 2018). The adaptation of breastfeeding to sociocultural contexts can lead to suboptimal breastfeeding and weaning practices that subsequently affect infant health and development (Howcroft 2013; Beaumont 2020). We know from ethnographic and anthropological studies that human

cultures tend to develop different ideas about ideal breastfeeding practices (Mays, Richards, Fuller 2002; Prowse et al. 2004; Dupras, Tocheri 2007; Jay 2009; Bourbou et al. 2013). Breastfeeding and weaning are undoubtedly influenced by environmental factors such as the availability of food resources, as well as social and ideological perceptions of childhood and parenting (Livingston 2016; Ganiatsou et al. 2022). Data on the duration of breastfeeding and weaning age can be obtained by studying isotopes of carbon, and particularly nitrogen, in the bones and teeth of past populations.

The stable isotope ratios of nitrogen and carbon circulate in the biosphere through plants and animals. At each level of the food chain, there is an increase in $\delta^{15}N$ values by 3–5‰ and in $\delta^{13}C$ values by 1‰ (Fig. 9.1). This phenomenon is referred to as the 'trophic effect' (DeNiro, Epstein 1978; 1981; Minagawa, Wada 1984; Schoeninger, DeNiro 1984; Ambrose, Norr 1993). At birth, the isotopic composition of the tissues of a newborn is similar to that of the mother (Fogel, Tuross, Owsley 1989). Once a woman starts breastfeeding, infants receive nutrition from maternal proteins and show increased $\delta^{13}C$ and $\delta^{15}N$ values compared to those of the mother due to the trophic effect (Kaupová et al. 2014; Drtikolová Kaupová et al. 2022). As soon as the weaning process begins, however, the isotope values of the newly formed tissues steadily decrease with the declining intake of breast milk (Fogel, Tuross, Owsley 1989; Fuller et al. 2006). $\delta^{13}C$ values decrease to maternal levels more rapidly than $\delta^{15}N$ values, which makes it possible to track the introduction of the first solid foods into the infant's diet, while $\delta^{15}N$ values better reflect the duration of breast milk consumption.

The optimal timing of weaning is defined by the so-called 'weaning dilemma'. This is the compromise between the need to balance the protective effect of exclusive breastfeeding against infectious diseases on the one hand, while also taking into account the fact that breast milk alone is no longer able to meet the infant's nutritional and energy needs after a certain age (Rowland 1986; Wilson et al. 2006; Kramer, Kakuma 2012). According to the traditional interpretation of the 'weaning dilemma', during the weaning process the infant first loses the immunological protection provided by breast milk (Newman 1995) and then comes into direct contact with pathogens from the environment through complementary foods (Katzenberg, Herring, Saunders 1996). Current studies, however, have somewhat reassessed the 'weaning dilemma', arguing that immunological protection is now known to be maintained even during partial breastfeeding (Kendall, Millard, Beaumont 2021). According to current recommendations, the optimal duration of exclusive breastfeeding is a maximum of six months (WHO 2002; Fewtrell et al. 2007; Kramer, Kakuma 2012). A positive effect of continued partial breastfeeding has been demonstrated during the first two years of life (Lamberti et al. 2011). Examples of the weaning age of children or the duration of breastfeeding are shown in Tab. 9.1. We can see that the data are highly variable. The onset of weaning can be observed from 6 months to 1 year old, and breastfeeding in some cases could continue until the child was 2, 3 or even 5 years old.

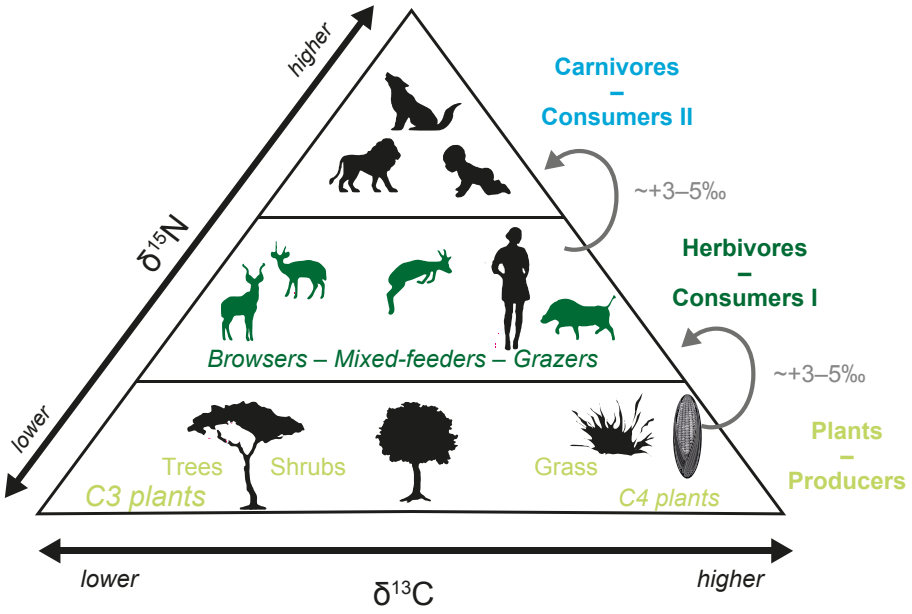


Fig. 9.1. The consumer pyramid and the position of the infant in the trophic chain. After Bocherens 2009.

Site(s)	Date of evidence (AD)	Type of evidence	Initiation of weaning	Completion of weaning	Ancient author(s) mentioned	References
Dakhleh Oasis modern Egypt	ca 250	Isotopic data from 49 bone samples and dentin of 102 individuals	Around 6 months	By 3 years	Soranos, Galen	Dupras et al. 2001; Dupras, Tocheri 2007
Various sites in modern Greece (including Crete)	6th–15th centuries	Isotopic data from bones of 61 individuals	Around 6 months	3–4 years	Oribasios, Aetios, Paul, and other Byzantine sources	Bourbou 2020; Bourbou, Garvie-Lock 2015; Bourbou et al. 2013; Bourbou, Garvie-Lock 2009
Isola Sacra, Rome, Italy	1st–3rd centuries	Isotopic data from 37 bone samples	End of first year	2–2.5 years	Soranos, Galen, Oribasios, wet-nursing contacts	Prowse et al. 2008
Avenches, modern Switzerland	1st–3rd centuries	Isotopic data from bones of 30 individuals	Not specified	Around 3 years	Soranos	Bourbou et al. 2019
Leptiminus, modern Tunisia	2nd–5th centuries	Isotopic data from bones of 99 individuals	Before 2 years	By 3 years	Soranos, Galen	Keenleyside et al. 2009
Queenford Farm, Oxfordshire, modern UK	4th–mid-6th centuries	Isotopic data from 87 bone samples	Not possible to establish but before 1.5 years	2–4 years	Soranos, Galen, Oribasios	Fuller et al. 2006
London, modern UK	1st–5th centuries	Isotopic data from bones of 58 individuals	Around 6 months	By 4 years	Soranos, Galen	Redfern et al. 2018; Powell et al. 2014
Bainesse, modern UK	1st–5th centuries	Isotopic measurements on tooth increments from five individuals	Around 6 months	2–5 years	Soranos, Galen, Oribasios	Cocozza et al. 2021

Tab. 9.1. Examples of bioarchaeological studies of weaning patterns in certain past populations from the 1st millennium. After Totelin 2023, adapted.

2.1 Intra-population variation in the duration of breastfeeding and weaning age in the Great Moravian population

Isotopic data obtained in a pilot study on a cohort of sub-adult individuals show that there was no uniform norm for the length of breastfeeding in the population of Great Moravia (Kaupová et al. 2014).

One reason for this may have been the greater influence of Christian rules, which probably spread earlier and faster among the populations of the power centres, and thus the pressure to comply with Christian precepts may have been greater here than in more remote areas. For the 9th century, we have no documented recommendations for the length of breastfeeding in Great Moravia (Bartoňková et al. 1971). However, the existence of certain rules in this period concerning family life and childcare can be assumed (Thorvaldsen 2008). The only documented example is the document *The Responses of Pope Nicholas I to the Questions of the Bulgarians*, which recommends sexual abstinence throughout the period of breastfeeding (Bartoňková et al. 1971). The new rules may have led at least some women in Mikulčice to abandon the previously accepted norms regarding weaning. Ancient medical sources concerning weaning and the cessation of breastfeeding, whether abrupt or gradual, when read in a sensitive manner, reveal a considerable ambivalence on the part of women, their physicians, and society as a whole towards the changes in the mother's organism associated with breastfeeding. These sources also speak, albeit very obliquely, of the states that accompany the separation of a breastfeeding woman from her own child or a child entrusted to her, whether this separation is temporary or permanent (Totelin 2023). The second reason for the diversity of the duration of breastfeeding was the very nature of Mikulčice as one of the most important centres of Great Moravia, and at least a temporary seat of the ruling dynasty (Poláček 2008b). A certain degree of immigration among the inhabitants can therefore be assumed. We know that infant feeding practices are among the most conservative habits that migrant families retain even when living conditions and livelihoods change dramatically (Fildes 1995). The higher variability identified in the diets of women from the elite classes suggests significant migration even from more distant areas. These women may then have been more likely to cling to the traditional practices of breastfeeding and weaning from their original homes. A third cause is socioeconomic stratification within the population buried in the Mikulčice

stronghold area. Different socioeconomic groups in Mikulčice may have practiced different weaning strategies. However, there exist many other individual factors that may have influenced the decision of mothers to stop breastfeeding earlier or later than what was the general norm.

Premature weaning, which is contrary to the generally accepted norm, may be motivated by problems with either the baby's suckling, the mother's health or her need to return to work, or potentially by her death (Simondon et al. 2001). On the other hand, there are circumstances that motivate mothers to prolong breastfeeding when food is scarce or when they are trying to prevent another pregnancy. Although the contraceptive effect of breastfeeding is not documented in writing before 1500, it can be assumed that it did not escape women's attention. Women also breastfeed longer if their child is weak, undernourished, or ill (Mulder-Sibanda, Sibanda-Mulder 1999; Sellen, Smay 2001). Because we are working with a sample of children who did not survive and whose sex is unknown, we cannot rule out the possibility that their dietary pattern differed from that of the general population. Finally, the possibility of the use of wet-nurses cannot be ruled out. This practice has been documented since antiquity. The first written references to wet-nursing in continental Europe date from the early 2nd millennium and relate to the upper strata of society. It was only in the Late Middle Ages that the practice spread to the middle class of artisans and merchants (Fildes 1995). From the point of view of isotope analysis, this practice can significantly influence the observed results. If wet-nursing was also employed in Great Moravia, it was most likely among the elites in Mikulčice, which could be reflected as a seemingly higher variability in the age of weaning.

The data presented in the pilot study by Kaupová et al. (2014) showed a high variability in the weaning age in the Mikulčice population compared to a uniform weaning strategy in the Josefov population. However, this work did not use the serial sampling method, which was only in its early stages of development at the time, and was thus able to provide only a cursory indication of whether or not a particular child had been weaned at the time of death.

For this reason, a new study was conducted using serial sampling of the dentition of first permanent molars to extend and verify earlier results from 76 individuals from Mikulčice, both adults and juveniles of both sexes, with equal representation of elite and non-elite individuals (Drtikolová Kaupová et al. 2024). The vast majority of the samples, meanwhile, came from burials in the acropolis. Age at death was considered to be an explanatory variable, as were sex, which in subadult individuals was estimated using proteomics (Drtikolová Kaupová et al. 2024), and socioeconomic status. The average values of the maximum nitrogen and carbon isotope difference in the isotopic profile were 3.1 ± 0.8‰ for $\Delta^{15}N_{max}$ and 1.6 ± 0.8‰ for $\Delta^{13}C_{max}$. Individuals who died during the first decade of life showed an earlier age of stabilisation of the nitrogen isotope curve than older individuals, suggesting complete weaning. Most individuals showed a positive covariance between $\delta^{15}N$ and $\delta^{13}C$ values during the breastfeeding period. Mean $\delta^{15}N$ values from the post-weaning period were similar to those in the bones of the same individuals, while $\delta^{13}C$ values from the post-weaning period were significantly higher than those in the bones. Although elevated $\Delta^{15}N_{max}$ may potentially attest to physiological stress, a comparison of early life experiences within the population does not indicate that individuals who died during the first decade of life experienced higher levels of environmental stress in childhood. The preponderance of positive covariance between carbon and nitrogen isotopic values during the breastfeeding period, along with increased $\Delta^{13}C_{max}$ and increased $\delta^{13}C$ values after weaning, suggests that millet either constituted a special diet preferred during breastfeeding or was introduced as a first supplemental food.

The weaning strategy in Great Moravia shows that the first decline in $\delta^{15}N$ values, indicating a significant intake of supplementary foodstuffs, was observed in most individuals at approximately 5–10 months of age. This suggests a weaning practice approximately in line with current medical recommendations (WHO 2009), which suggest exclusive breastfeeding for six months. However, given the limited temporal resolution of the sampling method used, only gross deviations from this rule could be identified. The earliest observed age of stabilisation of the nitrogen isotope curve, indicating the absence of significant breast milk intake, suggests that a considerable share of infants may have been completely weaned before 11 months of age. Even if our estimates of the age of complete weaning are considered to be at the high end (because the presence of biological stress could mimic prolonged breastfeeding), almost all individuals were weaned before the age of 2.2 years. In a historical context, this age appears relatively early (Fildes 1995; Dettwyler 2004; Thorvaldsen 2008). It should be kept in

mind, however, that a lower breast milk contribution of less than 10% of the total dietary intake would not be detectable isotopically (King et al. 2018). It should also be mentioned that, due to the sampling strategy chosen, the result corresponds to a relatively long interval between 2.2 and 3.75 years. This could further mask a possible minor consumption of breast milk even after 2.2 years.

The earlier stabilisation of the isotope curve observed among elites in comparison to non-elites has at least two equally valid possible explanations: the first relates to a higher incidence of stress during the weaning process in non-elite children, the second to the earlier weaning of elite children. A second factor may relate to the ongoing Christianisation of the Great Moravian population. Although there are no direct written testimonies from the Great Moravian milieu, it is likely that there were certain rules regarding family life and childcare, as noted earlier (Bartoňková et al. 1971).

In the case of nitrogen, mean values after weaning differed significantly between socioeconomic classes, with elites showing higher $\delta^{15}N$ values than non-elites. Gender also had a statistically significant effect on $\delta^{15}N$. Multivariate analysis, however, suggested that this difference was probably due to the different gender distribution within socioeconomic classes. Age at death had no significant effect on post-weaning $\delta^{15}N$ values. None of the factors examined had a significant effect on post-weaning carbon isotope values.

3. Puberty in past populations

In many populations, puberty corresponds to the transition in social age from childhood to adulthood (Reiches 2019). The ability to use skeletal markers of pubertal timing to explore the links between sexual maturation (biological) and the transition from childhood to adulthood (social) fits well with the biocultural approach used in bioarchaeology. As can be seen in a number of publications (e.g. Wood et al. 1992; DeWitte, Stojanowski 2015; Milner, Boldsen 2017), bioarchaeologists face a number of constraints in reconstructing health and life stages in the past.

A promising indicator in this regard is skeletal indicators of pubertal timing. For example, menarche reliably reflects living standards and growth conditions, possibly even better than body height (Sohn 2017), which is commonly used in bioarchaeology to assess 'fitness' and prosperity. In clinical studies of puberty, sex is usually known, and stages of development are determined on the basis of reproductive biology, such as gonadal and genital development (Marshall, Tanner 1969). In bioarchaeological studies, limitations are imposed by the existence of just a skeleton, and so the sex of non-adults is difficult to estimate. Proteomics holds great promise in this regard (Brůžek et al. 2024; Drtikolová Kaupová et al. 2024).

Puberty is a period of dramatic developmental changes that marks the beginning of adolescence in humans, leading to sexual maturation and the onset of reproductive capacity in adulthood (Bogin 2002; Ellison 2003; Zhu et al. 2019). In simple terms, it includes the maturation of the primary reproductive endocrine axis (the hypothalamic-pituitary-gonadal or HPG axis), the development of secondary sexual characteristics, acceleration and subsequent cessation of linear growth, and other related changes. Most of these are the result of the maturation of the HPG axis. The onset of puberty is characterised by increased pulsatile secretion of gonadoliberin (GnRH) by the hypothalamus. This leads to increased production of the pituitary gonadotropins – the follicle-stimulating hormone (FSH) and luteinising hormone (LH), which in turn stimulate the gonads to produce steroid hormones and gametes (Ellison 2003). The timing of puberty is defined as '*the variability in the chronological age at which adolescence begins and different stages of physical maturity are reached*.' In addition to variation within the normal range of pubertal timing, some individuals experience precocious or delayed puberty, i.e. timing that falls before or after the normal range, respectively (Ham, DeWitte 2023).

Menarche (first menstruation) marks the beginning of a woman's reproductive capability. Data from skeletal remains suggest that in the Paleolithic, menarche in women occurred between the ages of 7 and 13 (Papadimitriou 2016), with early sexual maturation apparently being compensation for reduced lifespan. New data indicate somewhat higher values, with the onset of puberty around 13.5 years for most individuals (Lewis, Shapland, Watts 2016a). In the Classical antiquity and in the Middle Ages, the age at menarche was generally reported to be around 14 years, with a range of 12 to 15 years. A significant slowdown in the onset of menarche occurred at the beginning of the Early Modern period, due to a deterioration in living conditions, with most studies reporting the onset of menarche between the ages of 15 and 16 years. In the 20th century, and especially in its latter half, the age at menarche decreased significantly in industrialised countries due to improved socioeconomic conditions, to 12–13 years (Papadimitriou 2016).

Shapland and Lewis adapted clinical indicators to bioarchaeological use. The skeletal and dental markers employed in this approach include the development of the hook of the hamate, mineralisation of the permanent lower canine, accretion of the epiphyses of the digits of the hand and distal radius, ossification of the cervical vertebrae, and ossification of the iliac crest (Lewis, Shapland, Watts 2016b; Shapland, Lewis 2013; 2014). Henderson and Padez (2017) tested this method using data from the Coimbra skeletal collection with known age at death and historical records of the average age of menarche in this population. They found that the mean age of menarche estimated from the skeletal data was consistent with contemporaneous historical records from the period. In particular, they emphasised the usefulness of the approach proposed by Shapland and Lewis for assessing puberty among men, for whom historical data are often lacking.

In the Etruscan population from Pontecagnano in southern Italy (7th–4th centuries BC), children entered puberty at the age of 10–12 years and completed pubertal development at approximately 20–21 years. Menarche appeared between the age of 14 and 17 years. Remarkable variability in the timing of puberty and the overall prolongation of pubertal development was observed. Unexpectedly, females ended puberty at the same age as males (Bareggi et al. 2022). Another study focused on the timing of puberty in England through the analysis of urban sites from Roman Britain (1st to 5th centuries AD; n = 48 individuals aged 8 to 20 years); the results suggest that the onset of puberty occurred at a similar age to that of modern European adolescents, but the overall duration of pubertal development was longer in the Roman-British period. Menarche, in particular, was delayed by approximately 2–4 years compared to modern Europeans (Arthur, Gowland, Redfern 2016). Likewise, an analysis of a large sample (n = 994) of adolescent skeletons aged 10–25 years from urban sites in medieval England (900–1550) revealed that the onset of puberty in these populations occurred at an age similar to that of modern children, i.e. at 10–12 years (Lewis, Shapland, Watts 2016a). However, the onset of menarche may have been delayed by up to three years, and the growth spurt deceleration phase in males lasted longer in comparison to modern trends. These differences in the timing of puberty may reflect the relatively poorer diet, higher exposure to infectious diseases, and greater physical stress in the medieval period compared to more recent historical data. Doe et al. (2019) examined adolescent individuals (n = 54; ages 9–19 years) from a Muslim cemetery in the Spanish city of Murcia (11th–13th centuries). They found that the onset of puberty occurred at an age similar to that of modern populations. This would imply an extended period of adolescent growth in this medieval context. Specifically, medieval individuals reached peak pubertal growth acceleration up to two years later and menarche approximately four years later than modern adolescents.

Even from these few examples, it is clear that bioarchaeologists can obtain evidence of the possible influences of diet, disease, physical activity patterns, and other factors on the timing of puberty in past populations. This not only sheds light on patterns of development, health, and behaviour in the past, but also expands our understanding of the temporal variation in the timing of puberty.

3.1. The onset of puberty in the Great Moravian population

Certain skeletal markers correlate with the pubertal growth spurt and can thus yield information about what stage of puberty the individual had reached at the time of death. These indicators include mineralisation of the permanent canines (Shapland, Lewis 2013) and mandibular premolars (Lacoste Jeanson et al. 2016), cervical vertebral maturation (Shapland, Lewis 2014), and ossification of the iliac crest (Shapland, Lewis 2013). This approach was used to estimate the age of onset of puberty and its chronology in a pilot study of 116 skeletons of immature individuals aged 7–20 years from sites in Great Moravia (Mikulčice and Rajhrad, supplemented by several individuals from Josefov and Prušánky) dated to the 9th–11th centuries (Pospíšilová 2017). Contrary to the original methodology, the formation of the hook on the os hamatum, the epiphysial accretion of the finger joints and the epiphysial accretion of the distal end of the radius, which are usually not preserved in archaeological skeletal material, were not studied.

The pioneering study presented here therefore relies on methods that use only age-related changes in the mineralisation of the permanent canine, premolars and cervical vertebrae (see Fig. 9.2; Pospíšilová 2017). The sex of non-adults was estimated by a population-specific method that uses the sex difference in the crowns of permanent canines of the same population, as proposed by Cardoso (2008).

From the results it can be seen that the prepubertal period ended for girls from Mikulčice and Rajhrad at the same age of 8–9 years. Girls from both locations entered the acceleration phase of puberty at the same

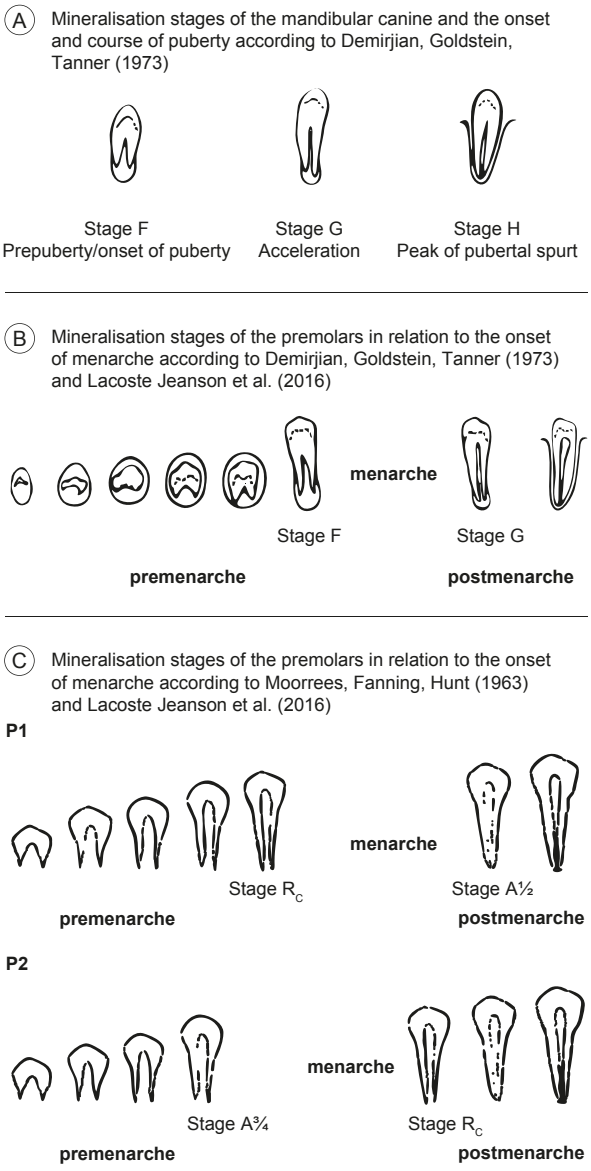


Fig. 9.2. The relationship of mineralisation of the permanent canines and premolars to the onset and progression of puberty. These are supplemented by the degree of cervical vertebrae maturation and the progress (stages) of ossification of the iliac crest. After Pospíšilová 2017, adapted.

age, but the phase lasted almost two years longer for girls from Rajhrad (Mikulčice: 10–11 years, Rajhrad: 10–13 years). The difference between the sites is evident in the onset of menarche, as assessed by premolar mineralisation, where its onset was delayed by up to two years in girls from Mikulčice (14–15 years) compared to girls from Rajhrad (ca 13 years). However, this discrepancy may be due to the different sizes of the two population groups, more precisely the absence of girls of higher age (11–15 years) at the Mikulčice site. Girls from both sites also entered the deceleration phase of puberty at a similar age of 15–16 years. These results indicate almost no differences in the timing of puberty between girls from different sites in Great Moravian society, and socioeconomic level did not play a significant role. Today, the mechanism of life history is calibrated based on socioeconomic conditions associated with food overconsumption, but also famine, wealth, poverty, and hard physical labour, rather than on adaptation to extreme environmental conditions (Crews, Gerber 2003). From this perspective, the Great Moravian adolescent population was probably not exposed to extreme differences in nutrition and physical activity.

All results of the submitted chapter must be considered as indicative due to the low number of individuals in each group, as well as the use of a method for estimating the sex of immature individuals with a medium level of reliability.

4. Conclusion

The study explores childhood development and adolescent growth in the 9th–10th centuries Great Moravian population of Mikulčice (Czech Republic), focusing on two key life-history markers: the age of weaning and the onset of puberty. Stable isotope analysis of nitrogen and carbon from teeth reveals that infants were typically introduced to supplementary foods between 5 and 10 months of age and were generally fully weaned before about 2.2 years – a relatively early age in historical context. Elite children may have been weaned slightly earlier than non-elites, reflecting social or cultural differences, including possible Christian influences, migration, or varying childcare practices such as the use of wet nurses.

Pubertal timing, reconstructed from skeletal and dental markers, indicates that Great Moravian girls entered puberty around 10–11 years and experienced menarche at roughly 13–15 years, similar to other medieval European populations. Socioeconomic status did not significantly affect pubertal onset. Overall, the findings show that early medieval Mikulčice exhibited weaning and maturation patterns shaped by both biological factors and cultural practices, combining relatively early childhood dietary transitions with puberty ages consistent with broader medieval trends.

Acknowledgement

This chapter is supported by the Ministry of Culture of the Czech Republic (DKRVO 2024-2028/7.I.b, National Museum, 00023272).

Chapter 10

Secondary and primary evidence of the occurrence of *Fagus sylvatica* in Mikulčice

Michaela Látková, Eva Jamrichová

1. Introduction

Common beech (*Fagus sylvatica* L.) is the dominant woody plant of the *Querco-Fagetea* class, which often creates dense and impermeable treetops in submontane forests, preventing the growth of other forest species. This ability is due to its shade tolerance, which enables it to form pure beechwoods of several storeys, where the suppression of other woody plants leads to the development of monodominant stands (Chytrý 2013, 194).

From an ecological perspective, common beech is a highly adaptable species. It prefers areas with a yearly precipitation of 800–1000 mm and can grow on various types of geological subsoil; however, it avoids dry sand, heavy impermeable clay, marshy and peaty soils. In the Czech Republic and Slovakia, it is considered a key woody plant which, under optimal conditions, forms non-mixed stands in which its aggressiveness often prevents the development of a herbaceous layer (Chytrý 2013, 195).

The spread of common beech in Europe is related to the changes of climate. The beginnings of its expansion to this country's territory date back to the Atlantic period, ca 6,000 years ago, when it started to spread from the Balkan refugium to the Middle Danube region. Its spread intensified in the Subboreal, ca 4,500–2,500 years ago; in lower altitudes, it was accompanied by the spread of common hornbeam (*Carpinus betulus*), while in the middle altitudes, beech spread with silver fir (*Abies alba*) and gradually pushed out noble broad-leaved trees to scree slopes and ravines.

The spread of beech was more intensive in periods with a more humid climate compared to drier periods. At the time of the Holocene climate optimum (Atlantic, 9000–5500 BP), for example, mixed oak woods with an admixture of pine were widespread in the floodplain of the lower reaches of the River Morava; towards the end of the Subboreal, alder predominated in the floodplain while a beech-fir forest was situated in its close neighbourhood (Opravil 1972, 15; Rybníček 1983; Pokorný 2005, 126; Jamrichová et al. 2013, Fig. 4; Kuneš et al. 2015).

While the conditions are currently not suitable for the local occurrence of common beech in the lower reaches of the Morava (Vachek et al. 1997), there are indications that the situation was different in the past. Paleoenvironmental research in this area has revealed sporadic evidence indicating a possible local occurrence of beech close to the Mikulčice settlement agglomeration in the Early Middle Ages, and probably also in earlier periods. One of the important archaeobotanical finds is a charred gall found in a settlement feature of the area 88 (church 3 – basilica; Fig. 10.1) site examined in 2011 (Poláček, Škojec 2012).

2. Common beech ecology

At present, beech stands are predominantly spread in submontane forests, above all in associations of the *Fagetalia sylvaticae* order, usually at altitudes of ca 300 m A.S.L. and higher (Opravil 1972, 15; Schieber et al. 2011).

From the ecological perspective, common beech is considered a relatively undemanding woody plant. At a young age, especially as one- and two-year seedlings, it tolerates strong shade from the surrounding vegetation, often caused by older individuals of the same species (Ellenberg 2009). In adulthood, beeches form dense crowns, which allow very little light through to the undergrowth, reportedly only 2%. As for soil demands, beech does not have high

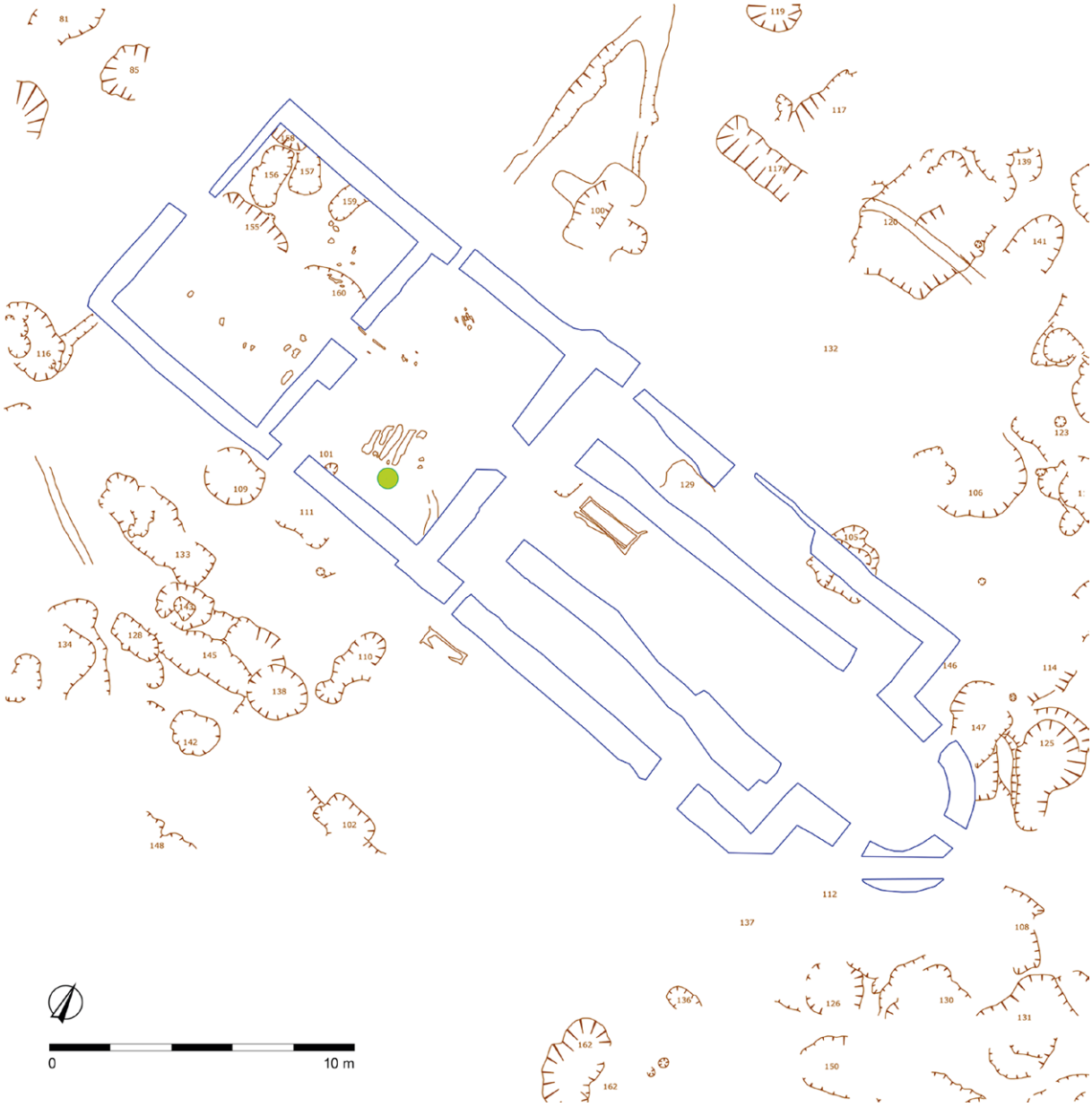


Fig. 10.1. Mikulčice-Valy. Layout of the foundations of the basilica (church 3) together with features of undetermined function. Green circle – sample collection site. Author P. Čáp.

requirements regarding the nutrient content. Despite that, it does not grow on dry sand soils, heavy impermeable clays, waterlogged soils or peat bogs (Schieber et al. 2011, 67). Its relatively shallow root system increases its sensitivity to drought (Hlásny et al. 2011, 630).

Unlike birch (*Betula sp.*), aspen (*Populus tremula*) or rowan (*Sorbus aucuparia*), beech is not a so-called pioneer woody plant; rather, it is a climax tree species that becomes established in the final stages of forest ecosystem succession (Barna, Jarčuška 2011, 227). Palynological analyses from central Bohemia suggest that its occurrence and development in that region were asynchronous and often associated with human occupation (Pokorný 2005, 126). This indicates that beech exerted its competitive abilities above all in forests disturbed by anthropogenic activity.

At present, the share of common beech in the forests of the Czech Republic is lower than it was in the past. The natural share of beech was 40.2%, compared to a mere 8.8% in today's stands (Vachek et al. 1997, 11). In south Moravia, beech forests are limited in extent; an example is the Strážnice area, situated 30 km from Mikulčice. The high variability of forest complexes is characteristic of this region, which incorporates the Hodonín-Bzenec Oak Wood

with extensive blown sand plateaus and the adjoining White Carpathians complex (Vachek et al. 1997, 33–37). The White Carpathians, where beech makes up 14% of the total forest population, include Velká Javořina, an important and well-preserved locality in terms of its occurrence (Vachek et al. 1997, 33–37).

Models simulating the occurrence of beech forests under the influence of climate change indicate that by 2050, beech might almost completely disappear from Záhorie and the adjacent south Moravia (Hlásny et al. 2011, 631). A representation in forest communities of only up to 10% is assumed in higher altitudes of this region (Hlásny et al. 2011, 631). This highlights the need to adapt forestry strategies to the changing climatic conditions and consider beech provenances suitable for maintaining its sustainable occurrence in the future.

3. Holocene development of beech forests

In the northern part of the Pannonian Basin, pollen grains of *Fagus sylvatica* begin to appear regularly already in the Early Holocene. Recorded chronological data confirm its presence at several sites: Vracov – 9500 cal BP (Kuneš et al. 2015); Šúr – 9600 cal BP (Petr et al. 2013) and 9000 cal BP (Hájková et al. 2013); Parížské močály – 8600 cal BP (Jamrichová et al. 2017). Original palaeoecological studies assumed that glacial beech refugia existed above all in the Alpine and Balkan regions (Huntley 1988). However, more recent studies also indicate the existence of local refugia in the Carpathian region, revising earlier hypotheses of its post-glacial migration (Willis et al. 2000; Rudne, Sümegi 2001).

Despite the early presence of beech pollen in the analysed sediments, its systematic expansion into the landscape around the River Morava only begins in ca 5500–3500 cal BP. This process is documented at several palaeoecological sites: Hodonínská Dúbrava – 5500 cal BP (Jamrichová et al. 2013); Dvůr Anšúv – 5000 cal BP; Svatobořice-Mistřín – 4700 cal BP (Svobodová 1997); Vracov – 3500 cal BP (Kuneš et al. 2015). Beech expansion was probably related to a slight decline in the average annual temperature and an increase in precipitation, as suggested by macroclimatic models (Kuneš et al. 2015). The increase in precipitation might have been related to a climatic event of ca 5500 BP, which led to a cooling and increased humidity of the European continent (Magny, Haas 2004). These conditions probably created favourable environmental conditions for the spread of beech to new territories (Tinner, Lotter 2006); the expansion of beech forests in the Late Holocene was probably initiated above all by changes of climate (Gardner, Willis 1999).

In addition to environmental factors, anthropogenic influence might also have contributed to the expansion of beech. The concurrent increase in the representation of *Fagus* together with other late-succession taxons, such as *Abies alba* and *Carpinus betulus*, correlates in time with an increase in human activity visible in pollen records from the region under study (Svobodová 1997; Kuneš et al. 2015). Several studies have highlighted a positive correlation between the spread of beech and an intensification of human interventions in lowland regions of central Europe (e.g. Ralska-Jasiewicz et al. 2003; Pokorný 2005; Giesecke et al. 2007). Interventions in the vegetation cover such as deforestation and forest management might have created suitable conditions for the spread of shade-loving plants, including beech (Lechterbeck et al. 2014). The above implies that the holocene beech dynamics in Central European lowlands were the result of a synergy between climatic factors and anthropogenic activity, whose mutual influences cannot be clearly separated.

4. Material and methods

The study focuses on an analysis of archaeological and palaeoecological finds, encompassing macroremains, palynological data and archaeological artefacts. The analysed macroremains include charred seeds, wooden sword components and pieces of charcoal. Palynological data were obtained from natural *in situ* sediments in a former channel of the River Morava in Mikulčice, as well as from off-site localities. One of the key archaeological finds was a charred gall, which is the subject of detailed analysis in this study.

The sample containing the gall came from the lower part of the fill of a settlement pit (feature/context 133) located under the foundations of the basilica (church 3), specifically in the area of a narthex added later to the building (Fig. 10.1). The feature was situated close to the stone foundations of the church, and part of its fill was excavated as early as the 1960s (Poulík 1975, 73–88; Poláček, Marek 2005, 56–67). However, part of the sediment remained in the original, undisturbed condition, which enabled its later detailed analysis (Poláček, Škojec 2012).

Based on stratigraphic observations, it can be stated that the examined feature, like several other pits in the same position, was not functionally linked to the basilica and, therefore, preceded its construction. Archaeological finds from the fill indicate that the feature can be dated before the second half of the 9th century; the material probably comes partly from the earlier Great Moravian period and partly from the pre-Great Moravian period (Poláček, Škojec 2012, 149–150).

A detailed analysis of additional plant macroremains from the sample, as well as other features examined during a revision excavation in 2011, is presented in a separate study (Látková 2017).

Publications by Emanuel Opravil dealing with archaeobotanical data from earlier excavations are marked by certain shortcomings in the level of detail of the presented data. Specifically, information about the number of plant macroremain finds by taxon is often missing, as are data on the particular contexts from which the finds originate. For this reason, this paper focuses primarily on the information presented in the work published in 1972, which provides the most objective data (Opravil 1972).

5. Results

5.1 Gall

Galls (*cecidia*) are specific and diverse structures found on the leaves and other vegetative organs of plants. Galls are typically described as spatially delimited, spherical structures or deviations from normal plant growth (so-called neoplasms), resulting from a specific response to the presence of an alien organism. Each gall-forming organism uses its gall as protection against adverse environmental factors and as a food source. These parasites stimulate plant tissue cells to multiply, causing the affected cells to change and increase in volume (Skuhravá, Skuhravý 2010, 219).

The gall identified at the archaeological site of Mikulčice (Fig. 10.2–10.4) has been determined as a common beech (*Fagus sylvatica*) gall according to the taxonomic key (Lendělová 2008). Its identification was based on general morphology (Látková 2017, 65) and dimensional parameters of 7.8 × 5.79 mm. Beech galls are characterised by their distinctive barrel-like shape with a pointed apex and, therefore, easy to recognise (Fig. 10.5, 10.6). Their size usually ranges from 5 to 10 mm (Zúbrik, Kunca 2011, 134). Beech galls are formed by the



Fig. 10.2. Mikulčice-Valy. Lateral view of the burnt beech gall. Photo by M. Látková.

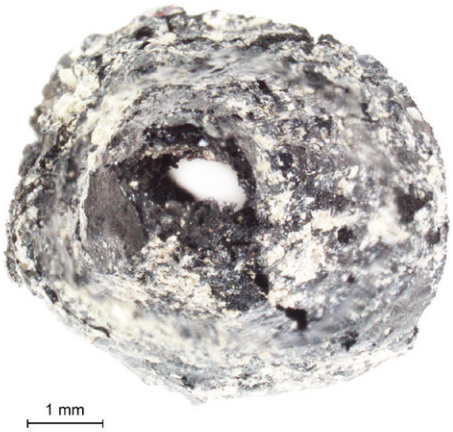


Fig. 10.3. Mikulčice-Valy. Apical view of the burnt beech gall. Photo by M. Látková.



Fig. 10.4. Mikulčice-Valy. Dorsal view of the burnt beech gall. Photo by M. Látková.



Fig. 10.5. Beech leaves infested by beech gall midge. Photo by M. Fiala.



Fig. 10.6. Dimension timber of the beech gall. Photo by M. Fiala.

parasitic midge *Mikiola fagi*, whose larvae (4–5 mm) develop exclusively on the leaves of this tree species.

In addition to this gall, eight more gall specimens have been recorded in Mikulčice, but they were preserved in a water environment and determined as oak (*Quercus sp.*) galls. The original findspot of these specimens cannot be precisely determined, but they presumably come from the layers of damp, waterlogged sediments of the former riverbed (Opravil 2000, 350). Interestingly, one of the oak gall finds, registered under inventory number 188/98, was interpreted as a toy – a marble (Poláček et al. 2000, 220, 254, Abb. 15: 2).

5.2 Beech seeds

Two uncharred beech cupules were identified in the fill of the former riverbed (Opravil 1972, 10). Despite ongoing archaeobotanical research since 2005, including analysis of sediments from the former riverbed, no further finds of beech seeds have been recorded.

5.3 Beechwood in connection with sword scabbards

Further evidence of the presence of beech as a taxon in the archaeological context has the form of sword scabbards made of beechwood, preserved as mineralised fragments (Opravil 1972, 10). However, E. Opravil does not specify the exact number of swords from Mikulčice from which these samples originate; he only mentions their exceptional occurrence. A significant advance in this subject was made in 2016 when the mineralised wood remains on the blade of a sword newly found in Mikulčice-Valy, specifically from grave 2041 at the Kostelisko site (PL 144), were analysed. The analysis of three fragments of wood provided important information regarding the use of beech in sword scabbard production in the given period.

The wood samples were taken from different parts of the sword blade and in all cases, the mineralised remains were identified as common beech (*Fagus sylvatica*). Organic fragments from the hilt area could not be taxonomically determined more closely due to their significant damage and degradation.

The selection of beechwood for the production of sword scabbards was probably not accidental. The characteristic dense arrangement of medullary rays in the wood considerably limits the penetration of water and moisture into its structure, thereby reducing the risk of corrosion of metal blades kept in such scabbards. For these reasons, beechwood seems to be an exceptionally suitable material for protecting steel weapons such as swords – artefacts that were considered extraordinary and prestigious in early medieval Central Europe.

Given the rarity of the weapon itself and the specific requirements on the quality of the wood used in scabbard manufacture, it cannot be ruled out that beechwood, or even finished scabbards, were imported to Mikulčice from greater distances.

5.4 Other beechwood finds from Mikulčice

Neither precise quantitative data nor the localisation of all finds are known from archaeobotanical surveys conducted in the past, but according to E. Opravil's report (1972, 22–26), pieces of beech charcoal occurred only sporadically. They were identified primarily in fire rings, features with residential functions and settlement layers within the stronghold complex, including sediments from the former riverbed. Uncharred fragments of beechwood, by contrast, come exclusively from the deposits of the former riverbed.

A comprehensive analysis of plant material from the Trapíkov site in the hinterland of the Mikulčice agglomeration involved over 1,300 pieces of charcoal from a variety of settlement features. Beech charcoal accounted for 4% of these finds (Hladík et al. 2022, 93, 106). Based on these archaeological contexts, it can be inferred that beechwood did not primarily serve a construction function in Mikulčice but was used mainly as firewood.

5.5 Pollen evidence of the occurrence of beech in the Mikulčice region

Additional indirect evidence of the possible presence of beech in the wider vicinity of Mikulčice in the Early Middle Ages is pollen grains identified in palynological profiles in the area of Vracov (Rybníček 1983; Jamrichová et al. 2013, Fig. 4; Kuneš et al. 2015) and in natural sediments of the former riverbed directly at the Mikulčice stronghold (Dohnalová 2014, Taf. 8.2).

Palynological data published from the region make it evident that the occurrence of beech was limited in the period under study. The representation of beech pollen ranged from 0.2% (Svatobořice-Mistřín) to a maximum of 10.2% (Vracov profile; Svobodová 1997). The highest values of beech pollen occurrence were recorded in a former lake profile near Vracov (Svobodová 1997); this profile likely reflects the regional vegetation cover of the lowlands and adjacent mountain ranges.

Quantitative pollen data modelling from the Vracov site using the REVEALS method (Kuneš et al. 2015) corrected the occurrence of beech to ca 5%; the authors assume that stands with a dominance of beech occurred above all in more varied and higher-altitude parts of the examined area. In lowland areas, such as the Mikulčice stronghold itself, beech was probably not as represented as in higher altitudes, such as the White Carpathians, where the percentage of its pollen was considerably higher in the given period.

6. Discussion

The interpretation of the occurrence of beech in archaeobotanical material from Mikulčice and its vicinity is complicated due to taphonomic and post-depositional processes that participated in the formation of the macroremain assemblages and pollen data. These processes can considerably influence the composition of the identified species and their quantitative representation in archaeological contexts.

Beech pollen regularly occurs in palynological profiles from the given region, but its representation is usually low. This phenomenon can be partially explained by long-distance transport of pollen in a more open landscape where approximately 20% of the area was comprised of open vegetation (Kuneš et al. 2015). Such (semi-)open landscape structures might have enabled the spread of pollen from greater distances; for example, from the Carpathians, where beech and fir forests were the dominant component of the vegetation cover (Rybníček, Rybníčková 2008; Hájková et al. 2013; Petr et al. 2013).

Even so, the presence of beech macroremains in archaeological contexts may also indicate its isolated or sporadic occurrence in lowland forests, probably in ecologically more favourable microhabitats with higher humidity. However, the beech cupules found in the fill of the former riverbed need not have originated from the immediate vicinity. They might have been brought into the river from other localities and then transported at a greater distance by the stream. Beechwood excels in high calorific value and favourable impregnation, which makes it a suitable material for the production of sword scabbards. Nevertheless, there is no evidence of its use as a building material, for example, in the construction of sacred buildings or the fortification in Mikulčice (Opravil 1972, 22–26). In the archaeobotanical record, it appears to be a tree species that was used primarily for energy purposes.

The presumed specialised production of precious metal jewellery at the stronghold might have required quality fuel with a high calorific value. In this context, it seems likely that beechwood, or possibly beech charcoal, was imported to Mikulčice from other regions (Opravil 1972, 23). This hypothesis is also corroborated by the evidence of the limited occurrence of beech in settlement layers and its presence in the form of small fragments of pieces of charcoal and uncharred cupules in river sediments, which in themselves do not make it possible to unambiguously determine the provenance of this tree species.

The presence of galls, which occur exclusively on beech leaves, may also indicate the possible import of beechwood, which, even at greater distances, would have been justified from the perspective of economic activities, especially in the case of transporting leaf hay (leaf fodder), a phenomenon archaeobotanically documented in some regions of Europe (Haas et al. 1998). Based on the present occurrence of beech, leaf hay would have to be imported to Mikulčice from a distance of at least 30 km (from the

Strážnice region, for example). Such transport does not seem very likely, however, in view of the logistical and economic limitations of the Early Middle Ages. For this reason, the presence of galls in the archaeobotanical material can only be interpreted as indirect evidence of beech in the immediate or wider neighbourhood of the Mikulčice stronghold.

Another indicator of the presence of beech is its seeds – beechnuts. They serve as an important source of food for forest animals and as nourishing fodder for farm animals (Nilsson 1985). Moreover, beechnuts contain up to 48% of fat, which makes them suitable material for the production of high-quality oil (Stoličná 1997, 288). Home extraction of oil from beechnuts was a traditional practice that persisted in west Slovakia (Záhorie) and south Moravia until the 20th century (Stoličná 1997, 288).

7. Conclusion

The presented archaeobotanical evidence indicates a sporadic but increasingly distinct presence of common beech (*Fagus sylvatica*) in early medieval settlement and natural contexts in the area of the Lower Morava Valley. Even though the number of macroremains (pieces of charcoal, mineralised wood fragments, cupules, galls) and microanalytical records (pollen) is gradually increasing, their interpretation is considerably limited due to taphonomic and post-depositional processes.

The data obtained provide primarily indirect evidence of beech occurrence in the region under study. Wood used for the manufacture of sword scabbards or as fuel may have been transported to Mikulčice from greater distances, preventing unequivocal determination of its local origin. Nor can palynological records satisfactorily resolve the question of beech origin in the area – the low share of its pollen may be due to long-distance transport in the open landscape, which was typical of south Moravia in the early medieval period.

The most relevant evidence for the local presence of beech is the find of a gall, which is directly associated with beech leaves and whose presence cannot be easily explained by secondary transport or import. The import of leaf fodder (leaf hay) from more distant regions (e.g. from Strážnice) appears unlikely in the context of the Mikulčice stronghold, considering the economic demands of such an undertaking in the Early Middle Ages.

Based on the available data, it can be assumed that beech did occur in the vicinity of the Mikulčice agglomeration, albeit probably only in limited quantity, as a component of oak-hornbeam forests with moister microhabitats. While the natural conditions of the Lower Morava Valley are not optimal for the natural development of beech, its high quality as a fuel and technical wood might have led to its targeted exploitation or selective import.

The results presented in this paper contribute to our understanding of the distinct character of the floodplain environment around Mikulčice in the Early Middle Ages compared to the present situation. Today, beech has disappeared from the immediate surroundings of the stronghold, and its current retreat to higher altitudes reflects contemporary climatic changes and the ecological limits of this tree species.

Acknowledgements

The work of Eva Jamrichová was supported by a long-term research and development project RVO 67985939 – Czech Academy of Sciences.

III Artefacts

Chapter 11

The little helpers: Amulets in Avar graves

Falko Daim, Kayleigh Saunderson

1. Introduction: People, magic, and religiosity

Amulets are pendants with magical powers assigned to them, bringing luck or warding off harm. They are usually worn around the neck or carried in a pouch. It would be too simple to dismiss amulets as pure hoax. They are directly related to humans as spiritual beings. On a level beyond the material world, everything that surrounds us is organised, interpreted and evaluated. This is where myths, religiosity, art, culture and value systems arise,[1] as well as spiritual strategies for dealing with dangers of all kinds and strengthening confidence. People feel threatened in many different ways, by storms and drought, illness, death and much more. The actual causes or backgrounds for this were usually unclear to humans, but they created world views that provided explanations for everything and anything. Thus, humans had ideas of good and evil forces, demons, devils, and angels. Prayers and sacrifices to the supernatural or other religious practices could provide support in all situations in life, and in some circumstances even sorcery. A certain effect is guaranteed, as any strategy against adversity and for aid can give hope and mobilise resistance. The fact that amulets could actually have a certain effect in this way should not be underestimated.

From the Mediterranean, we have numerous texts on the sometimes highly detailed ideas of supernatural beings that threaten or protect humans and the corresponding Christian reinterpretations. Demons have a special significance here – they stand between humans and gods and, in the Christian interpretation as fallen angels, are the devil's helpers but also God's creatures (Rapp 2012). In addition to faith and trust in God, all kinds of rituals and 'little helpers', amulets, also called talismans, are needed to ward them off. They played a major role in everyday life in all situations.

At the Council of Laodikeia (360), clerics were forbidden to work as magicians, conjurers, mathematicians or astrologers or to produce so-called *phylakteria*. This was apparently an attempt to counter a common practice (Partially literal: Rapp 2012, 111–112).

However, wearing amulets is warmly welcomed by the church. Patriarch Germanos (early 8th century) claims: '*From time immemorial we Christians have worn phylacteries made of gold and silver, either around the neck or hanging in front of the chest. These give our lives protection and security, and salvation for body and soul. This is where they get their name, as they are used to heal ailments and to ward off the attacks of impure demons*' (Antirrheticus, Sp. 433C–D.; Rapp 2012, 112). The description matches the late antique amulets from Halbturn and Frankfurt surprisingly well.

In the year 2000, a silver amulet case was found in a late antique child's grave in Halbturn,

1 The cognitive possibilities for pre-modern humans were naturally very limited, but the observed phenomena, such as volcanic eruptions, lightning and thunder, up to existential questions about the meaning of life and death, demanded explanations. Humans found these in complex thought structures that could not be derived directly from observations or experiences, but rather complemented them. The image of the two levels, the material and the spiritual world of humans, is derived from constructivist concepts, whereby the 'most radical' variant assumes that humans cannot recognise reality at all and that their images of it arise exclusively in their heads. E.g. Watzlawick 1976.

Burgenland. It contained a rolled gold sheet with a Greek inscription, which H. Taeuber (University of Vienna) was able to decipher and interpret (Taeuber 2014). The text is the beginning of the Jewish creed '*Hear, Israel: Yahweh is our God, and there is one Yahweh*' (Doneus 2010; Doneus Hrsg. 2014). Amulet capsules of this type have been found in Palestine since the 7th century BC (Kotansky 1994). Amulets with religious or magical texts therefore have a very long tradition.

Another late antique amulet capsule was recently discovered in a late Roman burial ground in Frankfurt. In the grave of a 35- to 45-year-old man, a case was found below the chin with a rolled up, heavily corroded silver foil inside. The Leibniz Centre for Archaeology (LEIZA) in Mainz was able to examine the roll using computer tomography and partially reconstruct the inscription. Markus Scholz (University of Frankfurt) was able to decipher and translate the *Frankfurter Silberschrift* (Wiki). As Christ is mentioned several times in the text and explicit reference is made to the Letter of the Paul to the Philippians, it is clearly a Christian testimony.

An astrological-astronomical composite manuscript from the 15th century, which also contains instructions for making amulets, is evidence of uninterrupted practice until the Late Middle Ages. It is illustrated with drawings and spells and evidently enjoyed great popularity, as shown by the additions made by various users of the book (Daim Hrsg. 2012, 248).

2. Armour amulets in Avar period burials

Occasionally, multiple interlocked rings, mostly iron but in some cases with added bronze, are found in graves of women and girls of the Avar period on the left side of the deceased.[2] They are partially riveted, partially open with overlapping ends (Fig. 11.1). They differ from chains used for attaching bags and pendants to belts on or as a long strap, as known from, e.g. Zamárdi-Rétiföldek, Hungary, which are made from bronze with figure-eight-shaped chain elements, though also on the left side (Garam 2010, 148–149). Rather, they are placed in small piles with multiple iron rings interlocked into one another. These appear to be parts of ('chain-')mail armour, comparable to the mail found in Derecske, dating to the first third of the 7th century (Hága 2022, 188).

This practice of using mail pieces as amulets was previously identified in Late Roman Pannonia at the cemetery of Štrbinci near Đakovo (Croatia) (Migotti 2007, 210). The two pieces were found in children's burials. The piece from girl's grave 45 is particularly interesting: the mail fragment was clearly wrapped in a piece of textile, which is quite well-preserved, further underlining its function as a ritual-religious relic (Migotti 2007, 204–205, Fig. 1). While this find is dated between the second half of the 4th and the first half of the 5th centuries, the ritual ideas may well be overlapping. At the cemetery of Tiszadob-Sziget belonging to the Sarmatian territory around the turn of the 5th century, similar chain pieces have been found and on which traces of textile and wood have been noted (Istvánovits 1993, 99–100, 103, 105; Migotti 2007, Fig. 3a, b). The 5th–6th-centuries Gepid-period girl's grave 74 at Szőreg-Téglagyár again contains fragments of such mail at the pelvis with mineralised textiles (Nagy 2005, 132).

It has been suggested that the tradition of placing mail armour fragments into graves derives from the Przeworsk cultural circle (Poland), where such finds date as far back as the late 2nd century AD (Istvánovits 1993, 130–131; Migotti 2007, 207). One has also been found in Opatów, grave 147, belonging to the Przeworsk culture (Godłowski 1980, 92, Fig. 6, after Beilke-Voigt 1998, Taf. 24). The amulet from grave 22 from the cemetery of Absdorf, Lower Austria, probably dating from the end of the 8th to the beginning of the 9th centuries, showed that this ritual spread to the north during the end of the Avar period (Friesinger 1971–1974, 74 and Taf. 19).[3] A systematic collection of mail and plate armour amulets is still to be assembled.

Similar finds have been described as pieces of mail armour by A. Ierusalimskaja, derived from outside the Avar Khaganate – Moshchevaya Balka in the Northern Caucasus, dating to the 8th to 9th centuries. They appear similar in size and shape to those of the Avar period, with partially riveted rings, also from women's burials (from graves I/12 and I/15; Ierusalimskaja 1996, 166). Anna Ierusalimskaja suggests that these armour amulets were sewn onto the clothing of women seeing their men off to war and also as a sign of mourning (Ierusalimskaja 2012, 292), which she based on ethnographical

2 For the history of the Avars and the Avar Empire see Pohl 2018.

3 We thank Martin Obenaus for pointing this out.

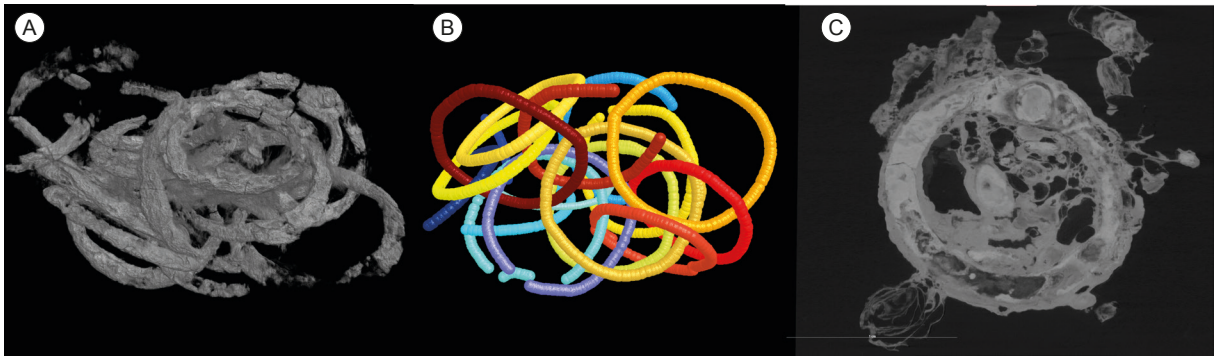


Fig. 11.1. CT-scans of mail fragments from Mödling. A – mail from grave 255(?); B – visualisation of the interlinking of the mail from grave 255 – red indicates riveted rings, yellow indicates non-riveted rings, blue indicates that it could not be identified; C – riveted ring from the mail fragment found in grave 6. Author V. Winkler (NhM Vienna).

sources from 19th- and 20th-centuries Georgia (Volkova, Javakhishvili 1982, 141). It is unlikely that this exact meaning can be transferred to the Avars, as the amulets are often found in young children's burials and a protective function seems more likely.

Péter Major and Bence Gulyás have noted the finds of single armour plates in Avar-period graves in the Carpathian Basin. Their study concluded that in 75 cases (63%), only one plate was placed in the grave, by the head, chest, hips (most commonly) or legs. In terms of age, more than half are considered infants to juveniles, while the biological gender distribution is quite balanced. The idea of *pars pro toto* burial goods must be considered here, symbolising a complete set of armour of a person of warrior status, but also – in a similar way – the symbolic meaning of armour being represented by it and its use as an amulet providing protection from harm (Major, Gulyás 2023, 33, 35).

3. Mödling – An der Goldenen Stiege

The Avar necropolis of Mödling – An der Goldenen Stiege (Lower Austria) with 553 graves and dating to the 7th and 8th centuries was excavated between 1967 and 1973 by K. Matzner as well as H. and L. Schwammenhöfer (Daim et al. 2023). The burial site was located on a plateau on the slope of the Vienna Woods between prehistoric burial mounds. It overlooked the Vienna Basin, and the burial ground was most likely visible from the associated settlement in the valley. However, it is unclear exactly where it was located due to dense modern development.

Like the cemetery of Leobersdorf (Lower Austria; Daim 1987), located about 20 km further south, the necropolis of Mödling underwent a full archaeogenetic investigation as part of the ongoing international research project 'HistoGenes: Integrating genetic, archaeological and historical perspectives on eastern Central Europe 400–900 AD' (Wang et al. 2025). This showed that the population of Leobersdorf was of 'eastern Asian' origin (ancestry) and – contrary to our expectations – did not mix with the neighbouring clans in the 150 to 200 years of occupation of the cemetery. However, as there was neither inbreeding nor reproductive partnerships within the cemetery in Leobersdorf, the mothers must have come from other related groups, perhaps from Avar settlements east of the Danube or the Tisza or even from Eastern Europe. In contrast, the population of Mödling – An der Goldenen Stiege is clearly Central European – probably a mixture of the Roman, Balkan-Eastern Mediterranean-Southern European population and North-Eastern European (Slavic?) immigrants. Perhaps it will be possible to characterise them more precisely in the future. A monographic series on the Avar period cemetery of Mödling is currently in preparation (Daim, Stadler, Schwammenhöfer Hrsg. in preparation).

What makes the population of Mödling very different from that of Leobersdorf are the objects found in numerous burials that can be described as amulets. These are mainly small pieces of ('chain-')mail and rectangular iron plates with perforated edges

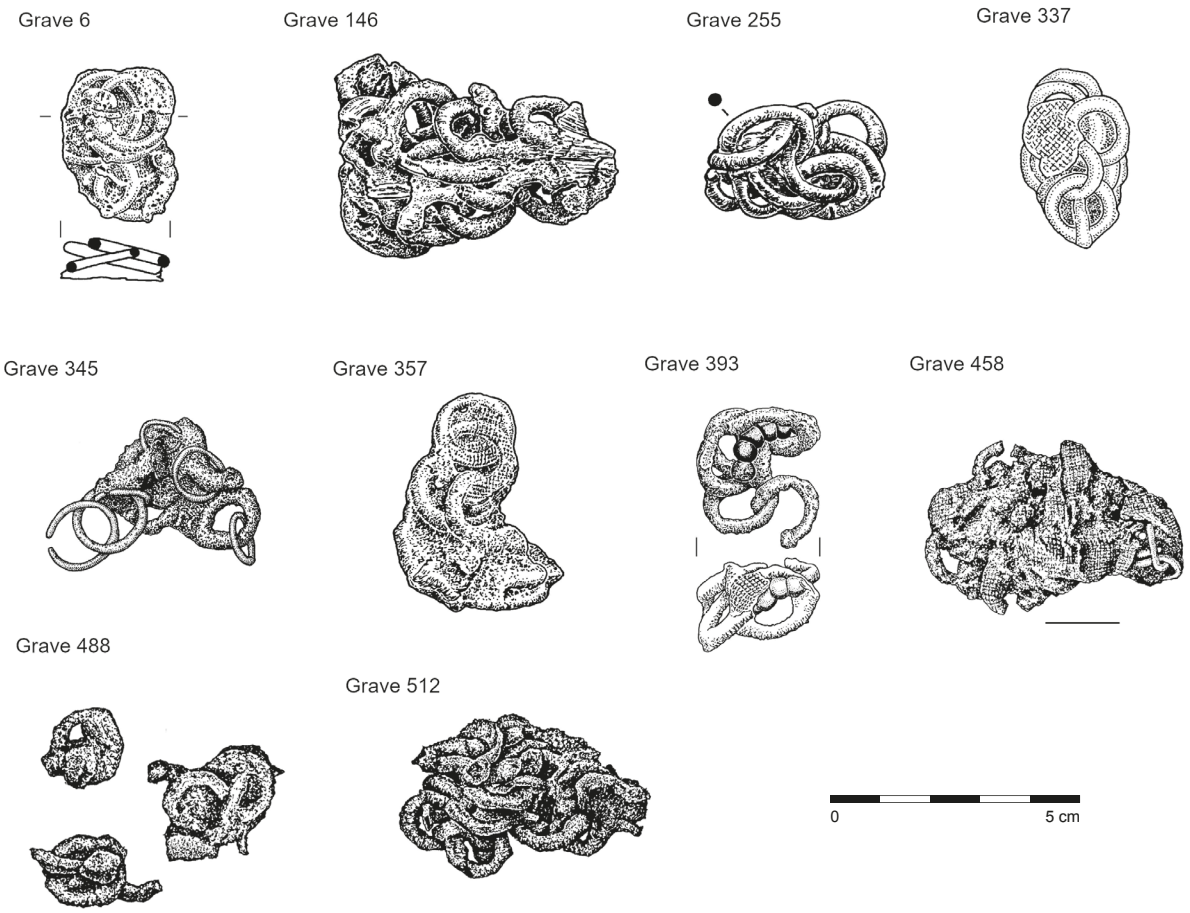


Fig. 11.2. Mail amulets from Mödling grave 6, 146, 255, 337, 345, 357, 393, 458, 488, and 512. Grave 345 also contains a plate armour amulet. After Daim, Stadler, Schwammenhöfer Hrsg. in preparation.

from a cuirass, but snail shells[4] and perforated mussel shells should also be mentioned in this context. A tower snail shell from Mödling child's grave 305 is particularly interesting, since it is not fossilised and thus must have been brought to Mödling from the Mediterranean Sea.[5] This means that this shell could have been brought as a 'souvenir' by one of the members of the Mödling society from the Mediterranean, or, what the authors deem more likely, reached the Avar Khaganate through an amulet trader.

The mail pieces were exclusively found in burials of women and young girls in Mödling (6, 146, 255, 337, 345, 357, 393, 458, 488, 512) (Fig. 11.2). They lay by the left hip or the left upper arm, possibly in a satchel. Only in women's grave 6 did they lie at the base of the neck and could therefore have been attached to the necklace. This suggests that they were part of costume and were therefore also worn on the body before death. Although we can also assume this for the other mail amulets, as they were probably intended to protect the wearer not only in death but also in everyday life, this cannot be proven and it can also be considered that amulets were only placed on the body after death by the surviving mourners, thus protecting the wearer in the afterlife.

4 Although snail shells are found in 11 graves in Mödling, in contrast to chain armour amulets we see no ritual canon for wearing or the use of snail shells. Very different types of snail shells were used, from very small March snails (*Zebrina detrita*) to large vineyard snails (*Helix pamatia*). They can be joined together to form a necklace or complete a string of beads and can be found under the skull or 30 cm above it. They are found in children's, women's, and men's graves. This lack of uniformity makes it difficult to postulate a simple logic. Perhaps they served different needs, as jewellery for the living or as congratulations for the transition.

5 Information kindly provided by Fritz Steininger, Eggenburg.

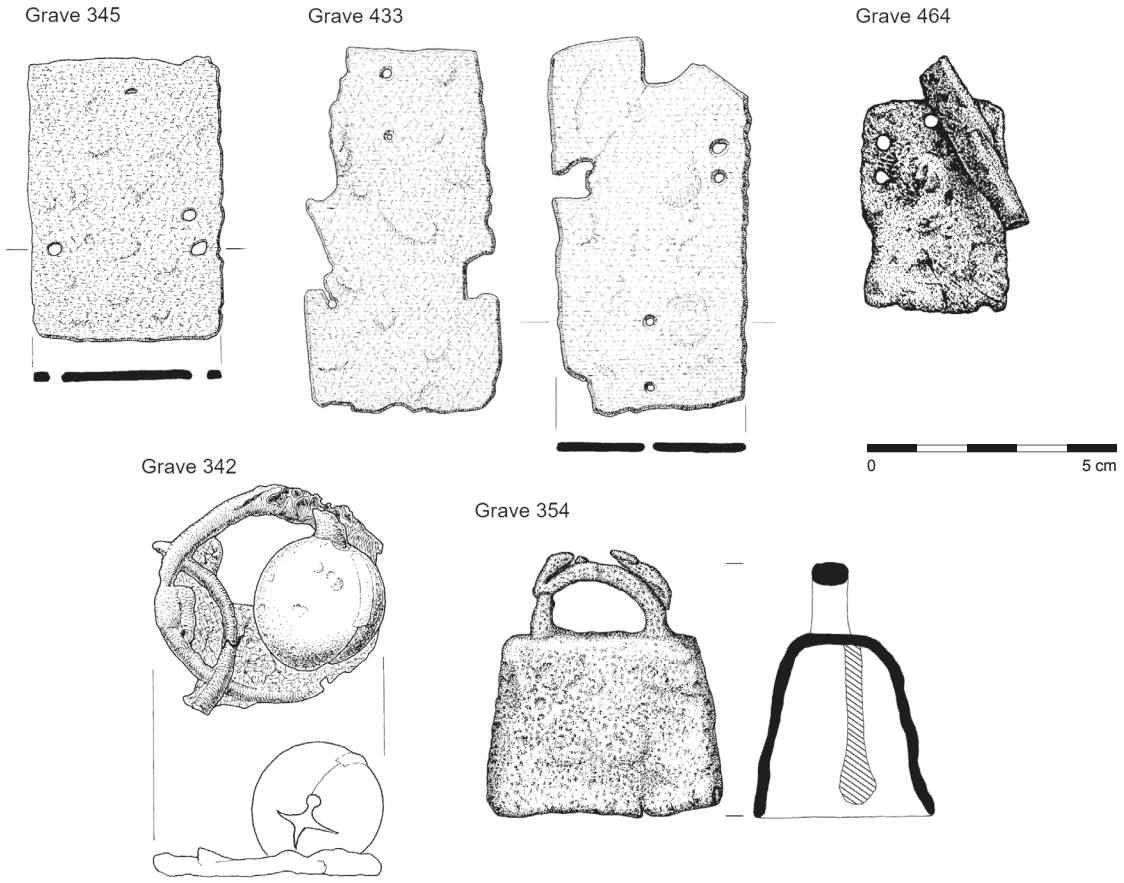


Fig. 11.3. Additional likely amulets from Mödling. Plate armour amulets from grave 345, 433, and 464 as well as a pellet bell from grave 342 and a bell from grave 354. After Daim, Stadler, Schwammenhöfer Hrsg. in preparation.

The four rectangular and perforated armour plates (Fig. 11.3) were found in different places: in the case of the woman in grave 345, the iron plate with multiple holes around its edge was lying next to other objects near her right forearm. The infant in grave 433 had two armour plates placed at the foot of the grave together with a clay pot (with unknown contents). It is therefore unlikely that the infant would have carried the iron plates with it during its lifetime. This finding is also important because the two armour plates clearly represent grave goods. The sex of the child is uncertain. In grave 464, an armour plate was discovered under the left pelvis, i.e. roughly in the same place where – with the exception of grave 6 – the mail fragments were also found in the aforementioned women's graves. It is interesting to note, however, that here – in contrast to all the graves with mail amulets – it was a young man who was buried with an armour plate. It seems that the armour plate rite had no fixed rules as to how the plates should be handled. However, the effect of the armour plates must have been known throughout Mödling. Grave 433 and 464 belong to the earlier burials in Mödling, while grave 345 dates to the Late Avar period.

Grave 345 in Mödling is a special case. The late Avar period woman was furnished with an excessive number of amulets and other presumed lucky charms. Apart from the mail amulet together with a small bone tube, probably a needle case, she also had an iron armour plate, two needle cases, one of them with an iron needle, a perforated shell, a ringlet made of shell lime and a knife near her right arm. Whether all of this could also have been contained in a bag remains unknown. However, two things are interesting: the large number of 'helpers' in the grave apparently means that the powers of the amulets can be added together in the imagination of the wearers or bereaved. The woman's age at death is also intriguing. She was 18 to 24, which is about the same age as the

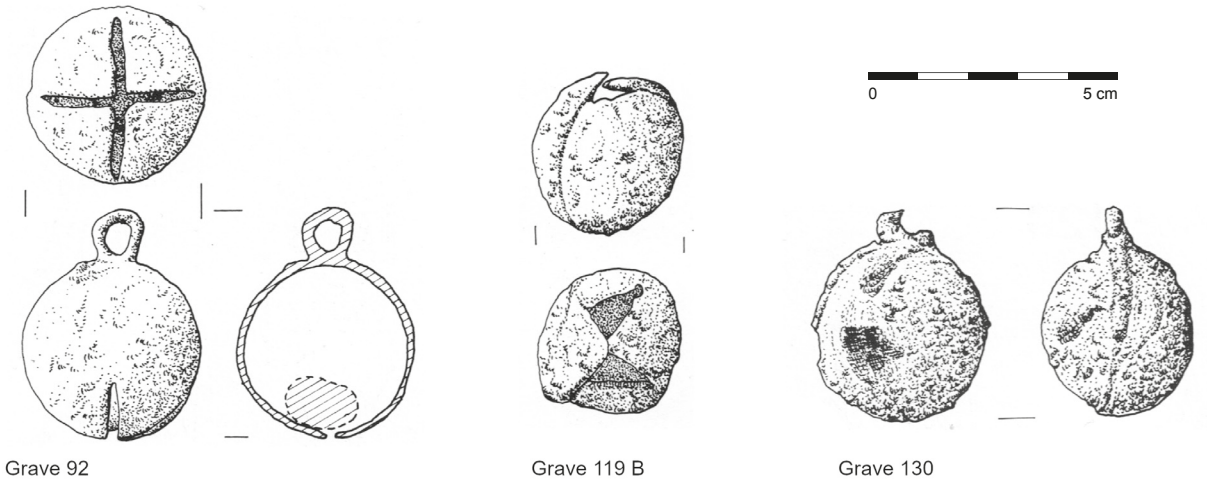


Fig. 11.4. Pellet bells from Leobersdorf grave 92, 119 B, and 130. After Daim 1987, 271, 305, 406.

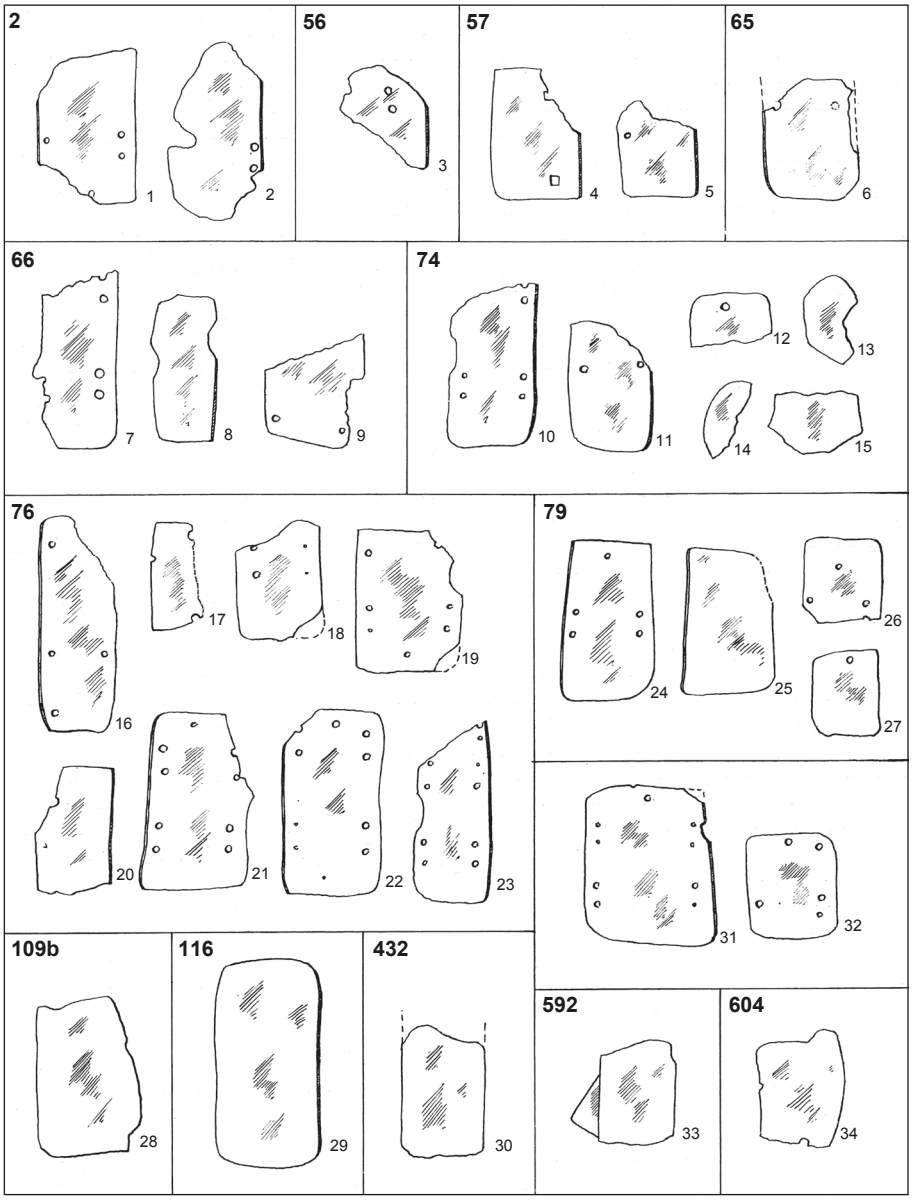


Fig. 11.5. Iron plate armour remains from Alattyán. After Kovrig 1963, Fig. 6.

'princess' from grave 144 (20–25 years). Perhaps she was entitled to a more elaborate funeral because of her gender and age group (see also Distelberger 2004).

Furthermore, a pellet bell and bell were also found in two graves from Mödling, which can also be seen as amulets (see discussion below). In Leobersdorf, while no armour amulets were found, three graves contained pellet bells (Daim 1987, 100), which could have served a similar purpose (Fig. 11.4).

The use of armour plates as amulets is not limited to Mödling. Fourteen such plates were also found in Alattyán, an important necropolis in the centre of the Avar Empire. Ilona Kovrig deems it possible that there are superstitious beliefs behind the 'armour scales' in women's graves (Kovrig 1963, 117 with Fig. 6, 118) (Fig. 11.5).

Tivadar Vida has analysed early medieval discoid and spherical amulet cases and Christian elements in the Avar Empire and beyond multiple times (Vida 1995; 2002; 2009; 2025). The detailed analysis of the necropolis of Zamárdi-Rétiföldek by É. Garam (Bárdos, Garam 2009; 2014), and in particular a small study on 'old finds', which she dedicated to H. Dannheimer in 2010, is very informative and important for the evaluation of the Mödling amulet culture (Garam 2010). In Zamárdi, for example, there are also cases containing mail amulets, some of which were added to rich belt hangings (Fig. 11.6). The rich Mediterranean amulet culture certainly served as a model for the practices in Pannonia and it can be assumed that there was a lucrative trade in talismans and *phylacteries* from the Mediterranean to the Avar Empire. The association of the goods in silk or other valuable textiles, which K. Saunderson was able to prove, put the amulets in the proper light. The fact that two chain mail amulets were also found in the cave tombs of Moshchevaya Balka in the northern Caucasus shows how widespread these talismans were.

Although there are no amulets in the men's graves in Mödling, in contrast to the graves of women and female infants, there are many 'female' objects, such as short necklaces and spindle whorls. In Leobersdorf, however, this custom is completely unknown. Men's and women's outfits are strictly separated from each other.

As with other early medieval societies, perforated coins, glass fragments, pieces of metal and much more were also integrated into the necklaces of the Mödling women. We presume that many of these finds were looted from older graves, perhaps even the armour amulets, though this has not been conclusive. The people of Leobersdorf also treasured archaic artefacts such as coins and a Roman oil lamp. They may have been considered of special value purely due to their age and being connected to past cultures and ancestors. However, an amulet character cannot be ruled out in all cases, with many Roman objects likely being seen as curiosities. They might have been connected to a mythical past, thereby possessing magical properties (Dobos, Nyulas 2022, 174–176).

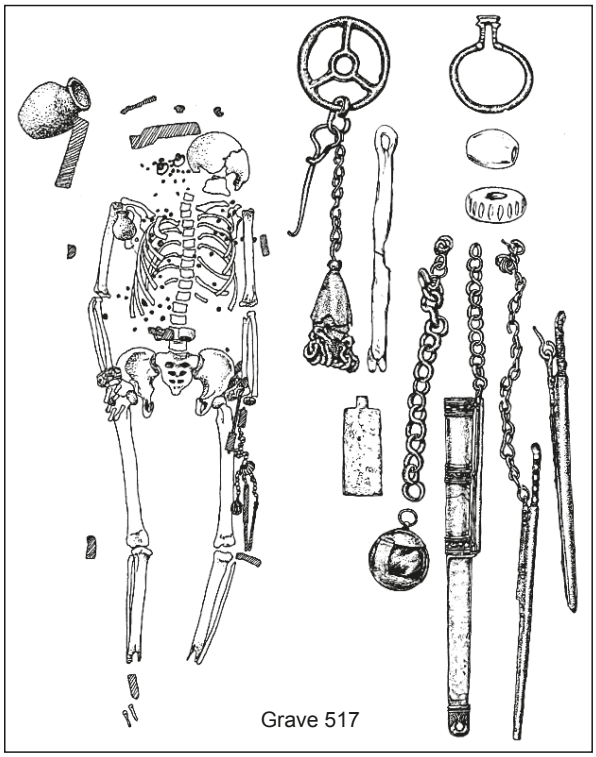


Fig. 11.6. Zamárdi-Rétiföldek grave 517 with multiple objects hanging from the belt on chains. After Garam 2010, Fig. 1.

4. Textiles on amulets from Mödling

Textiles are an important part of daily life and burial rites in a wide variety of cultures and eras. In graves of the Early Medieval period, we can expect to find clothing textiles, more or less purely functional textiles such as pouches and pillows, fabrics as valuable gifts, but also textiles connected to the ritual and beliefs on death and the afterlife. The latter typically include burial linings, shrouds and 'wrappings' for individual grave goods, but it might not be reasonable to imagine only the functional value of these textiles in rituals, rather also the textile in and of itself. However, further ritual levels of the textiles are all the more complex and challenging to identify.

Grave	Sex	Age	Object	Textile	Twist		Thread diameter		Threads per cm		Weave	Material
146	F	40–60	Mail	Fine silk weave	I	I	0.1–0.2	0.1–0.2	35–40	35–40	Tabby	Silk
				Small, single thread	z		0.15		/		/	
337	F	30–45	Mail	Dense weave	z	z	0.3–0.35	0.3–0.35	22–23	20–23	Tabby	Bast fibre
345	F	18–24	Mail	Dense weave	z	z	0.35–0.45	0.35–0.45	18–20	14–16	Tabby	Wool
				Parallel threads			1.2		/		/	
				Coarse textile?			ca 0.5	ca 0.5				
			Plate	Twill weave	s	s	0.3–0.4	0.3–0.4	15–16	15–16	2 : 2 twill	Wool
				Unknown weave	z		0.3–0.4	0.3–0.4	20	16	2 : 1 basket?	Bast fibre?
357	F	adult	Mail	Fine, dense weave	z	z	0.3–0.4	0.25–0.4	22–25	23–25	Tabby	Bast fibre
393	F	2	Mail?	Dense weave	z	z	0.3–0.4	0.4–0.5	25–26	14	Tabby	Bast fibre
441	F?	25–35	Mail	Fine, dense weave	z	z	0.2–0.3	0.2–0.3	24–26	24	Tabby	
458	F	5–9	Mail	Dense weave	z	z	0.35–0.45	0.35–0.45	22	21–22	Tabby	Bast fibre
488	F	1–3	Mail	Dense weave	z	z	0.35–0.5	0.3–0.5	17–19	14–16	Tabby	Bast fibre?
				Wrapped thread	z		0.25–0.35		/		/	
512	F	10–15	Mail	Fine, dense weave	z	z	0.3–0.4	0.3–0.4	18–20	18–20	Tabby	Bast fibre?
				Wrapped thread	z		0.2–0.35		/		/	

Tab. 11.1. Table displaying the characteristics of the textiles found on the armour amulets. Cells highlighted in yellow indicate features that are unusual for the Avar period. Author K. Saunderson.

Small, mineralised remains of textiles on these amulets may indicate a further aspect that points to the special value of the armouring amulets. At the Avar burial site in Mödling, textiles were found on 10 of these amulets (mail from graves 146, 337, 345, 357, 393, 441, 458, 488 and 512; armour plate from grave 345) (Tab. 11.1).

Textiles of the Avar period are very characteristic and so uniform in their technical features that one could speak of 'standardised' production. The percentages given are based on data from 651 analysed textiles from the Avar period (Saunderson 2025). It should be noted that most of these finds come from the eastern Austrian region (82%); some were found in Slovakia (13%), Hungary (3.3%) and Croatia (1.5%). Although there are no regional differences, there are isolated unusual finds that for now come only from the Hungarian region and which could be connected to the Frankish region (Básti 2022, 156).

Chronologically, the textiles can be dated to the Middle to Late Avar period.

A typical Avar textile is woven in simple plain weave (98% of the fabrics) with z-spun yarns (92% of all threads), mostly with a thread thickness of 0.35–0.55 mm (70%) and a weaving density of 10–20 threads per centimetre (80%). Surprisingly, they are often made from bast fibre (probably flax/linen) (also the clothing: 59% secured bast fibre, another 25% probably bast fibre, only 10% wool). Textiles that do not fall into this typical spectrum therefore raise a number of questions. Some of them, especially those made from particularly fine threads or with a different weave, certainly stood out visually at the time of their use. Detailed characteristics such as s-twisted threads were probably not easily recognised, although in research these provide very valuable indications of other (foreign?) production (Saunderson in print). High qualities, with fine threads and a high weave density, stood out both visually and to the touch. A higher value must be assumed for these, as the amount of work involved increases immensely – both during spinning and weaving.

The high share and frequency of atypical textiles on the amulets is striking and does not appear to be a coincidence. Many of them are of particularly high quality, especially fine threads that were densely woven.

It should be emphasised that the only archaeological evidence of silk to date also comes from a mail amulet (grave 146). The fact that silk was known in the Late Avar period comes as no surprise: The Annals of Northumbria describes an Avar hoard that fell into the hands of the Franks in the year 796: 'fifteen carts full of gold, silver and robes/fabrics made of valuable, pure silk' (*plaustris auro argentoque paliisque olosericis preciosis repletis*) (Kardaras 2018, 149). It is assumed that silk came to the Khaganate via trade or gifts from Byzantium (Kardaras 2018, 149).

5. Functions of textiles on armour amulets

As mentioned previously, it is apparent that the textiles on the armour plates and chain mail parts are of exceptionally high quality or have unusual characteristics. This raises the question of whether the fabrics came to lie with the amulets by chance and are perhaps connected to them. In order to come closer to the question of the functions of the textiles, however, more concrete features must also be considered.

It is important for the interpretation to consider where exactly the amulet was lying (which could indicate whether it was clothing, for example, or where the amulet was attached), which other objects were associated with it, which other organic remains were preserved on the amulet, where exactly (on how many sides of the artefact) textiles are preserved, which microstratigraphy is recognisable (e.g. several layers of the same textile or other substances) and whether the same textiles can also be found elsewhere in the grave. However, the fundamentally fragmented preservation of textiles must always be taken into account, so that their absence cannot be regarded as strong evidence. It is also necessary to consider taphonomic processes and disturbances, as a result of which some objects are no longer in their original position.

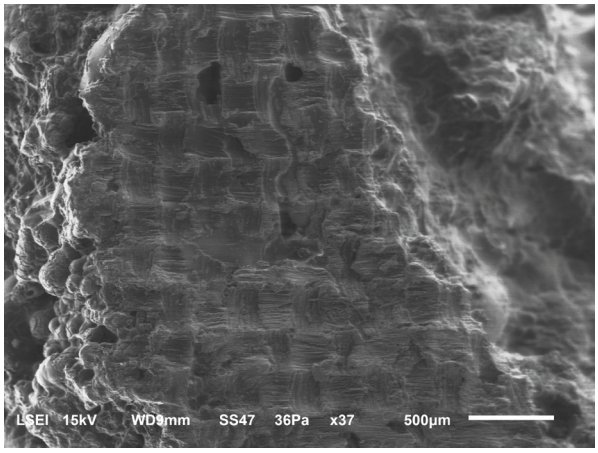


Fig. 11.7. Silk SEM: scanning electron microscope image of the woven silk found on the mail amulet in Mödling grave 146. Apart from the very fine threads typically lacking twists, the material could also be identified by the cross-sections. Author K. Saunderson.

Due to the high-quality rare material of the silk, the textile from grave 146 stands out (Fig. 11.7) – one could claim that it is the most valuable object in the (otherwise not too richly furnished) grave.

This silk certainly made a special impression on contemporary people, as the sheen and the extremely thin, unspun threads would have been remarkable. Clothing made of silk fibres seems to have been reserved for the elite in the Early Middle Ages, such as in the Merovingian tombs of Saint Denis (late 6th century) and Chelles (late 7th century) (Rast-Eicher 2016, 55). The amulet from Mödling grave 146 (Fig. 11.8) was located just below a needle case on the left forearm. The silk remains are concentrated in an area measuring 15 × 21 mm, where the rings lie flat. It should be mentioned that silk preserves and mineralises very poorly (Rast-Eicher 2016, 40). Another loose thread cannot be further identified. The wooden fragments preserved on both sides of the mail are interesting and reminiscent of wood preserved on late antique mail pieces found in Tiszadob-Sziget (Istvánovits 1993, 99–100, 103, 105). They could be the remains of a small box in which the amulet was kept. The relationship to the silk is not clear from the finds, but it may have been a small piece of fabric used to line the box or to 'wrap' the amulet. We cannot rule out that the amulet might also have been attached to the belt. It is possible that the silk itself had the function of an amulet and/or enhanced the value of the mail. It seems less likely that the silk was from clothing, as remains of the belted garment were preserved on the back of the simple iron buckle and fall within the typical spectrum of Avar-period fabrics. However, the silk could have been a decorative patch on this garment.

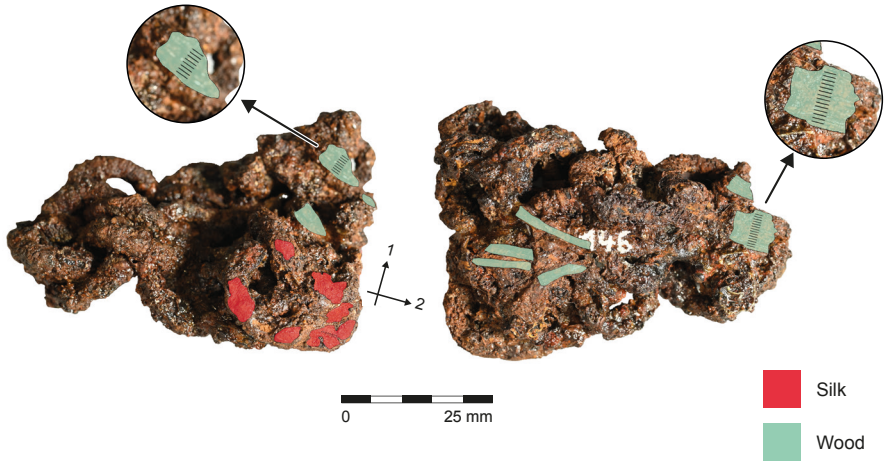


Fig. 11.8. Mapping of the locations of the silk and wood on the mail amulet from Mödling grave 146. Author K. Saunderson.

In the case of the woman from grave 337, a different belted clothing fabric can also be identified on a buckle. The mail amulet, located by the left humerus together with a knife and a needle box, has a fine, very dense linen weave on both sides (much more on one side) (see below Fig. 11.10: 1), which suggests 'wrapping', perhaps to protect the amulet from rust and dirt, or also a small fabric bag.

The young woman in grave 345 was furnished with two presumed armour amulets (Fig. 11.9). The mail found close to a needle case on the left forearm is made of both iron and a copper alloy. One side of the mail is covered with a dense wool fabric. Very coarse parallel threads lie above it, suggesting some kind of wrapping or tying. A poorly preserved fragment of a woven plant fibre textile is preserved on the other side. Unfortunately, the function of the textile is unclear – it may have been the clothing on which the amulet was placed, but it may instead have been a 'wrapping' that was tied up with the coarse threads. On the right forearm were another two needle boxes, a shell lime ringlet, a shell, a knife and the iron armour plate. The textiles preserved on it exhibit two unusual features: on one side there is a small fragment of wool textile in a 2 : 2 twill weave with s-spun threads in both systems (eleven cases known). The textile on the other side (and at the other end) is difficult to determine due to poor preservation – a 2 : 1 basket weave is possibly recognisable, which is only known in one other case from the Avar period. Unfortunately, it is not possible to determine the function of the two textiles on the plate; one may be a 'wrapping', the other clothing, or even a shroud.

The adult woman in grave 357 had a small fragment of iron mail with a fine, densely woven bast fibre textile attached to both sides (Fig. 11.10: 2). This indicates that the amulet could have been contained in a fabric bag or wrapped in this fabric.

In grave 393, the determination of the iron rings as part of mail and therefore an amulet is quite insecure due to the fact that there are not multiple interlocked rings. The warp- or weft-faced linen fabric is only preserved in one spot on the rings (Fig. 11.10: 3) in the pelvic area of the girl, who was about two years old. There are also slight traces of a thread wrapped around at least one ring, as well as some glass beads that may once have been attached together. There is no indication of the function of the fabric; the thread may have been used to attach the rings.

In grave 441, presumably belonging to a woman, a knife and possibly a mail amulet lay under the right hand – the only one on this side. Due to the poor preservation and the unusual placement, it is unclear whether it is in fact an amulet. On one side of the heavily iron-mineralised object, an extraordinarily high-quality textile made of bast fibre in a tabby weave is preserved over a large area (Fig. 11.10: 4). It is unlikely that this is the belted clothing – the belt buckle has probably slipped into the leg area, but the coarser linen weave on the back indicates a tightly belted garment. The textile on the possible amulet is difficult to interpret – it might derive from a small bag, wrapping or clothing, perhaps also from a burial lining.

Grave 458 belonging to a very young girl has an iron mail with two bronze rings next to her left thigh. One side is covered by a fine, dense linen fabric that runs slightly around the edge of the amulet (Fig. 11.10: 5). This course could be due to a fold in a fabric, such as clothing, or to a pouch, for example, with no fabric touching the top. It could also have been attached to the belt.

Fragments of mail were found in the pelvic area of the one- to three-year-old girl in grave 488, along with a knife and an iron rod. At least three layers were found on one fragment (Fig. 11.10: 6). These layers could be due to folds (e.g. of clothing), a wrapping (of a 'package' or shroud) or a satchel (compare Moshchevaya Balka below). On the other side is a fragment of leather. Furthermore, parallel threads were also documented on a ring, which could again be the wrapping of a ring for attachment, perhaps to be worn on the belt during her lifetime.

There is a similar textile find in grave 512, where some mail lay next to a needle case on the girl's left upper arm. Two layers of fine, dense fabric can be seen on one side (Fig. 11.10: 7). On at least three of the rings there are numerous wrappings with individual threads (Fig. 11.11), which in turn must have been used for attaching them to something.

A function as an amulet, a satchel or wrapping seems likely for the textiles. This has been observed with the amulets from Moshchevaya Balka, which are usually wrapped in small fabric bags, mostly of silk and linen decorated with silk. Anna Jerusalemskaya suggests that these amulets were also worn during one's lifetime – for women also on the left side. Due to the excellent preservation, the exact shape is known: They were folded twice and sewn together on the sides, with leather pieces added to the top and they could be attached to the clothing. They are likely related to Christian reliquary bags of the later 11th to 12th centuries. They were often dyed red – a colour associated with apotropaic properties in the Caucasus (Ierusalimskaja 1996, 62–63).

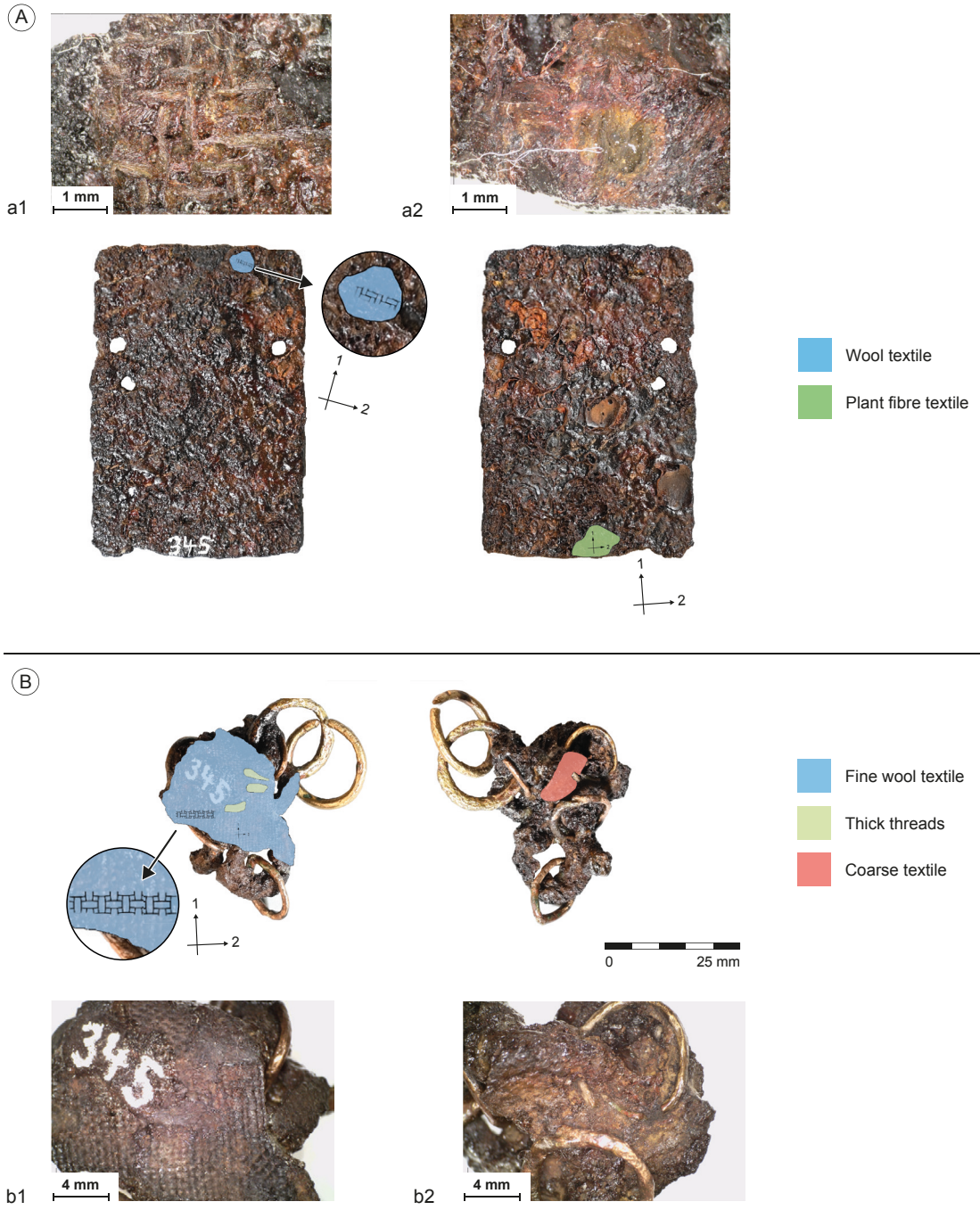


Fig. 11.9. The two armour amulets in Mödling grave 345. A – two sides of the supposed armour plate with two textile remains; a1 – detail of the wool twill textile; a2 – detail of the plant fibre textile. B – two sides of the supposed mail amulet with three textile remains (50× magnification); b1 – detail of the fine wool textile and the thick threads on top of it; b2 – detail of the coarse textile pierced by the bronze ring (20× magnification). Author K. Saunderson (DinoLite digital microscope).

6. Indications on the attachment of mail amulets

Wrappings with individual threads were visible (Fig. 11.11) on isolated rings of the mail amulets (graves 488, 512). There is no doubt that these are traces of the attachment of the mail, but it is unclear what they were attached to. In any case, it seems likely that these threads originate from the use phase as an amulet, rather than from the original use as armour, when they may have been attached to a carrier material (leather or linen). The reason for this assumption is that these threads would tend to unravel when the armour parts were separated. It therefore seems that the mail amulets were attached

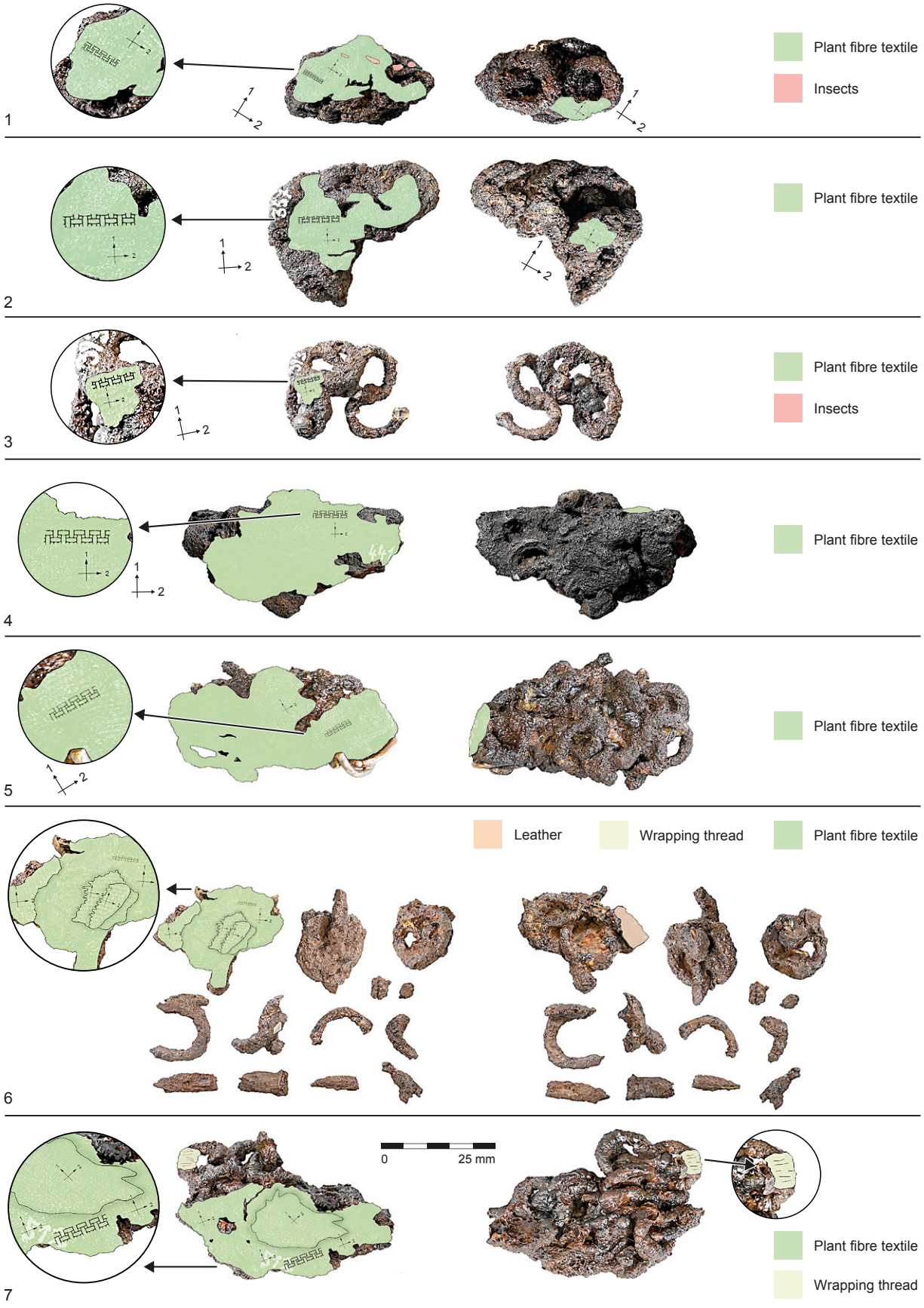


Fig. 11.10. Mail fragments from Mödling with adhering textiles. 1 – grave 337; 2 – grave 357; 3 – grave 393; 4 – grave 441; 5 – grave 458; 6 – grave 488; 7 – grave 512. Author K. Saunderson.

to something using these threads – sewn onto something, hanging from something, etc. during their use as an amulet during the wearer's lifetime. This does not rule out the possibility that they were enclosed in a pouch or wrapped fabric in a burial.

In the case of grave 345, one of the bronze rings passes through a hole in a seemingly woven textile. This might have been a means for attaching the mail to clothing.

Leather was also preserved on one of the mail amulets. Could it be the remains of primary use, a leather carrier material for mail armour? Was this leather deliberately left behind or could it not be separated from the ring? Was a strap or a pouch? Unfortunately, the preservation does not allow for precise interpretations.

7. Bells and pellet bells

When discussing apotropaic amulets in the Avar period, bells and pellet bells must be mentioned, even if they only occur in 0.7% of the graves. They were both mostly found in children's and women's burials, but, interestingly, they are not consistently placed on the left side in the female graves (Pomberger, Stadler 2018, 240). They were usually placed near the neck, hands, hips, and legs, suggesting that they were attached to necklaces, belts, or clothing. Chains are often still attached, while we can also expect strings to have been used. The custom may have originated from around the Black and Caspian seas and they also occur during the 1st millennium BC in Central Europe as well as in the Roman Era (Pomberger, Mühlhans, Saunderson 2023, 162–167).

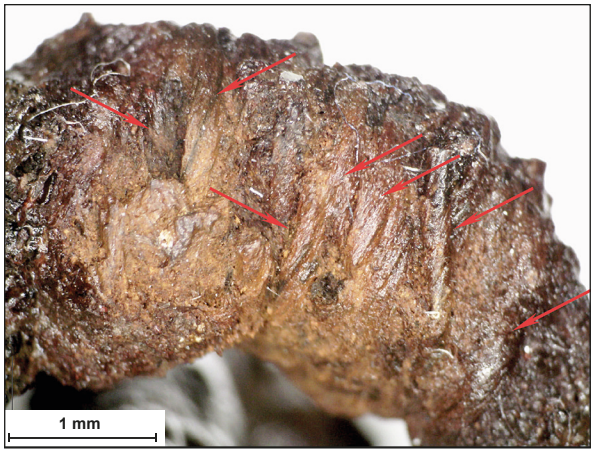


Fig. 11.11. Detail of threads wrapped around one of the rings from Mödling grave 512 (50× magnification). Author K. Saunderson (DinoLite digital microscope).

Some of these also carry mineralised textile remains, though most are difficult to interpret, with some exceptions: an iron pellet bell from Zillingtal grave 229, found by the child's right hip, clearly carries densely woven wool clothing on one side and very coarse wool on the other, possibly a blanket covering. This suggests that the instrument was worn as part of the clothing, whereby the dangling pellet bell would have sounded when the child moved. Much more interesting concerning the topic of amulets is the textile on an iron pellet bell from grave 63 in Gyenesdiás (Müller 2019). The entire pellet bell, found near the right hip of the child, was covered in the same textile, which was gathered at the top and probably tied. Thus, this shows that the symbolism of the pellet bell must have outweighed its decorative function, as the sounds of the pellet bell would have been muted by the fabric and the eyelet would have been obsolete (Pomberger et al. 2023, 47–49). As the eyelet was therefore not used, we deem it likely that the bell was wrapped or placed in its small bag solely for the burial.

These pellet bells may also be seen as a *phylakterion*, perhaps providing protection from disease or demons, even after death (Bendlin 2006). This phenomenon has been observed across a wide range of cultures and time periods (Pomberger, Mühlhans, Saunderson 2023, 153). For example, sounding objects supposedly eased the way to Hades (Crummy 2010, 79). Another bell from the Roman period even carries the Greek inscription: '*I am subject to evil eyes*' (Villing 2002, 256).

The pellet bells from Leobersdorf 92, 119B, and 130 all come from child's graves (Daim 1987, 249, 260, 264), perhaps suggesting a connection to a protective amulet for the vulnerable members of society. In Mödling, apart from a pellet bell in infant's grave 342, a sheet iron bell was also found in baby's grave 354 (Fig. 11.3) and might be associated with similar beliefs and considered amulets.

8. Conclusion

The textiles on the amulets provide further clues as to how the mail parts may have been worn during one's lifetime and how they were placed in the burial, but they also raise new questions, especially due to their unusually high quality, which is not found with other grave goods from the same graves. Thus, we suggest that these textiles are directly related to the amulets – not only physically, but also to the perceived value of the amulets. Perhaps these pieces of armour once protected a high-ranking warrior, giving

the amulet a further protective meaning. One could imagine that these parts were widely traded, with a high-quality textile as 'packaging' emphasising the value to the merchant. Regarding the armour pieces themselves, it can also be considered that they were likewise looted from graves, thus some remains, such as the leather and threads, might actually have been mineralised from a previous use.

The three iron pellet bells from Leobersdorf and the many different amulets from Mödling remind us that people in the Avar Empire had fears and worries, just as we do today. But they hoped to face them with the help of amulets. Since the spiritual world of the Avars is largely closed to us, even the smallest finds that help to reveal a fraction of it are welcome.

Acknowledgements:

We would like to thank the Museum Mödling for kindly permitting extensive analyses of textiles on the objects from the cemetery of Mödling. Thanks are also due to the Central Research Laboratories of the Natural History Museum Vienna, especially Viola Winkler, who conducted CT-analysis of the mail, and Wencke Wegner, who enabled the SEM-analysis of the textiles.

Chapter 12

Heracles or some other hero: A fragment of a story on a late 8th-century fitting from Tismice hillfort

Naďa Profantová

1. Introduction

Belt fittings are an important and multi-layered source not only in socio-cultural terms, but also symbolically. This chapter aims to analyse and interpret an exceptional cast fitting of the main strap of the decorated belt of the Byzantine-late Avar type found in 2022 in the Tismice production and supraregional centre (central Bohemia, Czech Republic, Fig. 12.1). Among more early medieval fittings from this site, this main belt fitting found in the southern part of the suburb is quite unique. The front side contains a depiction of two persons; the motif, its dating and symbolic significance will be discussed further in detail.

The fitting is one of a total of 83 finds made during repeated prospections with metal detectors in Tismice in 2022 (Fig. 12.1),[1] among them 27 late Avar-type fittings (e.g. Fig. 12.2), a western-style harness ornament, a fragment of a bronze spur with hooks, a jingle bell, one gold bead with filigree decoration (No. 1074, first half of the 9th century),[2] two iron hammers, ten casts (Cu-based alloys) and one lead weight (?). Along with other excavated objects, these finds are important for an interpretation of the existence of the local production of belt and horse harness ornaments (semi-products, ingots, assemblages of casts in both non-ferrous metals and lead), as well as bronze and iron spurs with hooks (Profantová 2022). Gold jewellery was also produced at the acropolis, and a fragment of a crucible containing panned gold was found in feature 68 from the latest phase of the hillfort (trench 3; Profantová et al. 2020, obr. 11, 42). Everything indicates that the Tismice hillfort was one of the central hillforts, with a fortified area covering 21 ha[3] and divided by a large ditch into an acropolis and a large suburb (Fig. 12.1). Based on ^{14}C data (see below in Subchapter 5), it was dated to the second half of the 8th century and to most of the 9th century up to 885/886 (Profantová et al. 2020, Fig. 3, 4; Profantová 2024).

2. Description of the fitting and its XRF analysis

The openwork cast fitting of the main belt strap is of an armorial shape, pointed at the top, without a preserved pendant and with one hinge (Fig. 12.3: 1). It has two rivet holes in the vertical axis, one containing a rivet. It depicts two persons in profile with slightly bent legs standing facing each other (one may not be pure profile, just a semi-profile); one has his right knee bent more pronouncedly as if it is

1 The surface of the hillfort is heavily disturbed by ploughing, therefore systematic prospecting with metal detectors has been carried out since at least 2013.

2 A reconstruction of the production of this bead appears in the document *Za tajemstvím tismického zlatníka / Secret of Tismice Goldsmith* (YouTube 1; YouTube 2).

3 Based on archaeological evidence, it has at least three early medieval phases, but it may not have been fortified in the first of them.

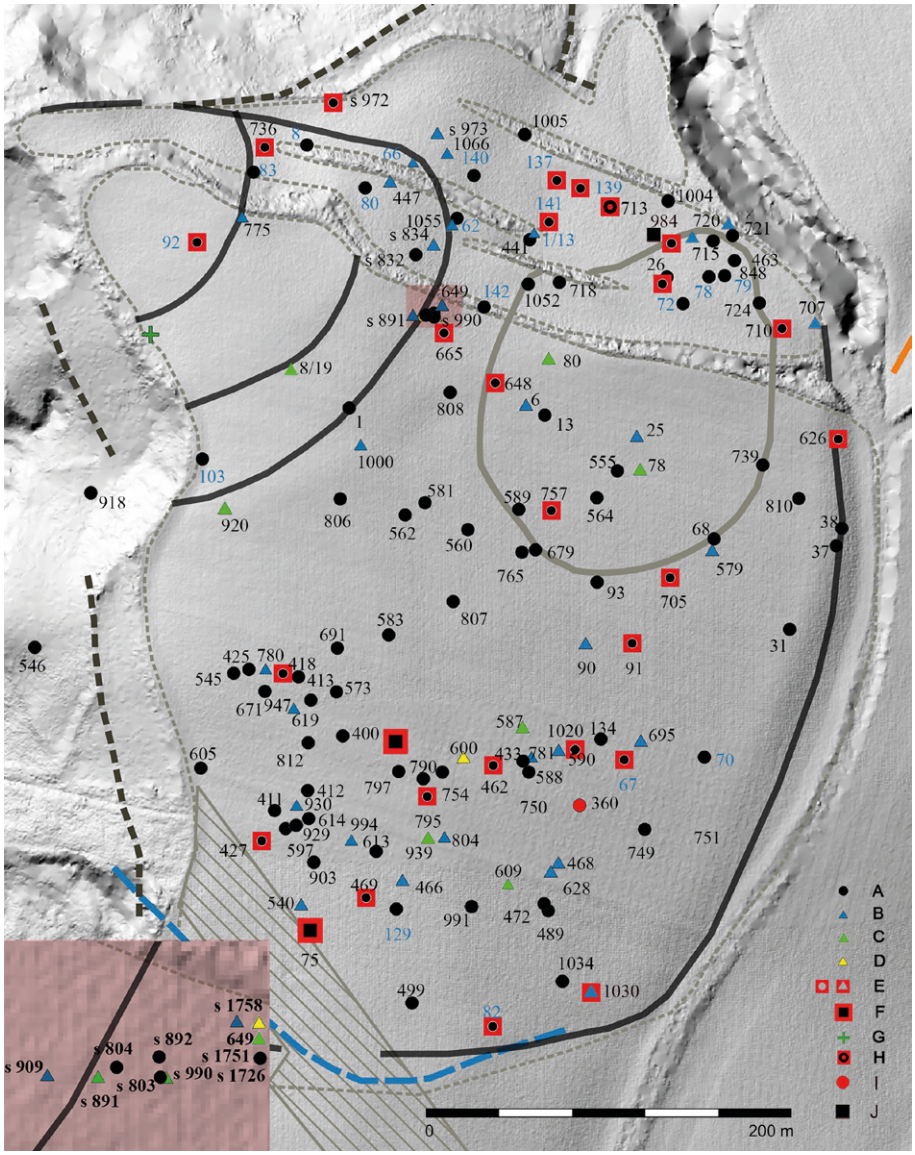


Fig. 12.1. Tismice hillfort, Kolín District. Localisation of find No. 1034/22 on the southern edge of the hillfort suburb: A – late Avar belt fitting; B – horse harness decoration of the Avar type; C – spur with hooks; D – iron part of a horse harness; E – fittings with more than 4 g in weight; F – tool; G – Carolingian coin (minted before 792/3); H – bracelet; I – special fitting from scabbard or knife handle; J – gilded early Carolingian fitting 984. Cut-out: trench 4/18, where the fittings and spurs were found. Graphics by K. Levá and J. Hasil (modified and supplemented after Profantová et al. 2020, Fig. 14).

kneeling (?). The person on the left (from the reader's perspective) is holding a longer object, which he hands to the person on the right, or the object is being held or touched by both figures. This object is cut through at the top by a short crossbar; it may be a sword, a sabre or a special staff. The curve of the lower end touching the figure on the right could indicate a sabre, as could the bend of the possible hilt. However, it also cannot be ruled out that the object is curved at both ends towards the person on the right. Both persons have a longer quilted and belted coat and possibly suggested trousers (?) to the knees (or is it part of a coat?); one definitely has some sort of flat cap on his head – perhaps both figures had it. The chin, eye and ear (under the cap) are highlighted. The person on the right has a corroded face. The decoration is legible. Visible on the detail photo (Fig. 12.3: 7) beneath the hem is a groove copying the line of the hem: a trace left by the tool used in the chasing (ciselure) of the decoration, possibly a hint of the intended engraved hem. The fitting has the following dimensions: height – 30 mm, thickness 2.6 mm; weight 5.8 g. It is stored at the Institute of Archaeology of the Czech Academy of Sciences, Prague, under Inventory No. 1034/22.

2.1 XRF analyses of the fitting

The fitting was twice analysed by XRF, first in laboratory of the Institute of Archaeology of the Czech Academy of Sciences, Prague (L. Barčáková)[4] and

4 The hand spectrometer Niton XL3t GOLDD+ in 'General Metals' mode, the beam was focused to a point with a diameter of 3 mm.



Fig. 12.2. Tismice, Kolín District. Selection of the fittings of the Late Avar type. Photo by I. Hrušková.

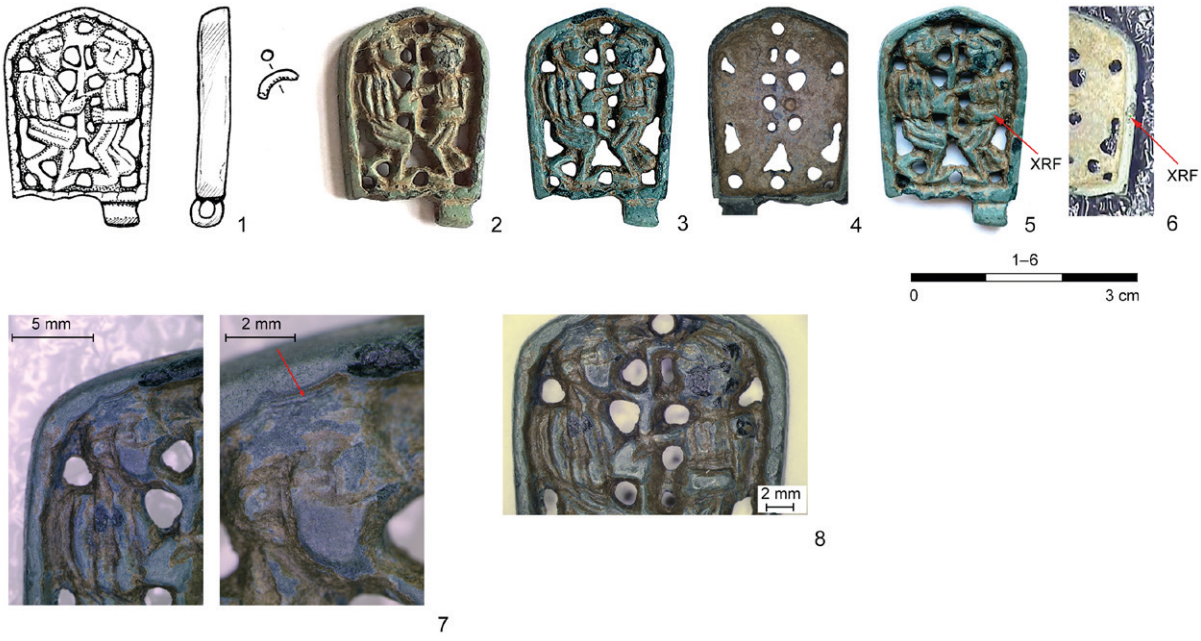


Fig. 12.3. Tismice, Kolín District, fitting 1034/22. 1 – drawing by L. Raslová; 2 – state before conservation (photo by L. Barčáková); 3 – state after conservation (photo by L. Barčáková); 4 – reverse; 5 – obverse with marked places of the XRF analyses (photo by L. Barčáková, projection of the measurement point of M. Fikrle); 6 – reverse with marked place of the RFA analyses (photo by M. Fikrle); 7 – a groove copying the line of the hem (a trace of the tool used in chasing); 8 – detail of the peeling tin plating layer.

Sample, location of XRF measurement	Laboratory	Fe [%]	Ni [%]	Cu [%]	Zn [%]	Ag [%]	Sn [%]	Sb [%]	Au [%]	Pb [%]	Sum [%]
Tismice, fitting 1034/22, reverse core (Fig. 12.3: 6)	Nuclear Physics Institute of the Czech Academy of Sciences	0.49	<0.1	81.2	1.1	0.35	6.01	0.21		10.4	99.8
Tismice, fitting 1034/22, obverse (Fig. 12.3: 5)	Nuclear Physics Institute of the Czech Academy of Sciences	3.4	<0.1	32.5	0.66	2.04	34.9	0.9		25.3	99.7
Tismice, fitting 1034/22, obverse	Institute of Archaeology of the Czech Academy of Sciences, Prague	4.18		46.9		1.8	24.9		0.26	19.7	98.7

Tab. 12.1. XRF analyses of fitting 1034/22 from Tismice. The core is a point where the surface was ground off. Made by M. Fikrle and L. Barčáková.

then (with greater precision) in the Nuclear Physics Institute of the Czech Academy of Sciences in Řež near Prague (M. Fikrle).[5]

The measurement of the obverse was made from the middle of the right figure's forearm (Fig. 12.3: 5) and from the reverse in the middle of the frame on the side without the hinge from a spot that has been drilled to the core (Fig. 12.3: 6). The detail photo (Fig. 12.3: 8) shows that a tin layer is peeling off in the place of the right figure's face – which indirectly indicates the deliberate surface finishing of the ornament. It was cast from copper alloy (Cu 47% and more in the core of an alloy: 81.2%). The alloy can be called bronze, although it is rather lacking in tin content and this should not be ascribed to the influence of corrosion due to the measurement being taken after clearing away the majority of corrosion.

According to our interpretation, the surface was treated with a mixture of tin and lead (Sn 25% or rather 35% compared to 6.1% in the core) and lead (Pb 19.7–25.3%). The origin of the silver (Ag 2.04–2.6%, as well as gold 0.26) found in the surface layer is unclear. It may come from the main construction material (copper alloy) or be part of the lead used in the mixture for surface treatment (tinning). The analytical method used cannot answer this question; Tab. 12.1.

A similar tinning is known from the Tismice site in at least 26 cases (23 XRF analyses are published, Profantová et al. 2020, Tab. 7), and the real share of tinned fittings is probably around 33–43%. Six items of the 26 analysed ungilded pieces were the main belt decorations like our fitting, and four were strap-ends, the others were small ones. It is important that another ornament with a geometrised anthropomorphic decorative motif (No. 360/15) was also tinned (Profantová et al. 2020, Tab. 7).

3. Occurrence of similar motifs

The motif on fitting 1034/22 belongs to the circle of similar figural motifs, drawing on late antique and early Byzantine ornaments (cf. Daim et al. 2010). They are relatively rare not only in Bohemia (Fig. 12.4; 11 sites),[6] but also in the Carpathian Basin and on the Euroasian steppe (Bálint 2010, 149). These ornaments are always more exclusive compared to fittings decorated with more common floral or geometric decoration, but quite often the two groups complement each other on a single belt (in Moravia, e.g. Hevlín or Dolní Dunajovice; in Slovakia, e.g. Nové Zámky, grave 232, cf. Čilinská 1966, Taf. XLIV; Profantová 1992, Taf. 12A). The only analogy clearly depicting the same motif is the rectangular fitting from Achau in Austria, a smaller yet unpublished burial site (preliminarily published in Özyurt, Tobias 2021).[7] The cast fitting from grave 3 has a beaded border, the composition is almost the same, but the figures kneel in the direction from the object (outwards) while looking at each other, and also differ by a break caused by a casting error, which probably caused the figure on the right (from the reader's perspective) not to touch the symbolic object, because a piece of the arm is missing (Fig. 12.5: 3). The symbolic long object between the figures is identically located as the one on the fitting from Tismice (both ends above the ground), and these two differ from the Dolní Dunajovice fitting in its position (here the

5 The XRF analyses were performed with the Spectro-Midex instrument of the third generation. The instrument is equipped with a molybdenum (Mo) X-ray tube. The operating parameters of the measurement are as follows: current 45 kV, voltage 0.5 mA. I thank M. Fikrle from the Nuclear Physics Institute of the Czech Academy of Sciences for his analysis.

6 There is another belt fitting with a figural motif from Tismice – fitting 360/15 depicting a highly stylised human representation with plant elements. This is atypical decoration of a knife handle or scabbard. We do not know if the motif of this atypical fitting is part of some mythical creature from a local ritual or story as fitting 1034/22 (cf. Profantová et al. 2020, Fig. 37).

7 21 graves in a row arrangement were uncovered there near the better-known burial site of Mödling.

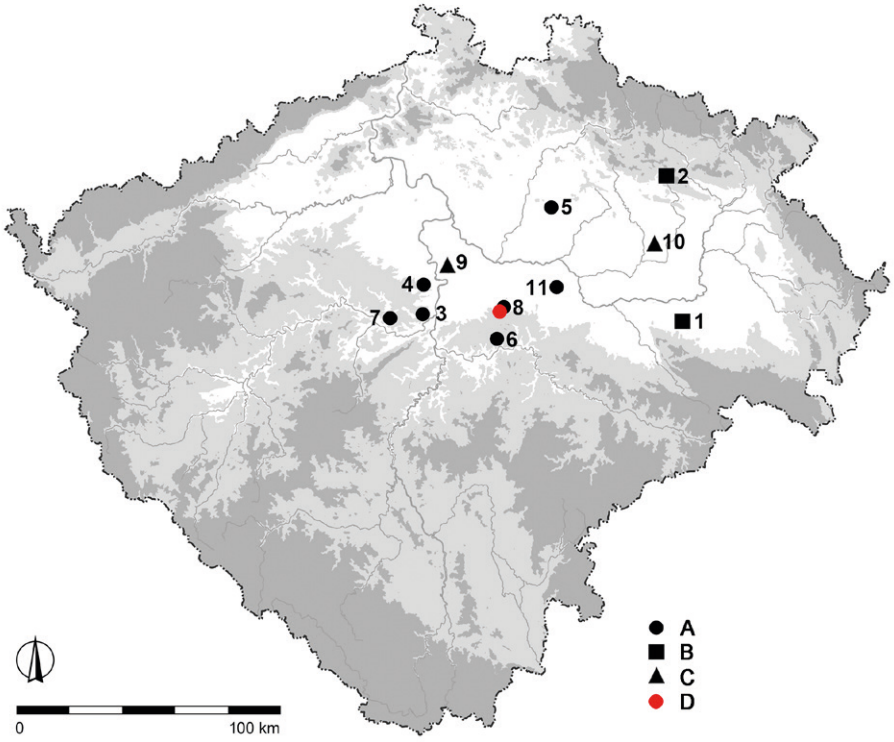


Fig. 12.4. Cast fittings with symbolic figural motifs in Bohemia, most often of Byzantine / Eastern Mediterranean origin: A – various motifs of late antique origin (with certainty); B – fight of a peacock dragon/bird of prey and a snake; C – special anthropomorphic motifs; D – motif with two persons. Sites: 1 – Blato, Pardubice District; 2 – Kal, Jičín District; 3 – Kosoř, Prague-West District and Radotín, Prague 5 District; 4 – Šárka hillfort, Prague 6 District; 5 – Semčice, Mladá Boleslav District; 6 – Senohraby, Prague-East District; 7 – Sv. Jan pod Skalou, Beroun District; 8 – Tismice, Kolín District; 9 – Dolní Chabry, Prague 8 District; 10 – Nový Bydžov, Hradec Králové District, 11 – Ratenice, Kolín District (after Profantová 2018, Abb. 1, supplemented).



Fig. 12.5. Scene depicting the hero story could be inspired by the Heracles' cycle (8th century). 1 – Tismice, Czech Republic (photo by L. Barčáková); 2 – Dolní Dunajovice, Czech Republic (photo by M. Frouz); 3 – Achau, Austria (after Özyurt, Tobias 2021), 4 – Jois-Strassäcker, Austria, incomplete fitting (after Winter 1997, Taf. 61: 26c/2). Whitout scale.

long object touches the ground). At the same time, there is a kind of roof (inverted V) in the centre of the fitting; it may be the feet of the two figures leaning against one another or just the foot of one of them. The orientation of the figures is the greatest difference not only from Tismice but also from Dolní Dunajovice. The Achau fitting has no visible rivet holes; the fitting could have been glued or had bottom rivets. The authors correctly place the scene in the circle of late antique motifs, but they interpret it as a modified depiction of a Roman emperor with a captive (barbarian), but they do not think about the complete series of scenes as we know them from Dolní Dunajovice.

It is not ruled out that the rectangular incomplete fitting from the Jois-Strassäcker (Austria) site is from the same or very similar type. It was drawn without understanding the sense of the motif in the publication (Fig. 12.5: 4; Winter 1997, Taf. 34: 2, 61: 26c/2). I can recognise half of the first figure and a larger part of the second figure in the photo; the upper part with both heads is not preserved.



Fig. 12.6. Dolní Dunajovice, strap-end from grave 7 (in the collection of the Moravian Museum, Brno; photo by M. Frouz; drawing after Klanica 1972, Fig. 7).

The most important analogy is known from south Moravia, from male grave 7 in the small burial ground in Dolní Dunajovice (Fig. 12.5: 2, 12.6; Klanica 1972, 5–18). The main strap-end is decorated with three main fields depicting a hero's story and one smaller auxiliary field in the upper part.

The first hero scene is similar to the scene from Tismice, but has a different detail. The arms of the figures, bent at the elbow, touch with outstretched fingers. Only under the figure's hand on the left does a symbolic object appear, the end of which runs down to the strip separating the two fields. At the top of the centre of the field is a break, and the opening may have been subsequently enlarged. The breaking in this part differs in Tismice and Dolní Dunajovice. The Tismice fitting in this part (between the bodies of figures) is more similar to those in Achau (Fig. 12.5: 3). The middle hero scene field from Dolní Dunajovice depicts the hero/god riding or taming a mythical four-legged animal with a longer neck and tail, with the hero holding it by the neck or strangling it. The same person in the last hero scene holds an elongated object with folds – some say lion skin (Dekan 1972), others a long-necked bird with a small head (Klanica 1972, 30; Fancsalszky 2007). If it is a bird, the hero holds it by its neck, the tail feathers curling by his feet and right hand holding a curved pole with a curl at the top at waist level. The form of stylisation is rustic and simplified, which may be partly due to its small size.[8] There is also another smaller auxiliary field in the upper part with the motif of a boar with its head lowered, decorated with embossed rings.

The same story is told by the figural scene on the unpreserved Pančevo strap-end (Serbia), but our opening scene is omitted (Fig. 12.7; Dekan 1972, Abb. 112: 4; Mrkobrad 1980, Tab. 117: 3, 4; Kovačević 1977, Photo 1, 1a) and the middle scene from Dolní Dunajovice is instead depicted twice with minimal differences. The last field, from what we could discern, is similar to the last scene from Dolní Dunajovice. In the drawing of G. Fancsalszky (2007, 26; here as Fig. 12.7: 2), the item looks like a tall bird; however, it cannot be interpreted as such based on an earlier drawing (Fig. 12.7: 1). The strap-end from Pančevo is simpler than the one from Dolní Dunajovice, it has no ornamental separation of the first field and also no complementary shorter field; it looks less grandiose.

The tongue-shaped fittings with the motif of a single figure with similarly bent legs and similarly stylised clothing from Dömös in Hungary can probably be loosely assigned to the group derived from the same narrative (Fancsalszky 2007, Pl. 54: 11). The case of Mosonszentjános, grave 259, is unsure since the upper part is damaged (Fancsalszky 2007, Pl. 54: 13). But in both cases, it is only a similarly stylised static figure without interaction with other figures.

8 I studied the strap-end as original. On the reverse is the lace in which it was wrapped. The strap-end is 12.5 cm high; the first field is 26 mm high.



Fig. 12.7. Pančevo, Serbia. 1 – after Fancsalszky 2007, tab. 55: 1; 2 – after Mrkobrad 1980, Tab. CXVII: 3; 3 – after Kovačević 1977, photo 1 (right).

There is a minimum of 8th-century strap-ends that repeatedly depict the same scene or various illustrations of the story. If we look in G. Fancsalszky's book on figural motifs, we find only two other different scenes with a mythical being. The first one is on the Mindszent strap-end, maybe also with an additional scene, which is again on a shorter part than others (Fancsalszky 2007, Fig. 26: 2; Dekan 1972, 433, Abb. 140). All three fields with mythical beings are visually separated. In the second case, the strap-end from Pohořelice (south Moravia) perhaps repeats three scenes with winged riders associated with a primitively depicted Dionysus (?) or winged Eros from Dionysus' procession; only in the upper part is there a winged figure together with a four-legged animal with longer ears, possibly a donkey according to J. Dekan (1972, 402, Abb. 109; Profantová 1992, Taf. 33B). In this last case, the scenes are not separated by relief lines. This strap-end is typologically earlier from the first half of the 8th century.[9] A true story with multiple scenes in the fields is depicted only by the discussed strap-ends from Dolní Dunajovice and Pančevo, perhaps Mindszent. In this last case, the motif is tied again to Dionysus or an unknown cycle (mythical being with two legs and with the head of a feline beast).

4. Hero, mythical twins or ruler: Motif interpretation

The interpretation of an exclusive scene with two figures depends on how we identify the symbolic object in the middle of the scene. It also depends on how we interpret the whole story, which must have been well known among the elite in the Carpathian Basin and may have been spread through an epic song. The ride on a mythical wild animal was interpreted by J. Dekan (1972) as the killing of the centaur Nessus and the acquisition of two important objects: a lion skin and some kind of staff in this interpretation (to an antique statue of Heracles with a lion skin in his left hand in the Hungarian National Museum in Budapest, Récsei 1894, 107, Fig. 7 a, b).

The object in his left hand has a slight bend above the hero's hand on the Tismice fitting and may be something different (a cutting weapon, cf. the description in Subchapter 2) than the club seen by J. Dekan – a stick with a bent upper end resembling a crutch or the upper part of a pastoral staff (only the upper half, since it does not reach the ground), a badge or some kind of sceptre. The mythical animal may not be a centaur, but something different.

Nándor Fettich (1937, 22–23) interpreted the same scene in Pančevo as the triumph of Dionysus, identified the characters' clothing of figures as chlamys, part of the male garment. One of these two men in Dolní Dunajovice is interpreted by J. Dekan as antique Heracles (Hercules in Latin), but this is based on the last scene in which an object is interpreted as a lion skin, though this interpretation is not certain (Fig. 12.6; Dekan 1972, 407; 1980; other drawing Fancsalszky 2007, Fig. 26).

The first scene in Dolní Dunajovice is interpreted by J. Dekan in his Hellenistic prism as a struggle between Heracles and Queen Hippolyta of the Amazons, yet it is impossible to discern whether one of the depicted figures represents a woman![10] He

9 The strap-end from Martély from the first half of the 8th century could also depict a story, but interpreting it is more problematic (Dekan 1972, 423–425, Abb. 132).

10 Also, the strap-end from the grave 7 of sword-wielding warrior from the 7th-century burial site of Linz-Zizlau was simply carved with two figures in profile with faces turned towards each other and legs bent (Ladenbauer-Orel 1960, Taf. 32 below; the strap-end was part of a three-piece or multi-part set of decorations). The figure on the left from the wearer's perspective is a bearded male with an erect phallus. This scene is related to fertility rituals, i.e. to a different range of meanings. The stylisation of engraving is most likely related to pressed/moulded ornaments in the Carpathian Basin and possibly in southern Ukraine and Russia (Crimea region).

supports his interpretation with the identification of the Erymanthian boar[11] that Heracles was ordered to capture by King Eurystheus. This depiction in a shorter field on the upper part of the strap-end may not be directly related to the story. The boar head is repeatedly depicted on the decorations of horse harnesses of 8th-century Avaria. These ornaments were also common in Bohemia, including in Tismice (Profantová 2020b).

Arnulf Kollautz (1970, 54) also favours a connection with the Heraclean cycle (Pančevo), but interprets some details differently; the lower image could represent a satyr holding a thyrsus, a staff wrapped in ivy, in his left hand – an attribute of the god Dionysus. He compares the two figures to a pair of dancing women on a Coptic cloth, which also bears the motif of a triumphant emperor known from other fittings of the late Avar type.

Gábor Fancsalszky (2007, 158) also favours the interpretation of the Dolní Dunajovice fitting in the framework of the Heraclean/Herculean cycle; he considers the beast not to be centaur and also thinks the hero wearing 'a crown of flames' is strangling him. He also draws attention to the closeness of the heroic scenes to the thinking and beliefs of the nomads. He does not exactly interpret the first scene from Dolní Dunajovice – for us the most important one.

Zdeněk Klanica looks for parallels to this scene from Dolní Dunajovice on Roman coins of the late empire; this is the right direction. On the reverse of the coin of Emperor Magnus Decentius (350–353, under Magnentius) are two female figures facing each other – personifications of Victory (Victoria) and Liberty (Libertas). Both hold a tropaion, a pole festooned with captured enemy weapons. The figure on the right still holds a sceptre (Klanica 1972, 29). Is the likeness accidental? We have other belt fittings inspired by late Roman coins (portrait of emperor, Profantová 2018 with map). In my opinion, the depiction shows no typically female details or symbols. Zdeněk Klanica (1972, 30–31) thought of a local hero-ruler with a 'feathered crown' ('a crown of flames' of G. Fancsalszky), which is also on the head of the figure of the falconer on the strap-end from Moravský Svätý Ján after him (cf. Profantová 1992, Taf. 43; 2020a, Fig. 3: 1–2). According to numismatic P. Radoměrský (1958), this symbolic crown of peacock feathers was in the possession of the Byzantine emperors of the 6th–7th centuries, as a written source from the 11th century lists the symbolic crowns. And it was represented on the Column of Justinian with an equestrian sculpture of Emperor Justinian in commander armour, his right hand raised in a commanding gesture; it was erected in the Augustaion in 543 and was 50 m high (Fig. 12.8).[12] It was probably also depicted from the front view on the follis of Constantin IV Pogonatos (668–685) minted in Syracuse (668–672) or another type in Constantinople (Radoměrský 1958, obr. 19; often interpreted as a helmet with feathers – *Federbusch*, because the emperor is in a cuirass on the coin from Constantinople – Fig. 12.9; Hahn 1981, III, 161, No. 104 and



Fig. 12.8. Statue of Emperor Justinian I. with symbolic crown or *toupha* from column in Constantinople. Reconstruction after the drawing from the 15th century, now in Budapest. After Jiřík et al. 2023, 145 (cf. Boeck 2021, Fig. 12.5).

11 After Z. Klanica (1972, 26), a boar with an arrow.

12 The statue was destroyed in the 15th century (the reconstruction is from the 16th century), description of the memorial in: Kollwitz 1941, B. 2, p. 13, also Radoměrský 1958, obr. 18, cf. also the entry Toupha: Kazhdan 1991, 2100, newly and in detail Boeck 2021.



Fig. 12.9. 1 – Constantin IV Pogonatus, AE Follis, Byzantine Empire. Hahn 1981, No. 104; After Marc R. Breitspreche; 2 – Constantin IV Pogonatus (Constantinople), after Hahn 1981, No. 78.

No. 78).[13] In the 12th century, the pope sent a similar crown to the king of Ireland. Radoměrský also saw it on the coins of Czech Duke Břetislav I († 1055), even if he knew of the Scandinavian inspiration for it. Radoměrský's hypothesis about the significance of the feathered crown was severely criticised from the historical point of view (Fiala, Třeštík 1959) and also later from the numismatic one (Hásková 1990a; 1990b).[14] Byzantine depictions from the 6th and 7th centuries could have influenced the artistic representation of the symbol – crown on the strap-end from Dolní Dunajovice while independent of the concrete likeness of the crown. Klanica's uncritical use of Radoměrský's hypothesis cannot be accepted, even if we can also find a connection with the ritual of gaining and securing power. We can also agree that the hero wears in the subsequent two scenes a crown, although the size and stylisation of the scene make it impossible to say whether it is composed of precious metal, feathers or fire. The scenes with the crown are not separated from each other, but are separated from the one in which the hero does not have it, which could be a deliberate emphasis on the change of status.

The scene with the two figures can also be interpreted as Zeus' sons Castor and Pollux (Dioscuri or Gemini, in Greek and Roman mythology; Pollux is Polydeuces in Greek; their mother was Leda) or other divine twins. Both of Leda's sons took part in the hunt for the Calydonian boar, the Argonauts' expedition, and helped Heracles in his expedition against the Amazons. One of the Dioscuri is even depicted in Rome with a ruffled cloth in his hand – this may resemble what we see in the last scene on the strap-end from Dolní Dunajovice. The depiction of a boar on the strap-end in Dolní Dunajovice also makes sense in this case. Castor and Pollux are also consistently depicted as patrons of horsemen (Gartrell 2021, 113–144), which may had found consonance in the Carpathian Basin with its strong emphasis on the status of riders (if the information reached the local nobility).

5. Dating of the Tismice fitting

The chronology of the hillfort is important for dating the fitting from Tismice. The hillfort has been dated by ^{14}C data to the second half of the 8th and most of the 9th centuries (ca 30 ^{14}C data were analysed, and some of them are unpublished). Feature 68 and older layer 18 in the same stratigraphy are important for dating the latest and the earliest phases of the hillfort. In feature 68, a fragment of a crucible containing panned gold was found, as a residue of gold jewellery production (trench 3; Profantová et al. 2020, Fig. 11, 42). The ^{14}C-calibrated dates from this feature are 772–892 (1185 ± 21 BP) and 687–875 AD (1237 ± 22 BP; 95 and 96% probability, animal bones). The ^{14}C date 650–764 (1333 ± 20 BP) from older layer 18 is the post quem date not only for the lower limit of the interval of dating feature 68, but is important for the beginning of intensive settlement in the hillfort and indirectly also for the lower limit of the presence of the evaluated fitting (after 764 AD, Profantová 2024, tab. 1).[15]

13 These feathers are called a plume or helmet with plume in the modern numismatical literature (Grierson 1993, 537, 554 for Constantinople). This type of portrait on coinage is rarer compared to other types of emperor diadems, from which at least two variants have appeared on the Avar type fittings with a portrait of the emperor.

14 The crown evokes the later Moravian legend about a feathered crown as a symbol of Moravian rulers that was to have been symbolically transferred to Bohemia at the turn of the 10th century and the connection between this legend and the symbolic crown on the strap-end has been used by the Moravian nationalists for nationalistic propaganda (Klanica 1995, 47–55, in this text the hero was a combination of Samson and Heracles; these nationalistic explanations were used mainly outside the archaeological community; see webpage (Moraviamagna.cz).

15 All data are from the Czech Radiocarbon Laboratory in Řež (I. Světlík).

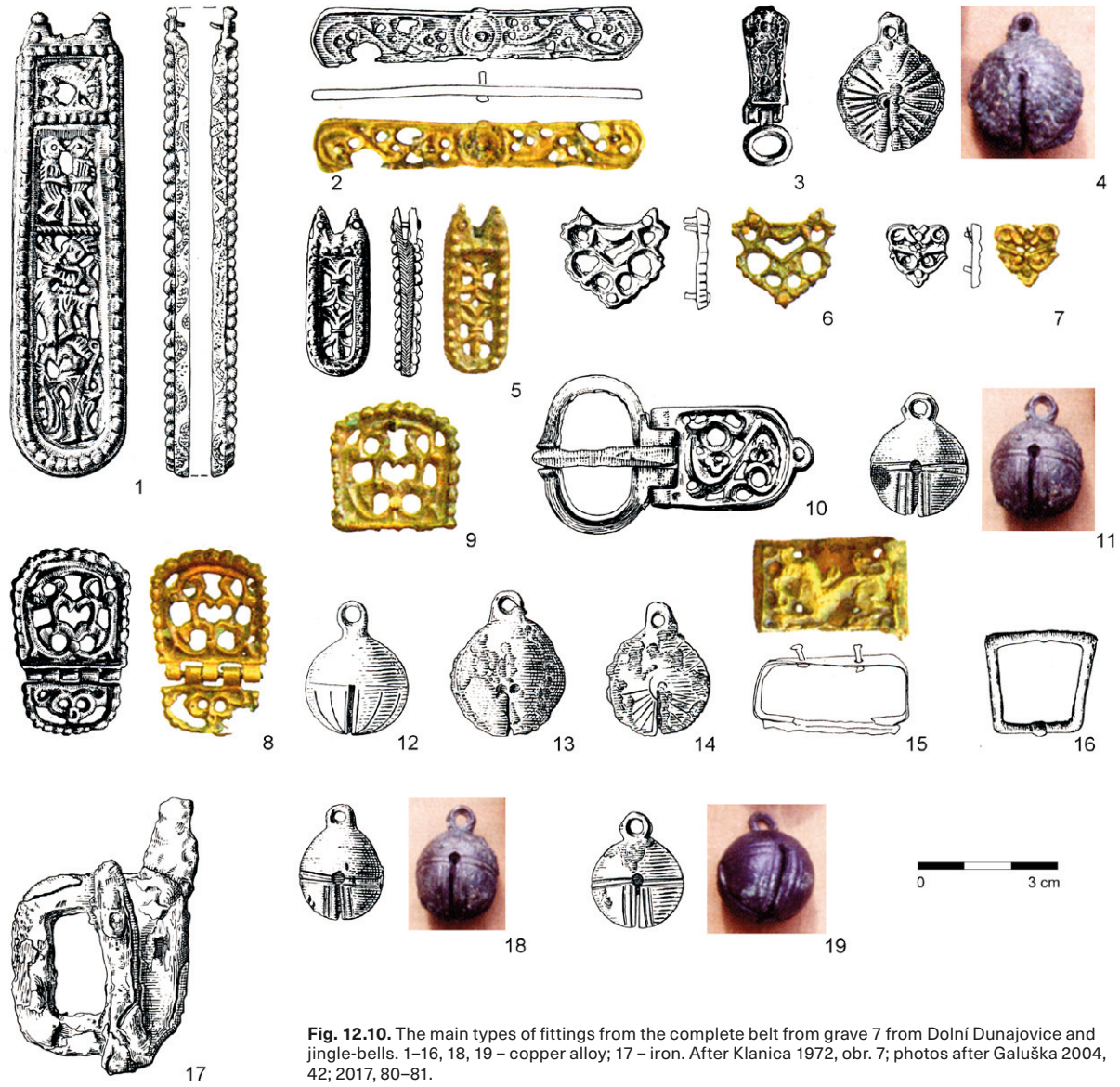


Fig. 12.10. The main types of fittings from the complete belt from grave 7 from Dolní Dunajovice and jingle-bells. 1–16, 18, 19 – copper alloy; 17 – iron. After Klanica 1972, obr. 7; photos after Galuška 2004, 42; 2017, 80–81.

The suggested dating of the fitting is also partly based on the analogies already mentioned from Dolní Dunajovice and Pančevo. Both finds belong chronologically to the second half of the 8th century. In the case of Dolní Dunajovice, the entire small burial site with 18 uncovered and damaged graves is dated to this interval. The discussed belt from grave 7 in Dolní Dunajovice was decorated with 48 fittings (Fig. 12.10, 12.11) and part of it was also an iron knife, seven jingle bells, two iron buckles and a pot that completed the equipment of the buried man (Klanica 1972, tab. 7; Galuška 2017, photo on p. 81). The main belt fitting has, atypically, three protrusions for a hinge holding the pendant (Fig. 12.10: 8). A similar technological detail is known on the fitting from the Vrap hoard dated to the end of the 7th and first third of the 8th centuries (Werner 1986, Taf. 25: 17), and three rivets arranged in a triangle instead of the usual two as special details showing a stronger Byzantine influence.[16] Other details of the fittings also confirm its dating to the second half of the 8th century. This is evidenced not only by the massive sculptural frame with hemispherical protrusions, which, according to the enlarged photograph, could have been decorated by punching (Fig. 12.5; 12.6), but also the protrusions for the rivets on the strap-end, and the presence of numerous small ornaments on the side straps. The

16 The same fittings were also found in Břínkov in Bohemia (unpublished).

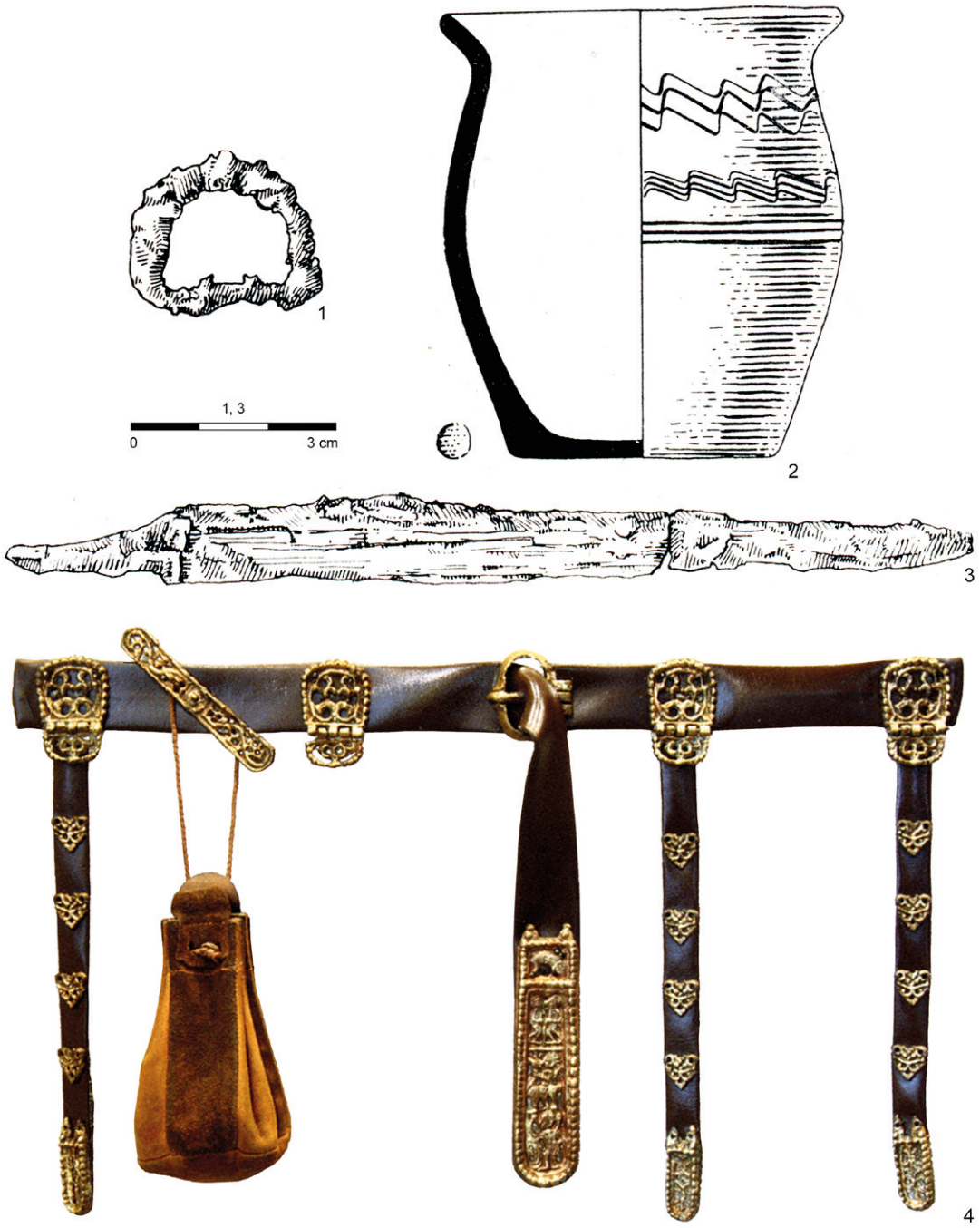


Fig. 12.11. Dolní Dunajovice, grave 7. 1–3 – other finds from the grave (1, 3 – iron; 2 – pottery; after Klanica 1972, obr. 7); 4 – reconstruction of the belt (after Galuška 2017, 80).

sides of the strap-end are decorated with engraved floral decoration on a punched background. Also important from a dating perspective is the fact that Dolní Dunajovice is the northernmost necropolis of the late Avar type, probably together with the mostly destroyed burial ground of Vranovice (Profantová 1992, 692; Galuška 2001). The fitting from Tismice was probably made at the same time according to the same pattern as the item from Dolní Dunajovice.[17]

17 The fitting from Achau is also dated to the 8th century. More detailed dating has not yet been published due to the partial processing of the find (Özyurt, Tobias 2021).

6. Conclusion

It is not clear who the two heroes are on the fitting from Tismice. Their visualisation points to late antique inspiration; the story of Heracles as well as divine twins are a possible explanation. The similar domestic adoption of an originally foreign motif is also probable in the case of Dolní Dunajovice. The first scene in Dolní Dunajovice and the Tismice motif may depict divine or mythical twins who, by touching a symbolic object, acquired a new/higher social status or supernatural power. This change may be demonstrated by the addition of the crown in the later scenes. Both scenes depict the same couple in an important ritual or legally binding gesture.[18] At the same time, they highlight the significance of the symbolic object; it is essential to possess or touch it, it can be a source not only of social status but also of magical power. To be given a belt with such a fitting could seal political ascension and at the same time remind one of a commitment or promise. It may be a representation of a ritual affirming a new status by passing on a symbol similar in meaning to a sceptre, i.e. a rite of passage. It may also have been an inaccurate, or better, a distorted understanding of a late antique motif by the prism of another culture (local adoption in the Carpathian Basin as well as in the Slavic milieu in Bohemia). The occurrence of this motif, as in the case of the Merlion (sea beast with lion head) rider motif, is so far limited to the northwestern periphery of the Avar Khaganate. The local product from Tismice is probably an imitation or copy of the scene from the strap-end found in Dolní Dunajovice and it is dated to the last third of the 8th century in the case of the import or the beginning of the 9th century if it is a local imitation. The fitting is one of about 30 of the most exclusive within Tismice, only as the second piece to depict a human representation. The exclusivity of the fitting is shown by the fact that among the thousands of graves with belts in the Carpathian Basin, we do not know of a belt that is decorated with both a strap-end with this depicted narrative and an armorial-shaped or square main piece(s) with a single scene from the same depiction as on the main strap-end.

The wide geographical distribution of the scenes with two men and on an animal riding hero indicates multiple possible designs and a domestic adoption of an originally foreign motif. It is the earliest early medieval visualised story in the territory of Bohemia, the only evidence that the stories were told and spread over a large area and that they interacted.

Acknowledgement

This chapter was produced as part of Czech Science Foundation project No. 25-15417S 'Forma společenské integrace nebo chyba v matrixu? Raně středověké „megasídliště" v Roztokách (6.–7. století n. l.)' / 'A form of social integration or an error in the matrix? The early medieval 'mega- settlement' in Roztoky (6th–7th centuries)'.

18 On the importance of the gestures in Middle Ages, see Schmitt 1990.

Chapter 13

A hoard of silver dirhams from the early medieval ringfort of Phöben (Brandenburg) – numismatics, archaeology, cultural and historical context

Felix Biermann, Dorota Malarczyk

1. Introduction

In 2017, a hoard of Islamic silver dirhams was discovered at the Slavic ringfort of Phöben (part of Werder/Havel, Potsdam-Mittelmark District, Brandenburg, Germany) on the River Havel, about 35 km west of Berlin (Fig. 13.1). It was deposited after 912/913 (perhaps around 920) and consists mainly of dirham fragments of the Sāmānid emirs; in addition, there is one whole and a few coin fragments of the early ʿAbbāsid caliphs, as well as Volga-Bulgarian dirham imitations. It is one of the few hoards of its kind and dating in the federal state of Brandenburg.

With only one complete dirham and 42 coin fragments, the hoard is not very large. However, it is particularly interesting because it was deposited far from the Baltic Sea coast and within the outer bailey of a fortification that can be interpreted as the seat of a small ruler on the eastern periphery of the Hevellian-Stodoranian tribal area. As there is no evidence of the site having been an economic centre, it can be assumed that the dirhams are evidence of connections to the Baltic coast that are linked to the involvement of the lord of the ringfort in slave hunting and trade. The find is presented below from a numismatic and archaeological perspective and placed in its cultural and historical context. The ringfort where the hoard was found, the research conducted there and the other finds from this site will also be briefly outlined.

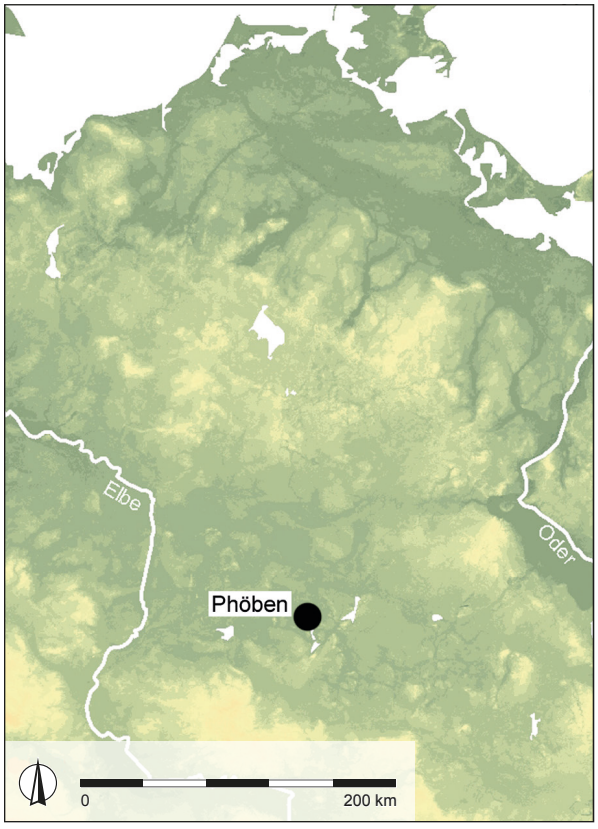


Fig. 13.1. Location of Phöben. Authors F. Biermann, A. Swieder; based on SRTM-1 with kind permission of the U.S. Geological Survey (USGS) and the National Aeronautics and Space Administration (NASA), public domain; Natural Earth; free vector and raster map data @naturalearthdata.com.

2. The site and its investigation

A good 1.8 km north of the village of Phöben lies the Räuberberg, a well-known medieval fortification on a peninsula on the west bank of the River Havel in the Zauche region (Fig. 13.2).[1] The site, which has been destroyed except for flat thresholds and trenches, consisted of a circular ringfort about 75 m in diameter at the north-eastern tip of the peninsula and two north-south ramparts and trenches that secured the trapezoidal headland measuring ca 210 × 200 m in the west (Fig. 13.3, 13.4). This is a rare example in Brandenburg of an early medieval fortification with a main castle and two fortified outer baileys. The fortification occupied a low hill in the floodplain, which enjoyed natural protection not only from the river but also from the wet meadows to the west.

Between the 1870s and the 1940s, the ramparts were demolished to obtain soil. A section of the main circular stronghold, which was still 2.5 m high in 1932 and rose impressively from the river and meadow landscape according to an aerial photograph from 1940, vanished for good.[2] Ernst Friedel's description of 1872 gives us an idea of the lost monument: '*A boat trip* [...] *took us to the Röberberg, which is surrounded on three sides by the river and on the other side by marshy meadows and ditches and can only be accessed by water* [...]. *It is a perfectly circular rampart, about 10 feet* [ca 3 m] *high at its highest point* [...]. *It was obviously higher, but part of the rampart crown seems to have been used to raise the interior and part to fill in the moat* [...]. *The profile is steep, so that the whole structure rises quite abruptly from the flat lowlands and is visible from a great distance, serving as a good landmark for sailors. By that time, the outer ramparts were already worn down to their present-day height*' (Friedel 1873, 251).[3] The entire area of the stronghold-settlement complex was temporarily cultivated.[4]

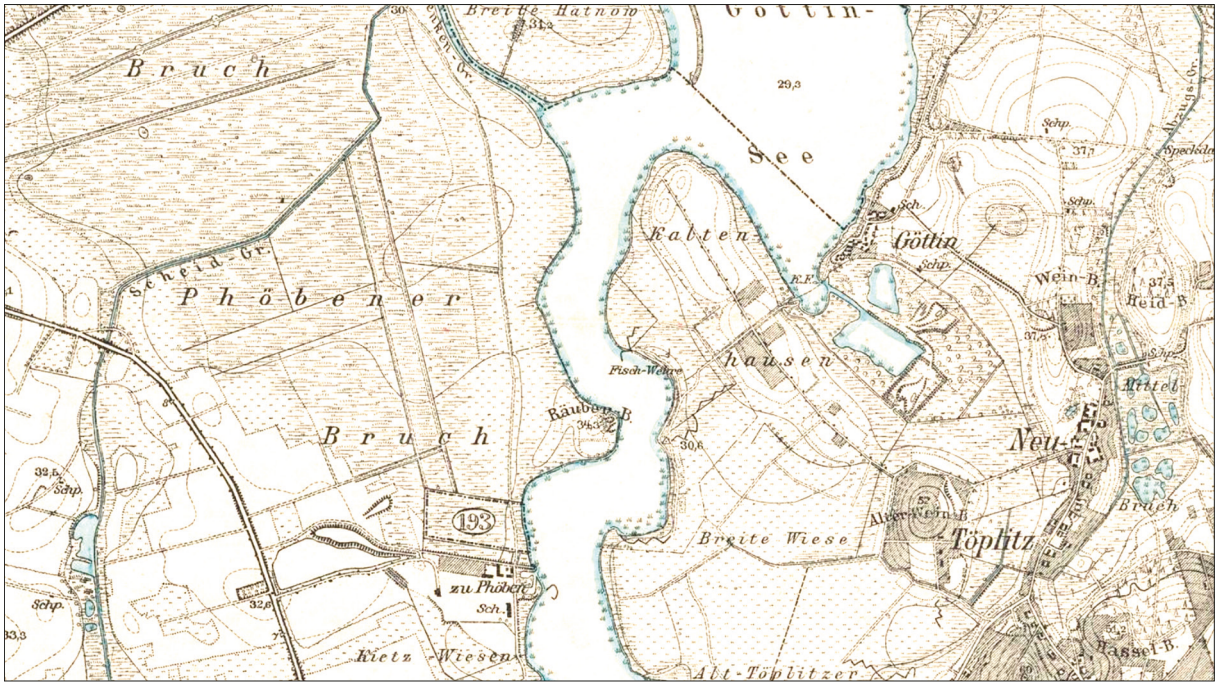


Fig. 13.2. Phöben. The Räuberberg on the 1 : 25,000 map, 1920 edition. Reichsamt für Landesaufnahme, Messtischblatt 1 : 25,000, No. 1905 Ketzin; reproduction Sächsische Landesbibliothek – Staats- und Universitätsbibliothek Dresden.

1 Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum, Zossen-Wünsdorf (BLDAM), site No. 1; cf. on the hillfort: Behla 1888, 133; Marschalleck 1930; Herrmann, Hoffmann 1959; Herrmann 1960, 188, Cat. No. 323, with older literature; Corpus 3, 1979, 81/95; Schwarzländer, Kersting 2012; comprehensive: Wehner 2012, 267–268.

2 BLDAM, Archive, site records Phöben No. 1, including sketch and photos of the complex; Herrmann, Hoffmann 1959, Taf. 46; Herrmann 1960, Taf. 7.

3 All German quotations in this paper have been translated by the authors into English.

4 A short article in the Potsdam *Tagespost* newspaper dated 17 August 1946, entitled *Abschied vom Räuberberg* [Farewell to the 'Räuberberg'], reports that the ringfort had been destroyed and ploughed over, as does an excursion report by E. Wulfert from the same year (BLDAM site records Phöben No. 1).

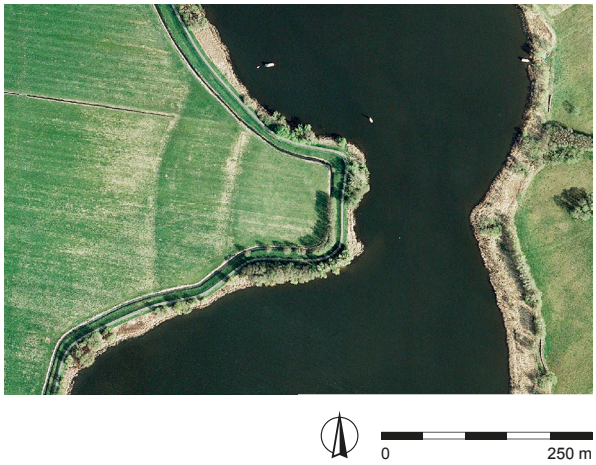


Fig. 13.3. Phöben. Vertical view of the peninsula with clearly visible vegetation features of the outer bailey fortifications and faintly discernible remains of the main ringfort. Landesvermessung und Geobasisinformation Brandenburg (LGB), revised by F. Biermann.

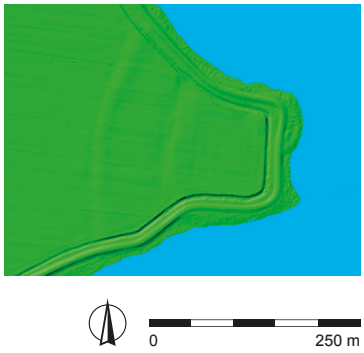


Fig. 13.4. Phöben. Digital terrain model of the peninsula with faint remains of the rampart and moat. LGB, revised by F. Biermann.

During the demolition work, a series of small excavations were carried out, providing insights into the history of the ringfort (see, among others, Bestehorn, Hoffmann 1930); the most important of these took place in 1930/1932, but were not published in detail until 1959 (Herrmann, Hoffmann 1959). According to these findings, there was initially an unfortified Slavic settlement at the site, of which an extensive cultural layer, fire pits and charred beams could be identified. The stratum contained, among other things, pottery, millstones, animal bones and various metal objects (Herrmann, Hoffmann 1959, 296; Herrmann 1960, 29, Abb. 9; Wehner 2012, 267–268). Based on the pottery, which can mostly be classified as Menkendorf type,[5] but is poorly stratified (cf. Wehner 2012, 267–268), this phase can be dated to the second half of the 9th century; certainly before 900, as the stronghold was built at that time.

This was a small circular ringfort, additionally protected on the water side by a low rampart (Herrmann 1960, 35), whose approximately 50 m wide courtyard contained a hearth and a house site with several complete clay pots (Fig. 13.5).[6] In view of these findings, the multi-phase nature of the rampart and numerous cultural layers, intensive settlement use can be assumed. Three dendrochronological data from a hook construction at the foot of the rampart from rescue excavations in 1980 (887±10, shortly after 895, 909±10) prove that it was built around 900,[7] i.e. at the heyday of the Tornow ringfort type (cf. Henning 1998; 2002; Biermann 2000, 124–140). It is not entirely clear when the outer bailey fortifications were built, but they probably belonged to the ringfort of the Tornow type.

This stronghold-settlement complex was abandoned before ca 980 (Herrmann, Hoffmann 1959, 299), as there are no late Slavic artefacts among the extensive earlier finds,[8] and those are largely absent from the more recent survey material (see below). The site is thought to have been abandoned due to increasing flooding, as indicated by fluvial sand deposits over the medieval relics (Herrmann, Hoffmann 1959, 299; cf. Kersting 2004, 116–117). However, the immediate cause was certainly the destruction of the fortification during warfare, as evidenced by the charred beams, smashed vessels found in the interior, and '*five upper and lower* [human] *leg bones and a* [...] *largely preserved skull* [...] *from the lowest layer of the mound*' discovered during the excavations.[9] Two skeletons are also said to have been found earlier in the ringfort (Rademacher 1902, 55).

5 Cf. Corpus 3, 1979, 81/95, Abb. 14–45; for the ceramic typology used here, see Schuldt 1956.

6 The uncertainly stratified find of a burnt house site with numerous complete vessels likely dates back to the destruction of the ringfort, under whose ruins such finds were more likely to be preserved than in an open settlement. It therefore certainly belongs to the stronghold and, when linked to the dendrochronological data from around 900 (see below), can be dated to the first half of the 10th century; cf. Schuldt 1958, 289, 297, Abb. 95; Herrmann, Hoffmann 1959, 297; Wehner 2012, 57–58, 267.

7 Herrmann, Heußner 1991, 277; Wehner 2012, 145, 267–268, Tab. 2; J. Herrmann refers to a well as the source of the data (followed by Biermann 1999, 112; 2008, 50), but according to D. Wehner (2012, 268) and also the BLDAM site records Phöben No. 1, the wood comes from the rampart; the excavation was led by K. Grebe.

8 BLDAM site records Phöben No. 1; Corpus 3, 1979, 81/95, Abb. 14–45.

9 See below, the quote from a letter by court clerk H. Rademacher, Potsdam, dated 15 September 1899, from the files of the Museum für Völkerkunde Berlin, transcript in the BLDAM site records Phöben No. 1; this presumably refers to human bones. On linking human bones found in strongholds to attacks and further violent events: Biermann 2017.

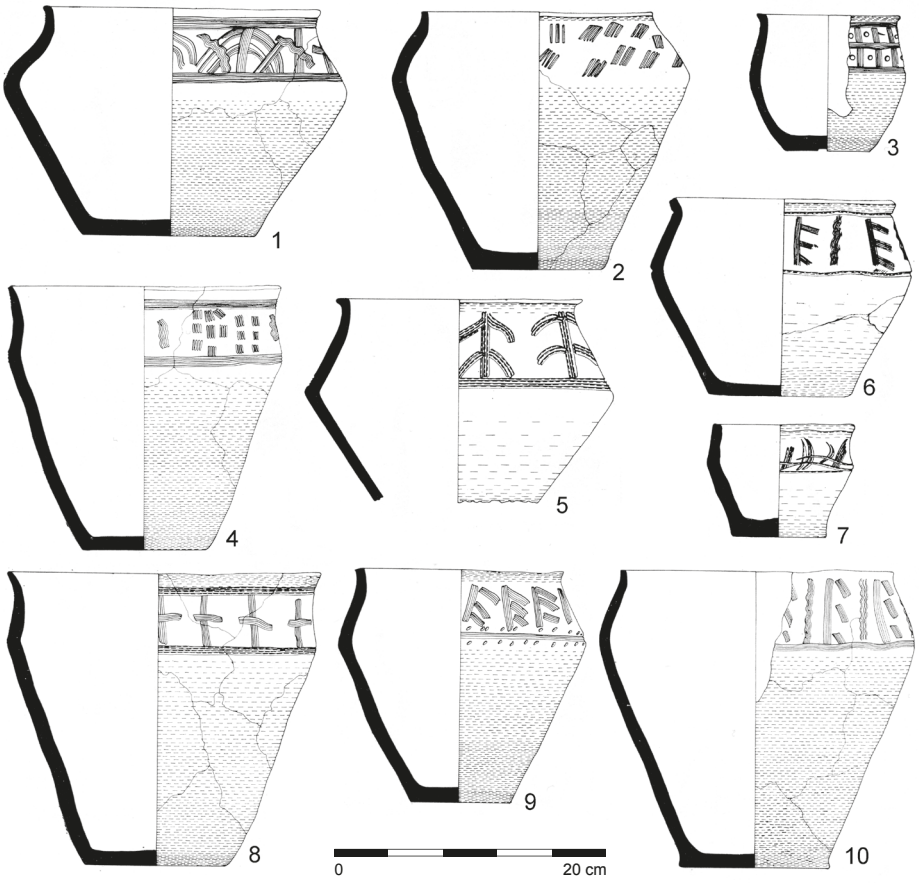


Fig. 13.5. Slavic ceramic vessels of the Menkendorf type from a house found in the courtyard of the main Phöben ringfort, excavations in 1913. After Corpus 3, 1979, 81/95, Abb. 36–45.

Joachim Herrmann (1960, 58–65) assumed that the first ringfort was the centre of a castle district (*Burgbezirk* or *civitas*) in the Hevellian-Stodoranian settlement area – '*one of the VIII civitates of the 9th century in Heveldun*' (Herrmann, Hoffmann 1959, 306). However, the outer bailey fortifications, which were rather unusual in the region in terms of their size, led the researcher to assign them to a second phase in the 10th century. He concluded that there had been a change in function and in the lords of the Phöben ringfort at that time: '*It is highly probable that in Phöben* [...] *we are dealing with a Slavic civitas in the 9th and 10th centuries and a German Burgwardium in the 10th century*' (Herrmann, Hoffmann 1959, 302 [citation]; cf. Herrmann 1960, 71–73; Sasse 1987, 167–168). The latter, the centre of an East Frankish administrative and military district, should have been a base to rule the country after 929, under King Henry I († 936) or more likely under Otto I (912–973) (cf. e.g. Bachrach 2012, 59, note 138).

The site was reused in the High and Late Middle Ages, when the small ringfort, which had already been abandoned for 200–250 years, served as the basis for a new castle. From this, embankments above the older rampart and cultural layers with greyware ceramics were found, as well as a few brick fragments. Nevertheless, the buildings are thought to have been mainly made of wood and clay (Herrmann, Hoffmann 1959, 297). The character of the defensive structure is not entirely clear: Was it one of those ringfort-like structures that emerged in several places in the region during the early period of German expansion in the 12th and early 13th centuries, often on the grounds of earlier Slavic hillforts (cf. Herrmann 1960, 84–85, 92)? The findings from 1932 certainly suggest that it was still a ringfort (cf. Herrmann, Hoffmann 1959, Abb. 2), but the later earthworks could also have belonged to a mound of a motte type castle, which became very common in Brandenburg from the 13th century onwards (Biermann, Posselt 2022).

At the same time, a settlement existed again in the western foreground, which – according to rather uncertain observations – also included a cemetery (cf. Corpus 3, 1979, 81/95, 271, Abb. 67). The relationship between the two rampart-ditch lines in the western part of the peninsula and this settlement is unclear. However, J. Herrmann dated the new castle to the second half of the 12th and the following

century. According to Herrmann, it was only used for a short time and was soon abandoned because of the rising water levels due to the construction of mills during the German Eastern settlement period (*Deutsche Ostsiedlung*) (Herrmann, Hoffmann 1959, 300; Kersting 2004, 117). In Corpus (3, 1979, 81/95), K. Grebe dated the end of the complex to the beginning of the 13th century. This second main phase of use remained unmentioned in written records due to its early demise; however, based on its size and multi-part structure, it was considered as one of the significant '*castles of territorial lords*' (Herrmann, Hoffmann 1959, 305–306), a '*German sovereign castle*' (Corpus 3, 1979, 81/95).

3. The hoard – archaeology

In October 2017, M. Fenner, S. Wolter and other volunteers from the BLDAM repeatedly searched the site with metal detectors, focusing in particular on the two outer settlements to the west of the main ringfort. In addition to a few small finds and a number of scattered Brandenburg denarii (see below) at the northern tip of the peninsula, just inside the outer section of the outer baileys, they found several dirhams in varying degrees of fragmentation over an area of approximately 45 × 20 m. This led to a larger-scale survey and excavation of the area in December 2017 (Fig. 13.6, 13.7). Later, several follow-up surveys were conducted (cf. Biermann, Kersting 2020).[10]



Fig. 13.6. Archaeological prospecting on the Phöben site in December 2017, view to the southeast. On the right, faint remains of the outer bailey fortifications are visible. Photo by F. Biermann.

The excavation trench (trench 1) covered an area of 10 m² (5 m in the east–west direction, 2 m in the north–south direction) in the centre of the dirham scatter (Fig. 13.8). The trench was excavated by hand down to the loamy sand at a depth of 0.5 m (Fig. 13.9). This was followed by a 7.2-m-long and 1-m-wide test pit in the south-east corner, which only affected the top layer to a depth of 0.25 m and was used to recover coins. This revealed that beneath



Fig. 13.7. Detector prospecting in the northern area of the outer bailey of Phöben, December 2017. Photo by F. Biermann.



Fig. 13.8. Phöben. Trench 1, excavation in the area of the dirham concentration in December 2017, view from the southwest. Photo by F. Biermann.

10 In addition to F. Biermann, Dr. Th. Kersting (BLDAM), A. Pratsch (monument protection authority of the Potsdam-Mittelmark District) and several volunteers were involved, including G. Dittrich, M. Fenner, W. Herkt, M. Hertz, M. Leukhardt, D. Meier, L. Pahl, C. Puppa, O. Reule, M. Schambach, E. Splisteser, D. Wegner and S. Wolter. We would like to thank all collaborators and those who provided information and support during the evaluation, including Dr. K. Frey (Prenzlau), Dr. L. Ilisch (Tübingen), Prof. Dr. A. Leube (Berlin), Dr. S. Schwarzländer, Dr. D. Westendorf (both Wünsdorf) and Dr. H.-U. Voß (Frankfurt/M.).

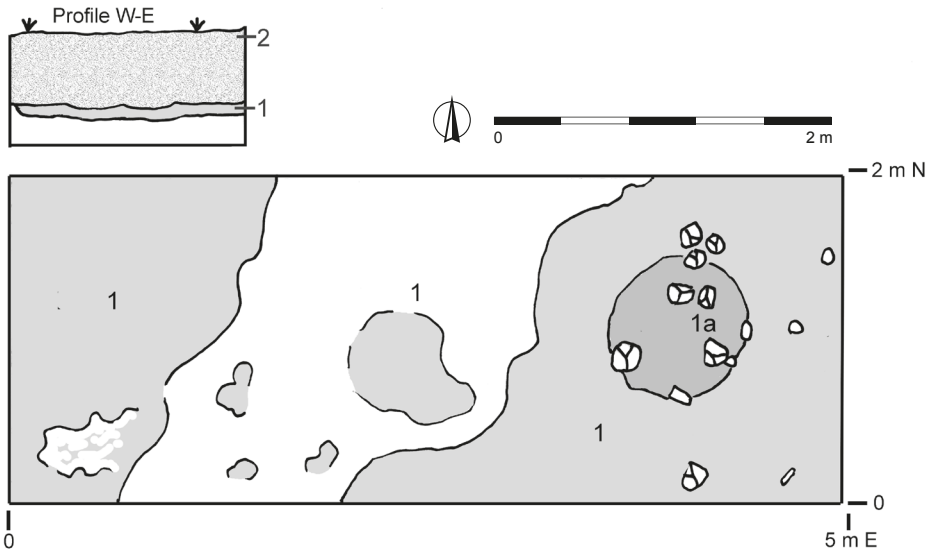


Fig. 13.9. Phöben. Section 1, plan and example of the profile situation. Humus-sandy layers and objects are marked in grey and numbered. Drawing by F. Biermann.

0.4 m of slightly peaty, humic sand (feature 2), in which the dirhams were scattered and which yielded 38 middle Slavic sherds (Menkendorf-type, one Tornow-type) and 19 later greyware fragments, a 0.05–0.1-m-thick grey-brown, humic-loamy cultural layer was preserved (feature 1). This contained charcoal, animal bones and pottery. The potsherds were (with the exception of two small greyware sherds that had been carried there secondarily) exclusively middle Slavic: mostly Menkendorf-type, one Sukow and one Woldegk sherd (Fig. 13.10). This stratum did not contain any dirhams. In the eastern area, there was a round, slightly darker stone setting with charcoal and burnt clay – a fireplace (feature 1a). The picture corresponds quite well to the profiles recorded in 1932 in the outer settlement (Herrmann 1959, 94, Abb. 4; Herrmann, Hoffmann 1959, Abb. 2), even though the alluvial sand bands and clearly distinguishable peat layers documented at that time are missing. The coins were distributed in the mixed top layer (feature 2).

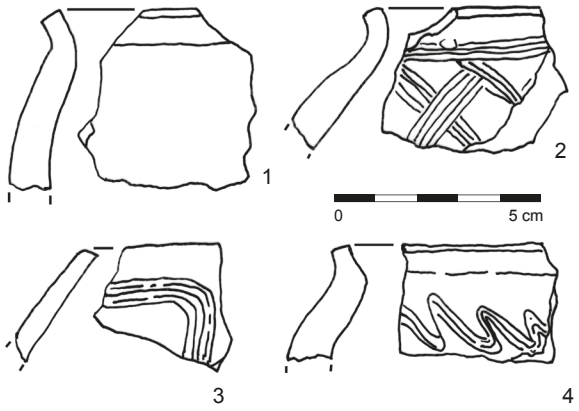


Fig. 13.10. Phöben. Section 1, selection of Slavic sherds from cultural layer 1. Drawings by F. Biermann.

The 43 dirham fragments, many of which are very small and chopped up, some with test cuts, certainly originate from the immediate vicinity – probably from a deposition placed on or in the rear of the rampart of the outer bailey – and were distributed here during post-medieval levelling work. The blistered traces of melting visible on some of the coins could indicate that they were exposed to fire. No vessel or other container was found. However, as the dirhams were only found in one area, even though the entire outer bailey was searched thoroughly, this is undoubtedly a treasure that has been scattered (Fig. 13.11). Under these conditions, its complete preservation and recovery cannot, of course, be guaranteed. Based on the available evidence, however, it was a pure dirham hoard that was buried after 912/913 on the outer edge of the western outer bailey of the ringfort, in a settlement or residential context.

4. The hoard – numismatics

The hoard from Phöben consists of one whole coin and 42 dirham fragments, among which the dirhams of the early ʿAbbāsid caliphs, the Sāmānid emirs as well as Volga-Bulgarian dirham imitations were identified. Due to their size and state of preservation, seven pieces with minimally legible or completely illegible inscriptions were included in the indeterminable group (Fig. 13.12). All dirhams are presented in the catalogue (see below).



Fig. 13.11. Distribution of detector finds in the area of the Phöben stronghold, prospecting 2017/2018. Purple – prehistoric finds; green – Migration Period; red – dirhams; light blue – Slavic Period; blue – High and Late Middle Ages; yellow – denarii from the 13th/14th centuries. Black indicates trench 1 of 2017. Based on LGB, mapping by S. Schwarzländer, F. Biermann.

The ʿAbbāsid dynasty is represented by one complete dirham and three (?) dirham fragments. Two of them were minted during the reign of Caliph Hārūn ar-Rašīd (AH 170–193 = 786–809 AD) (Cat. No. 1, 2; Fig. 13.12: 1, 2) and the other one was attributed to Caliph al-Ma'mūn (AH 198–218 = 813–833 AD) (No. 3; Fig. 13.12: 3). The first one (No. 1) was struck at Madīnat as-Salām (Round City of Baghdad, Iraq) in AH 192 (807/808), the second (No. 2) at al-Muḥammadiyya (present-day Iraq) probably in AH 181 (797/798), as may be indicated by the layout of the legend in the reverse field.[11] The third ʿAbbāsid dirham fragment has been identified as an issue of Caliph al-Ma'mūn (No. 3). Unfortunately, the mint name is missing, while the year of minting can be reconstructed as AH 21[4] (829/830) or AH 21[7] (832/833). The arrangement of the legends and rings as well as traces of the additional line of inscription below kalimah in the reverse field could perhaps suggest that the coin was minted in Madīnat Arrān (modern-day Azerbaijan).[12] The fourth fragment is very poorly preserved, but traces of inscriptions with a large question mark might indicate its origin from a coin minted by an unspecified ruler of the ʿAbbāsid dynasty (Fig. 13.12: 4).

The main component of the hoard is the fragments of Sāmānid dirhams (22 pieces), among which five pieces (No. 5–9; Fig. 13.12: 5–9) were attributed to issues of Ismāʿīl ibn Aḥmad (AH 279–295 = 892–907 AD), eight pieces (No. 10–17; Fig. 13.12: 10–17) have been identified as fragments of dirhams minted during the reign of Aḥmad ibn Ismāʿīl (AH 295–301 = 907–914 AD), six pieces (No. 18–23; Fig. 13.12: 18–23) due to the surviving incomplete date of issue were attributed to two consecutively reigning emirs: Ismāʿīl ibn Aḥmad and Aḥmad ibn Ismāʿīl, and three remaining fragments (No. 24–26; Fig. 13.12: 24–26) have been separated as Sāmānid based on the character of the lettering.

Unfortunately, the mint name is preserved only on three pieces full (No. 5, 6, 12), and on six it has been reconstructed. The Sāmānid dirham fragments in the Phöben hoard are represented by coins from mints in Transoxiana (Mā-warā-an-nahr, Western Central Asia, present-day mainly Uzbekistan): Samarqand (No. 5 and 10?) and aš-Šāš (Tashkent) (No. 6, 11?, 12, 13?, 14, 15); one of the pieces (No. 16) may come

11 Cf. Lowick, Savage 1996, 207, No. 1754–1755; Leimus 2007, No. 399–401; Nicol 2012. 3, No. 1411, 1413–1414.

12 On dirhams minted at AH 214 and 217 in Arrān, there is an additional inscription above and below the kalimah in the reverse field: al-ʿAbbās ibn // amīr al-mu'minīna, cf. Tiesenhausen 1873, Nos. 1823, 1833; Lowick, Savage 1996, 122–123, No. 860; Nicol 2012. 3, No. 302.

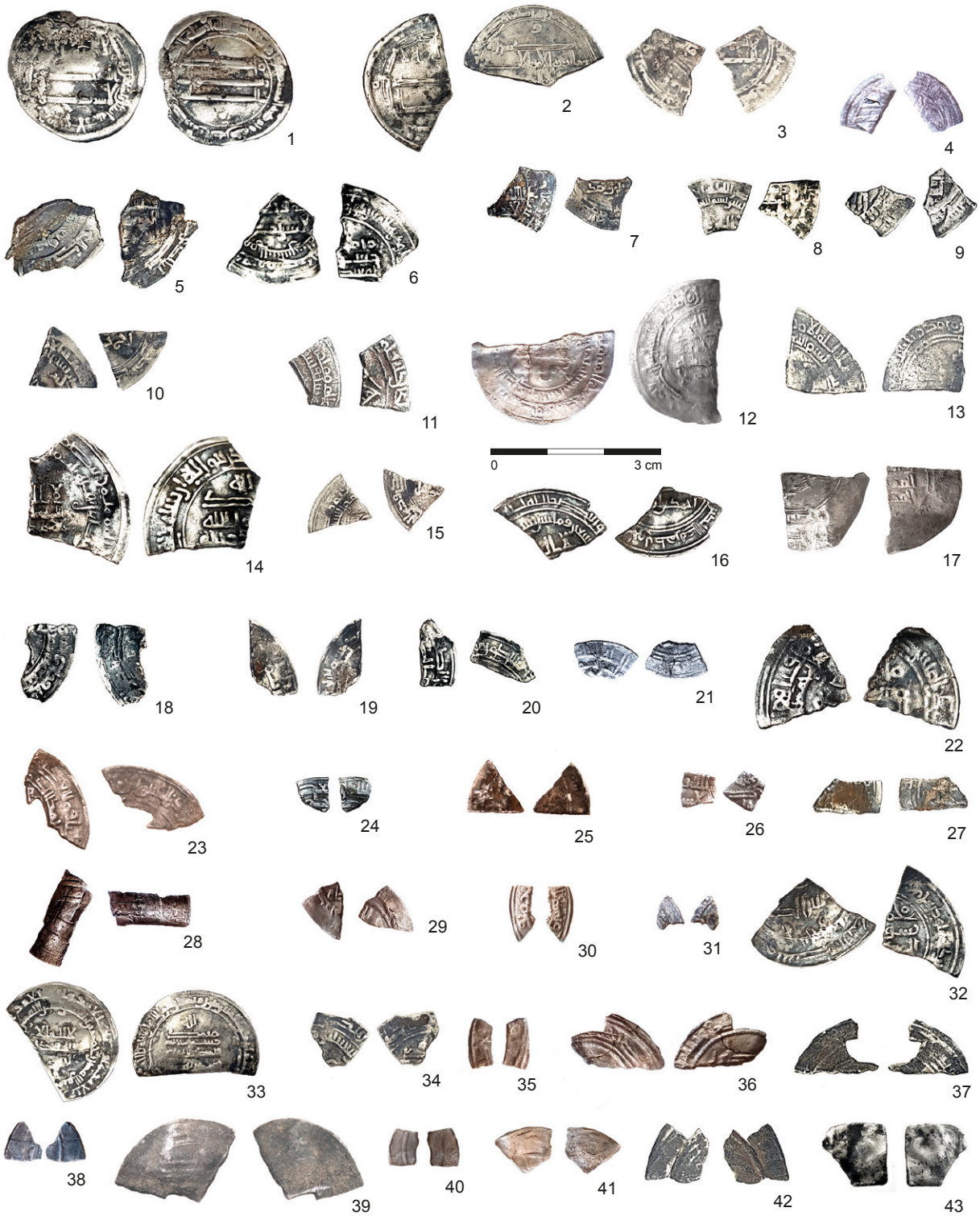


Fig. 13.12. Phöben. Dirhams. The numbers correspond to the catalogue numbers. Photo by M. Fenner, M. Schambach, F. Biermann.

from a dirham likely minted in Nīsābūr (Ḫurāsān) (modern-day Iran).[13] The situation is similar with the dates. The full name of the Sāmānid emir is not preserved on any fragment and in all cases has been reconstructed. The minting year was preserved on only one fragment (No. 14): AH 300 (911/912);[14] on five fragments the year of minting, partially preserved, has been reconstructed (No. 7, 11–13, 17), while the remaining fragments (13 pieces) were dated by the years of the reign of the emirs and the caliphs whose names appear on coins or, as for dirham fragments No. 22 and 23, the attribution was based on a characteristic mistake in the marginal legend of the reverse.[15] A separate small group consists of three fragments, which for typological reasons we can also classify as Sāmānid issues. In view of the fact that we have only two issuers among the fragments specified: Ismāʿīl ibn Aḥmad and Aḥmad ibn Ismāʿīl, we can assume that these pieces may represent fragments of dirhams minted by the two emirs mentioned above.

A small (3 pieces) but very interesting group is Volga-Bulgarian imitations (No. 32–34; Fig. 13.12: 32–34), for which the prototypes were dirhams of Sāmānids: Ismāʿīl ibn Aḥmad and Aḥmad ibn Ismāʿīl. On all of them, although preserved in fragments, incorrectly executed legends in the obverse and reverse fields are visible. The first specimen (No. 32) was probably struck with the name ʿIsmāʿīl ibn Aḥmad' citing Caliph al-Muk[tafi billāh], partly preserved, whose name has been reconstructed here and the mint ʿBalḫ'. The distinctive elements of this imitation fragment that allow it to be reconstructed include the barbarised word ʿšarikah' in the third line of the kalimah on the obverse – here an ornamental, letters in the kalimah of the reverse split tops and omitted word المشركو[ن] (al-mušrikū[na]), of which only the letter ʿnūn' remains. The prototype for this type of imitation was dirhams struck in Balḫ (Balkh, Afghanistan) in AH 290–295 (902/903–907).[16] Gert Rispling includes this type of imitation in the Jena Collection in the group of ʿImC2' struck in Bulġār in AH 294–323 (906–934).[17] Two copies of this type of imitation were recorded in the Terslev hoard (Denmark), Tpq 940–944,[18] and another one in Gannarve hoard (Gotland, Sweden), Tpq 944/945.[19] The same type of imitation was noted in the hoard found in 2021 near the village of Belousovo (Zhukovsky District, Kaluga region, Russia).[20]

Very interesting is the dirham imitation with the emir's name Aḥmad ibn Ismāʿīl and Caliph al-Muqtadir billāh (No. 33). As a prototype for the above emission served probably the dirhams of Aḥmad ibn Ismāʿīl struck in aš-Šāš in AH 297 (909/910) (Golemikhov 2023a, 5; cf. Leimus 2007, No. 1537–1539). This specimen was characterised by the ʿdouble' strike of kalimah in the obverse field and repeated the same fragment of marginal legends several times. In this case, we are dealing with the use of a broken obverse die, which was not preserved in its entirety, and the remaining part was used to make a new obverse die. According to repeated fragments of circular legends, we can surmise how many times ʿthe surviving fragment of the die' was used. Unfortunately, we do not have the whole coin, but fragments of obverse circular legends are repeated on our copy probably four times. More extensively, this imitation is described by A. V. Golemikhov, who presents a graphic reconstruction of this type of die and the probable mechanism of their production (see Golemikhov 2023a, 5–7, Ris. 5).[21] According to G. Rispling, these imitations also included

13 A distinctive feature of dirhams minted in Nīsābūr is the circle between inner and outer marginal legends of the obverse, cf. Leimus 2007, No. 1421, 1422; SNAT XIV a, No. 425–426; Kolosov, Kalinin 2022: Ni. 295.1–Ni. 299.

14 The preserved year of minting, the mint's name, ligatured لا (lā), omitted and incorrectly written letters in the kalimah and marginal legend of the reverse allowed this piece to be counted as an issue of Aḥmad ibn Ismāʿīl, cf. Leimus 2007, No. 1627–1630.

15 The preserved fragment of marginal legend of the reverse is characterised by the omitted letter hā' in the word كره (kariha), which in these cases looks like a dot, cf. mint aš-Šāš: Leimus 2007, No. 1316, 1324, 1327 (AH 292), 1338, 1340 (AH 293), 1352, 1359 (AH 294), 1512, 1514–1515 (AH 295), 1527, 1531 (AH 296), 1554, 1563 (AH 298); SNAT XV b, No. 243–244 (AH 292), 248 (AH 293), 259 (AH 295); Kolosov, Kalinin 2022, Sh. 295.1.

16 Cf. Leimus 2007, No. 996–1002 (AH 293), 1003 (AH 295); Kolosov, Kalinin 2022, Bl. 290, Bl. 291, Bl. 292, Bl. 293, Bl. 293.1.

17 According to G. Rispling, these types of imitations are undoubtedly Volga-Bulgarian, the die-chain K101 67/R41, cf. Rispling 2005b, 173, Tab. 1; 192–193, Nos. 1437–1440. For the dating and classification of Volga-Bulgarian imitations, see also Rispling 1990, 276–277; 2001, 329; Jankowiak 2021, 67–69; 2023, 334–335, Fig. 18.6.

18 After Rispling 2005a, 216, No. 237; 2005b, 192: 1–2, Fd. Terslev (Tpq 329–33), No. 163, 191.

19 After Rispling 2005a, 216, No. 249; 2005b, 192: 3, Fd. Gannarve, Lokrume (Tpq 333), No. 88, 2,90 g.

20 The hoard contained about 200 Sāmānid dirhams with a small admixture of ʿAbbāsid and Baniğurid coins and dirham imitations. Unfortunately, we do not know what is the latest coin and thus the year of the hidden hoard (see Zeno).

21 According to the author, '*each new die fragment was ground before use and applied at a slight angle before striking for a smooth transition of images*'.

in group 'ImC2' were minted in Suwār (Volga Bulgaria; now Russia) with AH 297 and in his classification belong to die-chain K 018-01/R01.[22] Analogies of this type of imitation were noted in the private collection and in the Makushki hoard (Russia).[23]

The third specimen of the dirham imitation in the Phöben hoard (No. 34) has been preserved in a small fragment. We can read in the inner marginal legend the name of the mint, which is made correctly: نيسابور (Nīsābūr/Naisābūr), but when it comes to the outer marginal legend, we see a different part of the legend than usual above the mint name: here is the last part: ... بنص ...ن ([al-mu'minū]na bi-naṣ[r]). An analogy for the type of our imitation, taking into account the clear name of the mint, the circle between the inner and outer marginal legends of the obverse and the type of writing, the letter 'dāl' in the first line of the kalimah in the reverse field may be, among others, dirham imitation No. 1444 in the Jena Collection and, according to G. Rispling, belongs to the die-chain K22 3/R3 and the 'ImC2'[24]. This type of imitation has been noted in the following hoards from Sweden: Triberga, Tpq AH 301 (913/914);[25] Spillings I, Tpq AH 325 (936/937);[26] Lilla Tollby, Tpq AH 332 (943/944);[27] Gannarve, Tpq AH 333 (944/945);[28] Rangsarve, Tpq 342 (953/954)[29] and Rondarve, Tpq 343 (954/955);[30] one specimen was also noted in the Danish hoard Sejrø, Tpq Islamic coins AH 331 (943),[31] and another was found in the Makushki hoard (Russia), Tpq AH 301 (913/914).[32]

As far as can be seen, in the Phöben hoard only one of the Islamic coins was complete (No. 1), the remaining 42 larger or smaller fragments have been identified on the basis of partially preserved inscriptions, i.e. the mint name, year of minting, additional inscriptions and lettering characteristic of the coinage of the dynasty. Most of the identified mints have been reconstructed or determined based on the character of the lettering. The oldest coin is a dirham of Hārūn ar-Rašīd (No. 1) struck at Madīnat as-Salām in AH 192 (807/808), while the latest closely dated is the dirham of Sāmānid emir Aḥmad ibn Ismāʿīl (No. 14) minted in AH 300 (912/913).

The oldest coins in the present assemblage, the ʿAbbāsid dirhams, are dated to the early 3rd century AH (early 9th century AD) and are separated from the Sāmānid dirhams by a period of about 70 years. The Sāmānid coins, on the other hand, constitute a compact group covering a period of about 20 years. They include coins from two major mints, aš-Šāš and Samarqand, and probably a coin struck at Nīsābūr. They are also supplemented by dirham imitations, minted by the Volga Bulgars, whose dating, applying Rispling's typology and classification, was determined to be AH 294–323 (906–934).

5. Further finds from 2017

During the prospection and excavation in 2017, only a few additional medieval finds came to light (Fig. 13.13–13.17).[33] Various non-ferrous metal sheet fragments and a decorated oval buckle with a pin and long metal fitting decorated with rough triangular punches (4 cm long; BLDAM inv. No. 2019-130/53) (Fig. 13.13) belong to the Slavic period. The piece probably dates from the late 9th or 10th centuries, but given the general rarity of comparable items in

22 Rispling, Jankowiak, Treadwell in preparation.

23 Golemikhov 2023b, 69, No. 268. The Makushki hoard was found in spring 2018 between the village of Matchino and Zarechye of the Kozielsky District, Kaluga region, and it contained 268 dirhams and dirham imitations, Tpq AH 300 (912/913), see Golemikhov 2023b; Zeno, No. 185040.

24 Rispling 2005b, 194–195, No. 1444.

25 Rispling 2005a, 212, No. 131; Triberga, Hulterstad, Öland, 677 coins, with 88 imitations.

26 Rispling 2005a, 215, No. 220; Spillings I, Othem, Gotland, 857 coins, with 18 imitations.

27 Rispling 2005a, 216, No. 248; Lilla Tollby (Uggårds), Källunge, Gotland, 894 coins, with 112 imitations.

28 Rispling 2005a, 216, No. 249; Gannarve, Lokrume, Gotland, 894 coins, with 102 imitations.

29 Rispling 2005a, 217, No. 282; Rangsarve, Alva, Gotland, 750 coins, with 55 imitations.

30 Rispling 2005a, 217, No. 292; Rondarve, Eksta, Gotland, 306 coins, with 33 imitations and 2 Volga Bulgar.

31 Rispling 2005a, 216, No. 243; Sejerby (Sejrø), Sejerø (Denmark), 97 coins, with 8 imitations; 46 Western European coins also occurred in the hoard, Tpq 953–965.

32 Golemikhov 2023b, 69, No. 267.

33 A catalogue of other finds is not provided here. It can be found in the BLDAM find records, where the finds are also stored under inv. No. 2019-130.

Polabian material culture,[34] it certainly represents elite high-quality equipment. Of particular interest is a rectangular, probably pressed bronze fitting or rivet decorated with nine bosses (1.6 cm in diameter; inv. No. 2019-130/70; Fig. 13.14), four of which appear to be designed as face masks – men's heads with nasal helmets? The central boss is highlighted by a ring of smaller pearl punches. The piece probably dates from the 9th/10th centuries and could reflect Scandinavian influences, but cannot yet be classified more precisely.[35] Nasal helmets were popular among both the Vikings and the Slavs in the Early Middle Ages.[36]

The early German period finds include two profiled bronze buckles probably from the 13th century, one with a separate notched pin (1.6 and 2.8 cm height; inv. No. 2019-130/39, 58; Fig. 13.15: 4, 5) (cf. Biermann 2010, 263–264, with further literature), and a larger, heavily profiled bronze buckle probably from the 14th century (5.2 cm height; inv. No. 2019-130/75; Fig. 13.15: 3). A profiled, twice perforated fitting made of non-ferrous metal (3.8 cm long; inv. No. 2019-130/51; Fig. 13.15: 2) may have belonged to a casket.[37] The hanger of a small bell cast from non-ferrous metal (inv. No. 2019-130/59; Fig. 13.15: 7) corresponds to type 7 or 8 according to S. Krabath (2001, 215–224, Abb. 44) and was probably used on a horse harness rather than on a bell belt. A fragment of a rim (inv. No. 2019-130/69; Fig. 13.15: 11) is also likely to have come from a small bell. In addition, there is a rivet rolled and forged from non-ferrous sheet metal (inv. No. 2019-130/62; Fig. 13.15: 6), several sheet metal fragments, some of which are gilded or studded with rivets (inv. No. 2019-130/60, 61, 63, 65 and others; Fig. 13.15: 8, 12), and two melted feet of tripod skillets (*Grapen*) from the 13th century found close together (inv. No. 2019-130/67, 68; Fig. 13.15: 9, 10), which indicate a high or late medieval metal workshop. There are also various iron objects, fishing weights, pieces of non-ferrous metal and molten drops as evidence of metallurgical activity.

The medieval sherds recovered during the excavation of 2017 are interesting: the top layer contains



Fig. 13.13. Phöben. Non-ferrous metal buckle (BLDAM inv. No. 2019-130/53). Photo by M. Fenner.



Fig. 13.14. Phöben. Decorated non-ferrous metal fitting (BLDAM inv. No. 2019-130/70). Photo by M. Fenner.

34 See general parallels among the D-shaped buckles compiled by I. Heindel (1990, 14–15, Taf. 2), especially in the southern part of the West Slavic region.

35 General parallels among Viking belt and bridle fittings: Roesdahl (Hrsg.) 1992, 76, 287, 307, No. 225, 301; further studies on the find are planned.

36 Cf., for instance, Hewitt 1855, 129–143; Gorecki 2000; Bravermanová 2011; Macků, Pilná 2021, 451–461.

37 A similar piece in the broader sense has been found in the 12th/13th-centuries castle of Lenzen-Neuehaus in Prignitz (Biermann 2007, 118–119, Fig. 13), and another in the Wildberg hillfort near Neuruppin (Biermann 2020, 51, Fig. 3).

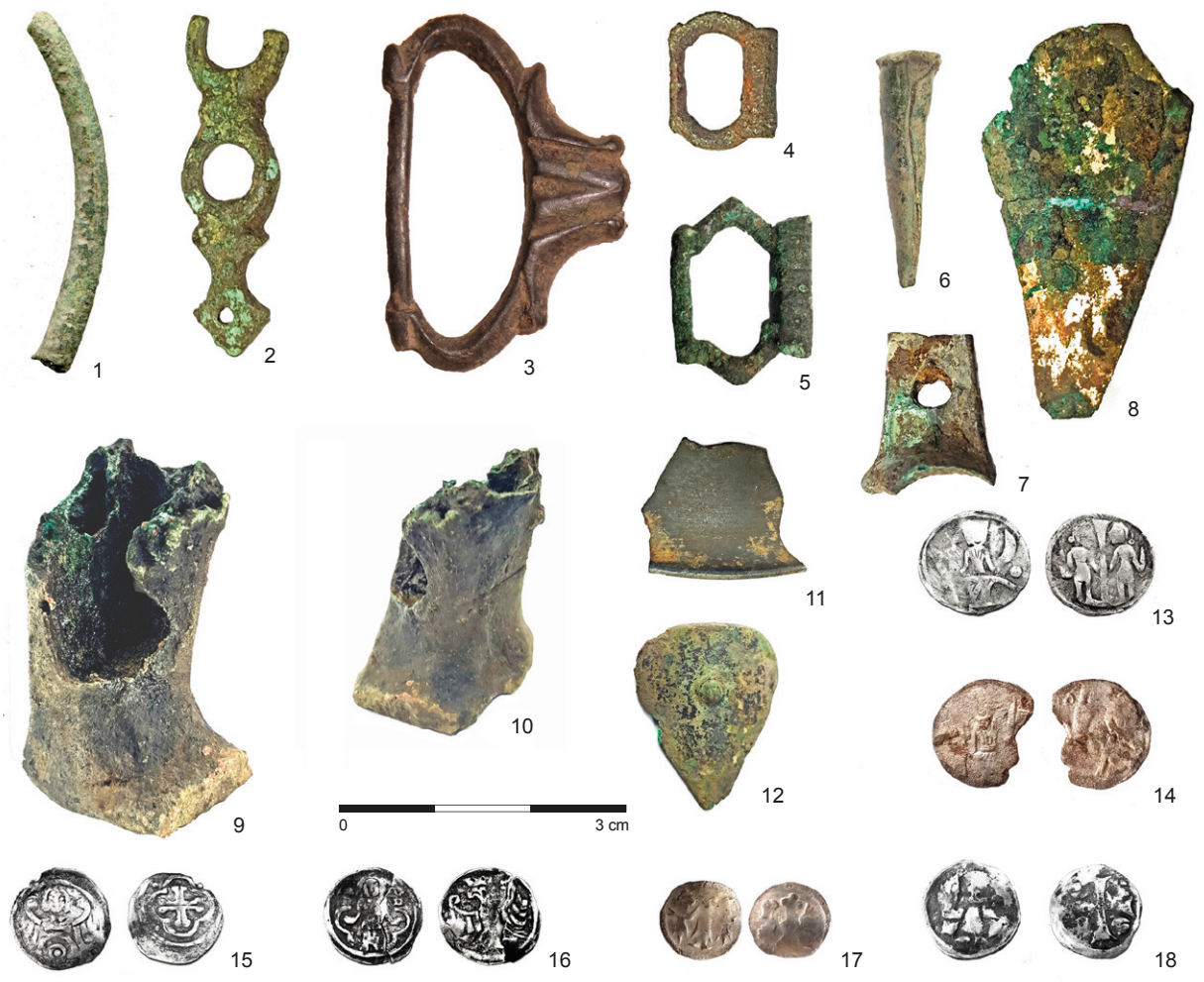


Fig. 13.15. Phöben. Finds made of non-ferrous metal (1–12) and silver (13–18). 1 – Fragment of a bracelet (BLDAM inv. No. 2019-130/38); 2 – casket fitting (No. 51); 3–5 – buckles (No. 39, 58, 75); 6 – rivet (No. 62); 7, 11 – bell fragments (No. 59, 69); 8, 12 – fittings (No. 60, 61); 9, 10 – *Grapen* feet (No. 67, 68); 13–18 – Brandenburg denarii (No. 40–42, 55–57). Photo by M. Fenner, M. Schambach, F. Biermann.

19 greyware fragments of ware groups 231, 411 and 412 according to F. Biermann (2003), including a grooved lip rim from a globular pot (*Kugeltopf*). These finds all date from the 13th to early 14th centuries, with a focus on the second half of the 13th century. However, there is no pottery from the second half of the 12th and early 13th centuries, which is the period previously assumed for the castle of the Early German period (see above). As no new finds have been made at the ringfort, the centre of the late medieval fortification, its dating to the early period of German expansion cannot be ruled out. However, the end of settlement with the rising water levels due to the construction of mills during the German Eastern Settlement period around or shortly after 1200 is certainly inaccurate – the Räuberberg was used as a fortification or settlement until the first half of the 14th century.

This is also supported by six Brandenburg denarii found scattered about the outer bailey grounds, which – according to the determination by M. Fenner based on E. Bahrfeldt (1889) and H.-D. Dannenberg (1997) – date from between 1220 and 1340: one type Da. 30 (Bf. 162) from around 1220 (inv. No. 2019-130/40; Fig. 13.15: 13), then type Da. 31 (Bf. 158) from around 1220/25 (inv. No. 2019-130/42; Fig. 13.15: 14), a coin of type Da. 61 (Bf. 206) around 1255/60 (inv. No. 2019-130/56; Fig. 13.15: 15), a denarius of type Da. 77 (Bf. 443) around 1270 (inv. No. 2019-130/55; Fig. 13.15: 16), one of the variant Da. 179 (Bf. 609) around 1320 (inv. No. 2019-130/41; Fig. 13.15: 17) and a silver piece of the type Da. 216 (Bf. 616) around 1340 (inv. No. 2019-130/57; Fig. 13.15: 18).

Three finds are of particular interest because they provide evidence of previously undocumented periods at the site: First, a fragment of



Fig. 13.16. Phöben. Non-ferrous metal fibula (BLDAM inv. No. 2019-130/52). Photo by M. Fenner.



Fig. 13.17. Phöben. Non-ferrous metal temple ring (BLDAM inv. No. 2019-130/64). Photo by M. Fenner.

an equal-armed, possibly repaired non-ferrous metal fibula with circular eye decoration from the late 4th or early 5th centuries was uncovered (inv. No. 2019-130/52; Fig. 13.16). This is likely to prove that the site on the Havel was settled during the Early Migration period (Schuldt 1950–1951; 1955, 65–67, Abb. 316–322; 1976, 36, Taf. 46). Second, there is the fragment of a large broken temple ring made of solid round bronze rod with an S-shaped terminal (inv. No. 2019-130/64; Fig. 13.17), which represents a late variant of this type of jewellery, mainly dating from the 12th century (Biermann 2009, 61–63, with further references). This find is the first evidence of the Late Slavic period at this site.[38] Finally, there is a fragment of a round, tapered bronze bracelet dating from prehistoric or early historical times, around the Iron Age (inv. No. 2019-130/38; Fig. 13.15: 1), but may also have come to the Räuberberg as metallurgical raw material in the Middle Ages.

6. Discussion and conclusion

Although the silver hoard is not particularly large, it is of great interest, as it consists exclusively of Islamic coins and dates from a period with only few silver deposits. The compact appearance of the Sāmānid coins suggests that the hoard was deposited in Phöben not too long after the issue of the latest coin (912/913), perhaps around 920. Hoards of this kind have rarely been found so far south in Brandenburg and so early in the 10th century.[39] The Phöben treasure has its precursors and parallels on the Baltic Sea and in its immediate hinterland (Biermann 2022, 110–117, Abb. 4). It has long been recognised that the Havel region – the area of the Stodoranian/Hevellian tribe and principality – was influenced by the economically highly developed Baltic Sea trading zone in the Early to Middle Slavic period, as evidenced by various older finds of foreign

38 Based on where the temple ring was found, it has nothing to do with the cemetery believed to be in the central part of the inner bailey (cf. Corpus 3, 1979, 81/95, 271, Fig. 67).

39 Biermann 2022, 110–113, Fig. 4, 6. The closest hoard in the Zauche-Havelland region, that of Paretz (HVL), which contained Islamic and European coins as well as hack silver, may have been buried between 965 and 973, but based on its overall character, it may also have been buried before or around 1000 (Corpus 3, 1979, 77/65; Sasse 1987, 114; Wehner 2012, 264). A new discovery of what is probably an early and comparable dirham hoard recently came to light at the Ragow ringfort in the Dahme-Spreewald District, 'Burgwallwiesen' (unpublished; pers. comm. F. Georgi, Berlin).

objects from Scandinavia,[40] but also from the existence of the large Feldberg-type strongholds that appear here as offshoots of the northern ringfort landscape (Brather 1998; Biermann 2011). There are also records of single dirham finds, for example from the Buchow-Karpzow hillfort and from settlements near Vieritz and Weseram.[41] Metal objects of Avar and Nordic origin, which have increasingly been found in recent years during metal detector surveys,[42] underline this fact and draw attention to the Havel as a transport axis in supra-regional trade. The largely navigable river connected the Müritz region in Mecklenburg, Zauche and Havelland – with important places as Brandenburg and (Berlin-) Spandau – and the Elbe near Havelberg (see, among others, Herrmann 1963). However, as in most comparable cases, it is uncertain what the Hevellians contributed to the trade that brought Islamic silver into the country.

The Phöben hoard came to light at a small ringfort (Fig. 13.18), which is likely to have been the seat of a tribal ruler or chieftain in the Hevellian territory. Such a find is quite astonishing here, as the small ringforts or corresponding settlement complexes of the second half of the 9th and 10th centuries in Brandenburg are generally characterised by rather modest finds, few foreign goods and low craftsmanship or market activity. These complexes were centres of power, but as the seats of rulers with rather limited influence, they were not associated with ostentatious displays of wealth, nor did they form economic centres in the sense of pre-urban or early urban settlements (cf. Biermann 2000, 85–88; Biermann, Kersting 2017, 111–112). The detector surveys of recent years have not changed this picture – while even late Slavic settlements in peripheral locations often yield unexpectedly rich finds, strongholds of the later 9th and 10th centuries continue to yield rather meagre material remains (Biermann, Kersting 2017, 112). Donat Wehner (2012, 112) emphasises that the economy in the Zauche and Havelland lagged behind the neighbouring regions to the north until the 10th century: '*As was generally the case in the inland Slavic settlement areas between the Elbe and Oder rivers, there were no large production and trade centres to drive the economy.*' In addition, the time around 900 and the first half of the 10th century was

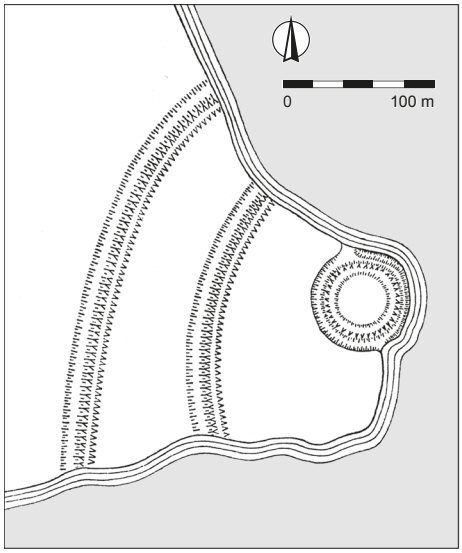


Fig. 13.18. Phöben. Plan of the stronghold with reconstructed fortification elements according to J. Herrmann. Adapted after Corpus 3, 1979, 81/95, Abb. 67.

marked by widespread economic crisis, evident in the decline of the maritime trading centres (*emporia*), of the large hillforts and associated mighty rules in the hinterland of the Baltic coast, and the end of high-quality Feldberg pottery (Biermann 2022, 115–117).

In Phöben, too, the finds made in 2017 – apart from the hoard – are not suitable for proving economic centrality; there are no indications of reputable supra-regional trade or of significant non-agricultural production. This is also true because the detector finds indicating non-ferrous metallurgy tend to be attributed to the 12th/13th centuries phase; at least the only two datable finds of this kind, the parts of *Grapens* with traces of melting as typical raw material for non-ferrous metal casting (cf. Biermann 2010, 265), can be attributed to this period. The only outstanding items associated with the elite furnishings of the 9th/10th centuries are the punched buckle and the anthropomorphically decorated fitting made of non-ferrous metal.

A look at the old finds from the Räuberberg does not paint a different picture: charred grains of corn and millet as well as nuts, ceramics, a spool with hemp fibres, bone awls and needles, sled bones, whetstones and grinding stones, wooden vessels, clay spindle whorls, fish hooks, a fishing net and net sinkers,

40 Weapons, clothing, etc.; cf. Wehner 2012, 110–111, 345–351, 354–355, Taf. 8–10, 12.

41 Buchow-Karpzow: Wehner 2012, 112, 219; Vieritz (unpublished detector find, fragment, Sāmānids, Nūḥ I. AH 331–346 = 943/944 AD, mint of Samarqand, Leimus 2007, No. 2865–2868, obverse not identical to die, reverse probably identical to 2867, determination L. Ilisch); Weseram: Biermann et al. 2018.

42 See Avar finds of Weseram (Biermann et al. 2018; Lobinger 2020) or Nordic fibula from Fernewerder (unpublished detector find).

iron tools such as scissors and bucket handles are common everyday relics, two iron arrowheads and a spearhead indicate the presence of warriors, iron slag from the smelting of bog iron ore found everywhere; only a black agate bead with white veins stands out somewhat.[43] The dirham hoard therefore appears to be more of a foreign object than the result of local prosperity acquired through lively economic activity.

In this respect, considerations to explain the deposition of the hoard are once again directed towards that economic sector which, even without the production of goods sought after beyond the region, could have gained possession of precious silver from the Orient: The involvement of the warlike lord of Phöben ringfort in slave hunting and the slave trade may have enabled him to acquire the small fortune or may have prompted the visit of a merchant with supraregional silver currency. The Phöben chief acquired the silver by selling people he had captured in wars against his rival rulers in the immediate and wider vicinity to traders from the emporia on the Baltic Sea. It can be assumed that the emporia functioned largely as slave markets. From there, the Vikings or Varangians organised the shipment of slaves across the Baltic Sea and the rivers of Eastern Europe to the Khazar Khaganate and the Islamic World. The Polabian areas were an important source of slaves. However, the hunt for humans was not primarily carried out by the Vikings themselves, but by competing Slavic tribal powers. These conditions had a significant influence on the economic, military and social development of the north-western Slavic tribal areas. The dirham hoard found far inland at Phöben indicates how large the sphere of influence of the Baltic slave trade network was, especially during the phase of decline of the emporia on the sea.[44]

Incidentally, this hypothesis regarding the presence of coins from Baghdad, Samarqand, Tashkent and other distant mints in Phöben, which travelled a distance of over 5,000 km via various intermediate stages, explains the remarkable phenomenon of this early globalisation better than the recently expressed assumption that the fur trade played a major role in the influx of silver into the Baltic Sea region (Callmer, Gustin, Roslund 2024). There were no special fur animals in the Zauche region whose sale would have been worthwhile in the emporia despite the long transport route to the Baltic Sea; however, transport to the Baltic Sea and as far as the Orient was worthwhile for slaves, who were incomparably more valuable. In either case, the former owner of the Phöben silver hoard would not have survived a dangerous, probably warlike event that prompted him to hide the coins.

With regard to the Slavic Settlement period, the new finds confirm the previous estimates for the Phöben stronghold-settlement complex: they all date to the Middle Slavic period (9th/10th centuries), for which the scarcity of metal – as just described – also appears to be quite typical. The 2017 research only contributes to the question of whether the originally Slavic settlement was expanded into an East Frankish stronghold after 929 insofar as there are no finds, either among the old or the new finds, that have to be dated definitively beyond the first third of the 10th century.[45] In this respect, it would also be conceivable that the ringfort was destroyed and abandoned during the epoch-making campaign of king Henry I in 928/929, which marked the beginning of the East Frankish conquest of the Slavic lands and was aimed primarily at the Hevelli.[46] The dirhams could also have been hidden in this context. These considerations must remain vague. However, they are appropriate, as J. Herrmann's premise that the outer bailey fortifications at Phöben indicate an East Frankish stronghold is by no means certain. Although outer bailey fortifications on ringforts are still rare in this region, they are more common than researchers could have assumed 60 years ago. Many are more likely to be linked to Slavic builders (cf. Biermann 2001, 44–45).

Only the temple ring indicates late Slavic use of the site. It may be related to limited settlement reuse or burial activities, perhaps as late as the early 13th century, but cannot prove continuity from the Middle Slavic period to the Early German phase. This is already evident from the coins, metal finds and potsherds from the outer bailey area, which only date back to the 13th century. As already mentioned, this does not rule out the possibility that the ringfort

43 Cf. BLDAM site records Phöben No. 1; Corpus 3, 1979, 81/95; Wehner 2012, 268.

44 With detailed descriptions of the archaeological and historical findings on slavery and the interpretations outlined here: Biermann 2021; 2022, 110–117, Fig. 4; see also Henning 1992; Biermann, Kersting 2017, 118.

45 Therefore, the middle to late Slavic cemetery located in the vicinity of Phöben, which dates mainly to the second half of the 10th and early 11th centuries (Grebe, Hoffmann 1964, 136–150), cannot be linked to the hillfort.

46 This was already suspected by R. Hoffmann in an apparently unpublished manuscript dated 27 July 1959 (BLDAM site records Phöben No. 1).



Fig. 13.19. Phöben. Aerial view of the Räuberberg from the east with clearly visible vegetation features of the main ringfort and the two outer baileys. Photo by O. Braasch, BLDAM.

was renovated in the second half of the 12th century. However, it is certain that the site was not abandoned around or shortly after 1200 '*in connection with the rise in the water table*' and that '*the fishing population was forced to abandon their settlement at the castle and move to the vicinity of the present-day village*';[47] rather, the pottery, the profiled buckles and, in particular, the Brandenburg denarii indicate a later founding, but in any case occupation from the 1220s to the middle of the 14th century. The finds from the Räuberberg (Herrmann 1959, 94, 98, Abb. 4; 1961), which were intended to demonstrate the dramatic effects of the mill building of 12th/13th centuries on the settlement pattern in the Havel region, appear in a new light in this respect: the second castle survived this period or was even built afterwards. The abandonment of the complex in the 14th century was probably due to the political and economic crises of that time.

The two periods of use in the Middle Ages, each lasting several decades and accompanied in both phases by considerable fortification efforts, certainly confirm the military and political importance of the site. Since it had no direct settlement hinterland, its geographical location in terms of transport and politics was certainly decisive: the Räuberberg controlled the River Havel, formed a strong demonstration of power on the headland jutting far into the river (Fig. 13.19), and there was probably also a river crossing in the vicinity. In any case, a Phöben ford ('*Vebene Fort*') is mentioned in 1305 (Rohrlach 1977, 321; Kersting 2004, 118; Schwarzländer, Kersting 2012, 223), although it did not necessarily cross the Havel. With the Slavic hillforts of Phöben, Ketzin and Neu Töplitz-Kaltenhausen (Corpus 3, 1979, 77/36, 81/85), there is a remarkable concentration of fortifications along the approximately 5-km-long section of the river east of the sharp river meander near Deetz (*Deetzer Havelknie)*, which underscores the economic and political relevance of this area.

Hypotheses can be made about the builders of the two Phöben fortifications, which were built at different times: The first ringfort, constructed around 900, was built by a chieftain of the Hevellian tribe, who had an unclear relationship of dependence on the tribal princes of Brandenburg. Given the imposing fortifications, it is well conceivable that the Ascanian Margraves of Brandenburg could have been responsible for the renovation. However, there are no written sources.[48]

Among the legends associated with the Räuberberg (cf. Kuhn 1843, 63–65) is the story recounted by E. Friedel, '*that the robbers buried their treasures here. The blue flames (will-o'-the-wisps) in this area speak for this, pointing to hidden riches. "Money is burning there"* [...]. *Anyone who wants the Räuberberg treasures must not speak or laugh. However, all adepts have so far been bewitched by all kinds of ghostly lights and tempted to break this prohibition.*' These ideas were still alive at the time, as the researcher discovered during his small excavations on Easter Day 1872: '*The fact that seven people, on such a significant day as Easter, were busily digging in this lonely but well-known place caused a certain amount of excitement among the sailors passing by. One said that a treasure was buried there, another that he had dreamed of hidden money there, and everyone seemed to think we were treasure hunters*' (Friedel 1873, 254). The silver hoard actually unearthed here 145 years later confirms these widespread ideas about buried treasures in old castles, albeit rather by chance. However, its discovery, as well as the other prospecting results from 2017, underline that the Räuberberg of Phöben, despite its unfortunate destruction in the 19th and 20th centuries, still has great potential for archaeological research into early to late medieval fortifications, the history of rule and economy in the area between Havelland and Zauche, and the interactions between Slavs, East Franks and Germans from the 9th/10th to the 14th centuries.

47 J. Herrmann (1959, 104) probably refers to the fishing population in the references to a Kietz (especially the 'Kietzwiesen' north of the present-day village) some distance from the Räuberberg, which, however, cannot be linked to the castle either locally nor temporally (cf. Krüger 1962, 29–30, 78, Fig. 7).

48 See Rohrlach 1977, 321; the connection between the Räuberberg and the noble family von Rochow, which was important in the region, belongs to the realm of legend (see Kuhn 1843, 63–65).

7. Catalogue of Islamic coins from the hoard of Phöben, Räuberberg

Abbreviations: 1st margin – inner marginal legend; 2nd margin – outer marginal legend (Koran, 30:3–4); AH – Anno Hegirae; circle – between marginal legends; margin – marginal legend; Obv. – Obverse: field (with kalimah I);[49] Rev. – Reverse: field (with kalimah II);[50] ring types: r. – ring type surroundings the field; m. – marginal ring type.[51]

The size specifications for the fragments refer to the largest diameter in each case.

ʿAbbāsids
Hārūn ar-Rašīd (170–193 = 786–809)
1. [Madīnat a]s-Salām, AH 192 (807/808); size: 22 mm; weight: 2.45 g; BLDAM 2019-130/2
(Fig. 13.12: 1)
Obv.: field: لا اله الا \ الله وهده \ لا شريك له;
1st margin: بسم اللـ... هذا الدرهم ... لسلام سنة اثنتين وتسعين ومئة; m. 24
Rev.: field (kalimah IIa 1): محمد \ رسول \ الله \ ه; r. 1
margin: محمد رسول الله ارسله بالهدى ... ظهره على الدين كله ولو كره المشركون; m. 64
Ref.: cf. Leimus 2007, No. 362–367; Nicol 2012. 3, No. 1702–1703
Comment.: marginal legend in obverse partly obliterated. *Edge partly broken, slightly bent.*

2. al-Muḥammadi[yya], AH [181?] (797/798); size: 24 mm; weight: 1.54 g; BLDAM 2019-130/6
(Fig. 13.12: 2)
Obv.: field: ... له الا \ ...ده \ ... ك له ...
1st margin: ...ـه ضرب هذا الدرهم بالمحمد...; m. 63
Rev.: field: ... \ ... امير الـ... \ ... محمد رسول الله \ مما امر به الأمير الأمين \ و; r. 2
margin: محمد رسول الله ارسله بالهدى ود... ـكون; m. 39?
Ref.: cf. Lowick, Savage 1996, p. 207, No. 1754–1755 (AH 181); Leimus 2007, No. 399–401 (AH 181); Nicol 2012. 3, No. 1411, 1413–1414 (AH 181)
Comment.: attribution according to the kalimah in reverse field and type of marginal ring in obverse.

al-Ma'mūn (198–218 = 813–833)
3. [Arrān?], AH 21[4] (829/830) or 21[7] (832/833); size: 13 mm; weight: 0.61 g; BLDAM 2019-130/8
(Fig. 13.12: 3)
Obv.: field: ... \ الله وحـ... \ لا ...
1st margin: ...ـع عشرة ومائتيـ...; 2nd margin: ...ون بنصر ا...; circle
Rev.: field: ؟... \ الـ... \ ... \ رسـ... \ ...؟; margin: ...لـه ولو كره المـ...; r. 2
Ref.: cf. Tiesenhausen 1873, No. 1823 (Madīnat Arrān, AH 214); 1833 (Madīnat Arrān, AH 217); Lowick, Savage 1996, 122–123, No. 860 (Madīnat Arrān, AH 217); Nicol 2012. 3, No. 302 (Madīnat Arrān, AH 217)
Comment.: reconstruction of the year of issue (the ending of an Arabic numeral 'four' or 'seven'), the arrangement of the legends and rings and traces of the additional line of inscription below the kalimah in the reverse field may suggest that the coin was struck in Arrān in AH 214 or 217. On the reverse are two additional lines above and below the kalimah: امير المؤمنين \ ... \ العباس بن.

ʿAbbāsids?
Indeterminable ruler
4. Mint and date missing (before AH 218/833); size: 12.5 mm; weight: 0.43 g; BLDAM 2019-130/15
(Fig. 13.12: 4)
Obv.: traces of marginal legend; unclear, illegible
Rev.: field; kalimah illegible; margin: ... دى؟ ...; r. 1
Comment: *cut off, bent*.

49 The kalimah in the obverse field after CNS 1.1, XIX; *lā*-types in the first line of the kalimah on the obverse after CNN 1.1, XIX.

50 The kalimah in the reverse field after CNS 1.1, XIX.

51 The ring types (r.) after CNS 3.4, Appendix VI, 209; the marginal ring types (m.) after CNS 3.4, Appendix VII, 210–211.

Sāmānids
Ismāʿīl ibn Aḥmad (279–295 = 892–907)
5. Ismāʿīl [ibn Aḥmad], Samarqand, AH [279–289] (892–902); size: 16 mm; weight: 0.64 g;
BLDAM 2019-130/18 (Fig. 13.12: 5)
Obv.: field: illegible; 1st margin: ...سمرقند سـ...; 2nd margin: ...يومئذ يفر...; m. 64
Rev.: field: ... اسمعيل \ المعتضـ... \ رسـ... \ ... \ ...; r. 2 (double circle around field?)
margin: ...هره على الدين كلـ...
Ref.: cf. Leimus 2007, No. 1064–1065, AH 288, 1067–1069 (AH 289); SNAT XV a, No. 711 (AH 288), 712 (AH 289), 713 (AH 290; old Rev. die); Kolosov, Kalinin 2022, Sa. 289
Comment.: the dating is defined because of Caliph's name al-Muʿtaḍid billāh. *Coins edge partly broken, three unevenly broken secondary edges, bent.*

6. [Ismāʿīl ibn Aḥmad], aš-Šāš, AH [279–289] (892–902); size: 16 mm; weight: 0.73 g; BLDAM 2019-130/20 (Fig. 13.12: 6)
Obv.: field: ... لا شريك \ ...ـه وحـ... \ ...
1st margin: ... هم بالشاش سنة ...; 2nd margin: ...ويومئذ يـ... ...; m. 64
Rev.: field: ... \ المعتضـ... \ رسو... \ محمد \ لـ...; r. 1
margin: مـ... لو كره المشركون
Ref.: cf. Leimus 2007, No. 1176–1177, 1179–1180, 1182–1185, 1187, 1189–1207, 1209–1213 (AH 286); 1217–1219, 1221, 1223, 1225–1226, 1230–1236, 1238–1239 (AH 287); 1241–1242, 1244–1248, 1249–1253, 1255–1260 (AH 288); SNAT XV b, No. 227–230, 232; Kolosov, Kalinin 2022, Sh. 286, Sh. 286.1, Sh. 287, Sh. 288
Comment.: the dating is defined because of Caliph's name al-Muʿtaḍid billāh.

7. [Ismāʿ]īl ibn Aḥmad, Mint missing, AH [29]3? (905/906); size: 12 mm; weight: 0.61 g; BLDAM 2019-130/12 (Fig. 13.12: 7)
Obv.: field: ...لا شريـ... \ الله ... \ ...
1st margin: ... [وتسـ...؟] سنة ثلث ...; 2nd margin: ...ح المؤ ...
Rev.: field: ...يل بن احمد... \ ... \ ... \ ... \ ...; r. 1
margin: ... ـدى ودين الحق ...
Comment.: marginal legends partly obliterated, illegible. *Two scratches in reverse field, indicating an attempt to divide the coin*.

8. Ismāʿī[l ibn Aḥmad], Mint missing, AH 2[89–95] (902–907); size: 12 mm; weight: 0.55 g;
BLDAM 2019-130/25.2 (Fig. 13.12: 8)
Obv.: field: ... \ ... \ ...الـه ا [لا]
1st margin: ...ـائتين ... بسم الله; 2nd margin: ...لله الا ـصر الله
Rev.: field: ...اسمعيـ... \ المكـ... \ رسـ... \ ... \ ...; r. 2; margin: ... على الدين كله ...
Comment.: the dating is defined because of Caliph's name al-Muktafī billāh.

9. Is[māʿīl ibn Aḥmad], Mint missing, AH [289–295] (902–907); size: 9 mm; weight: 0.38 g;
BLDAM 2019-130/29.3 (Fig. 13.12: 9)
Obv.: field: ... \ ... \ الا ...; 1st margin: ؟...الله ضـ...; 2nd margin: obliterated
Rev.: field: ؟...اسـ... \ ... \ ... \ ... \ ...; r. 2; margin: ...على الد ...
Ref.: cf. SNAT XIVb, No. 77–79; Leimus 2007, No. 983, 984 (reverse), 986 (reverse), 990
Comment.: the attribution is defined because beginning of the emir's name; the name of the caliph above is probably al-Muktafī billāh, because of the long letter yā' in the Caliph's name.

Aḥmad ibn Ismāʿīl (295–301 = 907–914)
10. Aḥmad [ibn Ismāʿīl], [Samarqand?], AH 2[95–99] (907–911/912); size: 12 mm; weight: 0.35 g;
BLDAM 2019-130/11 (Fig. 13.12: 10)
Obv.: 1st margin: ...ماتين بسم الـ... ; 2nd margin: ...ـه الامـ...لله; r. 1
Rev.: field: ... احمد ... \ ... \ ... \ ...; r. 2; margin: ...على الدين كـ ...
Ref.: cf. Leimus 2007, No. 1427, 1439–1441, 1443–1445, 1450, 1453–1457; SNAT XV a: 723, 726, 727; Kolosov, Kalinin 2022, Sa. 295.3, Sa. 296, Sa. 297, Sa. 298.2

Comment.: attribution defined according to the character of lettering, mainly ornamental ‘nūn’ in ‘mi’atayn’ in inner marginal legend of the obverse and ring’s type in the reverse (double circle around field); marginal legends partially obliterated.

11. Aḥmad [ibn Ismāʿīl], [aš-Šāš?], AH [2]96 (908/909); size: 11 mm; weight: 0.43 g; BLDAM 2019-130/26 (Fig. 13.12: 11)
Obv.: 1st margin: ...ـة ست وتسـ...; 2nd margin: ... ح المؤمنون ...; m. 64
Rev.: field: ... [ـد]احمـ \ ... \ ... \ ... \ ...; r. 1
margin: ... الدين كله ولو...
Ref.: cf. SNAT XV b, No. 260; Leimus 2007, No. 1523–1524, 1526–1527, 1529; Kolosov, Kalinin 2022, Sh. 296, Sh. 296.1
Comment.: the mint’s name is defined according to the character of lettering. *Broken piece*.

12. [Aḥmad ibn I]smāʿīl, aš-Šāš, AH [29]8 (910/911); size: 26 mm; weight: 1.33 g; BLDAM 2019-130/31 (Fig. 13.12: 12)
Obv.: field: ... \ الله وحده \ لا شريك له; r. 1
1st margin: ... هذا الدرهم بالشاش سنة ثمان و...; 2nd margin: ... قبل ومن بعد ويومئذ يفرح المؤمنو...
Rev.: field: ...معيل ... \ ...در بالله \ ... ـول الله \ ...ـد \ لله; r. 3
margin: ...كون ... محمد رسول الله ارسله بالهدى; m. 64
Ref.: cf. Leimus 2007, No. 1544, 1577; Kolosov, Kalinin 2022, Sh. 298.3
Comment.: reconstruction of the emir’s name and year of issue; outer marginal legend of the obverse and marginal legend of the reverse partly obliterated, illegible. *One edge irregularly broken off, slightly bent; deep crack on edge.*

13. [Aḥmad ibn Ismāʿīl], [aš-Šāš?], AH 2[98] (910/911); size: 17 mm; weight: 0.5 g; BLDAM 2019-130/30 (Fig. 13.12: 13)
Obv.: 1st margin: ...ـائتين ... بسم الله; 2nd margin: ... لله الامر الله; r.1; m. 64
Rev.: field: ... \ ... \ ... \ ...ـد \ ...ـه...; margin: ... محمد رسول ن
Ref.: cf. Leimus 2007, No. 1582; Kolosov, Kalinin 2022, Sh. 298.5
Comment.: attribution defined according to the character of lettering, mainly ornamental ‘nūn’ in ‘mi’atayn in inner marginal legend of the obverse and ring’s type in the reverse (double circle with annulets around field). *Legends partially obliterated. Several notches on the edge*.

14. [Aḥmad ibn Ismāʿīl], [aš]-Šāš, AH 300 (912/913); size: 21 mm; weight: 0.83 g; BLDAM 2019-130/5 (Fig. 13.12: 14)
Obv.: field: ...لا شـ \ الله و... \ لا الـ...; r. 1
1st margin: ...ثلثما ـشاش سنة ...; 2nd margin: ... ح المؤمنون بنصر...; m. 64
Rev.: field: ... \ ...ـالله \ ...در [بـ]ـول الله \ ...ـد \ لله; r. 1
margin: ...ـد ر[ســ]ـول [أ]لله ارسله بالهـ...; m. 64
Ref.: cf. Leimus 2007, No. 1627–1630
Comment.: ligatured *lā* type E; omitted and incorrectly written letters in the kalimah and marginal legend of the reverse. *Two cracks visible on the reverse side*.

15. [Aḥmad ibn I]smāʿīl, aš-Šā[š], AH [295–301] (907–914); size: 11.5 mm; weight: 0.29 g; BLDAM 2019-130/10.1 (Fig. 13.12: 15)
Obv.: 1st margin: ...هم بالشا...; 2nd margin: ... ويومئذ ...; m. 64
Rev.: field: ...معيل ... \ ... \ ... \ ...; r. 2
margin: ...دى ودين الحـ...; m. 64
Comment.: the dating is defined because of emir’s reign.

16. [Aḥmad ibn I]smāʿīl, [Nīsābūr?], AH 29[5–9] (907/908–911/912); size: 18 mm; weight: 0.54 g; BLDAM 2019-130/4 (Fig. 13.12: 16)
Obv.: field: ... \ ... \ ...لا الـ
1st margin: ...بسـ... سعين ومائتين; circle; 2nd margin: ... ون بنصر الله ...لله; m. 64
Rev.: field: ...احمد بن ا... \ ... \ ... \ ...; r. 2
margin: ... الحق ليظهره على الدين ...; m. 64
Ref.: cf. Leimus 2007, No. 1421 (Naysābūr, AH 298), 1422 (Naysābūr, AH 299); SNAT XIV a, No. 425–426 (Naysābūr, AH 298–299); Kolosov, Kalinin 2022, Ni. 295.1–Ni. 299
Comment.: the mint is defined because of the ring between inner and outer marginal legend of the obverse. *Coin's edge partially cut off, three notches on the edge*.

17. Aḥmad [ibn Ismāʿīl], Mint missing, AH [2]99 (911/912); size: 16 mm; weight: 0.69 g; BLDAM 2019-130/21 (Fig. 13.12: 17)
Obv.: field: ... لا \ ... الله \ ...لا; r. 1
1st margin: ...تسع وتسعـ ...; 2nd margin: illegible, obliterated; m. 64
Rev.: field: ... احمد ...المقتـ \ ...رسـ \ ... \ ...; r. 1
margin: illegible, obliterated
Comment.: the legends reconstruction of the caliph's name: al-Muqtadir billāh and emir's name. *Bent*.

[Ismāʿīl ibn Aḥmad] / [Aḥmad ibn Ismāʿīl]
18. Mint missing, AH xx8 ([28]8 / 900/901 or [29]8 / 910/911); size: 14 mm; weight: 0.37 g; BLDAM 2019-130/1.1 (Fig. 13.12: 18)
Obv.: 1st margin: ...سنة ثمان ...; 2nd margin: ...ـذ يفرح المؤ...; r. 1
Rev.: margin: ...لهدى ودين الحق...; r. 1; m. 64
Comment.: attribution defined according to the character of lettering.

19. Mint missing, AH 2xx (2[79–99] / 892–911/912); size: 15 mm; weight: 0.36 g; BLDAM 2019-130/14 (Fig. 13.12: 19)
Obv.: 1st margin: ...بسـ...ـائتين; 2nd margin: ...لله ...ـر الله; m. 64
Rev.: margin: ...د رسول الله ا...; r. 1; m. 64
Comment.: attribution defined according to the character of lettering. *A scratch along one of the edges in reverse field, indicating an attempt to divide the coin.*

20. Mint missing, AH 2xx (2[79–99] / 892–911/912); size: 12 mm; weight: 0.26 g; BLDAM 2019-130/22 (Fig. 13.12: 20)
Obv.: 1st margin: ...مائتيـ...; 2nd margin: ...ون بنصر اللـ...; m. 64
Rev.: margin: ...محـ...ـمشركون; r. 2?; m. 64
Comment.: attribution defined according to the character of lettering.

21. Mint missing, AH 2xx (2[79–99] / 892–911/912); size: 12 mm; weight: 0.28 g; BLDAM 2019-130/17 (Fig. 13.12: 21)
Obv.: 1st margin: ...بسم ...ماتين; 2nd margin: ...لله ...الله
Rev.: margin: ...ـه على الدين كـ...; r. 1; m. 64
Comment.: attribution defined according to the character of lettering. *Broken*.

22. Mint and date missing; size: 16 mm; weight: 0.57 g; BLDAM 2019-130/7 (Fig. 13.12: 22)
Obv.: field: ... \ ...ده \ ...لا ...
1st margin: ...ا[ذ]ـضرب هـ...; 2nd margin: ...ـر من قبل ومن بـ...; m. 64
Rev.: field: ... \ ...الـ... \ ...رسـ... \ ...محمـ...; r. 1; margin: ...المشركـ...[ه!] كر ـو ...
Ref.: cf. aš-Šāš: Leimus 2007, No. 1316, 1324, 1327 (AH 292), 1338, 1340 (AH 293), 1352, 1359 (AH 294), 1512, 1514–1515 (AH 295), 1527, 1531 (AH 296), 1554, 1563 (AH 298); SNAT XV b, No. 243–244 (AH 292), 248 (AH 293), 259 (AH 295); Kolosov, Kalinin 2022, Sh. 295.1
Comment.: hā' in كره in marginal legend of the reverse omitted, looks like a dot. *Deep crack on edge, three scratches visible on the reverse side.*

23. Mint and date missing; size: 18 mm; BLDAM 2019-130/71 (Fig. 13.12: 23)
Obv.: field: له ... \ ... \ ...
1st margin: ...هذا الدر...; 2nd margin: ...بل ومن بعد و... ...
Rev.: margin: ...محـ... لو كر[ه!] المشركون; r. 1
Ref.: as No. 22.
Comment.: hā' in كره in marginal legend of the reverse omitted, looks like a dot. *Cut in coin's edge.*

Indeterminable Sāmānid ruler
24. Mint and date missing; size: 6 mm; weight: 0.08 g; BLDAM 2019-130/5.1 (Fig. 13.12: 24)
Obv.: 1st margin: ...در... ...; 2nd margin: ... بعد ...
Rev.: margin: ... الله ار... ...
Comment.: attribution defined according to the character of lettering.

25. Mint and date missing; size: 11 mm; BLDAM 2019-130/72 (Fig. 13.12: 25)
Obv.: field: illegible; 1st margin: illegible; 2nd margin: ...يفرح الـ... ...
Rev.: field: illegible; margin: ... ارسله ...; r. 1
Comment.: attribution defined according to the character of lettering. *Broken in two pieces*.

26. Mint and date missing; size: 5.5 mm; weight: 0.14 g; BLDAM 2019-130/25.1 (Fig. 13.12: 26)
Obv.: field: ...لا شـ... \ الله و... \ ...
Rev.: field: ... \ ... \ ...ـول ... \ ...ـمد \ لله
Comment.: attribution defined according to the character of lettering.

ʿAbbāsids / Sāmānids
Indeterminable ruler
27. Mint and date missing (after AH 218/833); size: 13 mm; weight 0.32 g; BLDAM 2019-130/9 (Fig. 13.12: 27)
Obv.: illegible; traces of legends and rings
Rev.: field (kalimah IIb 1?): ... \ ...لـه... \ ...ـول... \ ... \ ...; r. 1; margin: ... له بالهدى ...
Comment.: attribution defined according to the kalimah in the reverse field. *Worn-out, poorly legible*.

Unattributed Islamic dynasty
28. Mint and date missing (after AH 218/833); size: 14 mm; weight: 0.23 g; BLDAM 2019-130/29.2 (Fig. 13.12: 28)
Obv.: field: ... ك ... \ ...د... \ ...; 1st margin: ...ذا الد...; 2nd margin: illegible
Rev.: traces of legends and ring; illegible
Comment.: worn-out, illegible.

29. Mint and date missing (after AH 218/833); size: 10 mm; weight: 0.25 g; BLDAM 2019-130/27 (Fig. 13.12: 29)
Obv.: field: ك له ... \ ... \ ...; 1st margin: ...لدرهـ... ...; 2nd margin: illegible
Rev.: illegible, obliterated; r. 1.

30. Mint and date missing (after AH 218/833); size: 10 mm; weight: 0.15 g; BLDAM 2019-130/28 (Fig. 13.12: 30)
Obv.: 2nd margin: ...ـمر من قـ... ...; m. 64
Rev.: margin: ...ولو كره الـ...؟ ...; m. 64.

31. Mint and date missing; size: 7 mm; weight: 0.02 g; BLDAM 2019-130/10.2 (Fig. 13.12: 31)
Obv.: field: ...له؟...; 1st margin: obliterated; 2nd margin: cut off
Rev.: margin: ... ظهر؟ ...; r. 1
Comment.: unclear inscriptions, illegible. *Broken? in two pieces, coin's edge cut off.*

Volga-Bulgarians Imitations
Sāmanid imitation with the name of Ismāʿīl ibn Aḥmad
32. [‘Ismāʿīl ibn Aḥmad’], Balḫ (?), date missing; size: 22 mm; weight 0.83 g; BLDAM 2019-130/3 (Fig. 13.12: 32)
Obv.: field: ... شريك ... \ ... \ ...
1st margin: ... بلخ؟ سنة ...; 2nd margin: ... ـون بنصر الله ...
Rev.: field: ... \ ...المكـ... \ رسو... \ محمـ...; margin: ...ن ... كله ولو كره ...مـحمـ...; r. 2; m. 64
Ref.: cf. Rispling 2005b, 192–193, No. 1437–1440; Zeno, No. 279029, 108467, 77568, 291143
Comment.: Obv.: ‘šarīkah’ in the kalimah floral; mint name unclear; outer marginal legend shifted 90 degrees; Rev.: letters in the kalimah split tops; there is only the letter ‘nūn’ from the word ‘al-mušrikūna’.

Sāmanid imitation with the name of Aḥmad ibn Ismāʿīl
33. ‘Aḥmad ibn Ismāʿīl’, mint and date missing; size: 28 mm; weight: 1,66 g; BLDAM 2019-130/1 (Fig. 13.12: 33)
Obv.: field: ... لا اله الا \ الله وحده \ اسريك
1st margin: بسم الله ضر... ـسم الله ضرب هذ نر الله ضرر
2nd margin: ... الامر ... الامر من قـ... الامر من قـ...
Rev.: field: لله \ محمد \ رسول الله \ المكتفـالله \ احمد بن اسمعيل; r. 1 (with a dot on the left)
margin: محمد رسول الله ارسله بالهـ... لـه ولو كره المسركون
Ref.: cf. Zeno, No. 185040 (Private collection); Golemikhov 2023a, 5–8, Ris. 5e–f, h; see Rispling 2005b, 173, Tab. 1
Comment.: on the obverse ‘double’ strike of kalimah in the field and the same fragment of marginal legends struck several times. *Cut on the coin’s edge*.

34. [‘Aḥmad ibn Ismāʿīl’], Nīsābūr, date missing; size: 10 mm; weight: 0.26 g; BLDAM 2019-130/16 (Fig. 13.12: 34)
Obv.: 1st margin: ...بنيسابور ...; 2nd margin: ...ن بنصـ...; circle between marginal legends
Rev.: field: ... \ ... \ ... \ ...ـد \ ...لـه...; r. 1; margin: ... كمد؟ ...;
Ref.: cf. Rispling 2005b, 194–195, No. 1444
Comment.: marginal legend in the reverse illegible. *Coin’s edge partly broken*.

Imitation?
Unidentified type
35. Fragment of dirham imitation?; size: 8 mm; weight: 0.14 g; BLDAM 2019-130/29.6 (Fig. 13.12: 35)
Obv.: margin: ...كولامـاللـ؟...
Rev.: unclear inscriptions; m. 65
Comment.: this is probably a very small fragment of a dirham imitation with an outer marginal legend, as may be indicated by the preserved *lā*. Unfortunately, the fragment is too small to confirm this, but cf. CNS 1.2.38.2662, Pl. 38: 2662.

36. Fragment of dirham imitation?; size: 16.5 mm; weight: 0.56 g; BLDAM 2019-130/29.5 (Fig. 13.12: 36)
Obv. and rev.: unclear inscriptions, two reverses?; r. 2 and m. 65 on the one side, r. 1 on the other side
Comment.: *broken, two pieces?*

Indeterminable
37. Dirham fragment; size: 14 mm; BLDAM 2019-130/29.4 (Fig. 13.12: 37)
Obv. and Rev.: illegible, obliterated, traces of legends and rings. Irregular shape. *Two scratches forming a triangle visible both on the obverse and reverse sides indicating an attempt to divide the coin.*

38. Dirham fragment; size: 6.5 mm; weight: 0.17 g; BLDAM 2019-130/19 (Fig. 13.12: 38)
Obv. and Rev.: totally worn, obliterated; on both sides traces of marginal legends and rings are visible. *Broken*.

39. Dirham fragment; size: 21 mm; BLDAM 2019-130/73 (Fig. 13.12: 39)
Obv. and Rev.: totally worn, obliterated; on one of the sides traces of legends and rings are visible.

40. Dirham fragment; size: 7.5 mm; weight: 0.26 g; BLDAM 2019-130/23 (Fig. 13.12: 40)
Obv.: totally worn, obliterated
Rev.: totally worn, obliterated; r. 1.

41. Dirham fragment; size: 10 mm; weight: 0.3 g; BLDAM 2019-130/24 (Fig. 13.12: 41)
Obv. and Rev.: totally worn, obliterated.

42. Dirham fragment; size: 10 mm; BLDAM 2019-130/29.1 (Fig. 13.12: 42)
Obv. and Rev.: totally worn, obliterated. *Broken, two pieces.*

43. Dirham fragment; size: 11.5 mm; weight: 0.44 g; BLDAM 2019-130/13 (Fig. 13.12: 43)
Obv. and Rev.: totally worn, obliterated. *Bent*.

Chapter 14

Bird-shaped hooks from western Slovakia: The material culture of Great Moravian elites

Zbigniew Robak, Karol Pieta

1. Introduction

Bird-shaped hooks, characteristic of early medieval belts primarily discovered in elite burials from central Great Moravian fortified settlements, have intrigued researchers for decades. The unique construction mechanism of the belt set – a buckle without a pin, typically featuring a distinctive and richly decorated fitting at the end of the leather strap, combined with bird-shaped hooks used to secure the belt – makes these sets a remarkable example of technical innovation paired with refined design. The majority of the twenty known specimens have been found in Mikulčice, Moravia (Poláček 2018, 102–103), although isolated examples have also appeared at other Great Moravian sites. Despite numerous studies on their typology and ornamentation (Poulík 1975, 67–68; Wachowski 1992, 51–52, 55–56, ryc. 30; Ungerman 2002; 2020a; Profantová 2003, 66–68), the question of where these extraordinary fittings were actually produced and their origins remains unresolved.

The aim of this article is not only to present a brief overview of these bird-shaped hooks but, more importantly, to analyse the arguments for and against their exclusively Moravian or non-Moravian origins. Scholars lean towards the hypothesis that they were mainly produced by one or several craftsmen operating in Mikulčice (Ungerman 2020a, 319). However, new perspectives have emerged from reconnaissance research conducted at the Dolné Vestenice stronghold in Slovakia (Pieta 2017, 41; 2019; Pieta, Robak, Jakubčinová 2019; Ruttkay, Pieta, Robak 2019), where a lead fitting interpreted as a model or trial cast of a bird-shaped hook was discovered, significantly expanding our knowledge of potential production sites for these unique artefacts.

This chapter presents conclusions drawn from existing literature and introduces new perspectives, considering discoveries from Slovakia. The focus is primarily on finds from the Middle Nitra region, which in the 9th and early 10th centuries served as a secondary political centre of Great Moravia. The article examines the archaeological and chronological context of these discoveries, with particular emphasis on the find from Dolné Vestenice, and discusses the arguments supporting the local production of such hooks in the Nitra region. The conclusion summarises the key findings and suggests future research directions that could shed light on the mystery of the production of these intriguing artefacts.

2. General characteristics of belts with bird-shaped hooks

Belts fastened with bird-shaped hooks represent a unique Great Moravian phenomenon, with no direct parallels recorded thus far in other regions influenced by Carolingian culture. The vast majority of bronze (sometimes gilded) belt sets of this type have been discovered in Mikulčice, all in graves. While some finds are incomplete, others allow for the reconstruction of their original form. A complete set consisted of a buckle without a pin, one or more bird-shaped hooks, and a strap-end fitting. There were several variants of hook placement – they could be arranged in a single or double row, and there were also double hooks. However, their function remained consistent: they prevented the belt from shifting, much like a pin would in a standard buckle (cf. Hrubý 1955, obr. 36, tab. 59: 1a). This fastening system distinguishes it fundamentally from traditional belt clasps.

A detailed analysis of the finds from Mikulčice was recently conducted by Š. Ungerman (2020a), who concluded that the concentration of belt sets with bird-shaped hooks at this site might be viewed, with the current state of knowledge, as a local peculiarity that did not gain widespread acceptance in other parts of Great Moravia. This phenomenon is directly linked to the continuous presence of a large elite group in Mikulčice. The similarity of some hooks from Mikulčice suggests that they were locally produced in workshops within the settlement. This is further supported by other components of the belt sets – most of the strap fittings adorning belts with bird-shaped hooks were unique works of contemporary artistic craftsmanship. Among them were those belonging to the well-known 'strap-ends with orants' group, one of the most recognisable elements of Great Moravian elite culture. A particularly exceptional example is the strap-end fitting discovered in grave 13 in Břeclav-Pohansko, where the reverse side of the decoration features an unusual depiction of a 'demon', which is, in reality, a mirror image of a quadruped (Vavák 2015). The fittings from grave 310/48 in Dolní Věstonice (Czech Republic) were accompanied by a lead strap mount depicting an unidentified quadruped (Ungerman 2023a, 316; 2023b, 62–63, tab. 66: 2). Notably, this is the only set with bird-shaped hooks that has a relatively modest character and lacks elite attributes. Another exception is the belt found in grave 156/49 in Staré Město near Uherské Hradiště (Hrubý 1955, 190–191, 440, obr. 36, tab. 59: 1–2), where both the hooks and the terminal fitting were made in a simplified manner, merely imitating the concept of this fastening type. Hooks for fastening belts were also discovered in grave 22 in Modrá near Staré Město. However, their shape more closely resembles a heart (Hrubý, Hochmanová, Pavelčík 1955, 74–75, 90–93), although their function was undoubtedly similar. These artefacts are in very poor condition, raising the possibility that they were originally bird-shaped hooks but are now severely corroded. Grave 22 from Modrá seems to be the oldest assemblage in which such fastenings appear – it is considered one of the earliest elite inhumation burials in Great Moravian culture, and, according to the elements of its furnishings (Carolingian-type strap-end, Late Avar fitting), the grave can be dated to the turn of the second quarter of the 9th century (Galuška 2013, 61–63; Robak 2013, 159, 193). This would suggest that the idea of belts with hooks may have accompanied Moravian elites from the very beginning of their formation (or reformation) in the context of the new sociopolitical situation that emerged after the fall of the Avar Khaganate and the adoption of Christianity from Western Europe. However, whether they initially took the form of birds or whether this stylistic feature developed later remains an open question.

Although Great Moravian belts and their decoration generally conformed to contemporary Carolingian fashion and stylistically (as well as archaeologically and typologically) fit well into prevailing trends (Robak 2013, 189–190, 201; 2018), belts were more than just functional items. They played a crucial role in image creation, particularly among elites and those aspiring to elite status. The best evidence of this is the presence of an ornately decorated belt of this type in the elite burial of a 3 years old child in grave 100/II in Mikulčice (Poulík 1975, 67–68; Poláček et al. 2021, 102–103). The belt's appearance, form, and decoration signified not only the social status of the wearer but could also serve as a means of expressing political or religious beliefs, group affiliation, and more (Ungerman 2001, 245–253; 2017a, 274–277). It seems that this was precisely the function that a belt adorned with bird-shaped fittings fulfilled in Great Moravian elite culture.

In summary, a significant number of these hooks have been found in elite burials in Mikulčice and at nearby sites of a similar nature, suggesting that this style of belt set was particularly popular in the central region of Great Moravia. Although finds from outside this area are rarer, they do exist. The second key area of occurrence for bird-shaped hooks is the Nitra region, which served as a secondary

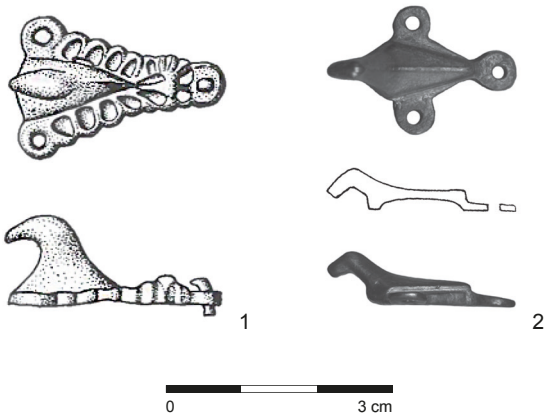


Fig. 14.1. Bird-shaped hooks. 1 – Bojná I – Valy, Topoľčany District (Slovakia), gilded copper alloy (Archive of the Institute of Archaeology of the Slovak Academy of Sciences, Nitra – Archive of IA SAS Nitra); 2 – Nitra-Šindolka, Nitra District (Slovakia), silver (after Fusek 2007a).

centre of Great Moravia's political structure. Perhaps central Bohemia – a region that, particularly towards the end of the 9th century, came under strong Moravian political influence – may in the future need to be recognised as a third area of occurrence. Three bird-shaped hooks from Libice nad Cidlinou discovered during surface prospection are on display at the National Museum in Prague (information kindly provided by J. Mařík). However, until these fittings are formally published, it remains difficult to undertake a critical analysis.

3. Bird-shaped hooks from Bojná and Nitra-Šindolka

The group of finds from Slovakia consists of three artefacts – a gilded bronze fitting discovered at the Bojná I – Valy hillfort (Fig. 14.1: 1; Pieta et al. 2011, 206, obr. 96: 2), a silver fitting from grave E299 in Nitra-Šindolka (Fig. 14.1: 2; Fusek 2007a; 2007b), and a lead model found at the Dolné Vestenice II hillfort (Fig. 14.2: 1; 14.4); a detailed analysis of the last one is presented in the following subchapter. In contrast to the finds from Moravia, all of these objects

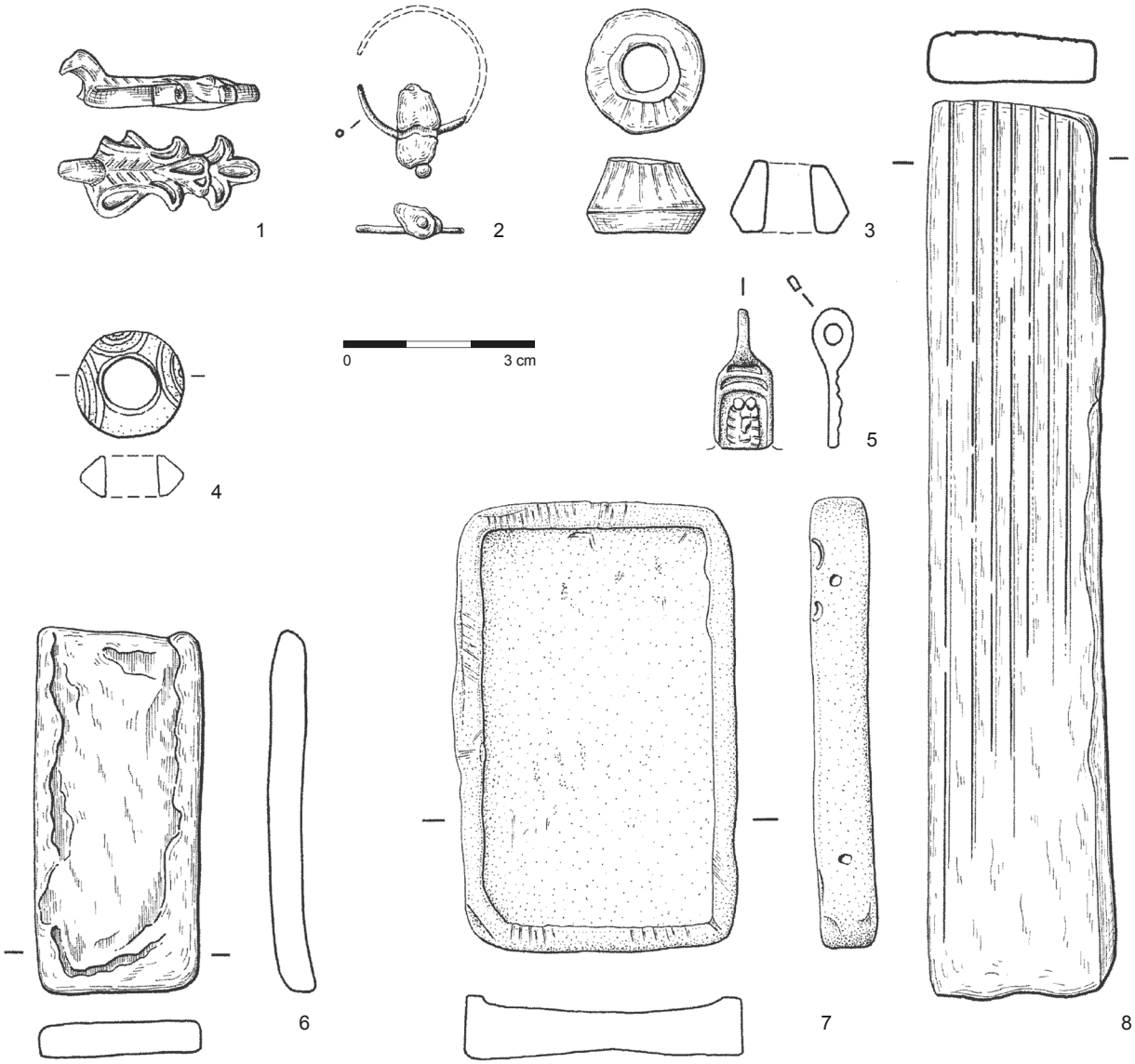


Fig. 14.2. Dolné Vestenice II – Hradov, Prievidza District (Slovakia), lead finds. 1 – bird-shaped hook (probably model); 2 – earring (fragment); 3, 4 – weight or spindle whorl; 5 – cross pendant (fragment); 6–8 – lead bars (ingots). No. 2, 5–8 were included in one of the concentrations. Archive of IA SAS Nitra.

were discovered outside their original context, meaning they were not part of complete belt fitting sets. At the beginning, this caused difficulties in interpreting the first two finds, which were initially published as book clasps.

The fitting from Bojná was discovered during regular excavations in a shallow cultural layer of the hillfort (at a depth of 5–16 cm), near the northeastern corner of the rampart, alongside other metal objects that do not seem to have a direct functional connection to it (a simple iron buckle with a pin was found in the same trench). The fitting is made of gilded bronze. It has the shape of an elongated triangle, and without knowledge of other similar artefacts, it is difficult to recognise a bird form in it, if at all (it would have to be seen as an extremely abstract representation). It was attached using three rivets positioned in the angles of the triangle or, alternatively, with a wire passing through eyelets for the rivets. This method of attachment is fundamentally different from that of most bird-shaped hooks from Mikulčice but is nonetheless a technique used in similar fastenings. An almost identically designed fitting was found in Libice nad Cidlinou.

The archaeological material from the Bojná-Valy hillfort includes a vast number of finds associated with Great Moravian military culture (Pieta, Robak 2017; 2023; Robak 2021b). Among them, elements of belt fitting sets constitute a significant share, numbering in the hundreds (Robak 2013; 2014; 2021a; Jakubčinová 2018). However, the bird-shaped fitting is unique within this collection. To date, no comparable fastenings have been discovered at Bojná, nor have any elements of belt sets that could be associated with it to form a complete ensemble (e.g. pinless buckles or large decorated strap-end fittings). At this stage, it remains unclear whether such fittings were produced at or near the hillfort or whether the specimen in question represents an import. It is also uncertain how it ended up in the cultural layer. Recent interpretations of data from the Bojná excavations suggest that at least some of the objects found at the site and in its surroundings may be associated with a form of symbolic activity (Pieta, Robak 2023, 98), thereby opening up new avenues for research. Notably, a short distance away, albeit in a different excavation trench, a uniquely decorated sword scabbard chape featuring bird motifs was discovered – an unparalleled find in Europe (Robak 2021a, 40–41). This strongly indicates the significance of the bird motif in the elite culture of Great Moravia.

The fitting from Nitra-Šindolka was part of a grave assemblage. It had been re-used as an ornament worn around the neck of a buried child, along with a bronze button and an amber bead. The entire ensemble appears rather incidental, though it is possible that it held a deeper meaning for the owner or the person who placed it in the grave. The fitting takes the form of a highly stylised and geometric bird. It is made of silver and was originally attached using three rivets passing through eyelets that simultaneously formed the wings and tail of the bird. Similar in terms of technical design, though more geometric in shape, is the third fitting from Libice nad Cidlinou.

The secondary use of the fitting in a way that was inconsistent with its original purpose complicates its analysis. Grave E299 is attributed to the so-called Bijelo Brdo culture and is dated to around 995–1030 (Fusek 2007a). Such fastenings are entirely foreign to the material culture characteristic of this cultural unit. Despite ongoing debates about whether the Bijelo Brdo assemblage should be classified as a distinct 'culture' (Bilogrivić 2019; Ungerman 2021, 77), the Nitra-Šindolka cemetery consists of assemblages typical of the emerging multi-ethnic Hungarian Kingdom (Fusek 2012). By this time, the material culture characteristic of Great Moravia (or, more broadly, the Carolingian cultural sphere) had already faded. However, artefacts from this cultural background can still appear in early Hungarian contexts (and so-called Bijelo Brdo contexts) as antiques used as ornaments (Bollók 2014). This case seems to fit such a pattern.

Similarly, in grave F246 from Nitra-Šindolka – dated to the second half of the 10th century – a gilded Carolingian-style buckle was found in the chest area of the deceased (Fusek 2016). The item itself should be dated to the 9th century (Robak 2013, 88–89). The origins of such artefacts remain difficult to trace. It is generally assumed that these objects were plundered by the Hungarians during their raids across Europe in the first half of the 10th century and that they subsequently circulated within the Hungarians' native cultural environment (Bollók 2014; Ungerman 2020a, 327), experiencing a second life. However, in the case of the fitting from grave E299, even this hypothesis is no more plausible than the possibility that it was simply a local find from Moravia, Slovakia, or western Pannonia. Given that such fastenings do not appear in Western Europe, we must assume that it originated in an area influenced by Great Moravian culture.

4. The case of Dolné Vestenice

The Strážovské vrchy Mountains on the border of western and central Slovakia effectively enclose the Middle Nitra Valley from the north. The hillfort complex at Dolné Vestenice is located in their southeastern part, approximately 30 km northeast of Bojná. The Dolné Vestenice II – Hradov hillfort and neighbouring Dolné Vestenice I – Paluchy date back to prehistoric times, most likely the Middle La Tène period. Situated atop hills at elevations of 675 m and 817 m A.S.L., respectively, they provided a secure location and refuge in later periods as well. The short-term occupation of these sites is evidenced by surface finds from the Migration period and the early medieval period (7th century), and possibly from the late 8th or early 9th centuries (Fig. 14.3: 1, 2; Pieta 2017, 18). Hradov is a relatively small hillfort (ca 1.8 ha) with a highly exposed position at the end of the same ridge as Dolné Vestenice I, suggesting that the two sites may have been functionally connected.

Surface survey and test-pitting conducted in 2013–2017 at and around the Dolné Vestenice II – Hradov hillfort confirmed its intensive use during the Great Moravian period (Pieta 2019). Narrowing its chronology without additional studies and environmental data is challenging, but certain finds suggest activity in the late phase of the Great Moravian period (Fig. 14.3: 6–10). These include small strap fittings in the shape of 'fish tails' or palmettes, as well as later objects that are highly atypical for Great Moravian contexts and should be dated to the 10th century. Particularly notable is a spur with a York- type prick (Pieta 2017, 41) – an unusual find for the Middle Danube Region – which was discovered alongside a Carolingian-style fitting (Fig. 14.3: 3, 4). The majority of military finds from Hradov are typologically and stylistically similar to those from the Bojná-Valy hillfort, which are dated to the late 9th and early 10th centuries. This suggests that Dolné Vestenice II – Hradov was resettled (or reoccupied) around the same time and may have remained in use until the mid-10th century. The use of such a high, difficult-to-access, but already fortified location, which also served as an excellent observation point, primarily indicates the need for security and defence.

4.1 Workshop zone and metallurgical activity

In the northeastern part of the hillfort, an area was identified as a zone for metallurgical activity,

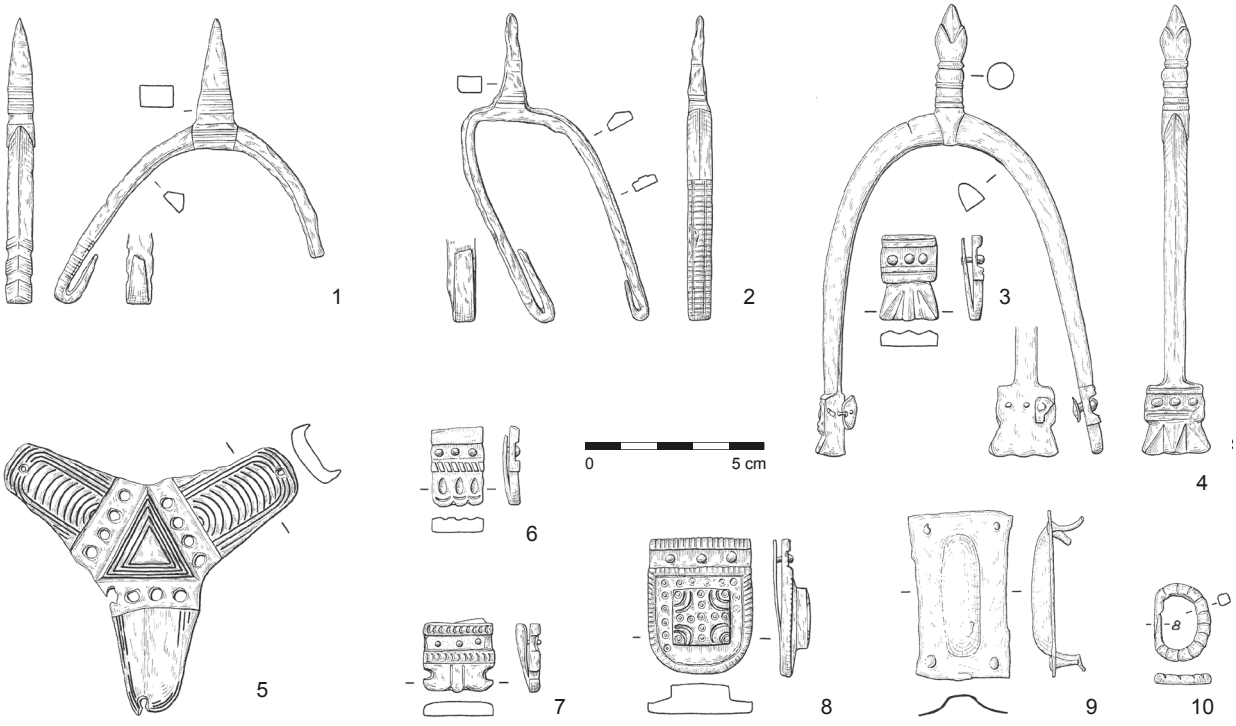


Fig. 14.3. Dolné Vestenice II – Hradov, Prievidza District (Slovakia), metal finds. 1, 2 – hook spurs; 3 – strap-end; 4 – plate spur with York type prick; 5 – trefoil fitting (sword strap divider); 6–8 – strap-ends; 9 – 'bubble' mount; 10 – buckle. 1–4, 6–10 – iron; 5 – iron, copper, silver. Archive of IA SAS Nitra.

probably with a blacksmith's workshop(s). This interpretation is based on numerous (almost 400) small finds including production waste materials and damaged or unfinished objects on the field with an area of ca 3,200 m^2 with several concentrations, as confirmed by the test trenches. The small finds included nails, axe-shaped bars in various stages of processing, and a decorated iron sword trefoil fitting adorned with a silver and copper inlay (Fig. 14.3: 5), along with other small iron items. Slag, semi-finished products, and four hoards/deposits of iron items containing axe-shaped bars and agricultural and blacksmithing tools were also discovered, strongly indicating local metalworking activity.

A significant part of the finds from Dolné Vestenice II consists of lead ingots, rods, and castings, as well as lead models (?) of ornaments (e.g. a strap fitting) and fragments of jewellery (a cross, an earring), from the metalworking zone (Fig. 14.2; 14.4). These items and fragments were likely intended for recycling, as they probably represent failed or unusable forms. Additionally, items resembling spindle whorls (Fig. 14.2: 3, 4) were found. This assemblage is among the largest collections of lead objects from Great Moravian hillforts in Slovakia. The only comparable assemblage comes from Bojná-Valy, which has been only partially published (Haruštiak 2010). It was recently supplemented by the discovery of a hoard containing lead ingots (Pieta 2024). Both collections confirm the extensive use of lead in metal production and its importance as a traded commodity, particularly in the late Great Moravian period (cf. Macháček, Měchura 2013, 276–278; Ungerman 2023a, 211). This also raises the question of the origin of the raw material – recent discoveries suggest that copper ore deposits in Slovakia may have been exploited as early as the Late Avar period (Mozgai et al. 2024). It will therefore be necessary to investigate whether local lead ore deposits were also explored in the 9th–10th centuries.



Fig. 14.4. Dolné Vestenice II – Hradov, Prievidza District (Slovakia). Lead bird-shaped hook (probably model). Photo by Z. Robak.

4.2 The bird-shaped hook from Dolné Vestenice

A model of a bird-shaped hook stands out (Fig. 14.1: 1; 14.4) among the lead artefacts from Dolné Vestenice. The item is obviously a failed casting – the tip of the right wing is missing, the head is broken, and the surface decoration is irregular. Additionally, the hook attachment elements are absent, suggesting that it may have been an unsuccessful or trial model rather than a flawed lead ornament. The hook bears some resemblance to the one from grave 13 in Břeclav-Pohansko, although the bird's tail is shaped differently, and it lacks rivet holes. It also shares similarities with a silver hook found in a grave near St Hadrian's Church in Zalavár (Szőke 2014, Fig. 85), as well as with a third specimen from Libice nad Cidlinou, which is on display at the National Museum in Prague. However, these forms are quite distinct from the hooks produced in Mikulčice or the more abstract versions from Bojná and Nitra.

The fact that the Dolné Vestenice hook was found in a context indicating strong metallurgical activity (though as a single find, not in a find unit), along with other lead artefacts, unfinished products, and production waste, suggests that such objects were being manufactured at the hillfort. This indicates that Mikulčice was not the only production centre for these ornaments – they were also made in other Great Moravian centres, particularly those closely associated with elite groups.

5. Chronology of the fittings

Since the series of artefacts is too small to capture any stylistic or typological transformations that might reflect changes in form over time, the dating of individual specimens can only be based on the general dating of their specific find contexts. These contexts, however, vary – while the Moravian artefacts come from grave finds, which facilitate analysis, the finds from Slovakia can only be dated approximately, based on the findings from the sites at which they were discovered.

It appears that the phenomenon of bird-shaped hooks was associated with the elite culture of Great Moravia throughout its existence. The chronology of grave 22 from Modrá suggests that they appeared as early as the first quarter of the 9th century, though it remains unclear what exactly triggered the emergence of this phenomenon (see Hrubý 1955, 191; Profantová 2003, 66; Ungerman 2020a). This, however, is a subject for further research.

The series of artefacts from Mikulčice can be placed with reasonable certainty in the second half of the 9th century. Almost without exception, these hooks are associated with short U-shaped strap-end fittings, D-shaped Carolingian-style buckles, and plate spurs with a transverse row of rivets. The widespread adoption of such sets before the mid-9th century seems unlikely (Robak 2013, 34–35, 88–89, 167; 2018, 334–336). Even if we assume that elites anticipated and shaped fashion trends, it is reasonable to assume that bird-hook belts were in common use in the last two-thirds of the 9th century. This is indirectly supported by the grave find from Zalavár, which, for historical reasons, can be dated to ca 840–900 (Szőke 2007).

Dating the finds from Slovakia is more challenging. The Bojná I – Valy hillfort was established around 890 and remained in use after 908 (Pieta, Robak 2017, 343–349). Stratigraphic evidence suggests that the vast majority of artefacts recovered from the cultural layer of the hillfort date to this phase, meaning that most of the objects found at Bojná can be assigned to the late 9th – early 10th centuries (Robak 2021b, 57–59). However, the presence of a few earlier artefacts (e.g. Late Avar or some early Carolingian fittings) suggests the possibility of an earlier dating for certain finds. It remains unclear whether these objects are traces of an earlier phase of the hillfort or settlement, were used for an extended period, or simply represent recycled materials used in local workshops operating at the turn of the 10th century to supply the warrior group stationed there.

A similar situation applies to the Dolné Vestenice II hillfort. It is assumed that the bird-shaped fitting comes from a local workshop, meaning it can only be dated approximately – within the general timeframe of the Great Moravian phase of the site. Based on the currently available archaeological evidence (Pieta 2019), this phase can only be broadly defined as the late 9th – mid-10th centuries. In this context, an identical issue as in Bojná arises – whether the typologically older damaged objects from Dolné Vestenice II (Fig. 14.3: 1, 2), which predate the second half of the 9th century, indicate earlier occupation of the site or whether they were merely scrap intended for reprocessing.

The analysis of archaeological finds reveals some very interesting coincidences, which may, of course, be purely accidental. However, in our view, they indicate a system of connections between specific central sites and their associated production centres. For instance, Bojná produced an almost identical fitting to the one



Fig. 14.5. Dolné Vestenice II – Hradov, Prievidza District (Slovakia). Lead plate with animal motif. Photo by Z. Robak.

that adorned the belt found in grave 22 in Modrá. Meanwhile, at the Zalavár cemetery, a strap-end fitting was discovered, most likely in the grave adjacent to the burial with the silver bird-shaped hook – identical copies of this fitting are known from Mikulčice and Bojná (Robak 2016). In grave 310/48 from Dolní Věstonice (Czech Republic), the strap was decorated with a lead plate depicting an unidentified quadruped (Ungerman 2023b, tab. 66: 2). A very similar artefact, depicting perhaps a lamb or a lion, assuming the use of popular Christian motifs, also made of lead, was found in Dolné Vestenice (Slovakia; Fig. 14.5).

These last two finds are particularly remarkable, as strap fittings decorated with animal figures are extremely rare in both Great Moravian and Carolingian crafts. Apart from those mentioned above, they are only known from the fitting from Břeclav-Pohansko (Vignatiová 1992, 83; Robak 2013, 186) and a spur from Mikulčice (Poulík 1963, Taf. 27: 5). Following the decline of the highly distinctive style of Tassilo's Chalice (sometimes incorrectly referred to as the 'Anglo-Carolingian animal style' or 'Insular style') at the beginning of the 9th century, small-scale Carolingian crafts became dominated by geometric and vegetal motifs, inspired by antique and Near Eastern art. Animal figures – particularly quadrupeds depicted in profile – reappeared in small-scale Carolingian artistic crafts only in the last third of the 9th century. They became a defining feature of Carolingian-Ottonian ornamentation in the first half of the 10th century (Wamers 1994, 77–79; 2005; 2008, 49–50; Schulze-Dörrlamm 2008, 391–392; 2009, Abb. 14: 3; 18; Robak 2013, 185–186). This chronology broadly aligns with the dating of the hillfort in Dolné Vestenice and may also serve as an indicator for dating the burial from Dolní Věstonice. It is likely that the collapse of Great Moravian culture in the early 10th century prevented the widespread adoption of quadruped motifs in Great Moravian

crafts. Paradoxically, objects of this kind, when found in a Great Moravian context, may serve as valuable chronological indicators for dating specific assemblages. Such finds are also encountered in Early Hungarian (Bollók 2014, Fig. 4: 1; 6: 5) and Scandinavian (Panum Baastrup 2009, 222–223) contexts.

6. Conclusion

Bird-shaped hooks were closely associated with the elite culture of Great Moravia and may be regarded as a demonstrative element intended to signify membership in a specific group or aspirations to such an affiliation. They were not a common costume element, but rather a rare fashion exception – a small item carrying a significant symbolic load. In this context, bird images may have served as a unifying, group-building 'totemic' element referencing the core symbolism of the newly adopted Christian faith endorsed by the elites (which likewise functioned as a component of their self-representational strategy). The presence of appliqués depicting quadrupeds, such as a lamb or a lion, in association with bird-shaped hooks, as well as the pervasive symbolism of the cross on clothing accessories – including strap-ends, gombíky (spherical buttons), and similar elements – supports this hypothesis.

The phenomenon of bird-shaped belt hooks in the 9th century appears to have been largely confined to two central regions of Great Moravia: the Mikulčice – Břeclav – Staré Město zone and the Nitra region. The exception from Zalavár, a centre of Carolingian Pannonia with documented ties to Great Moravia in the second half of the 9th century (Szőke 2021, 240–273), further reinforces this observation. The chronology of the phenomenon spans the entire period of Great Moravian culture, from the transition between the first and second quarters of the 9th century to the early or even mid-10th century, with its peak occurring in the second half of the 9th century. However, the unexpected finds from the hillfort in Libice nad Cidlinou, one of the key centres in the formation of the early Czech state, remain a mystery, as we lack detailed information about them and it is difficult to unequivocally associate them with any specific phase of the hillfort. Nevertheless, the fact remains that the chronology of the earliest phases of the hillfort (Mařík 2009, 31–37) overlaps with the chronology of the phenomenon under study.

The small number of known fittings and the even smaller number of complete sets is likely due to a combination of a few factors. First, as scholars of Great Moravian burials have rightly observed (Galuška 2013, 63; Ungerman 2020a, 326), not everyone who wore a belt was necessarily buried with it. Moreover, the belt, as an object of significant symbolic meaning, may have been subjected to ritual practices after the owner's death, leading to its deliberate destruction or damage (Ungerman 2002, 99).

Second, the limited number of bird-shaped hooks that have been found may also be attributed to the gradual decline in the custom of furnishing burials, a trend observed particularly from the late 9th century onwards (Štefan 2011, 334–336). Although research into this phenomenon extends beyond the scope of this article, it may be linked not only to religious trends originating from the West but also to the stabilisation of late Great Moravian social structures, which ensured a secure position for the elites, and to the abandonment of the need to demonstrate wealth and social status through burial practices with furnished graves (cf. Schulze-Dörrlamm 1993; Loveluck 2011; Wickham 2011).

Third, it is important to note that large cemeteries (cemetery complexes) with richly furnished burials were a uniquely Moravian feature, particularly in centres such as Mikulčice, Břeclav-Pohansko, and Staré Město. No equivalent sites have yet been discovered in Slovakia, which is difficult to explain, especially considering elite finds from Bojná and the broader Middle Nitra Valley region, as well as the political significance of the city of Nitra, particularly in the final quarter of the 9th century. The discovery of such a cemetery could significantly change the state of the source base and the relevance of the hypotheses presented here. As research progresses, it is possible that bird-shaped hooks will prove to have been more widespread than currently assumed.

Fourth, extensive archaeological research at sites such as Mikulčice has been ongoing for more than seventy years (Poláček et al. 2021), whereas excavations in Bojná and its surroundings have been conducted for less than twenty years (Robak 2021b; Pieta, Robak 2023). At Nitra Castle, which has been extensively investigated since the 1990s, very few structures dating to the Great Moravian period have been preserved, including only a handful of graves (Robak, Bednár 2021). This situation, along with the factors mentioned above, significantly hinders an objective assessment of the intensity of the phenomenon under study in the area of western Slovakia. As archaeological research in the Bojná or Dolné Vestenice agglomeration progresses, a change in the state of the source base can reasonably be expected.

The similarity of individual finds suggests mutual inspiration or a shared origin of the concept. The cause of minor stylistic differences remains uncertain, but they likely depended on the workshops producing the objects or the specific requirements of the clientele. A tendency towards 'naturalistic' forms can be observed in Mikulčice artefacts, a schematised style in the Staré Město area, and advanced abstract forms in Middle Nitra Valley region. The chronology of production may also have played a role, but it is currently undetectable by archaeology. What is certain, however, is that the major Great Moravian centres maintained contacts and exchanged ideas, as evidenced by finds of other types of artefacts.

The concept of wearing a belt with bird-shaped hooks appears to have been limited to the Great Moravian elites and to those who, in some way, associated themselves with this group. Of course, this assumption is based on a selective artefact record, but it seems that the collapse and overall decline of Great Moravian culture in the early 10th century, driven by political events, prevented the widespread adoption of bird-shaped hooks across broader social strata and regions. The find from Dolné Vestenice in Slovakia may serve as evidence that the phenomenon of their production was not limited solely to the core area of Great Moravia.



Fig. 14.6. Bojná I – Valy, Topoľčany District (Slovakia). Bird-shaped hook. Copper alloy. Photo by Š. Hritz.

Appendix

At the end of September 2025, another object was discovered during logging control in the southern part of the western suburbium of the Bojná I – Valy hillfort. The find may represent a bird-shaped hook (Fig. 14.6). The mounting plate, measuring 16 mm in length and 7–11 mm in width, is shaped like an elongated, tall trapezoid with rounded angles. A hook was attached to its wider end. The total length of the item is 26 mm and its height 6 mm. The plate was fastened with three rivets. Overall, the piece appears rather crudely made – the edges are irregular, the rivet holes unevenly spaced, and the form is asymmetrical. It is possible that the object is damaged. XRF analysis, conducted with a handheld spectrometer, indicated that the alloy consists of Cu 51.40%, Sn 23.91%, Pb 15.29%, Ag 3.41%, Zn 0.95%, and Sb 0.78%. This composition is somewhat unusual for early medieval bronze alloys, though it does occasionally occur among Avar-period artefacts. The significant presence of several different elements, including silver, may suggest that the object was produced from scrap metal. Further detailed study will be required to confirm whether the piece can indeed be attributed to the early medieval period.

Acknowledgement

This work was supported from the Johannes Amos Comenius Programme – Project 'MSCAfellow7_MUNI' (No. CZ.02.01.01/00/22_010/0008854), 'EMStrong: Early Medieval Middle European Strongholds: Carolingian-age burghs as a visualisation of power on the Carolingian Empire periphery'.

Research supported by the scientific projects VEGA 2/0068/24 'Middle Nitra Region in the Early Middle Ages. Ad fontes' and 2/0043/22 'Archaeological sources to early historic times and Early Middle Ages in the Middle Danube region'.

The authors would like to thank Mgr. Jan Mařík, Ph.D., for providing information about the circumstances of the finds from Libice nad Cidlinou.

Chapter 15

How to fish: Ceramic fishing net weights from the early medieval period at the stronghold in Chotěbuz-Podobora

Pavel Kouřil

1. Introduction

Fishing, as an activity that diversified the diet of early medieval communities (if we disregard earlier or, conversely, later periods) played an important, though not decisive, role in the diet of the local population. Of course, the situation was different in coastal areas, where the consumption of fish (and seafood in general) was naturally higher than inland (e.g. Rulewicz 1994, 343–344). In the territory of the Czech Republic, fishing was practiced more as a supplementary activity (?) (Beranová 1980, 248; Měřínský 2011, 42), one pursued with a variety of techniques in rivers and their distributaries, streams, lakes and pools. However, the intensity of fishing, which depends on the natural environment and local conditions, which differ from case to case, is very difficult to monitor and quantify; a limiting factor is the state of research and the degree of preservation of situations and finds related to this particular activity (Mazuch 2003a, 355–356). Remaining unanswered is the possibility of importing selected types of fish from the seaside (dried, salted, smoked?) apparently linked to an elite circle of recipients (cf. Galuška, Chrástek 2024, 138; Nývltová Fišáková 2024, 90).

Czech (Czechoslovak) archaeological literature has only a few works, mostly older, devoted to the topic of fishing and finds documenting its practice (e.g. Kraskovská 1972, especially 150–153; Kostelníková 1973, 680–682; Andreska 1975, 132–139, with his additional works; marginally also Beranová 1980, 247–248; Měřínský 2002, 257, 303). Only the extensive study by Marian Mazuch (2003a, 355–399), based on the knowledge and finds from decades of research at the Mikulčice fortified settlement, exhaustively collected and evaluated local finds (and find situations) related to fishing and significantly advanced our ideas about this somewhat neglected form of subsistence. His other work, focused generally on the issue of weights, indicated uncertainty in their functional purpose in the sense of fishing net weights versus weights used with vertical looms (Mazuch 2003b, 401–419), although it cannot be ruled out that they could have served both purposes, especially in somewhat later periods (e.g. Marcinkowski 2003, 211–212; Romanowicz 2018, 323).

2. Finds of fishing net weights from Chotěbuz-Podobora, their analogies and dating

A certain shift in the perception of this type of material cultural heritage may be offered by the assemblage of ceramic weights collected at various places in the Chotěbuz-Podobora stronghold (Karviná District), located in the region of Bohemian Silesia just north of the Moravian Gate (Fig. 15.1). Relatively well-known archaeologically, the fortification had two basic periods of its existence – the earlier Hallstatt and the later Slavic. The later and very well-fortified Slavic stronghold was probably preceded in prehistoric times by a lightly enclosed settlement that gradually grew into a heavily fortified site (10th–5th centuries BC); culturally, it belonged to the Lusatian Urnfield complex, which can be associated with the Final Bronze Age and Early Iron Age. The fortification was razed and burned in phase HD2–3.

The larger Slavic population, which appeared at this particular site sometime during the second half of the 8th century, evidently did not find the small Hallstatt precinct sufficient and therefore annexed two

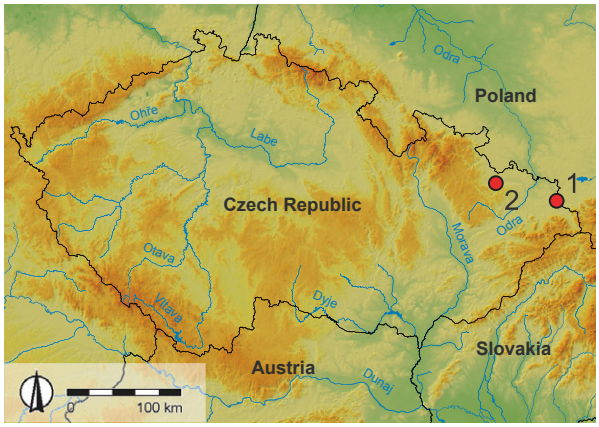


Fig. 15.1. Map of Czech Republic showing sites mentioned in text. 1 – Chotěbuz-Podobora; 2 – Hradec nad Moravicí. Graphics by M. Filip.

more sections separated from the surrounding terrain by ditches and ramparts, in the process creating a compound with three essentially independent, mutually separated parts with the River Olše flowing along its eastern base (Fig. 15.2). Around the same time, a whole group of strongholds appeared in the southern regions of Upper Silesia (Lubomia, Skoczów, Kamieniec, Komorno, Víno, Hradec nad Moravicí, Landek), which, together with Chotěbuz, can very likely be associated with the settlement territory of the Golensizi tribe, mentioned by the Bavarian Geographer (...*Golensizi, civitates V.*), an anonymous compilation from perhaps the last third of the 9th century providing an approximate list of settlements and landscapes north of the Danube (Horák, Trávníček 1956, 3; most recently Sikorski 2024, 27–44 with comprehensive literature and also Łuczyński 2024, 45–66, especially 49). The early medieval settlement in Chotěbuz is divided into two phases – the earlier phase covering the second half of the 8th to the end of the 9th or the very beginning of the 10th centuries, and, after a short break, the later phase defined by the final decades of the 10th century to about the middle of the 11th century. The earlier phase ended violently, as evidenced by the massive red-burnt fire layer with a thickness of up to several decimetres recorded both at the acropolis and especially in the first bailey; the later phase, which no longer achieved the previous dynamics, ended with a gradual, apparently conflict-free decline in settlement and the abandonment of the site (for details, see Kouřil, Gryc 2011, 217–243; 2019, esp. 95–111; Kouřil 2021a, 196–202).

The weights we wish to address belong without distinction to the earlier phase of Slavic settlement. We currently have 17 pieces at our disposal, 14 of which were obtained in the first bailey, especially in places near the inner wall of the rampart, where there was a concentration of production and economic features focused on blacksmithing (slag, ceramic blowpipes); textile production (spindle whorls, scissors); roasting, drying and grinding grain (burnt grains, threshing floors, quernstones, storage vessels); livestock shelters (primitive stables with burnt animal skeletons); etc. One piece comes from the ditch between the acropolis and the first bailey, one was also recorded in the layer at the acropolis, and finally the last specimen was found (which is important) in contact with the left bank of the River Olše flowing below the stronghold[1] and is thus strong evidence of its presumed function as a weight for a fishing net (cf. Fig. 15.2, Tab. 15.1).

The mass of the weights is in the range of 10–18 g, taking into account one extremely small piece weighing 5 g and the fact that eight of the total number were completely or partially secondarily burned, which may slightly distort their overall weight. All of the weights have a cylindrical or barrel-shaped form and a length ranging from 3.3 to 4.9 cm with a maximum diameter (width) of 1.6 to 2 cm; the diameter of the longitudinal inner central hole is 0.35 to 0.45 cm. Well-preserved pieces with a relatively hard firing are predominantly black or black-grey, indicating reduction firing; the surface is smooth to polished, apparently as a result of frequent contact with the water environment. The clay used to make them is consistent with standard handmade pottery produced for the needs of the local community.

The key point is that 12 weights were concentrated in one place, under a heavily burnt destruction layer (S-52/2010, S-52A/2011); as previously mentioned, some of them were fully burnt, some only partially, while still others were untouched by fire (cf. Tab. 15.1, Fig. 15.3). The discovered situation suggests that an above-ground structure must have been located here, leaning against the inner palisade wall of the fortification formed by fir and elm trunks, in which there was a device that included these ceramic weights. Although the find situation here was not entirely clear, it is possible to state that there was no indication that the artefacts were elements

1 The river changed course at the beginning of the 18th century, with its bed moving roughly 400 m eastward, today forming the border with Poland (Kouřil 1994, 71).

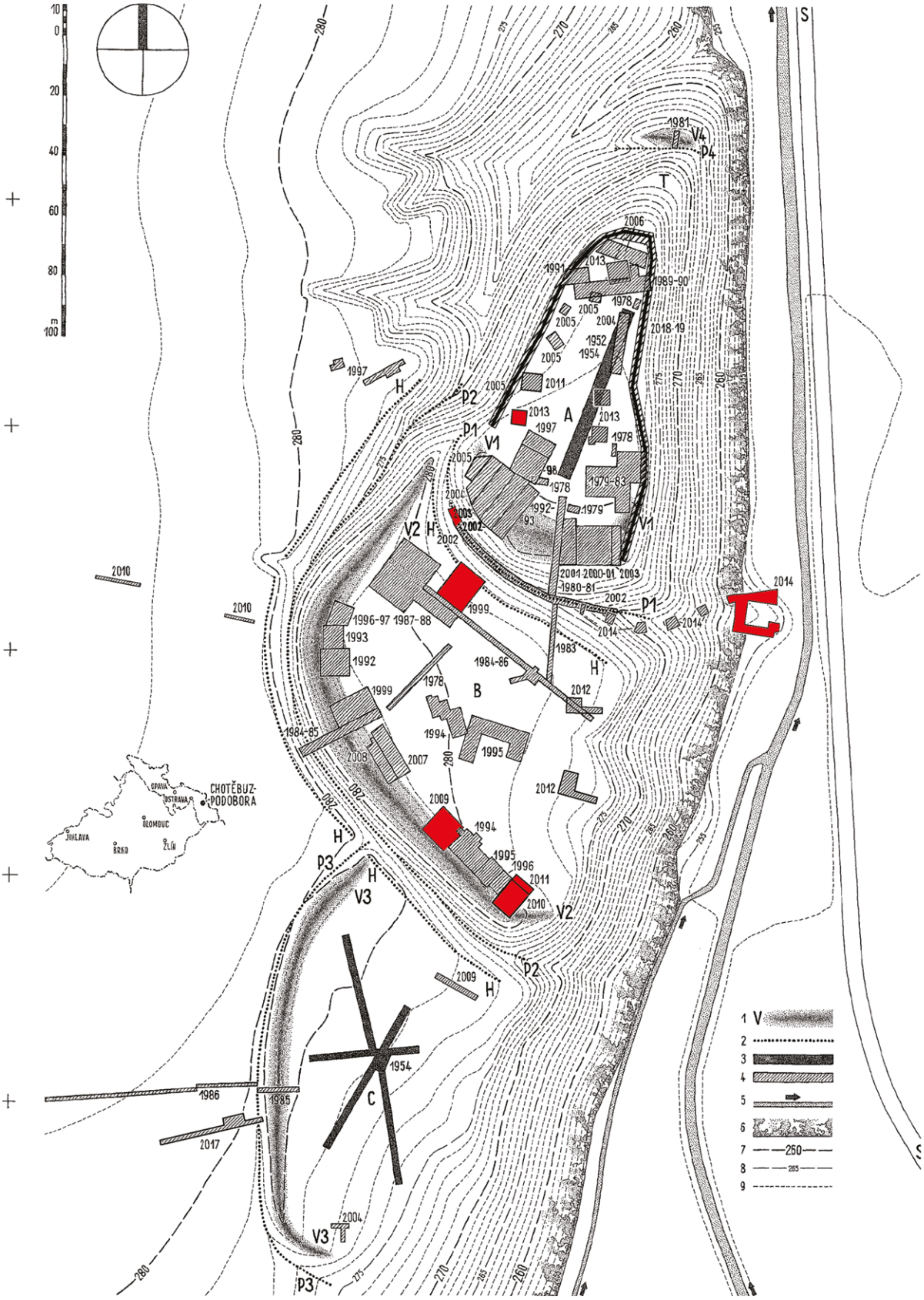
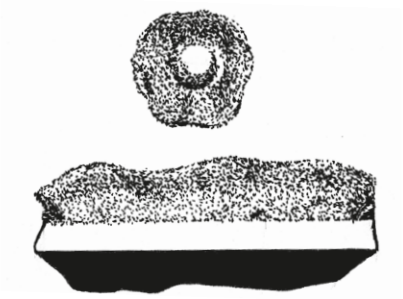
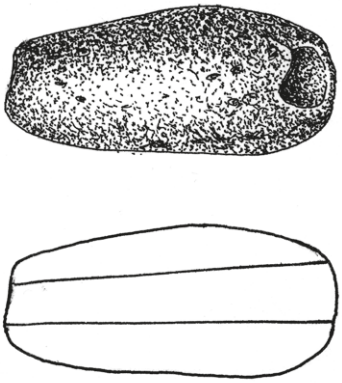
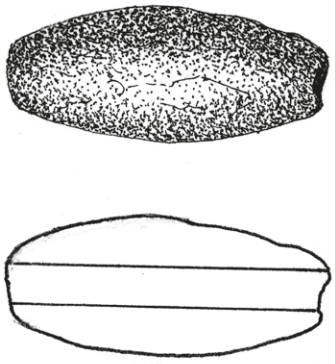
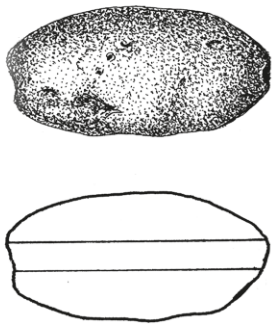
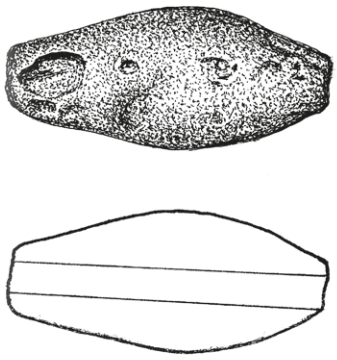
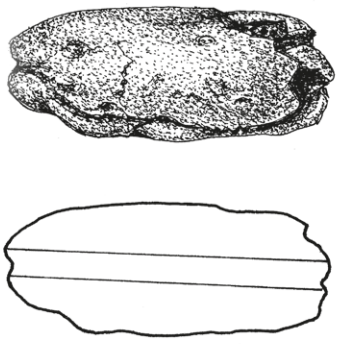


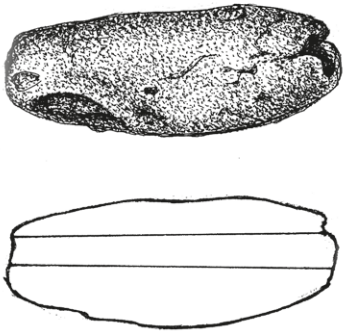
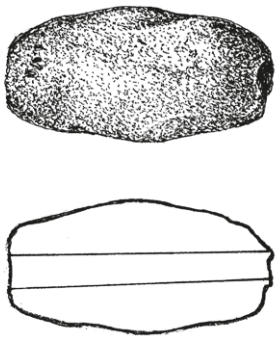
Fig. 15.2. Chotěbuz-Podobora, Karviná District. Contour plan of site showing trenches with finds of fishing weights (red). 1 – remains of ramparts; 2 – terrain breaks; 3 – trenches dug in 1952 and 1954; 4 – trenches dug between 1978–2019; 5 – watercourses; 6 – current forest edge; 7 – contour lines by 10 m; 8 – contour lines by 5 m; 9 – contour lines by 1 m; A – acropolis; B – first outer bailey; C – second outer bailey; H – outer edge of a ditch; V1– V4 – ramparts; P1–P4 – ditches; S – road. After Kouřil 1994, obr. 6, modified.

No.	1	2
Drawing		
Trench; year	S-32; 1999	Ditch between acropolis and 1st bailey; 2003
Shape	Cylindrical	Irregular cylindrical
Dimensions [cm]	4.5 × 1.6 Ø 0.4	4.4 × 2.0 Ø 0.5–0.7
Firing colour		Secondarily burnt
Surface	Smooth	
Weight [g]	15	15
Inv. No.	05296-791/99	06296-6001/03

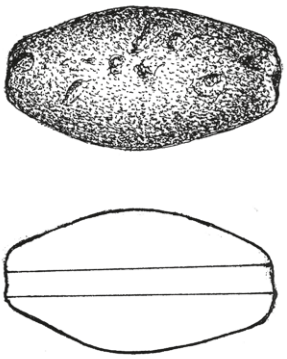
No.	3	4
Drawing		
Trench; year	S-50; 2009	S-52; 2010
Shape	Barrel-shaped	Barrel-shaped
Dimensions [cm]	4.3 × 1.8 Ø 0.5	3.5 × 1.7 Ø 0.4
Firing colour	Secondarily burnt	Secondarily burnt
Surface		
Weight [g]	13	8
Inv. No.	05296-607/09	05296-196/10

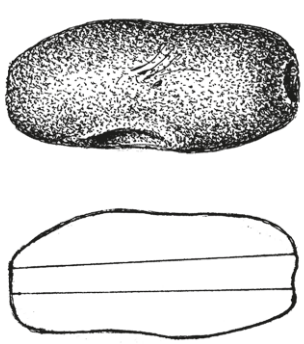
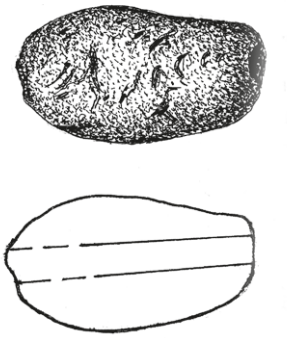
of a possible loom. Instead, we believe that they were an integral part of a fishing net that was stored there, perhaps hung on the wall, and we can also add that a feature identified in the immediate vicinity is interpreted as an above-ground granary (for more details, cf. Kouřil, Gryc 2019, 99). The weights found outside the first bailey (only three individuals), all unburned, are probably evidence of their loss during the transport of nets to the stronghold (2003, 2013) or during handling of the nets during the actual fishing (2014); it is interesting that despite the almost direct contact of the river with the inhabited area, the weights did not remain at the place of use but were (probably not all) removed to a protected area,

No.	5	6
Drawing		
Trench; year	S-52; 2010	S-52; 2010
Shape	Barrel-shaped	Cylindrical
Dimensions [cm]	4.2 × 1.9 Ø 0.4	4.3 × 1.7 Ø 0.4
Firing colour	Black	Secondarily burnt
Surface	Smooth	
Weight [g]	12	11
Inv. No.	05296-197/10	05296-198/10

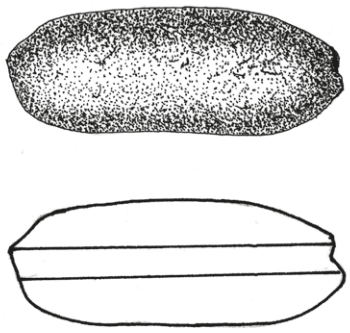
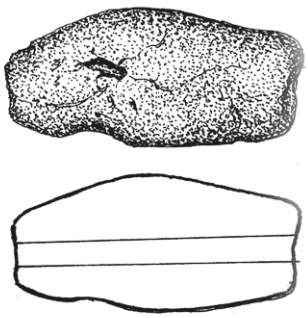
No.	7	8
Drawing		
Trench; year	S-52; 2010	S-52; 2010
Shape	Cylindrical	Barrel-shaped
Dimensions [cm]	4.3 × 1.7 Ø 0.4	3.5 × 1.7 Ø 0.4
Firing colour	Secondarily burnt	Black
Surface		Smooth
Weight [g]	10	11
Inv. No.	05296-199/10	05296-200/10

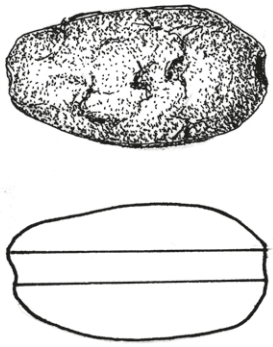
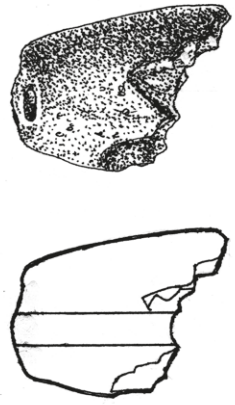
very likely for reasons of their repair, perhaps also the current season unsuitable for fishing, current climatic conditions, etc. In the context of prehistoric settlement, it should also be emphasised that these small weights cannot be intrusions from this older period that were then secondarily used, since the local Hallstatt pyramidal weights are large, heavy and poorly fired, clearly related to weaving fabrics (to load and stretch the vertical warp of the loom) and not to fishing (for the possible use of prehistoric weights by the Slavs, cf. e.g. Pleinerová 1999, 38); moreover, at first glance, the different composition of the material is also evident, distinguishing prehistoric ceramics from early medieval ceramics.

No.	9	10
Drawing		
Trench; year	S-52; 2010	S-52; 2010
Shape	Barrel-shaped	
Dimensions [cm]	3.5 × 1.9 Ø 0.35	Ø 0.35
Firing colour	Black, partially slightly secondarily burnt	Black
Surface	Smooth	Smooth
Weight [g]	11	4
Inv. No.	05296-201/10	05296-202/10

No.	11	12
Drawing		
Trench; year	S-52; 2010	S-52; 2010
Shape	Cylindrical	Irregular barrel-shaped
Dimensions [cm]	3.7 × 1.7 Ø 0.35–0.45	3.3 × 1.8 Ø 0.4
Firing colour	Black	Black, partially secondarily burnt
Surface	Smooth	
Weight [g]	10	5
Inv. No.	05296-240/10	05296-241/10

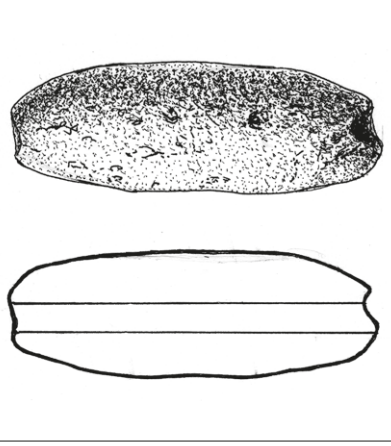
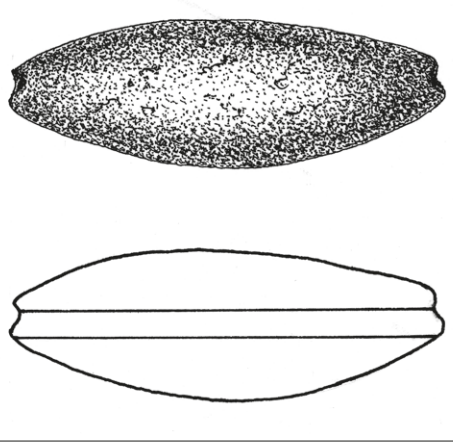
If we accept that the Chotěbuz artefacts are parts of nets, we must, on the other hand, admit that we do not have any other evidence of fishing here, whether it is skeletal remains or fish scales (some of the material was wet sieved) or other objects related to this activity – fishing hooks (iron, wooden, bone), harpoons (iron, bone) or elements made of organic materials (e.g. floats, netting needles, nets themselves and hook-shaped stumps for pulling them in), etc., which, however, had no chance of surviving in the local environment (for details on the individual categories of this material culture, see, e.g. Rulewicz 1994); it cannot be ruled out that some smaller iron spikes with a socket and one wing

No.	13	14
Drawing		
Trench; year	S-52; 2010	S-52; 2010
Shape	Cylindrical	Cylindrical
Dimensions [cm]	4.4 × 1.7 Ø 0.4	3.8 × 1.8 Ø 0.35
Firing colour	Black-grey	Partially secondarily burnt
Surface	Smooth	
Weight [g]	13	15
Inv. No.	05296-242/10	05296-386/10

No.	15	16
Drawing		
Trench; year	S-52A; 2011	S-58; 2013
Shape	Barrel-shaped	Apparently barrel-shaped
Dimensions [cm]	3.4 × 1.7 Ø 0.4	Ø 0.4
Firing colour	Secondarily burnt	Black-grey
Surface		Smooth
Weight [g]	11	6
Inv. No.	05296-24/11	05296-775/13

could also have been used for fishing (?). Given that the River Olše was not wide, we assume that a seine net was used here (Andreska 1975, 136). The nature of its riverbed, rather shallow and rocky in many sections, probably also influenced the shape of the weights used, as they were chosen to blend in as closely as possible with the line of the bottom edge of the net, and to extend out as little as possible, thus preventing their damage when being pulled over an uneven bottom.

In general, it can be said that weights represent the most frequently found artefact related to fishing; they were made of various materials – stone, fired clay, probably also hard and heavy wood (Steane,

No.	17	18
Drawing		
Trench; year	S-67; 2014	Unstratified, SE corner of today's château; 1984
Shape	Cylindrical	Thin barrel-shaped
Dimensions [cm]	4.9 × 1.7 Ø 0.4	5.5 × 1.9 Ø 0.35
Firing colour	Black-grey	Black-grey
Surface	Smooth	Smooth
Weight [g]	18	18
Inv. No.	05296-4062/14	158/84

Tab. 15.1. Fishing net weights with basic data. 1–17 – Chotěbuz-Podobora; 18 – Hradec nad Moravicí. Drawings by H. Pravdová, J. Grieblerová.

Foreman 1988, 180), in later periods from lead and even the use of heavy animal bones is considered (Hensel 1956, 134–135). Ceramic weights were preferred for both sea and river fishing, especially disc-shaped forms with a central hole or oval (spherical) to pyramidal with a perforation in the upper quarter of the body to minimise the catching and tearing of nets (e.g. Mazuch 2003b, 401–419; in Polish material, e.g. Rębkowski 1998, 137, 281–284; Kaźmierczak 2014, 239–242; Janowski 2019, 313); an important point was that these weights were approximately the same size on each of them (Steane, Foreman 1991, 98).

The form of the weights found at Chotěbuz is not very common and is known to us only from a few sites. The closest is the stronghold in Hradec nad Moravicí (Opava District) with origins in the Middle Hillfort period, unfortunately heavily damaged by later construction activities (for more details, see Kouřil, Prix, Wihoda 2000, 166–196; Kouřil, Gryc 2014, 117–120); a very well-preserved weight with parameters identical to the finds from Chotěbuz was recovered here, albeit from an unstratified position (see Tab. 15.1: 18). The River Moravice flowing around the fortification is similar to the River Olše in the Těšín region, both in terms of the width, shallow depth and rocky bottom. It therefore appears that the same fishing technique was used here with the same type of weights. If we take into account the possibility that the stronghold belonged to the Golensizi circle, the above similarities may not seem coincidental, but may signal a certain regional tradition related to the territory of this tribe. Two other locations on the Czech side associated with Golensizi tribe – the strongholds in Víno (Bruntál District)[2] and in Landek (Ostrava-City District), also situated near watercourses (the River Osoblaha and the confluence of the Odra and Ostravice rivers), have not been investigated to an extent that would provide any material of the nature we are investigating; beyond the Czech border, in today's Polish territory, the fortifications in Lubomia (Wodzisław Śląski District) and Skoczów-Międzyświeć (Cieszyn

2 In terms of fishing (8th/9th centuries), from Víno we have a small collection of iron hooks obtained during a detailed detector survey. They come in various sizes (3.5–6.5 cm), always with a twisted, reinforced body, but they lack a barb, which is more of an exception (cf. e.g. a nice collection from Wrocław, Poland – Kovalchuk et al. 2024, 6–7); a small conical lead weight may also be associated with fishing (Kouřil 2017, 63). Hooks shaped in this way were considered by some researchers, apparently mistakenly, to be parts of a belt (Heindel 1990, 69–70) and it is still debated whether the pieces without barbs, in particular, did not have a different function after all (cf. e.g. Herrmann 2005, 149–150, with additional refs.). Given the small width of the nearby Osoblaha, we believe that fishing with set rods or even classic hand-held rods was probably preferred here (Andreska 1975, 133).



Fig. 15.3. Chotěbuz-Podobora, Karviná District. Ceramic fishing net weights from trench 2010 and 2011. Photo by J. Foltýn.

District) have been subjected to relatively extensive research from the area under consideration, though to date without more detailed publications (Kouřil, Gryc 2011, 217–222, with relevant literature).

If we stay in Polish territory, we can still find ceramic weights that are approximately analogous in shape, although not on a mass scale; however, they are in most cases later or difficult to classify chronologically. This second case concerns, e.g. random finds without context made at the open settlement of Suraż in Podlachia; these are oval, barrel-shaped and cylindrical forms, some of which are covered with deeper notches for better attachment of the net (?), others bear, together with the image of a boat, a shallow grid imitating such a net; some may perhaps date from the Early Middle Ages, while others are even considered to be of modern origin (Pawłata 2008, 169, 205; see also Znamierowska-Prüfferowa 1988, 93). Later, high medieval pieces (barrel-shaped to spherical and cylindrical) are also known from coastal Kołobrzeg (Rębkowski 1998, 281). Although not entirely cylindrical, the more massive boat-shaped, curved specimens with two vertical holes from the Stare Drawsko site (Janocha 1963, 325), Słupsk (Sikora 1967, 625) and Żółte (Kowalewska, Kaźmierczak eds. 2014, 303, Fig. 6. 171/d) may be from the early medieval period; the somewhat more subtle ceramic weights found in Wolin, which are attributed to a high medieval origin (13th–14th centuries; Janowski 2019, 313–317), are similarly shaped and well-fired. One example from East Anglia, where cylindrical weights made of lead were used in fishing in the Thames estuary, can also be noted; they are also dated to the High Middle Ages (Steane, Foreman 1988, 179). Additional parallels are thus far unknown.

3. Conclusion

In conclusion, we can summarise that the type of weights found at the Chotěbuz-Podobora stronghold represents the largest collection of such artefacts found to date in our territory that can be considered part of fishing nets and associated with fishing. They are clearly from the early medieval period (its earlier phase) and prove that fishing, the extent of which we cannot determine in greater detail, had a certain relevance in the diet of the local population. We do not rule out that such objects or their parts (especially from earlier research) whose purpose has not been determined may still be in the depositories of collection-building institutions. The published assemblage could thus assist in their functional classification, while also facilitating the determination of newly acquired finds.

Chapter 16

Gold gombíky from Mikulčice and Staré Město – Uherské Hradiště: An analysis and comparison of two unique find assemblages

Šárka Krupičková, Luděk Galuška, Šimon Ungerman, Martin Fořt, Michał Płygawko, Jana Fořtová Torňošová, Lucie Valášková, Jakub Langr

1. Introduction

As part of the currently ongoing applied research project entitled 'Into the Great Moravian Jewellery',[1] a systematic processing of the find inventory of jewellery and clothing accessories is being performed from the two most important early medieval sites in Moravia, which are considered as centres of Great Moravia: Mikulčice and Staré Město – Uherské Hradiště. Both sites represent the residences of the highest elite, as evidenced by the extent and character of the recorded settlement, the form of fortifications, the presence of stone (church) buildings, and also the wealth of finds provided by the local extensive burial grounds. A number of graves contained artefacts typical for the elite, e.g. militaria, remnants of silk fabrics, and exclusive products of fine metalwork, typically jewellery and decorative clothing accessories. The latter category includes sheet metal spherical buttons or pendants (spherical hollow buttons), traditionally referred to as gombíky, and the connection of these artefacts with the Great Moravian elite is highly significant. They appear only exceptionally in graves outside central locations, and their representation within one burial ground in Mikulčice and Staré Město – Uherské Hradiště usually does not exceed 10%.[2] They are mostly found in graves with other rich furnishings and/or in graves at a burial ground in a prestigious position, including those excavated in the interiors of church buildings. Outside of Great Moravia and the areas with its cultural influence (Bohemia; the River Zala mouth), we encounter gombík-type ornaments relatively rarely and their decoration is limited to the application of granulation and filigree (e.g. rich graves from Trilj and Brestovac in Croatia; Petrinec 2009, 160–162; Bühler 2014, 191–192). Gombíky with decoration chased into the surface of their sheet metal shell are almost never found outside the cultural framework of Great Moravia.[3] As such, gombíky with chased ornamental decoration are considered a locally specific Great Moravian element of elite clothing (Krupičková 2024, 70).[4] In contrast, the occurrence

1 NAKI III, Ministry of Culture, No. DH23P03OVV020, 'Into the Great Moravian jewellery. Interdisciplinary research, analytical conservation and documentation of jewellery production from the Mikulčice and Staré Město sites' (2023–2027). More on the project and selected preliminary results at Velkomoravskysperk.cz.

2 The 10% occurrence threshold was exceeded at the following cemeteries: Mikulčice – church 2, Mikulčice – church 3, Uherské Hradiště – Sady and Staré Město – Špitálky (Krupičková 2024, tab. 38, 39). At some other burial grounds, especially in Mikulčice, the statistical occurrence of gombíky is also above 10%, but these are sites with a low number of graves (inconclusive) or with a significant representation of glass gombíky.

3 The exceptions are finds from the aforementioned territories culturally linked to Great Moravia – Bohemia (Košta, Barčáková 2023, 31–66), the River Zala mouth (Hungary) (Szőke 2010, 38–41; 2021, 446, Abb. 102) – and also Great Moravian gombíky discovered in the context of Old Hungarian graves, which they probably reached secondarily (Mesterházy 2000, 211–226). Pairs of gombíky with chased decoration appear only exceptionally elsewhere – e.g. Matzhausen (Hasil, Ottenwelter, Barčáková 2020, 333–345), Ptuj (Korošec 1999, 26).

4 The low occurrence of gombík-shaped ornaments (including those with chased decoration) outside Great Moravia could be related to the custom of placing rich grave goods in Great Moravian graves of the 9th century, while in the same period this burial custom had already disappeared in other regions. Since we know Great Moravian gombíky mainly thanks to their finds in graves, it cannot be ruled out that the end of placing rich furnishings in graves in other regions in the 9th century also led to a significant separation of the current gombík find inventory (see also Ungerman 2020d, 186).

of small, hollow, undecorated sheet metal gombíky and their cast counterparts is relatively common in the area from Central Asia to Central Europe with a wide temporal dispersion encompassing the entire Early Middle Ages (Jeroussalimskaja 1978, 203; Ierusalimskaja 2012, 75; Harrison et al. 1986, 262–264; Andrási 2015). However, these artefacts probably had a different function, social significance, and symbolic meaning for their wearers than the Great Moravian decorated gombíky.

Roughly 700 sheet metal gombíky from the context of Great Moravian burial grounds are known (Krupičková 2024, tab. 38–41). Exceptional artefacts include gombíky made of gold, which appear only at five burial grounds – at church 2 and 3 in Mikulčice, at the church burial ground in Uherské Hradiště – Sady, at the Na Valách necropolis in Staré Město, and also at the Chromečkova zahrada location in the Předmostí u Přerova archaeological site.[5] Gold in general is a rare commodity in the Great Moravian environment. Finds of gold artefacts are almost exclusively limited to grave inventories and, for example, a total of 101 gold artefacts come from all burial grounds within the Mikulčice–Kopčany agglomeration (Kouřil, Poláček 2013, 410). It is not entirely clear where the inhabitants of Great Moravia obtained their gold, or rather, it is speculative how many gold artefacts from Great Moravian graves were actually made directly in Great Moravia and how many of them can be described as imports (this issue was addressed using the example of earrings in Š. Ungerman, 2020c). Given the infrequent, but nevertheless demonstrable evidence of the occurrence of gold raw materials and documented evidence of gold processing at Great Moravian centres (Galuška 2013, 108–174), local production can be considered as a relevant variant of the origin of at least some gold ornaments, including gombíky. Byzantine coins were considered a possible source of gold (Krupičková et al. 2024), but precious metals, and gold in particular, were undoubtedly also obtained by repeatedly remelting older jewellery that was no longer used. The identification of the origin of gold is difficult for this very reason. Moreover, intact gold jewellery represents objects of extraordinary historical value, for which it is problematic to justify the use of destructive methods to capture trace elements (e.g. LA-ICP-MS), the detection of which is a prerequisite for determining the provenance of gold.

When processing the collection of gold gombíky from the two largest Great Moravian sites, we therefore focused on issues other than the determination of the origin of the raw material. The key for us was comparing both assemblages of gold gombíky from the two largest Great Moravian sites using the same methodology. We were primarily interested in whether products from both locations could be distinguished based on typology, material composition, or the employed production technique. The aim was to determine whether the production of gold gombíky from Mikulčice and Staré Město corresponds to different manufacturers or workshops, or different clients with different demands on the appearance and properties of the resulting object.[6] The methodological approach included cleaning the objects, detecting any older conservation and restoration interventions, recording characteristic details of production and the size of individual components, and also identifying the material composition of the surface, all with the help of instrumentation in the form of an X-ray, electron microscope and light microscopes (everything is described in more detail in Subchapter 2.2).

2. Material and the research methods

2.1 Material

The research included 39 gold gombíky that have been discovered thus far within the agglomerations of Mikulčice–Kopčany and Staré Město – Uherské Hradiště and are now available for analytical processing (see the Catalogue after the text). Both sites contributed to the compared assemblage in almost equal parts (Mikulčice 20 gold gombíky, Staré Město – Uherské Hradiště 19 gold gombíky). Except for one specimen (the Mikulčice settlement find, inv. No. 1897/57), all gold gombíky come from Great Moravian graves. Most of them were discovered during excavations in the 1950s. Two gombíky from grave 2032 from the revision excavation of church 2 in Mikulčice in 2008 and one gombík discovered

5 Three gold gombíky were also discovered in Staré Město – Špitálky, but unfortunately the assemblage of jewellery from this excavation was stolen in the past and it is not possible to analyse it (Staňa 2001, 92–93). These were a gold gombík with poppyseed granulation arranged in the shape of diamonds, complemented by a glass (?) insert in the lower field (grave 15 in the narthex of the church), and a pair of gold gombíky with chased plant decoration (grave 18) (Poulík 1955, 320–322, 328).

6 The issue of differentiating workshops in connection with Great Moravian jewellery – including with gombíky – was addresed by E. Ottenwelter (2022, 156–157, 363–367).

during an excavation in Staré Město in the same year can be considered new finds. All gold gombíky from Mikulčice are in the custody of the Czech Academy of Sciences, Institute of Archaeology, Brno; gombíky from Staré Město – Uherské Hradiště are in the collections of the Moravian Museum (Brno).[7]

The Mikulčice gold gombíky come from 12 graves, most from the burial ground near church 3 (9 graves with 14 gombíky), followed by church 2 (2 graves with 2 gombíky) and finally one gold gombík was discovered in a grave near church 11. The Mikulčice collection also includes the aforementioned settlement find. Gold gombíky from the Staré Město – Uherské Hradiště agglomeration were part of the grave inventory of 11 graves. The gombíky were mostly discovered at the Na Valách cemetery in Staré Město (8 graves with 13 gombíky), and gold gombíky were also found in three graves (a total of 6 specimens) in Uherské Hradiště – Sady.

2.2 Research methods

The processing procedure was uniform for the entire compared assemblage – it was carried out by the same team with the same equipment as part of the aforementioned 'Into the Great Moravian Jewellery' project. First, the artefacts were X-rayed on a stationary micro-X-ray machine in the range of 90–120 kV, 300 mA, via a digital detector. To clarify the position of hidden parts of artefacts and secondary interventions, it was necessary in some cases to use an XHD filter, which visualises better a three-dimensional hollow object. For easy orientation in the space of the scanned object, X-rays were taken in three positions (vertical, horizontal and diagonal). The gombíky were then mechanically cleaned with acupuncture needles under a light microscope; in particular, residues of casting materials from the production of replicas in the second half of the 20th century were removed (the gold gombíky were not lacquered, so it was not necessary to remove any finish). This was followed by an investigation using a Nikon SMZ745T light microscope at 0.67–5× magnification and photo documentation using a digital camera. Selected parts of the object's surface were also documented using SEM. All gombíky underwent non-destructive elemental composition analysis using an EDS detector. SEM/EDS analysis was performed on a Tescan Vega (4th generation) device, and the elemental composition was determined using Essence™ software. During elemental composition analysis, we maintain a uniform working analytical measurement distance of 15 mm for the entire assemblage; the result we work with represents the median of point measurements from one area. Size measurements were performed physically with a calliper in the case of determining the dimensions of entire artefacts or digitally using a microscope in the case of detecting the dimensions of individual parts (e.g. wire widths, tool imprint sizes, chased circle diameters on the lower poles, etc.).

With regard to the defined questions, three areas in particular were systematically monitored: metric characteristics, elemental composition of the gold alloy, and manufacturing processes. For the metric characteristics, we calculate the height of the gombík with and without the loop, the diameter of the gombík at the widest point, the diameter of the loop wire, the diameter of the beaded wire at the bead location, the size of the chased circle on the lower pole, the thickness of the sheet metal, and the dimensions of the pattern and granules. The elemental composition was recorded in terms of the ratio of three major metals: gold, silver and copper. The recorded manufacturing processes include the construction of the body and the attachment mechanism, the presence of a pressure relief hole, the shape of the loop, traces of the surface layout before chasing, the profile of the loop wire, the perforation direction of the hole for the loop in the shell, the presence of the seams on the beaded wires, and the occurrence of longitudinal traces on the loop from wire-drawing (Tab. 16.1, 16.2). An overview of the typology of gombíky and the terminology of their parts used in this text was recently published in detail by the same team of authors, so we refer to the relevant study (Poláček et al. 2024; for essential terms see bellow Fig. 16.1).

7 The majority of the gold gombíky have already been published in some form in the past: Krupičková 2024, 161, 171–172, 176–177, 179, 182, 184, 188, 190, 195, 196, 203, 239; Klanica et al. 2019, 35, 40, 65, 72, 94–95, 108, 117–118, 189, 196, 222, 236, 246, 263, 269, 282, 295; Kouřil ed. 2014, 420, 426, 429, 434–436; Ottenwelter 2022, 158–167; Poláček et al. 2021, 103, 130; Poulík 1957, 368, obr. 84: 1, 2; Hrubý 1955, 422, 455–456, 473, 511, 514, 518–519; Galuška et al. 2018, 27–28, 30, 49–50.

Inv. No.	Description	Site	Grave	Height with loop [mm]	Height w/o loop [mm]	Diameter [mm]	Size (small, medium, large)	Shell (A, B, C)	Loop (A, B, C)	Pressure hole design
781/57	Chased decoration, vertical ribbing	Mikulčice, church 3	425	22.2	13.3	15.8	Small	B	B	×
1897/57	Chased decoration, plant ornament	Mikulčice, settlement	×	17.1	12	16.4	Small	B	B	×
606/57	Chased decoration, plant ornament	Mikulčice, church 3	380	29.2	19.8	22.9	Medium	B	B	×
1120/57	Chased decoration, plant ornament	Mikulčice, church 3	490	21.6	15.9	17.4	Small	B	B	×
1616/57	Chased decoration, vertical ribbing	Mikulčice, church 3	580	20.8	13.2	18.4	Small	B	B	×
w/o ID No.	Undecorated	Mikulčice, church 2	2032	16.2	9.4	13.9	Small	A	B	×
w/o ID No.	Undecorated	Mikulčice, church 2	2032	15.4	9.6	13.6	Small	A	B	×
4883/65	Soldered decoration, poppyseed granulation in ornament	Mikulčice	827	21.2	15.6	15.1	Small	A	C	Yes – glass inlay, bottom pole
294/57	Soldered decoration, poppyseed granulation in ornament	Mikulčice, church 3	300	19.3	13.5	14.2	Small	A	A	?
100c/57	Combined decoration, polyhedral	Mikulčice, church 3	318	24.8	19.5	17.6	Small	A	C	Yes – glass inlay, bottom pole
100d/57	Combined decoration, polyhedral	Mikulčice, church 3	318	25.8	21	17.6	Small	A	C	Yes – glass inlay, bottom pole
4481/57	Combined decoration, polyhedral	Mikulčice, church 3	318	24.8	19.6	17.8	Small	A	C	Yes – glass inlay, bottom pole
862a/57	Soldered decoration, filigree	Mikulčice, church 3	440	26.5	20.2	19.5	Small	A	B	Yes – at loop
862b/57	Soldered decoration, filigree	Mikulčice, church 3	440	26.4	20.9	19.1	Small	A	B	Yes – at loop
1122a/57	Soldered decoration, double-shelled	Mikulčice, church 3	505	26.1	20.3	22	Medium	A	C	Yes – bosses, multiple locations
1122b/57	Soldered decoration, double-shelled	Mikulčice, church 3	505	25.5	20.3	22.3	Medium	A	C	Yes – bosses, multiple locations
1422a/57	Combined decoration, polyhedral	Mikulčice, church 3	553	25.1	16.4	18	Small	A	C	Yes – glass inlay, bottom pole
1422b/57	Combined decoration, polyhedral	Mikulčice, church 3	553	25.8	16.7	17.8	Small	A	C	Yes – glass inlay, bottom pole
4450/57	Undecorated	Mikulčice, church 2	71	11.4	7.8	8.7	Small	A	B	×
4451/57	Undecorated	Mikulčice, church 2	71	11.2	7.4	8	Small	A	B – crossed legs	×

Tab. 16.1. Metric characteristics and production processes of gold gombíky from Mikulčice. Table continues on next page.

Inv. No.	Description	Site	Grave	Au – shell [%]	Au difference in pair [%]	Ag [%]	Cu [%]	Au – loop [%]
781/57	Chased decoration, vertical ribbing	Mikulčice, church 3	425	92.82	×	5.21	1.98	88.16
1897/57	Chased decoration, plant ornament	Mikulčice, settlement	×	86.32	×	11.63	1.4	79.83
606/57	Chased decoration, plant ornament	Mikulčice, church 3	380	97.98	×	1.59	0.42	92.16
1120/57	Chased decoration, plant ornament	Mikulčice, church 3	490	70.18	×	29.35	0	×
1616/57	Chased decoration, vertical ribbing	Mikulčice, church 3	580	83.73	×	16	0.44	78.92
W/o ID No.	Undecorated	Mikulčice, church 2	2032	85.41	0.69	9.93	5.04	×
W/o ID No.	Undecorated	Mikulčice, church 2	2032	86.1	0.69	11.02	2.89	×
4883/65	Soldered decoration, poppyseed granulation in ornament	Mikulčice, church 11	827	97.48	×	2.58	0.01	×
294/57	Soldered decoration, poppyseed granulation in ornament	Mikulčice, church 3	300	93.96	×	5.71	0.15	98.31

Tab. 16.2. Elemental composition of gold gombíky from Mikulčice. Complete data – including spectra – are stored in the Zenodo platform (Zenodo Gold gombiky). Table continues on next page.

Loop legs	Diameter of smaller circle on bottom pole [mm]	Compass bottom pole	Number of ribs	Loop round wire diameter [mm]	Loop wire shape	Perforation direction of loop hole	Beaded wire – top seam	Pattern (punching) size 1/size 2 [mm]	Granule diameter 1/ diameter 2 [mm]	Diameter of beaded wire ring (at the beads) [mm]	Traces of drawing decoration	Lengthwise groove on loop
Straight	3	No	8	0.83	Round	×	×	0.4/0.33	×/×	×	Yes	Yes
Splayed	1.14	No	×	×	Square, smooth	Out	×	0.36/0.23	×/×	×	Yes	No
Straight	×	No	×	×	Square, profiled	×	No	0.47/0.39	×/×	1.15 (wider of two)	Yes	No
Slightly splayed	Not measured	Yes?	×	0.95	Round	×	Yes	0.3/0.25	×/×	0.69	Yes	No
Straight	2.04	No	8	1.28	Round	×	No	×/×	×/×	1.16	Yes	No
Slightly splayed	×	No	×	0.9	Round	×	No	×/×	×/×	0.92	×	No
Slightly splayed	×	No	×	0.86	Round	Out	No	×/×	×/×	0.98	×	No
Straight	×	×	×	×	Square, profiled	Out – (bottom pole)	Yes	×/×	0.49/0.63	0.54	No	No
Straight	×	No	×	×	Square, smooth	×	No	×/×	0.44/0.38	0.83	Yes	No
Straight	×	×	×	1.37	Round	Out	No	×/×	0.76/×	1.12	Yes	Yes?
Straight	×	×	×	1.38	Round	Out	No	×/×	0.79/×	1.11	Yes	Yes?
Straight	×	×	×	1.43	Round	×	No	×/×	0.79/0.84	0.98	Yes	No
Straight	3.22 (boss)	×	×	1.18	Round	Out	Yes	×/×	×/×	0.55	No	No
Straight	3.0 (boss)	×	×	1	Round	×	Yes?	×/×	×/×	0.53	No	No
Straight	2.44 (boss)	×	×	×	Square, profiled	×	Yes	×/×	0.25/0.3	0.73	No?	No
Straight	2.3 (boss)	×	×	×	Square, profiled	×	Yes	×/×	0.5? (according to scale)/×	0.79	No?	No
Straight?	×	×	×	1.44	Round	×	No	0.49 (depression)/ 0.49 (depression)	0.55/×	0.95	No	No
Straight?	×	×	×	1.43	Round	×	No	0.44 (depression)/×	0.58/×	0.71	No	No
Straight	×	No? (damage)	×	0.58	Round	Out	×	×/×	×/×	×	×	No?
Straight	×	Yes	×	0.57	Round	Out	Yes	×/×	×/×	0.6	×	No?

Inv. No.	Description	Site	Grave	Au – shell [%]	Au difference in pair [%]	Ag [%]	Cu [%]	Au – loop [%]
100c/57	Combined decoration, polyhedral	Mikulčice, church 3	318	99.31	4.35/1.72 (trio)	0.7	0	×
100d/57	Combined decoration, polyhedral	Mikulčice, church 3	318	94.96	4.35/1.72 (trio)	4.76	1.01	×
4481/57	Combined decoration, polyhedral	Mikulčice, church 3	318	97.59	4.35/1.72 (trio)	2.41	0	97.86
862a/57	Soldered decoration, filigree	Mikulčice, church 3	440	99.99	1.87	0.01	0	93.71
862b/57	Soldered decoration, filigree	Mikulčice, church 3	440	98.12	1.87	0.14	1.91	87.37
1122a/57	Soldered decoration, double-shelled	Mikulčice, church 3	505	93.05 (boss)	4.2	4.24	3.56	×
1122b/57	Soldered decoration, double-shelled	Mikulčice, church 3	505	88.85 (boss)	4.2	11.2	4.38	84.46
1422a/57	Combined decoration, polyhedral	Mikulčice, church 3	553	95.8	2.55	2.87	1.13	96.79
1422b/57	Combined decoration, polyhedral	Mikulčice, church 3	553	93.25	2.55	5.15	1.13	95.25
4450/57	Undecorated	Mikulčice, church 2	71	83.42	15.48	10.09	6.5	×
4451/57	Undecorated	Mikulčice, church 2	71	98.9	15.48	0.38	0.66	×

3. Results

3.1 Gold gombíky from Mikulčice–Kopčany

Gold gombíky from the Mikulčice–Kopčany agglomeration fall relatively evenly into all categories of decoration: five gombíky have chased decoration, six are decorated by soldering filigree and/or granulation, five gombíky combine chased and soldered decoration, while four are undecorated. The detailed typological spectrum includes gombíky with chased plant decoration, with vertical ribbing, double-shelled, with poppyseed granulation, with filigree wires, with combined chased and soldered decoration (i.e. polyhedral with glass inlays) and undecorated (Tab. 16.1; typology after Krupičková 2024, 34–40).

Gold gombíky from the Mikulčice–Kopčany agglomeration are most often small (up to 2 cm in diameter) and the shell construction consisting of two hammered hemispheres soldered together predominates. In the vast majority of cases, the design of the attachment mechanism takes the form of a split loop (variant B, 19 artefacts in total), while seven split loops were also equipped with a ring. Previously, it was generally assumed that the rings served a practical function, namely to strengthen the entire attachment mechanism. The ring was therefore illustrated as a massive piece of wire inserted into a hole with a split loop (Fig. 16.1: 1). However, a detailed analysis of the gold gombíky shows that the rings did not always serve a practical function, but could also have been a purely aesthetic feature. We therefore encounter both 'classical' loops extending into the interior of the artefact, as well as artefacts showing a subtle design in the form of a thin wire soldered to a ring (Fig. 16.2: 1; for details, see Subchapter 3.4). X-ray images reveal that the legs of the loops extending into the gombík are always straight and their length does not exceed half the height of the gombík shell (Fig. 16.3: 1–3).

On most gombíky, it is not possible to identify a pressure relief hole that would protect them from tearing during soldering (Ottenwelter et al. 2020, 9;

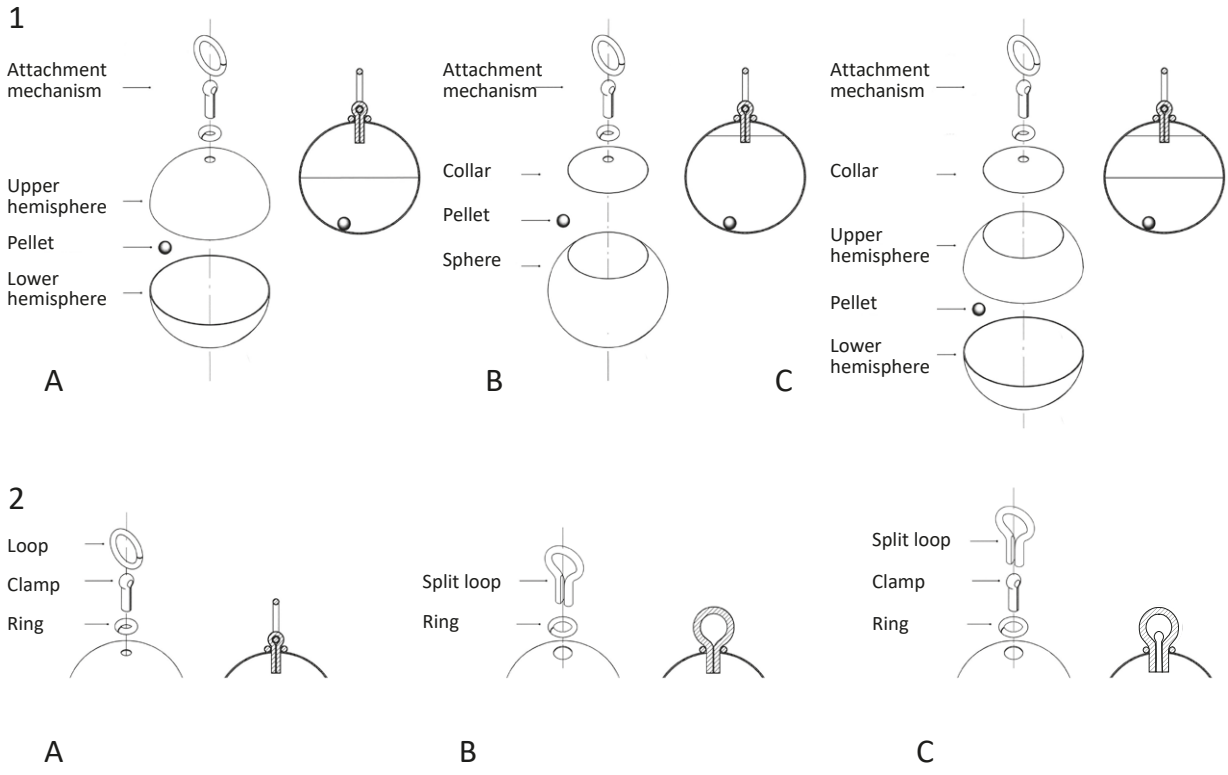
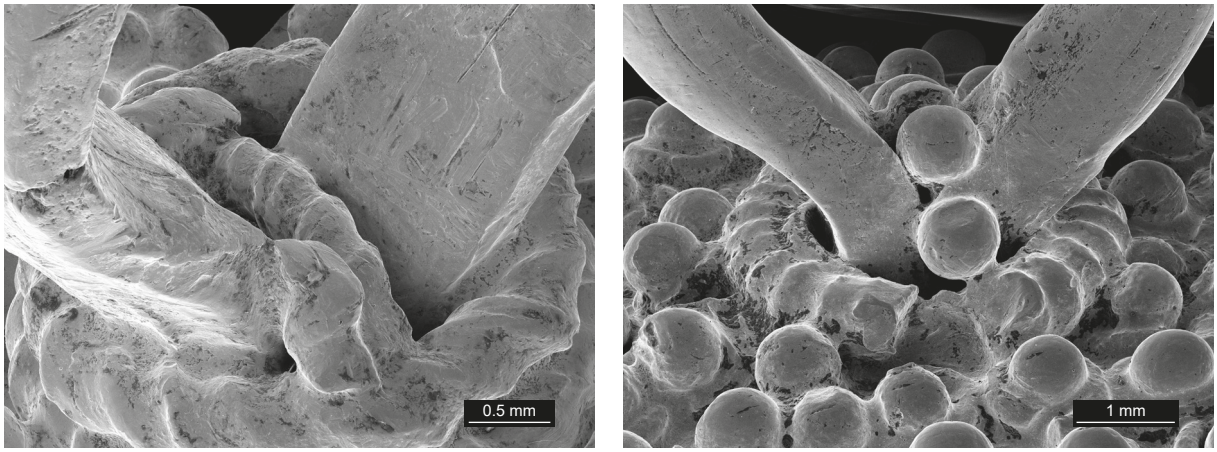


Fig. 16.1. Types of gombíky construction. 1 – different type of shell construction (A – with two hemispheres, B – with one sphere, C – combination of both); 2 – different types of attachment mechanism (A – loop-clamp-ring, B – split loop-ring, C – split loop-clamp-ring). After Ottenwelter et al. 2020, Fig. 8. Graphics by Z. Pavková.



1 2

Fig. 16.2. False 'clamp'. 1 – gombík 1122b/57, Mikulčice; 2 – gombík 105633, Staré Město – Na Valách. SEM images by M. Płygawko.

Ottenwelter 2022, 168, 170, 172, 181). A pair of gombíky from grave 440 with soldered filigree decoration are an exception (Fig. 16.4: 1). Holes hidden beneath bosses or glass inserts on the 10 Mikulčice gold gombíky could have functioned as pressure relief holes (Fig. 16.4: 2). Holes in the shell were punched outwards whenever detectable (Fig. 16.4: 1–3).

The gold wires from which the loops of the gombíky from Mikulčice–Kopčany were made had a variety of shapes in cross-section, most often round with flattened ends, indicating the production of the wire employing a drawing plate and the use of pliers in shaping the split loop (Fig. 16.5: 1).[8] In addition, there were two other specific wire profiles. The first is wire with a rectangular/square cross-section, with which a hammer was likely used to shape the loop (with facetted surface – cf. Oddy 1977, 83, Fig. 5: e). It was used on two gombíky found at Mikulčice – one with chased plant decoration (1897/57), the other with poppyseed granulation in the ornament (294/57), though the size of the wire is different and the loops were not created by cutting the same piece of wire (Fig. 16.5: 3, 4). Other gombík loops crafted from wire with a rectangular cross-section feature more detailed profiling in the form of a rib running along the entire length of the wire. Three double-shelled gombíky with a gombík decorated with poppyseed granulation featuring a motif of crosses have this central rib that is so similar that it is possible to assume the same origin of the wire used to make their loops (see details below in Subchapter 3.4). Beaded wire was used to decorate the majority of gombíky, typically in the form of a ring surrounding the entrance of the loop into the body of the gombík. Most beaded wires had individual beads in a regular size with a visible medial seam (*Äquatorschnitt*), which is usually evidence of the production of beaded wire by means of a hand-rolling swage, typically double-edged (Fig. 16.6: 1–3) (Whitfield 1998; Duczko 1985). On ten gombíky, it was not possible to distinguish the seam on the beads of beaded wire, so it is theoretically possible to consider their production using Theophilus' *organarium* (Hawthorne, Stanley Smith 2020, 88–90). This applies in particular to the gombík with vertical ribbing from grave 580, as well as to a pair of undecorated gombíky from grave 2032, the beaded wire of which shows a clear edge separating the beads from the spaces between them (Fig. 16.6: 7–9). A pair of double-shelled gombíky with bosses and appliqués from filigree from grave 505 have a specific type of spiral-beaded wire (Fig. 16.6: 10) soldered to them. This wire was made using a single-edged swage applied at an oblique angle.

The diameters of the spiral-beaded wire was variable, in the range of 0.54 to 1.16 mm in diameter (at the beads). Paired gombíky were most similar to one another. Likewise, the size of the applied granules fluctuated considerably, even on a single gombík, in the range of tenths of a millimetre (see Tab. 16.1). The thickness of the sheet metal from which the gold gombíky were made could not be reliably measured. All of the Mikulčice artefacts are in a complete state that does not allow the edge of the sheet metal to be seen; the edge of the sheet

8 No evidence suggests that block twisted wire appeared in Great Moravia (for more on the terminology, see Oddy 1977; for the beginnings of wire production on a drawing plate, see Ogden 1991).

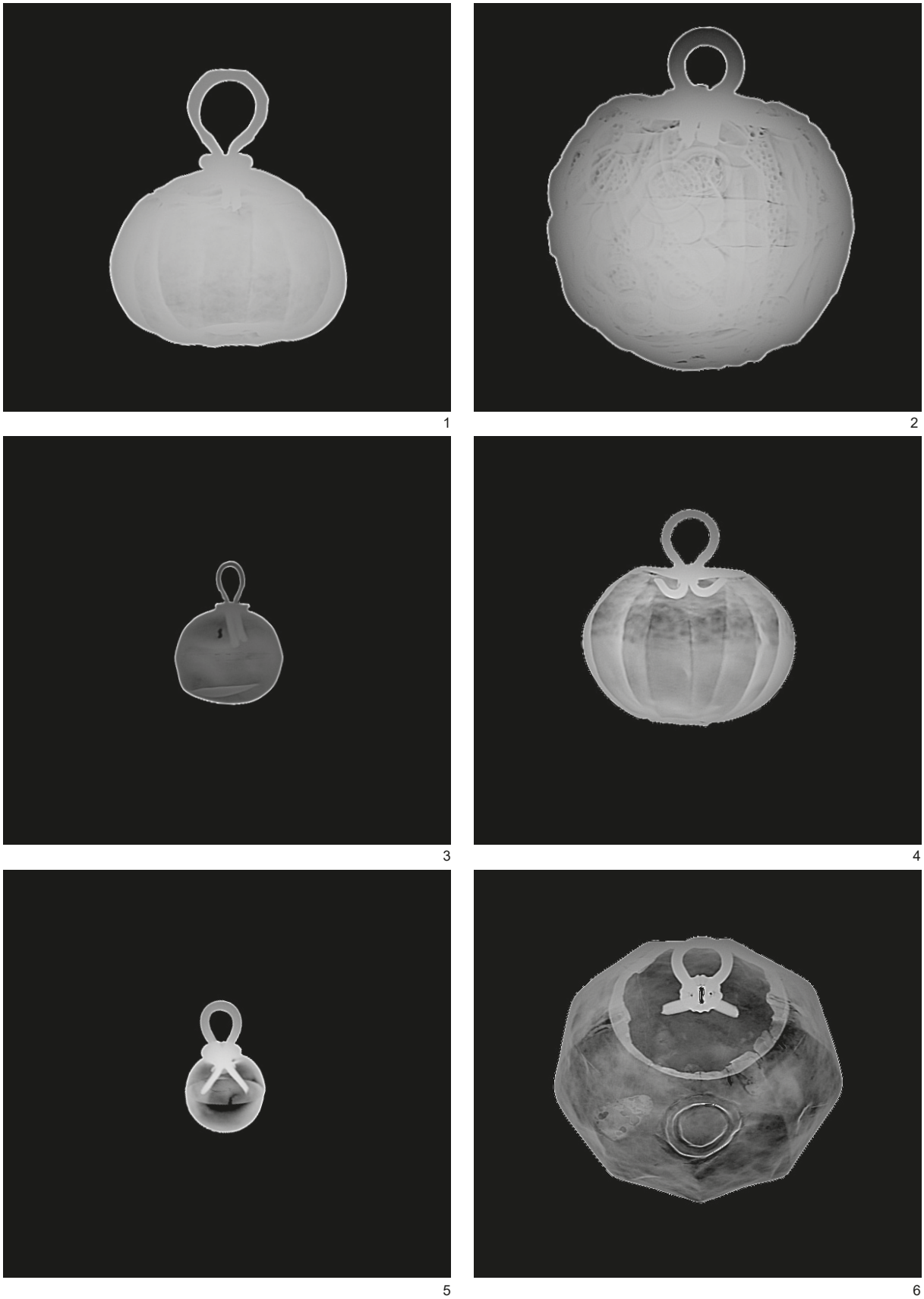


Fig. 16.3. Details of loop legs. 1 – gombík 1616/57, Mikulčice; 2 – gombík 606/57, Mikulčice; 3 – gombík 4451/57, 4 – gombík 105702, Uherské Hradiště – Sady; 5 – gombík 105652, Staré Město – Na Valách; 6 – gombík 105661, Staré Město – Na Valách; Mikulčice. X-ray images by J. Fořtová, M. Fořt. Scale 2 : 1.

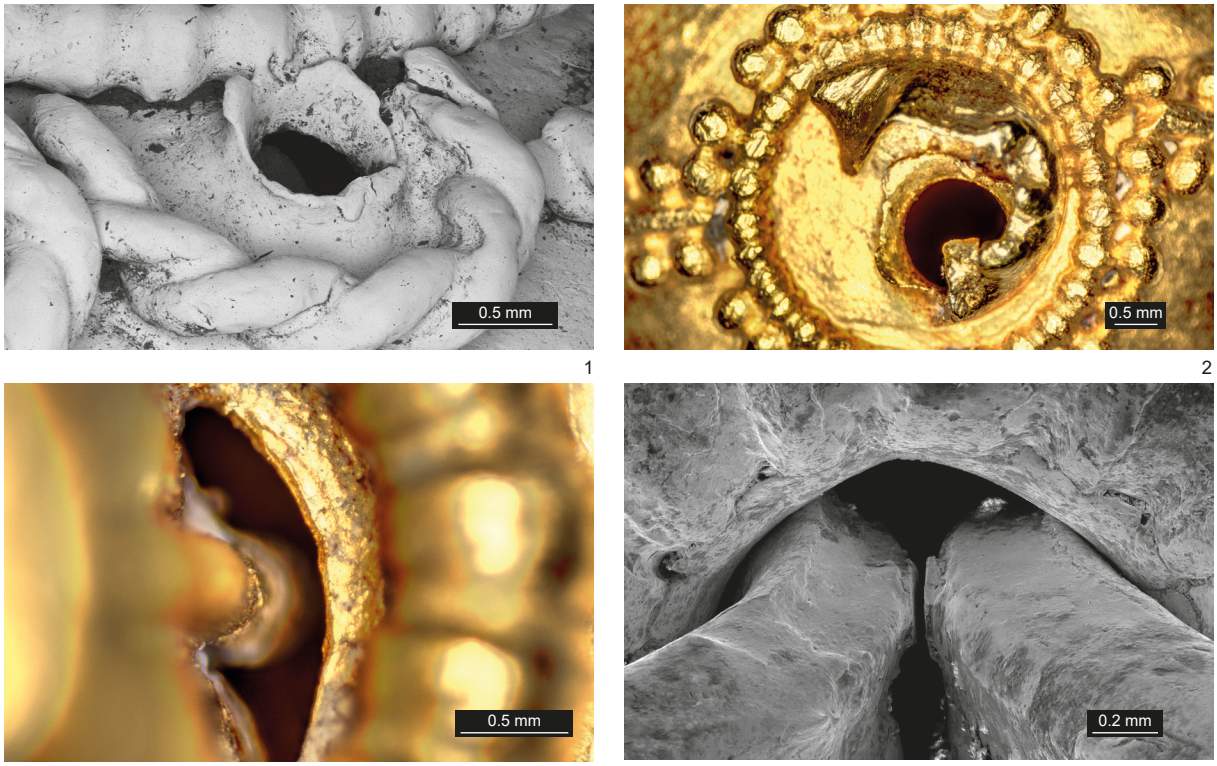


Fig. 16.4. Holes in shell. 1 – pressure relief hole, gombík 862a/57, Mikulčice; 2 – pressure relief hole, gombík 4483/57, Mikulčice; 3 – hole for loop, gombík 100d/57, Mikulčice; 4 – hole for loop, gombík 105652, Staré Město – Na Valách. Photos by Š. Krupičková, SEM images by M. Płygawko.



Fig. 16.5. Loop wire profile. 1 – impression of pliers, gombík 4481/57, Mikulčice; 2 – impression of pliers, gombík 105634, Staré Město – Na Valách; 3 – rectangular/square cross-section wire, gombík 294/57, Mikulčice; 4 – rectangular/square cross-section wire, gombík 1897/57, Mikulčice. Photo by Š. Krupičková.

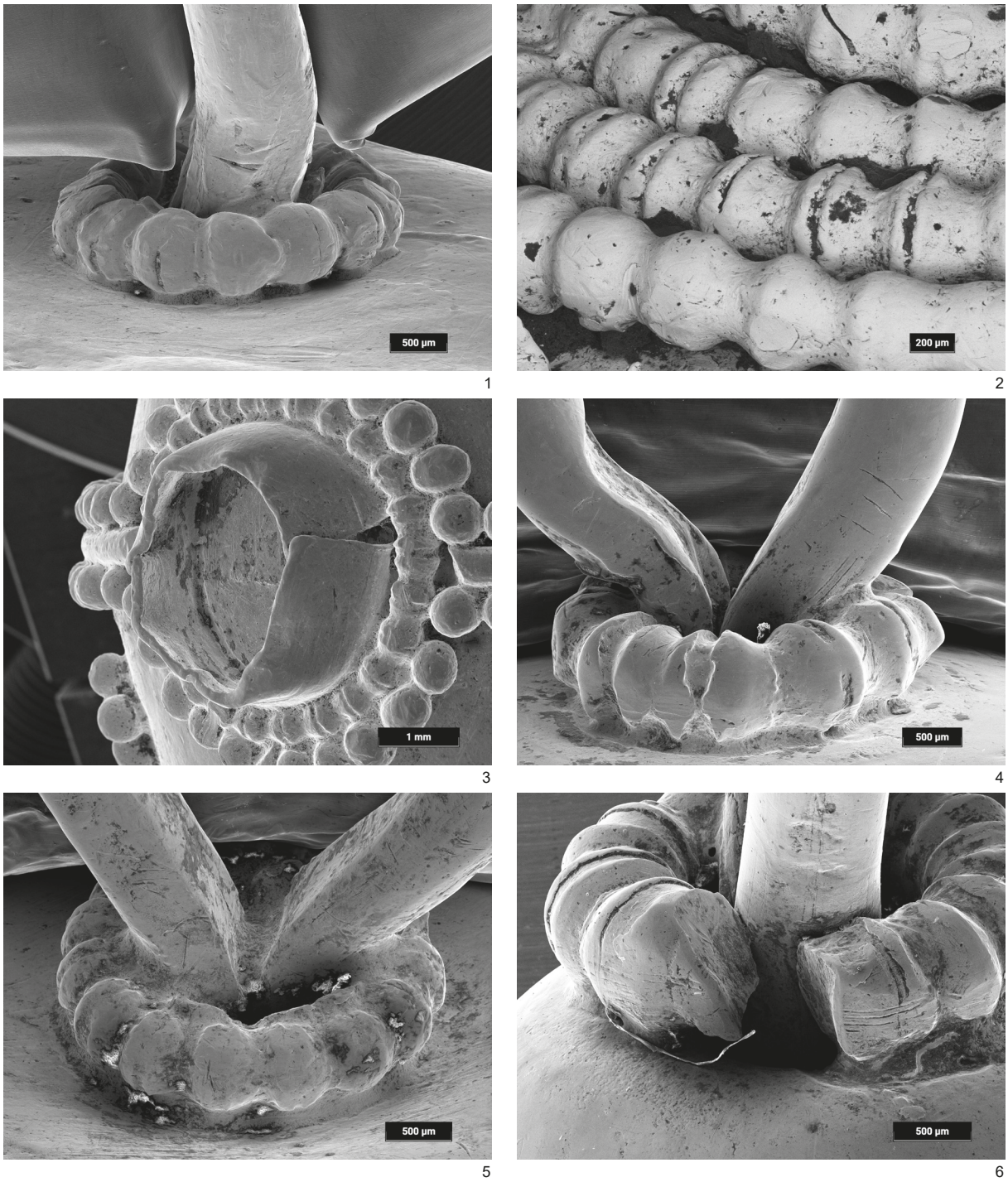
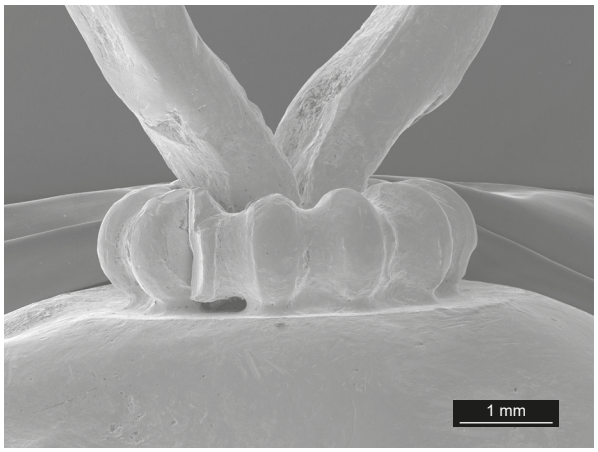
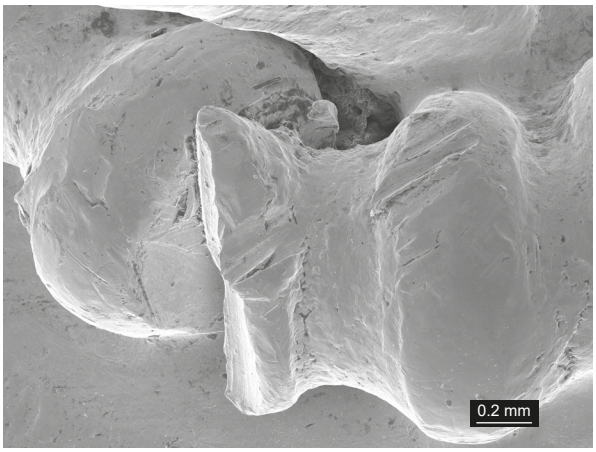


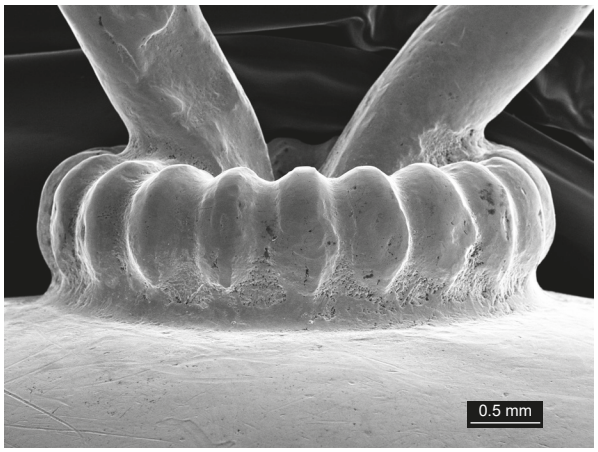
Fig. 16.6. Form of beaded wire. 1 – with seam, gombík 1120/57, Mikulčice; 2 – with seam, gombík 862a/57, Mikulčice; 3 – with seam, gombík 4483/65, Mikulčice; 4 – with seam, gombík 105703, Uherské Hradiště – Sady; 5 – with seam, gombík 105695, Uherské Hradiště – Sady; 6 – with seam, gombík 105661, Staré Město – Na Valách; 7, 8 – regular seamless, gombík 1616/57, Mikulčice; 9 – regular seamless, gombík without inv. No., grave 2032, Mikulčice; 10 – spiral-beaded wire, gombík 1122a/57, Mikulčice; 11 – regular seamless, gombík 105684, Staré Město – Na Valách; 12 – spiral-beaded wire, gombík 105628, Staré Město – Na Valách. SEM images by M. Płygawko. Figure continues on next page.



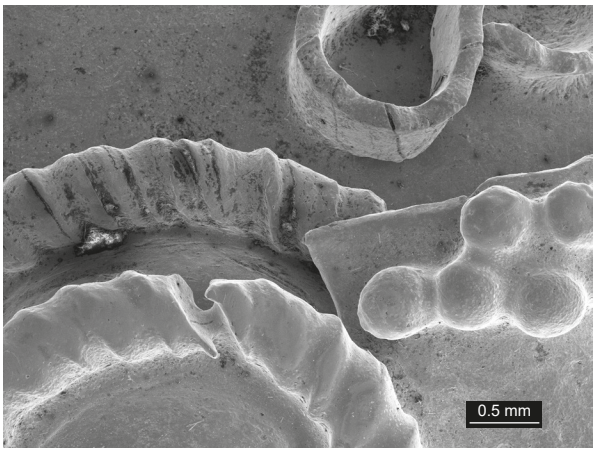
7



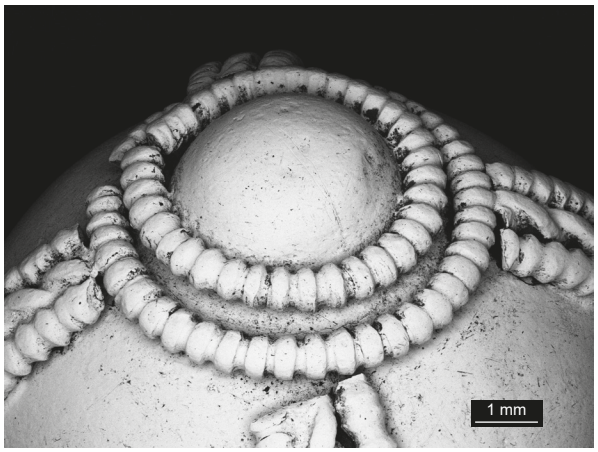
8



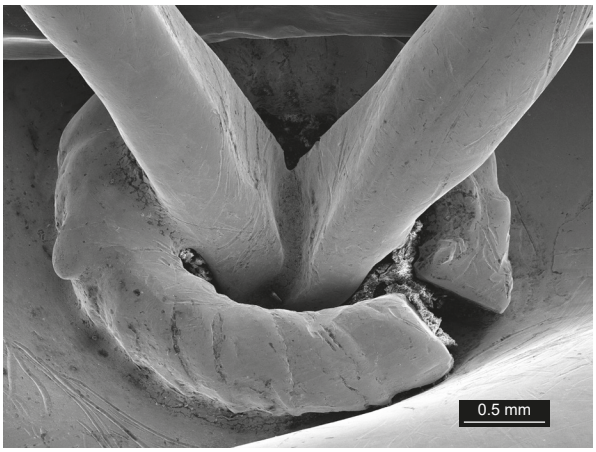
9



10



11



12

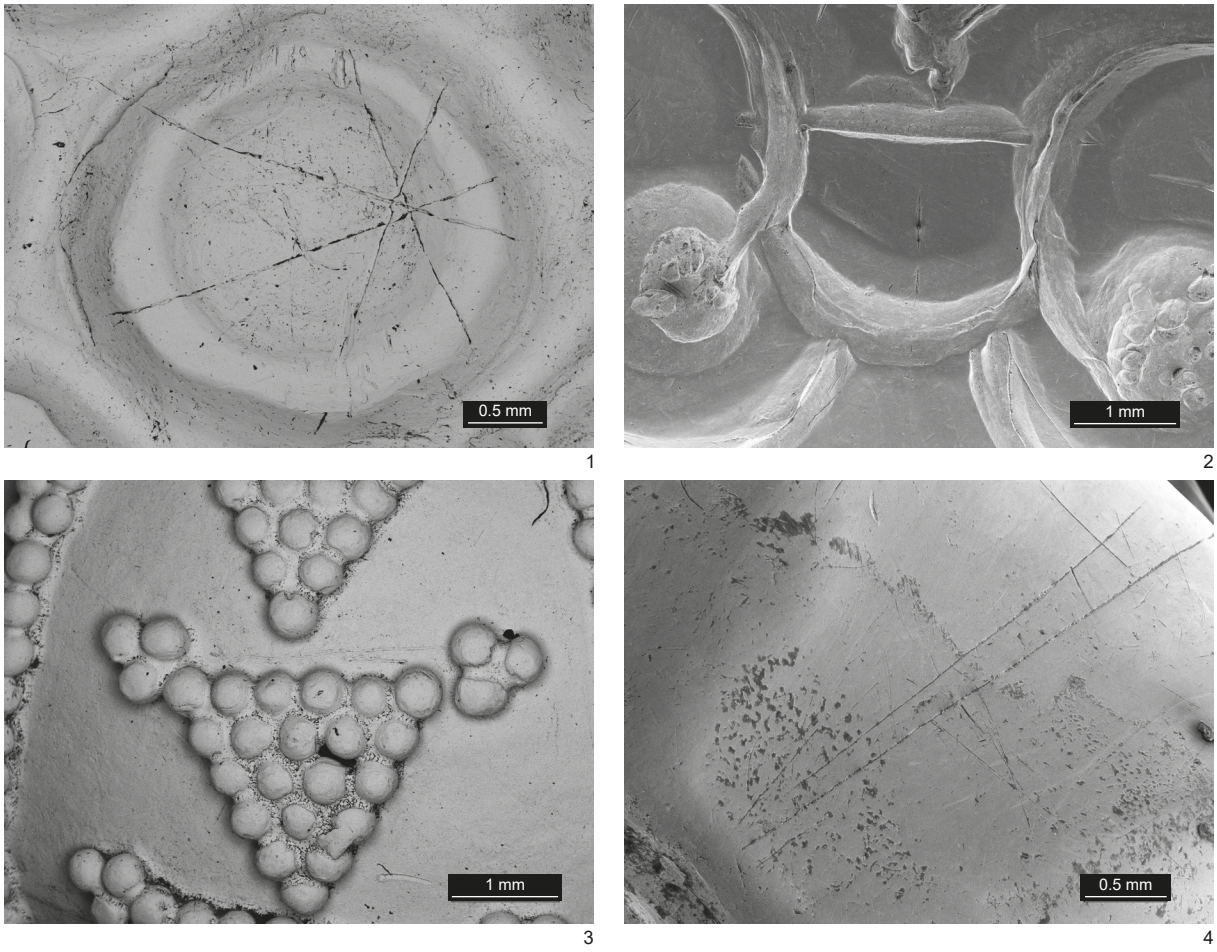


Fig. 16.7. Traces of surface decoration layout prior to chasing. 1 – lower pole of gombík 1616/57, Mikulčice; 2 – sphere of gombík 1897/57, Mikulčice; 3 – upper hemisphere with granules of gombík 294/57; 4 – sphere of gombík 105703, Uherské Hradiště – Sady. SEM images by M. Płygawko.

metal is visible only on the collars of artefacts with a type B shell construction, but the collar sheet metal is usually smoothed to the surface of the shell, which distorts the thickness of the sheet metal, and therefore this value was not compared.

A pattern was found on four gold gombíky; the imprints of the punching tools are similar in size, but do not have a similar shape of the striking surface (for more information, see Subchapter 3.4). On gombíky with chased plant decoration and vertical ribbing, preparatory lines always appeared, having been laid out on the surface by the artisan prior to hammering (Fig. 16.7: 1, 2). In one case, preparatory lines also appeared on a gombík with soldered decoration – inv. No. 294/57 decorated with poppyseed granulation (Fig. 16.7: 3). Longitudinal grooves along the entire length of the wire of the loop, which could be evidence of wire production using a drawing plate, were only occasionally observed. Four from five gombíky with chased decoration (i.e. with vertical ribbing and plant ornament) had a chased circle on the lower pole opposite the loop. This was always created with rounded, solid, single-track instrument of dimensions in the range of 1.68–1.8 mm in diameter – it could be one and the same instrument used for chasing all of them (Fig. 16.8: 1–4).

Gold gombíky from Mikulčice reach an average of 88.16% Au in the alloy, which is supplemented by 9.47% Ag and 2.32% Cu (Tab. 16.2).[9] The content of trace elements was not determined due to the methodology and instrumentation used. Typological groups with above-average gold purity include undecorated gombíky and gombíky with soldered filigree and/or

9 Values were calculated based on the average of the elemental composition of all artefacts in a given category (the value for each gombík was derived as the median of five shell measurements, as stated above in Subchapter 2.2). Complete data – including spectra – are stored in the Zenodo platform (Zenodo Gold gombíky).

granulation decoration (including polyhedral artefacts, which also have chased decoration and glass inlays). In contrast, gombíky with vertical ribbing and those with chased plant ornament show below-average purity. Of the 11 gombíky for which the composition of the loop was also measured, the loop purity in seven cases is lower than the shell purity. However, the differences in the purity of the loop and the shell do not have a stable character that would suggest a systematically applied deliberate treatment of the gold (e.g. with the aim of producing a stronger loop).

None of the finds contained any remnants of textile material (which is not surprising given the absence of heavy corrosion processes in gold). All of the gold gombíky are in good condition; in addition to traces of manufacturing tools, some of them show signs of period use or traces of modern manipulation. An analysis of impressions of production tools and traces of the period use of gombíky are currently the subject of intensive research and are being processed into separate publications. Evidence of manipulation of the Mikulčice gold gombíky as part of older conservation and restoration interventions includes, in particular, the remains of silicone sealants in which the objects were cast for the purpose of producing replicas, as well as the subsequent intensive cleaning of some of the gombíky (e.g. including traces of blasting – for details on older conservation and restoration interventions, see Krupičková et al. 2025, 74–80).

3.2 Gold gombíky from Staré Město – Uherské Hradiště

Gold gombíky from the cemeteries in Sady in Uherské Hradiště and Na Valách in Staré Město include specimens with chased and soldered decoration, as well as undecorated gombíky. The category of gombíky with chased decoration is represented exclusively by gombíky with vertical ribbing. An extraordinary concentration of this type of gombík was found in the cemetery in Sady, where a total of five artefacts were found in two graves (out of 6 local gold gombíky and 21 metal gombíky found in total at this cemetery). The gombíky with soldered decoration include a pair with full-surface granulation, a pair with filigree wires, and one gombík with poppyseed granulation forming geometric ornament on the surface. The remaining six gold gombíky were undecorated (Tab. 16.3).

Most of the gold gombíky from the Staré Město – Uherské Hradiště agglomeration were small in size (sometimes at the upper end of the 2 cm limit), only two specimens exceeded the medium-sized category (a pair with full-surface granulation from grave 282/49 at the Na Valách cemetery). The design variants of the gombík body include both variant A (made of two hemispheres) and variant B (made of a single piece of sheet metal closed by a collar), which is mainly represented by gombíky with vertical ribbing. The attachment mechanism is always in the form of a split loop (variant B); in one pair, the space between the legs of the loop was provided with a band of granulation, evoking a 'clamp' (Fig. 16.2: 2; see Subchapter 3.4 for details). The shape of the loop legs was visible on sixteen loops thanks to X-ray images. Five gombíky have straight legs (gombíky without decoration predominate), but eleven gombíky have legs that are fully or slightly splayed to the sides (Fig. 16.3: 4–6).[10] The largest number of gombíky with open loop legs within a single typological group is represented by seven gombíky with vertical ribbing. A pair of gombíky from grave 167/51 from the Na Valách cemetery has a loop coiled in the part above the gombík shell. No pressure relief hole for soldering was found on a gombík at the Staré Město – Uherské Hradiště agglomeration. On seven gombíky, the hole for the loop was likely perforated outward from the inside, i.e. the strike from the pointed tool was directed from the inside of the shell (Fig. 16.4: 4). However, the opening on the majority of gombíky was so well covered (by a ring, the loop legs and solder) that the direction of the perforation could not be determined. With just one exception, all the loops in Staré Město – Uherské Hradiště were profiled as round with flattening or bevelled at the points of entry into the shell of the gombík, as evidence of shaping the wire with pliers (Fig. 16.5: 2).

On five gombíky from Staré Město – Uherské Hradiště, more longitudinal grooves appeared along the entire length of the wire of the loop, which can be interpreted as a trace of the use of a drawing plate during the production of the wire (Fig. 16.9). However, the wires with this groove had the same diameter only within a pair from one grave (145/51 at the Na Valách cemetery, inv. No. 105661 and 105662), so tracking the use of the same wire blank to make the loops of multiple gombíky failed.

Beaded wire appeared on 16 gombíky in some form of application. Differences in the diameters

10 An experiment showed that the legs splayed to the sides do not need to be secured with soldering and the loop holds. The experiment was performed by Martin Fořt (unpublished). However, in practice the loop was always soldered – even when its legs were splayed.

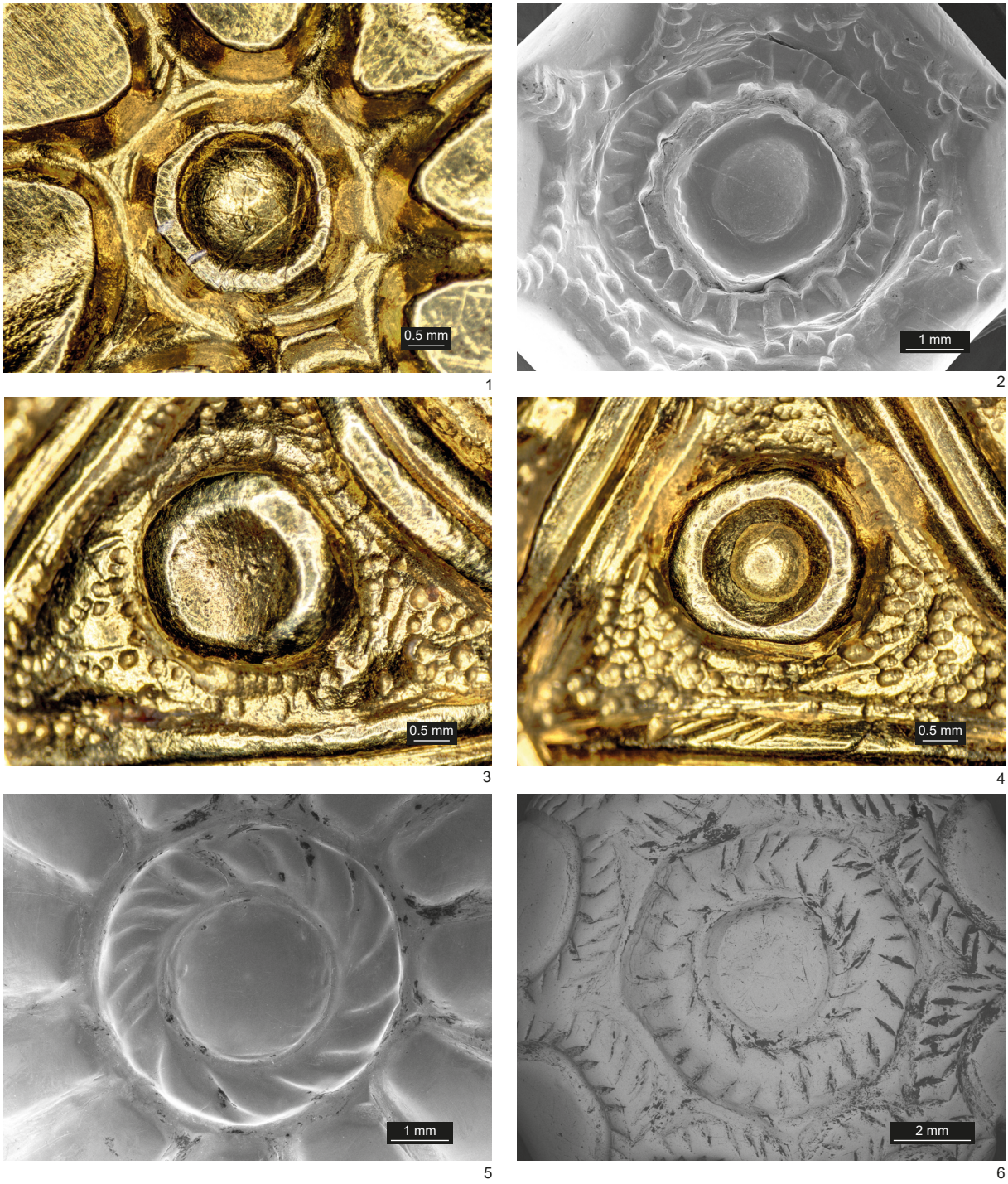
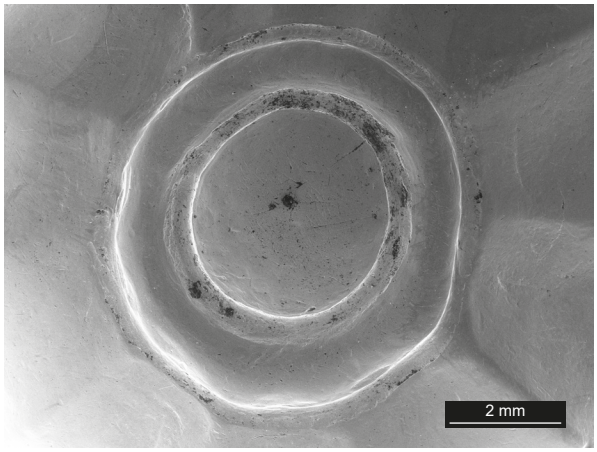
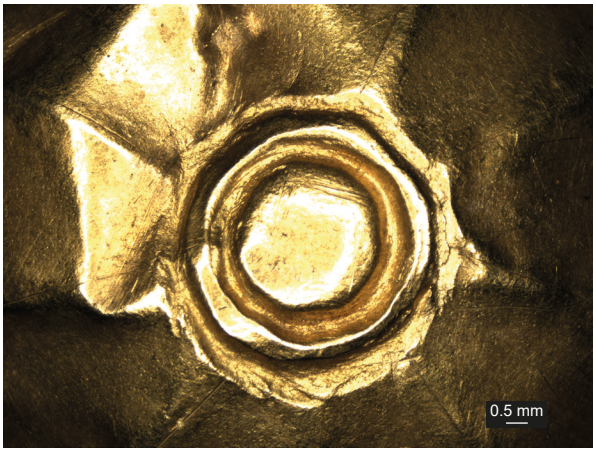


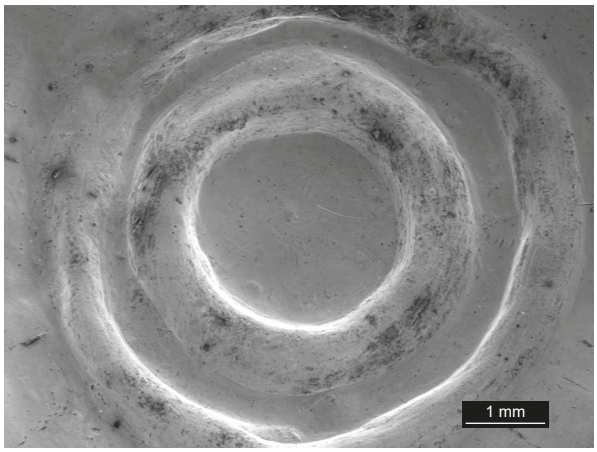
Fig. 16.8. Circle on bottom pole of gombíky with chased decoration. 1 – recessed circle, gombík 1616/57, Mikulčice; 2 – recessed circle, gombík 781/57, Mikulčice; 3 – recessed circle, gombík 1120/57, Mikulčice; 4 – recessed circle, gombík 1897/57, Mikulčice; 5 – protruding circle, gombík 105628, Staré Město – Na Valách; 6 – protruding circle, gombík 105697, Staré Město – Na Valách; 7 – protruding circle, gombík 105651, Staré Město – Na Valách; 8 – protruding circle, gombík 105652, Uherské Hradiště – Sady; 9 – protruding circle, gombík 105695, Uherské Hradiště – Sady; 10 – protruding circle, gombík 105696, Uherské Hradiště – Sady; 11 – protruding circle, gombík 105702, Uherské Hradiště – Sady; 12 – protruding circle, gombík 105703, Uherské Hradiště – Sady. SEM images by M. Płygawko, photos by Š. Krupičková. Figure continues on next page.



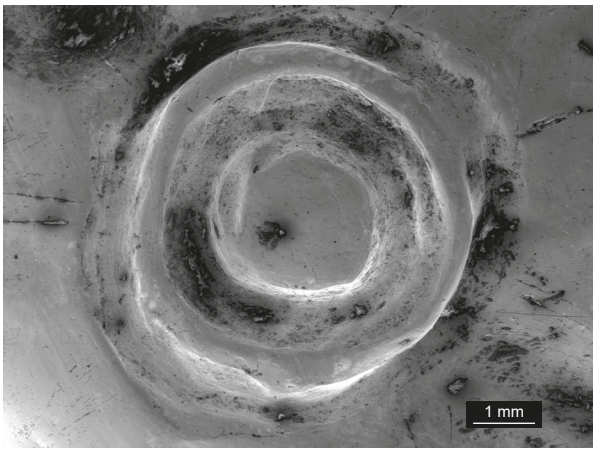
7



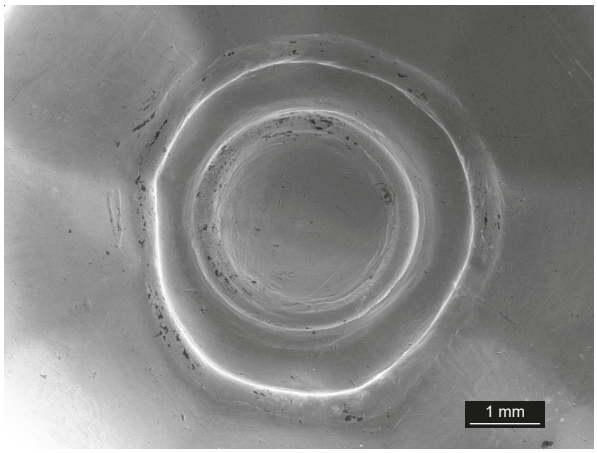
8



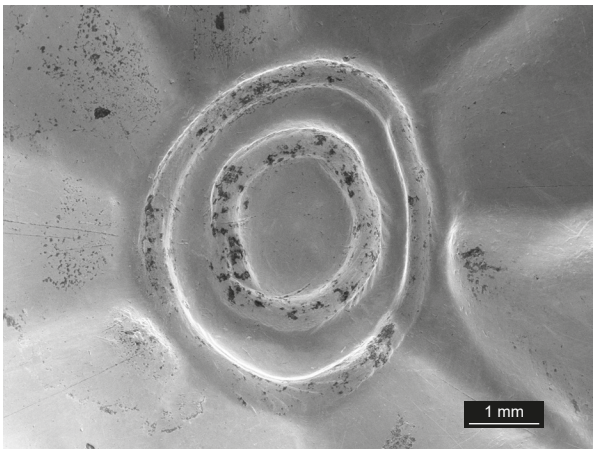
9



10



11



12

Inv. No.	Description	Site	Grave	Height with loop [mm]	Height w/o loop [mm]	Diameter [mm]	Size (small, medium, large)	Shell (A, B, C)	Loop (A, B, C)
105628	Chased decoration, vertical ribbing	Staré Město – Na Valách	78/48	17.9	13.7	18.25	Small	B	B
105651	Chased decoration, vertical ribbing	Staré Město – Na Valách	50/50	22	16.2	20	Small	B	B
105652	Chased decoration, vertical ribbing	Staré Město – Na Valách	51/50				Small	B	B
105695	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	19.5	14.3	20	Small	B	B
105696	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	19.3	14.6	19.8	Small	B	B
105697	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	17	12.9	17.8	Small	B	B
105702	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	173/59	16.8	12.5	16.4	Small	B	B
105703	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	173/59	17.9	13.6	16.2	Small	B	B
105694	Undecorated	Uherské Hradiště – Sady	16/59	15.5	10.2	11	Small	A	B
105660	Undecorated	Staré Město – Na Valách	145/51	19.1	14.6	14.9	Small	B	B
105661	Undecorated	Staré Město – Na Valách	145/51	10.6	7	6.4	Small	A	B
105662	Undecorated	Staré Město – Na Valách	145/51	10.3	7.2	6.4	Small	A	B
105667	Undecorated	Staré Město – Na Valách	167/51	17.1	9.2	9.7	Small	A	B?
105668	Undecorated	Staré Město – Na Valách	167/51	18.6	11.7	11.1	Small	A	B?
105633	Soldered decoration, full-surface granulation	Staré Město – Na Valách	282/49	27.6	20.4	21.6	Medium	Probably A	C
105634	Soldered decoration, full-surface granulation	Staré Město – Na Valách	282/49	28.4	21.7	21.4	Medium	Probably A	C
105683	Soldered decoration, filigree	Staré Město – Na Valách	193/51	20.2	14.8	14.9	Small	A	B
105684	Soldered decoration, filigree	Staré Město – Na Valách	193/51	19.6	14.8	14.9	Small	A	B
W/o ID No.	Soldered decoration, poppyseed granulation in ornament	Staré Město – Na Valách	2/08	12.2	9.2	8.9	Small	Probably A	B

Tab. 16.3. Metric characteristics and production processes of gold gombíky from Staré Město – Uherské Hradiště.
Table continues on next page.

Inv. No.	Description	Site	Grave	Au – shell [%]	Au difference in pair [%]	Ag [%]	Cu [%]	Au – loop [%]
105628	Chased decoration, vertical ribbing	Staré Město – Na Valách	78/48	53.83	×	40.35	6.30	50.36
105651	Chased decoration, vertical ribbing	Staré Město – Na Valách	50/50	90.08	×	8.03	1.88	82.67
105652	Chased decoration, vertical ribbing	Staré Město – Na Valách	51/50	88.65	×	9.33	2.04	83.94
105695	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	99.99	1.14	0.01	0.00	90.555
105696	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	98.85	1.14	1.16	0.00	89.87
105697	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	19/59	66.97	×	25.53	7.34	65.405
105702	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	173/59	90.20	11.84	8.35	1.46	84.63
105703	Chased decoration, vertical ribbing	Uherské Hradiště – Sady	173/59	78.36	11.84	18.39	3.43	74.82
105694	Undecorated	Uherské Hradiště – Sady	16/59	78.84	×	17.35	3.82	92.85

Tab. 16.4. Elemental composition of gold gombíky from Staré Město – Uherské Hradiště. Complete data – including spectra – are stored in the Zenodo platform (Zenodo Gold gombiky).
Table continues on next page.

Pressure hole design	Loop legs	Diameter of smaller circle on bottom pole [mm]	Compass bottom pole	Number of ribs	Loop round wire diameter [mm]	Loop wire shape	Perforation direction of loop hole	Beaded wire – top seam	Pattern (punching) size 1/size 2 [mm]	Granule diameter1/ diameter 2 [mm]	Diameter of beaded wire ring (at the beads) [mm]	Traces of drawing decoration	Lengthwise groove on loop
×	Splayed	3,03	No	12	0,73	Round	×	Yes? (bevelled)	×/×	×/×	0.62	Yes	No
×	Splayed	3,72	Yes	11	1,19	Round	×	Yes? bevelled, solder – deformation)	×/×	×/×	0.6	Yes	Yes
×	Slightly splayed	3,94	No	9	0,85	Round	Out	Yes	×/×	×/×	0.7	Yes	No
×	Splayed	3,68	Yes?	9	0,94	Round	Out?	Yes	×/×	×/×	0.62	Yes	No
×	Splayed	3,32	Yes	9	0,95	Round	×	Yes	×/×	×/×	0.8	Yes	No
×	x	3,28	Yes?	8	0,97	Round	×	×	×/×	×/×	×	Yes	No
×	Splayed	2,93	Yes?	9	0,97	Round	×	Yes	×/×	×/×	0.64	Yes	No
×	Splayed	2,32	Yes	9	1,05	Round	×	Yes	×/×	×/×	0.8	Yes	No
×	Straight	×	Yes?	×	0,83	Round	×	×	×/×	×/×	0.6	×	Yes
×	Straight	×	×	×	0,81	Round	×	Yes	×/×	×/×	0.75	×	No
×	Slightly splayed	×	Yes?	×	0,87	Round	Inward?	Yes	×/×	×/×	1	×	Yes
×	Slightly splayed	×	No (damage)	×	0,83	Round	Inward?	Yes	×/×	×/×	1	×	Yes
×	Straight	×	Yes	×	1,13	Round	Out	×	×/×	×/×	×	×	No
×	Straight	×	Yes	×	1,01	Round	Out?	Yes	×/×	×/×	0.8	×	Yes
?	x	×	×	×	1,21	Round	Out	No	×/×	0.8/×	0.82	×	Yes
?	x	×	×	×	1,47	Round	Out	No	×/×	0.8/×	0.92	×	No
Yes – boss, bottom pole	Slightly splayed	3,38	Yes	×	1,04	Round	Out?	No	×/×	×/×	0.69	No	No
Yes – boss, bottom pole	Slightly splayed			×	0,84	Round	×	No	×/×	×/×	0.71	No	No
×	Straight	×	×	×	×	Square, profiled	×	×	×/×	0.22/×	×	No	No

Inv. No.	Description	Site	Grave	Au – shell [%]	Au difference in pair [%]	Ag [%]	Cu [%]	Au – loop [%]
105660	Undecorated	Staré Město – Na Valách	145/51	54.29	×	30.84	14.78	62.50
105661	Undecorated	Staré Město – Na Valách	145/51	82.38	7.90	15.21	2.34	98.37
105662	Undecorated	Staré Město – Na Valách	145/51	90.28	7.90	7.55	2.00	68.08
105667	Undecorated	Staré Město – Na Valách	167/51	88.39	8.02	9.99	1.54	92.54
105668	Undecorated	Staré Město – Na Valách	167/51	96.41	8.02	2.48	1.11	95.16
105633	Soldered decoration, full-surface granulation	Staré Město – Na Valách	282/49	80.26 (granule)	13.58	2.47	0.71	97.32
105634	Soldered decoration, full-surface granulation	Staré Město – Na Valách	282/49	93.84 (granule)	13.58	8.31	5.13	84.19
105683	Soldered decoration, filigree	Staré Město – Na Valách	193/51	94.43	6.56	5.20	0.54	87.18
105684	Soldered decoration, filigree	Staré Město – Na Valách	193/51	87.87	6.56	9.73	2.36	88.39
W/o ID No.	Soldered decoration, poppyseed granulation in ornament	Staré Město – Na Valách	2/08	84.97	×	13.90	1.14	83.72

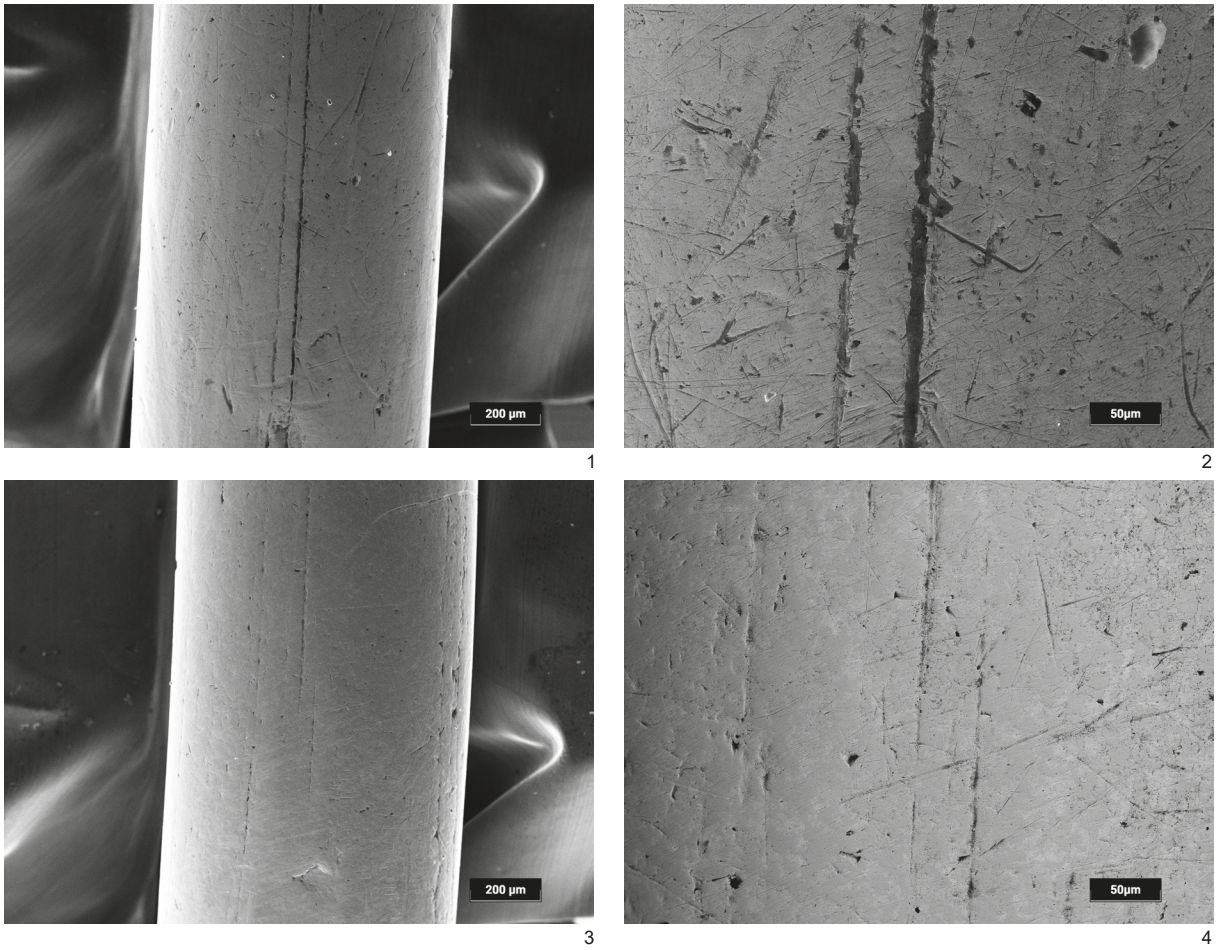
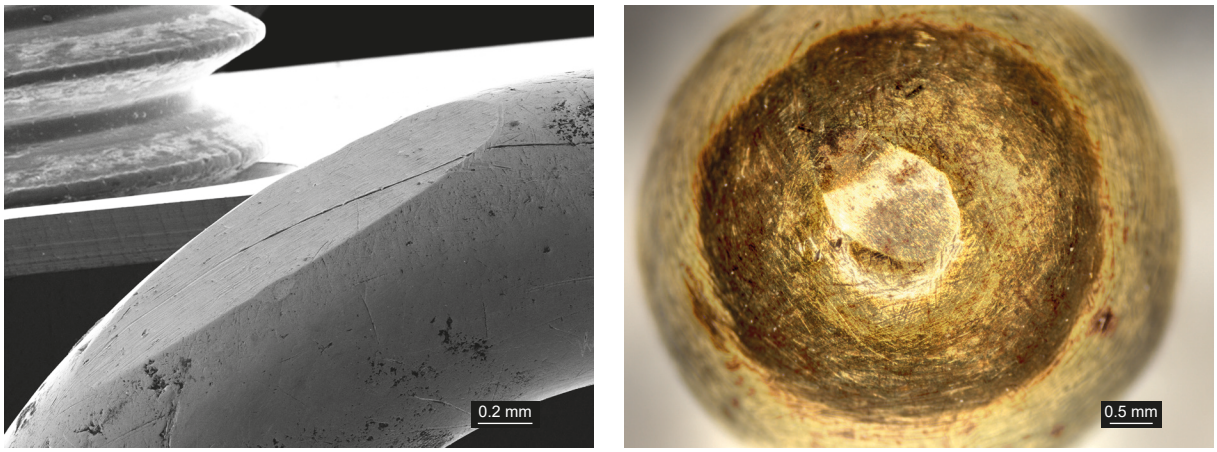


Fig. 16.9. Lengthwise grooves from drawing plate. 1, 2 – gombík 105661, Staré Město – Na Valách; 3, 4 – gombík 105662, Staré Město – Na Valách. SEM images by M. Płygawko.

of beaded wire (at the beads) ranged from 0.62 to 1 mm. Most of the beaded wires have a central seam (Fig. 16.6: 4–6) and were therefore produced using a hand-rolling swage, probably a double-pointed one (Whitfield 1998; Duczko 1985). In the case of gombík inv. No. 105684 from grave 193/51 at the Na Valách cemetery, it is possible to consider the use of an *organarium*, as the individual beads show significant separation from the spaces between them (Fig. 16:6: 11). The use of spiral-beaded wire (Fig. 16.6: 12) is also known from Staré Město – Uherské Hradiště. Differences in the diameters of the wire of round loops ranges from 0.73 to 1.47 mm. The values were closer for paired gombíky, but this was not always the case. The thickness of the sheet metal used to make the gombík shell could be measured on one artefact with a damaged surface (inv. No. 105668) and was a mere 0.1 mm (cf. Ottenwelter et al. 2020, 15; Ottenwelter 2022, 148–149).

The pattern (punching) was not applied to the gold gombíky from Staré Město – Uherské Hradiště, and the application of granules was also a relatively rare phenomenon – the granules were soldered to the surface of three gombíky and their size was the same on paired specimens. On all gombíky with vertical ribbing, traces of surface preparation prior to hammering were detected in the form of fine orientation lines (Fig. 16.7: 4), though these lines did not always correspond to the resulting shape of the ribbing – sometimes they were located near the edge (bend) of the rib and sometimes in the middle of the space between the ribs.

On gombíky with vertical ribbing, there is always a protruding circle in the middle of the lower hemisphere, which was created by chasing around the perimeter of the circle. The formation of convex circles through the impact of a single, large tool with a hollow was not proven. On the contrary, fan-shaped traces from individual blows of a thin, single-track tool are visible in the SEM images. The circles on the individual gombíky are of different sizes, which is consistent with their individual manual chasing (Fig. 16.8: 5–12).



1 2

Fig. 16.10. Traces from touchstone. 1 – gombík 105651, Staré Město – Na Valách; 2 – gombík 105662, Staré Město – Na Valách. SEM image by M. Płygawko, photo by Š. Krupičková.

Although seven gombíky contained more than 90% gold in their elemental composition, no typological group as a whole reached this percentage limit on average (Tab. 16.4). The highest purity was achieved by the group of gombíky decorated with granulation and/or filigree, while gombíky without shell decoration had the lowest purity. Fluctuations in gold content are evident in the material – not according to type groups, but in specific gombíky; lower purity is often associated with poorer production quality (e.g. on the three gombíky from grave 19/59 at Sady; this corresponds to the findings of Ottenwelter et al. 2020, 20). The individual parts of the gombíky are also not made of an alloy of the same purity. The loop had a lower purity than the shell on most gombíky (on 13 out of 19 specimens). However, the difference in the purity of the loop and the shell is not of a stable nature and seems to be random, indicating the use of different materials that were available at the time (e.g. one successively cut longer wire could have been used to make multiple loops, while the body was made of sheet metal of a different composition and perhaps even origin). This would also be consistent with the fact that a higher purity of the loop than the shell is most often found on undecorated gombíky; it seems that the material used to make the body was of lower quality, but the loop could have been added 'from stock', i.e. from wire of higher purity that the craftsman already had ready.

None of the finds from Staré Město – Uherské Hradiště had any residues of textile material. Authentic evidence of the production process includes traces of the surface layout of gombíky with chased vertical ribbing; traces of solder and its retouching, particularly visible on gombíky with undecorated shells; marks left by pliers and a broach on the loops, or production errors caused by using a flame temperature that was too high for soldering. Again, we also encounter traces of manipulation within living culture. Modern manipulation of gombíky includes the remains of silicone casting materials that were used in the 20th century to produce gombík replicas (similar to Mikulčice). A specific feature of the gombíky from Staré Město – Uherské Hradiště are traces of testing for purity using a touchstone, which appear on eight artefacts (Fig. 16.10). Given that the purity of gold objects is defined in Moravian Museum archival documentation, it is evident that the marks on the gombíky are remnants of modern activities from the second half of the 20th century.

3.3 A comparison of gold gombíky from both agglomerations

While the gold gombíky found in the two largest Great Moravian agglomerations do not fundamentally differ from each other, several characteristics can be mentioned that are significant for one or the other site. Based on a comparison of the typological spectrum of gold gombíky, it is evident that those with vertical ribbing dominate at the Staré Město – Uherské Hradiště agglomeration. Most of them represent a relatively uniform shape group, from which two gombíky (inv. No. 105628 and 105697) stand out for resembling the way the 'ribs' are formed on a pendant with enamel decoration, which were found in Bulgaria as part of the 'Preslav treasure'

(for more, see Krupičková 2025).[11] Both Mikulčice gombíky with vertical ribbing belong to the majority group with concave space between the ribs, which are also predominant in Staré Město – Uherské Hradiště. On the other hand, gold gombíky with chased plant decoration are significant for the Mikulčice-Kopčany agglomeration and have not appeared anywhere else.[12] The Mikulčice assemblage is also small and consists of three artefacts, two come from the graves of adult men (graves 380 and 490), while the third was discovered in a settlement context (inv. No. 1897/57). Stylised plant motifs are then found chased into a pair of gombíky from another male grave 553; this time they are polyhedral gombíky combining chased decoration with coarse granulation and a glass insert (inv. No. 1422a/57, 1422b/57). Chased ornament, though in the form of geometrically shaped lines, was applied to the surface of three gold gombíky from interior female grave 318. In this case, the gombíky also feature a combination of chased decoration and soldered components in the form of granulation and have a polyhedral shape (inv. No. 100c/57, 100d/57 and 4481/57). The decorative chasing of gold gombíky is therefore a Mikulčice phenomenon that does not occur in the Staré Město – Uherské Hradiště area. Likewise, combining chasing and granulation, as well as shaping the body of the gombík into a polyhedron, are production processes that are known only for gold gombíky from Mikulčice.[13] Gold gombíky with soldered decoration in the form of granulation and filigree appear at both agglomerations. Double-shelled gold gombíky as exclusive representatives of gombíky with soldered decoration are known only from Mikulčice.

While in terms of size, the gold gombíky from both agglomerations fall into the category of small gombíky up to two centimetres in diameter, the differences between the agglomerations are noticeable in the design of the shell and the attachment mechanism. The high share of gombíky with a type B shell design (one piece of sheet metal with a collar) from the Staré Město – Uherské Hradiště agglomeration is related to the local high number of gombíky with vertical ribbing, for which this design principle is characteristic. The design of the attachment mechanism also shows differences between the two agglomerations, with the differences again being linked to typological groups. On polyhedral gombíky (with combined soldered and chased decoration), as well as on gombíky with soldered decoration, there is a clamp inserted across the hole for the legs of the split loop, a characteristic detail that occurs only on gombíky from Mikulčice (consistent with the occurrence of the relevant typological groups). The only exception is an imitation of a clamp in the form of a row of stacked granules on a pair of gombíky from grave 282/49 at the Na Valách cemetery (inv. No. 105633, 105634). Only in Mikulčice did a single gold gombík have a type A loop (inv. No. 294/57), i.e. a circular one with a functional securing clamp, which is otherwise typical mainly for large gombíky made of silver or copper alloy. The way the legs of the split loop are shaped is different for gombíky made from both agglomerations (Fig. 16.3). The legs of the loop inside the shell of gombíky from Staré Město – Uherské Hradiště are regularly splayed to the sides, while in Mikulčice this design is found on only one gombík (inv. No. 1897/57 – with chased plant decoration). The high number of splayed loop legs at the Staré Město – Uherské Hradiště agglomeration causes the occurrence of this type of leg in the entire local group of gombíky with vertical ribbing.

The vast majority of gombíky from both sites (33 artefacts) had applied beaded wire, usually in the form of a ring soldered at the entrance of the loop into the shell. Neither the smooth wire of the loops nor the decorative beaded wire showed an exact match in size between the individual gombíky; greater or lesser differences always appeared even in pairs from the same grave, for which there is a strong assumption that they were deliberately made at the same time as an identical pair. For most paired gombíky from Mikulčice, the difference between the wires of paired gombíky was within 0.1 mm (Tab. 16.1), while for the gombíky from Staré Město – Uherské Hradiště, the differences between paired artefacts were slightly higher (only approximately half of the pairs had a difference of less than 0.1 mm, Tab. 16.3). The use of granulation appears more frequently in Mikulčice, and the rendering of the background

11 A pendant discovered at the Valchedram site, also in Bulgaria, likewise shows a close resemblance to the finds from Great Moravia and is now probably kept in the Regional Historical Museum in Shumen (Bulgaria). Unfortunately, the publication that the collective of authors had at their disposal does not allow for a more detailed comparison (Grigorov 2007, 252, Obr. 133: 8).

12 The artefacts from Staré Město – Špitálky are lost, see Staňa 2001, 92–93. Gombíky with chased plant decoration are numerous when it comes to artefacts made of silver and gilded copper alloys.

13 Polyhedral gombíky with geometric chasing and glass inlays ('lantern' gombíky) are also known from several other sites in the form of a gilded copper alloy (see Subchapter 3.4, or Krupičková 2020, 296, 298).

using a punched pattern is known exclusively from this site (this is largely related to the local occurrence of gombíky with chased plant ornament). On gombíky with chased decoration from both sites (i.e. on gombíky with vertical ribbing and on gombíky with plant ornament), a chased circle regularly appeared on the lower pole (opposite the loop). All circles discovered on gombíky from Mikulčice are recessed inward with a raised edge and were created by striking the centre of the lower hemisphere with a single-track tool. In contrast, all circles discovered on gombíky from Staré Město – Uherské Hradiště are convex and were therefore tapped around the circumference with a small punch (Fig. 16.8).

The gold alloy of gombíky from both agglomerations is usually made up of silver and copper in addition to the gold itself (Tab. 16.2, 16.4). Copper was not detected in several buttons and the gold is supplemented only with silver, or rather, it is almost pure gold without any admixtures (the median gold content in the alloy of the shell of two gombíky from Mikulčice is higher than 99% – inv. No. 100c/57 and 862a/57). On average, the gold content is higher by almost 4% in buttons from Mikulčice. The difference is made up for by both the increased silver content and the increased copper content in the alloy of the gombíky from Staré Město – Uherské Hradiště. The higher surface purity of the Mikulčice gold gombíky applies to all typological groups. This also applies to values measured from the shell and from the loop. Certain differences appear between individual typological groups. Based on the purity of gombíky of various types from Mikulčice, it might seem that the purity of the artefacts is influenced by the technique that was used to decorate the gombík. The lowest purity is found in gombíky with chased decoration (with vertical ribbing and plant ornament), so the explanation is that the purity of the gold was specially adjusted for the needs of chasing the decoration. But the finds from Staré Město – Uherské Hradiště do not confirm this theory. Although gombíky with vertical ribbing have a below-average gold content, even lower values were measured for undecorated gombíky. The differences in elemental composition between gombíky with soldered and chased decoration (i.e. gombíky with vertical ribbing) are not as great as in Mikulčice. The blanket justification for the lower purity of some typological categories of gombíky in connection with their production method is therefore not valid.

An interesting detail is the fact that the higher the purity of the gold used to make one pair, the more similar the pairs are to each other, both in terms of material and other technological details. As an example of the material and technological symbiosis of highly pure gombíky discovered in pairs, we can mention the gombíky with vertical ribbing from grave 19/59 from Staré Město (inv. No. 105695 and 105696, the third specimen was different), polyhedral gombíky from grave 318 from Mikulčice (inv. No. 100c/57, 100d/57 and 4481/57), also polyhedral gombíky from grave 553 from Mikulčice (inv. No. 1422a/57, 1422b/57) and gombíky with soldered decoration made of filigree wires from grave 440 from Mikulčice again (inv. No. 862a/57, 862b/57). On the contrary, with lower gold purity (below 90%), paired gombíky are more often dissimilar both in the material category (shell and loop) and in the measured diameter of the loop wire, or the beaded wire on the ring. Examples include a pair of undecorated gombíky from grave 145/51 (inv. No. 105661, 105662), a pair of gombíky with full-surface granulation from grave 282/49 (inv. No. 105633, 105634), and a pair of gombíky decorated with filigree wires from grave 193/51 (inv. No. 105683, 105684), all from Staré Město – Uherské Hradiště. More disparate pairs occur more often (albeit pairs in the single digits) among the gold gombíky from the Staré Město – Uherské Hradiště agglomeration.

Similar methods of gombík manipulation were recorded on gombíky from both agglomerations, whether this involved their use in living culture or was evidence of modern post-excavation interventions. Traces of purity tests conducted in the 20th century with a touchstone only on gombíky from Staré Město – Uherské Hradiště are exceptions.

3.4 Identification of workshops through case studies

The collective characteristics of gold gombíky from both central agglomerations (Subchapter 3.3) have already led us to the conclusion that the typological and technological spectrum of gombíky from these two centres is similar, but not identical. In our opinion, at least two different workshops working independently of each other were involved in the production of the artefacts. In this part of the chapter, we take a deeper look at the particular workshop form through specific case studies that closely monitor the consistency of characteristic production details in groups of gombíky. The combination of a larger number of these details, which indicate the production of gombíky at a common workshop, can usually only be observed within one typological

group. This is partly due to the heterogeneity of individual groups, e.g. the pattern appears mostly only on gold gombíky with chased plant ornament, glass inlays only on polyhedral gombíky, etc. Some details appear across the typological spectrum, but their occurrence does not reveal any correspondence or specific connection to other characteristic details. This includes, for example, the diameter of the beaded wire or the presence of a central seam on the beads. Some technological specifics also occur only on individual artefacts or pairs from one grave, are difficult to combine with other details and do not speak much to broader workshop contexts, as is the case, for example, with the occurrence of a pressure relief hole punched into the surface of the shell in a single pair of Mikulčice gold gombíky (grave 440, inv. No. 862a/57 and 862b/57). Given that three groups of gold gombík typologically intersect between the two sites, namely gombíky with vertical ribbing, gombíky with soldered decoration, and gombíky without decoration, the identification of characteristic details at both sites is based on artefacts from these groups.

The largest typological group of gold gombíky represented at both agglomerations is gombíky with vertical ribbing. Although two artefacts from Mikulčice are also known, this is a phenomenon of the Staré Město – Uherské Hradiště agglomeration, where eight specimens accounted for over 40% of all gold gombíky found there. For most of these gombíky, the characteristic details are so close that there can hardly be any doubt about their common origin in the same workshop. This is a group of five artefacts (inv. No. 105652, 105695, 105696, 105702, 105703; see Catalogue – gombíky with vertical ribbing), whose surface is divided by nine identical ribs bearing traces of auxiliary guide lines applied before hammering. On the lower pole, these gombíky feature a double-chased circle, which was created on all of the gombíky by gradual chasing using a single-track tool (i.e. it is not stamped with a single circular tool). All the gombíky from this group are decorated with a similar beaded wire with a central seam at the loop and the loop itself is made of wire with a round cross-section (flattened at the bottom with pliers as a result of holding the loop during its shaping).[14] It was possible to observe on two artefacts from two graves the direction of the hole for the loop in the collar – both outwards (other gombíky are soldered so heavily that this detail is not observable). The legs of the loop are always partially embedded and splayed in the body of the gombík (detail visible in X-ray images). On the other hand, the thickness of the wire of the loop and the diameter of the lower circle are details in which the gombíky do not match. The composition of the material is also heterogeneous, with a range of 78–99% gold in the alloy. We documented nearly 100% purity in shells of two gombíky from grave 19/59 (inv. No. 105695, 105696). Despite minor differences, the overall character of the products is so close that we are inclined to attribute them to a single production workshop. The mentioned differences may indicate work over a longer period of time using a variety of materials, or they indicate the processing of gold from different sources (different thickness of loops and beaded wire, different purity). Gold gombík inv. No. 105651 was similar to these five artefacts (see Catalogue – gombíky with vertical ribbing), but its shell was divided into a higher number of ribs (11), the ribs are higher and their edge is sharper than in the above group of gombíky with vertical ribbing. This latter gold gombík also has a clear trace of a compass mark on the bottom pole. The entire piece appears very confident and clean in terms of execution and could be a model for other products – a masterpiece. Two other gold gombíky with vertical ribbing from Staré Město – Uherské Hradiště are unique in terms of the character of their ribbed design, and their workshop connection to the previous group is debatable. Their surfaces are divided by grooves, i.e. exactly the opposite of the other pieces; the parts defined by the grooves are referred to as 'vertical fields'. The first one – gombík inv. No. 105628 from grave 78/48 in Staré Město – has a similarly shaped lower pole with a central circle, like the five mentioned above. The second unique artefact inv. No. 105697 was found in the same grave as another pair of gombíky with vertical ribbing (grave 19/59 in Sady), so it is possible that they were made at the same time in the same workshop. At the same time, both of these gombíky with 'vertical fields' have an extremely low gold content in the alloy (54% and 68%, respectively) and one of them also shows signs of failure during the production process (gombík inv. No. 105697 is burned and partially deformed). Both gold gombíky with vertical ribbing from Mikulčice differ from the gombíky from Staré Město – Uherské Hradiště in the number of ribs (8) and, above all, in the design of the lower pole, which, in contrast, makes them similar to each other. The circle on the lower pole is recessed

14 However, this is a common occurrence on gombíky with a split loop, which was always shaped with pliers.

and created with a single blow from a single-track tool. Together with the mounting of the ribs this decoration forms a kind of star. It is interesting to note the deposition of a gombík with vertical ribbing inv. No. 1616/57 of relatively low purity in the most important Mikulčice interior grave 580, which was located in front of the altar of the basilica and must have belonged to a leading representative of Great Moravia. One explanation for the use of low-purity gold may lie in the deliberate targeting of the metal's special colour (the low gold content and high share of silver give the metal the resulting light yellow hue). It can be summarised that gombíky with vertical ribbing may have had their primary production in the Staré Město – Uherské Hradiště agglomeration, to which at least five local gombíky probably belong. At the same time, within the Staré Město – Uherské Hradište agglomeration, we also encounter exact imitations made of less noble metal.[15] Mikulčice gombíky with vertical ribbing have their own typical common details, which correspond to a different craft style and were probably made independently in another (local?) workshop.

Gold gombíky with soldered decoration are also found at both sites. A detailed analysis of this typological group again indicates the concentration of some characteristic details in only one location. An example of the first variant (differences between gombíky from both agglomerations) is the application of filigree wire, or granules, to cover the split loop at the points where it enters the hole in the upper pole of the gombík (the clamp). This coverage appears on three gombíky from Mikulčice in the form of beaded wire (a double-shelled pair from grave 505, inv. No. 1122a/57, 1122b/57, and a gombík decorated with poppy granulation from grave 827, inv. No. 4883/65) and one pair from Staré Město in the form of separated granules imitating beaded wire (with full-surface granulation from grave 282/49, inv. No. 105633 and 105634) (Fig. 16.2). The aesthetic function of the wires (or granules) is obviously typical for this form of overlay. There is no doubt that granules cannot significantly secure the loop, but even the filigree wires on the three Mikulčice gombíky are cut only long enough to cover the opening between both sides of the ring and are soldered only to the beaded wire of the ring.[16] The three Mikulčice gombíky are thought to have been produced in a single workshop – the aforementioned application of beaded wire to cover the hole for entering the gombík is complemented by a specifically shaped wire loop, i.e. a flat wire with a distinct rib in the middle (Fig. 16.11).[17] This trio also has an identical layout of the shell surface into eight fields, and their decoration uses hundreds of small 'poppyseed' granules.[18] The granules also cover the entire surface of the gombíky with a clamp from Staré Město, but there is no further evidence for them belonging to the same production workshop as the three Mikulčice artefacts – the granules are placed on underlays of smooth wire, the clamp is not made of wire but of additional granules, and the loop has a different wire cross-section than the aforementioned trio of gombíky. We therefore lack convincing evidence of the production of a total of five gombíky with a 'fake' clamp (three from Mikulčice and two from Staré Město) within a single workshop. On the contrary, the Mikulčice trio, in our opinion, share characteristics supporting production in one workshop.

An apparent workshop similarity between gombíky with soldered decoration at both sites is represented by two pairs of gold gombíky decorated with filigree – from grave 440 at the Mikulčice basilica (inv. No. 862a/57 and 862b/57) and from

15 This is a pair of gombíky made of gilded copper alloy from the grave 209/59 at Uherské Hradiště – Sady. More gombíky with vertical ribbing were found within the agglomeration, but they do not correspond in detail to the described five with the same manufacturing style.

16 The 'clamp' covering the hole in combination with a split loop is also found on another typological variant of gombíky from Mikulčice, namely polyhedral gombíky with combined chased and soldered decoration. However, polyhedral gombíky do not feature filigree wire and the legs of the clamp are embedded in the body of the gombík. As such, we assume that this type of gombík may have been a functional clamp that held the split loop. The five polyhedral gombíky are covered separately in Subchapter 3.4.

17 The rib in the middle of the loop was created by hammering smooth round wire into a matrix with the appropriate profile. The similarity or, conversely, the variability of the profiling of wires with a central rib that were produced in a single 'matrix' should be verified experimentally. The rib in the middle of the loop is also found on two other gold gombíky – inv. No. 606/57 from Mikulčice and a gombík without an inventory number from grave 2/08 at Staré Město. Although these two gombíky expand the portfolio of this type of decoration on the loop wire and thus demonstrate its popularity, they do not have the same wire width of the aforementioned trio from Mikulčice.

18 Moreover, the decoration of these three Mikulčice gombíky all refer to Christian symbolism: the gombíky from grave 505 have filigree strips (made of hammered beaded wire) in the shape of the letter omega, and the gombík from grave 827 has granules arranged in the shape of an equal-sided cross.

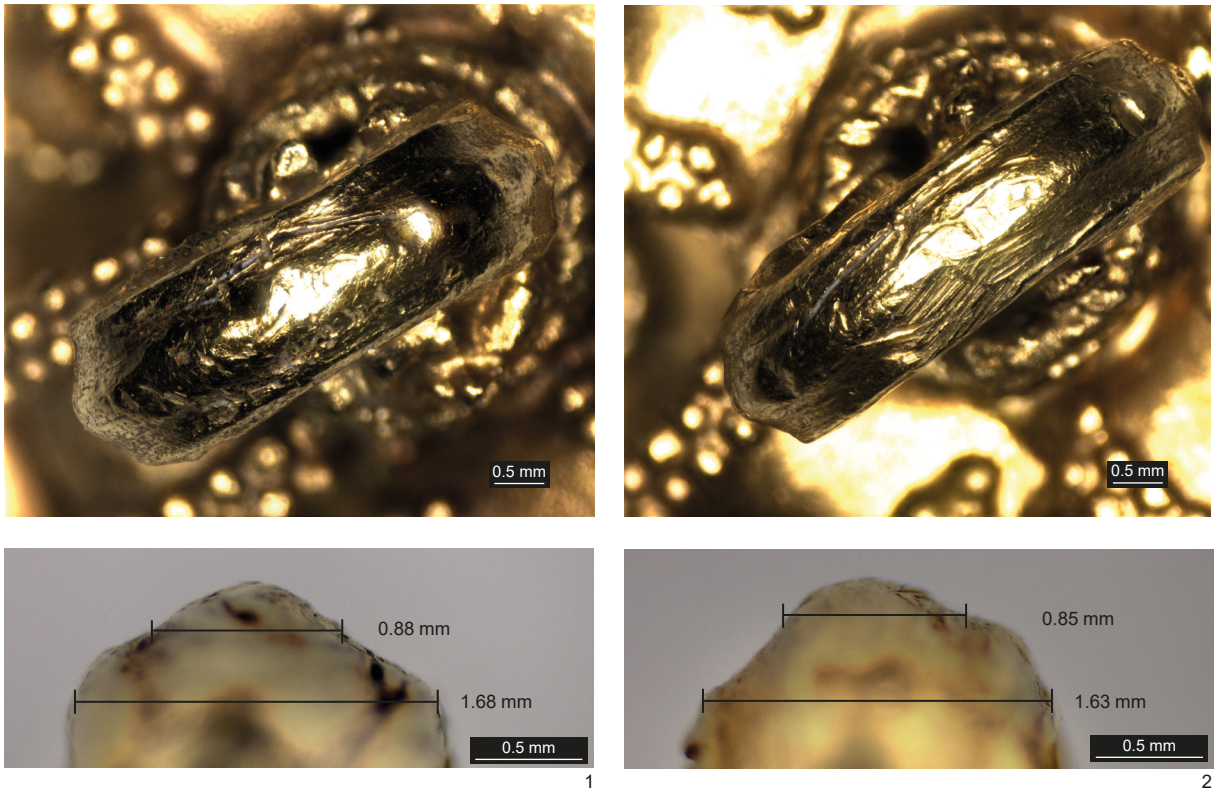


Fig. 16.11. Loop from flat wire with distinct central rib in top and side view. 1 – gombík 1122a/57, Mikulčice; 2 – gombík 1122b/57, Mikulčice; 3 – gombík 4483/65, Mikulčice. Photo by Š. Krupičková.

grave 193/51 from the Na Valách cemetery in Staré Město (inv. No. 105683 and 105684). Both pairs feature the application of multiple strips of filigree wire, which divides the surface of the gombík into quarters and eighths. The wire strips were prepared in the same way – they were soldered together and cut to the appropriate length before being applied to the gombík surface. Only then was the complete assembly of wires of the appropriate length soldered to the gombík. Both pairs feature the same types of filigree wires, namely beaded and twisted wire, though they are applied differently on each pair. Bands combined from wires of both types alternate on the gombíky from Staré Město, while on the Mikulčice pair, twisted wires are used to separate the fields, and beaded wire appears in the area around both poles of the gombíky in form of a spiral. The gombíky from Staré Město also use beaded wire to decorate the pole areas, although here the beaded wire forms concentric circles. The original characteristic detail that connects both pairs in question is the application of a boss on the bottom pole (opposite the loop of the gombík visible on X-ray, Fig. 16.12). This production element has no other analogues on other gombíky from either centre. It would therefore seem very likely that the gombíky were made in a single workshop. However, caution must be taken when interpreting, as other

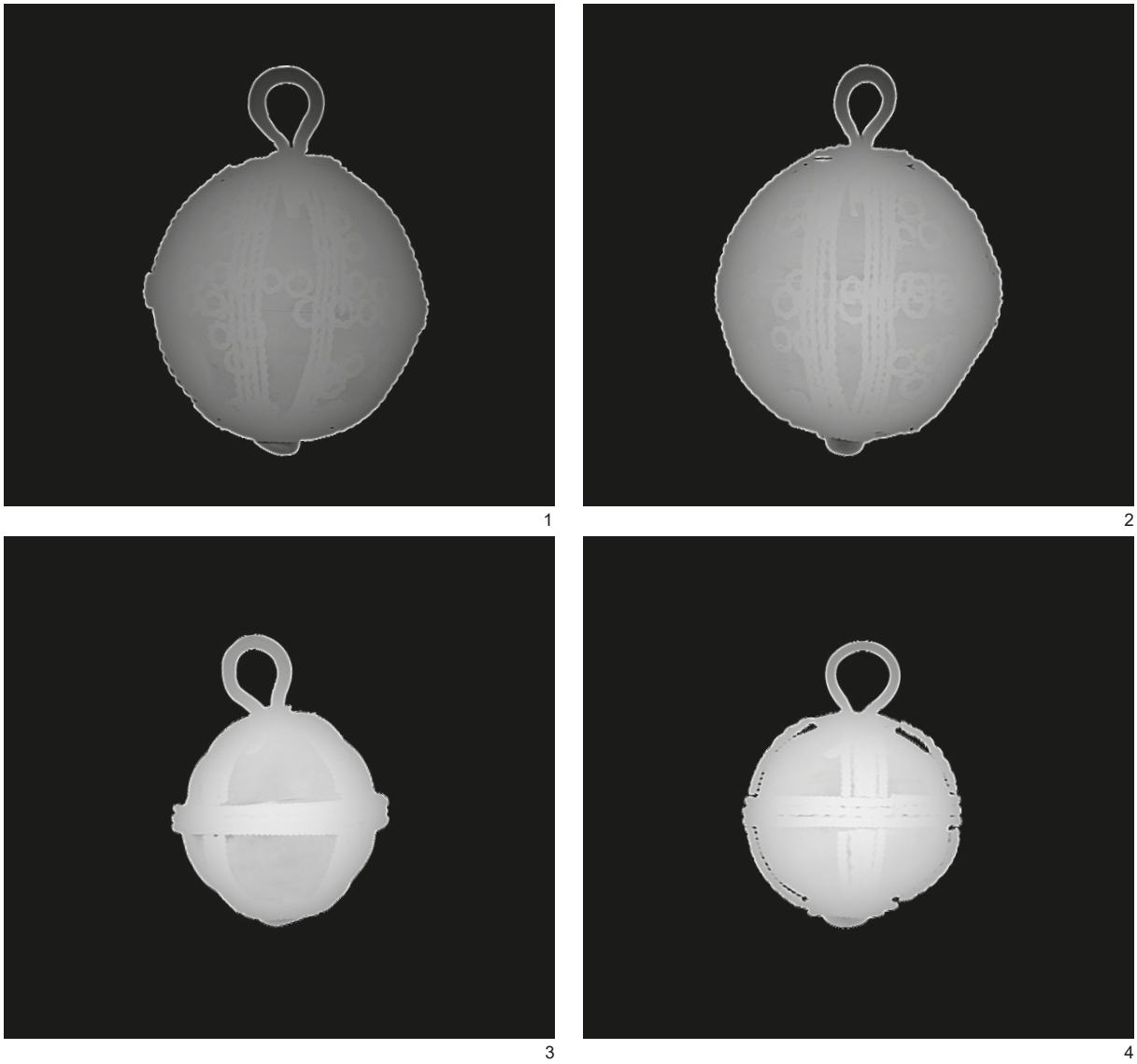


Fig. 16.12. Gombíky with boss on bottom pole: 1 – gombík 862a/57, Mikulčice; 2 – gombík 862b/57, Mikulčice; 3 – gombík 105683, Staré Město – Na Valách; 4 – gombík 105684, Staré Město – Na Valách. X-ray images by J. Fořtová, M. Fořt. Scale 2 : 1.

characteristic details are no longer consistent. This is mainly due to the presence of a pressure relief hole near the loop only in the Mikulčice pair, the slightly splayed legs of the divided loops on the Staré Město gombíky, or the form and method of application of the beaded wire (the pair from Staré Město does not have a central seam on the beads and could theoretically have been made on an *organarium*, while the Mikulčice pair clearly shows production using a hand-rolling swage – see Subchapter 3.1). Both pairs of gombíky were made in a similar style, but due to different characteristic details (and due to finds at different sites), they probably come from two production workshops.

Gold gombíky without decoration represent a relatively homogeneous group with limited possibilities for observing characteristic details, but upon closer examination it is possible to discern some procedures that may indicate a workshop origin. A certain parallel between the two agglomerations under discussion is represented by the gombíky from grave 2032 discovered during a revision excavation in 2008 near the negative of the masonry of Mikulčice church 2, and the gold undecorated gombík from grave 16/59 in Sady (inv. No. 105694). Their similarity lies in the lenticular shape of the body – the edges of both hemispheres are opened to the sides and create a distinctive seam after soldering (see Catalogue – gombíky without decoration). All three listed gombíky are also of a similar size, 11–13.9 mm wide at the widest point of the body and 9.4–10.2 mm high without the loop. The size



1



2



3

Fig. 16.13. Chased plant ornament. 1 – jug No. 7, Nagyszentmiklós; 2 – gombík 1120/57, Mikulčice; 3 – gombík 1897/57, Mikulčice. Photo by Š. Krupičková.

and shape of the loop are also similar in all these specimens. Beaded wire was apparently used on all of them, but the artefact from Uherské Hradiště was damaged (probably during soldering). On the same gombík, pieces of solder appear at two points where the hemispheres connect, where the solder was applied to patch the cracking surface of the gombík. These three undecorated artefacts could have been made in the same workshop, theoretically even in the same mould.[19] The other gombíky without decoration are similar only within a pair discovered in the context of a single grave, as is common for gombíky.

Gold gombíky with characteristic details indicative of production within a single workshop and which occur simultaneously at both locations, can be found in the material but constitute a significant minority. Most gombíky – within one typological group – indicate that they were created in multiple (at least two) workshops. The theory of (two) separately functioning workshops is further supported by the occurrence of entire typological groups of gold gombíky that appear only within one agglomeration, namely in Mikulčice. These are gombíky with chased plant decoration and gombíky with combined chased and soldered decoration, accompanied by glass inlays. Gombíky with chased plant decoration form a small but significant group. The three Mikulčice artefacts are the only representatives of the application of 'classical' chased plant motifs to the surface of gold artefacts originating from the Great Moravian environment. The decor used has a supra-regional character and is very similar, e.g. to the ornaments applied to the surface of certain gold vessels from the famous treasure from Nagyszentmiklós (Sânnicolau Mare), which contained vessels made in the Avar Kaganate in some of the workshops associated with the Byzantine goldsmithing tradition. Two artefacts in particular are decorated with ornament that is almost identical to that which was chased onto the surface of jug 7 of from the aforementioned hoard

19 Coincidentally, the largest hole in the antler plate/mould with three semicircular holes discovered in Staré Město – Na Dvorku also has a similar diameter (Galuška 2013, 148–150, on the size of the gombíky and the discovered mould, Galuška 2013, 182–183).

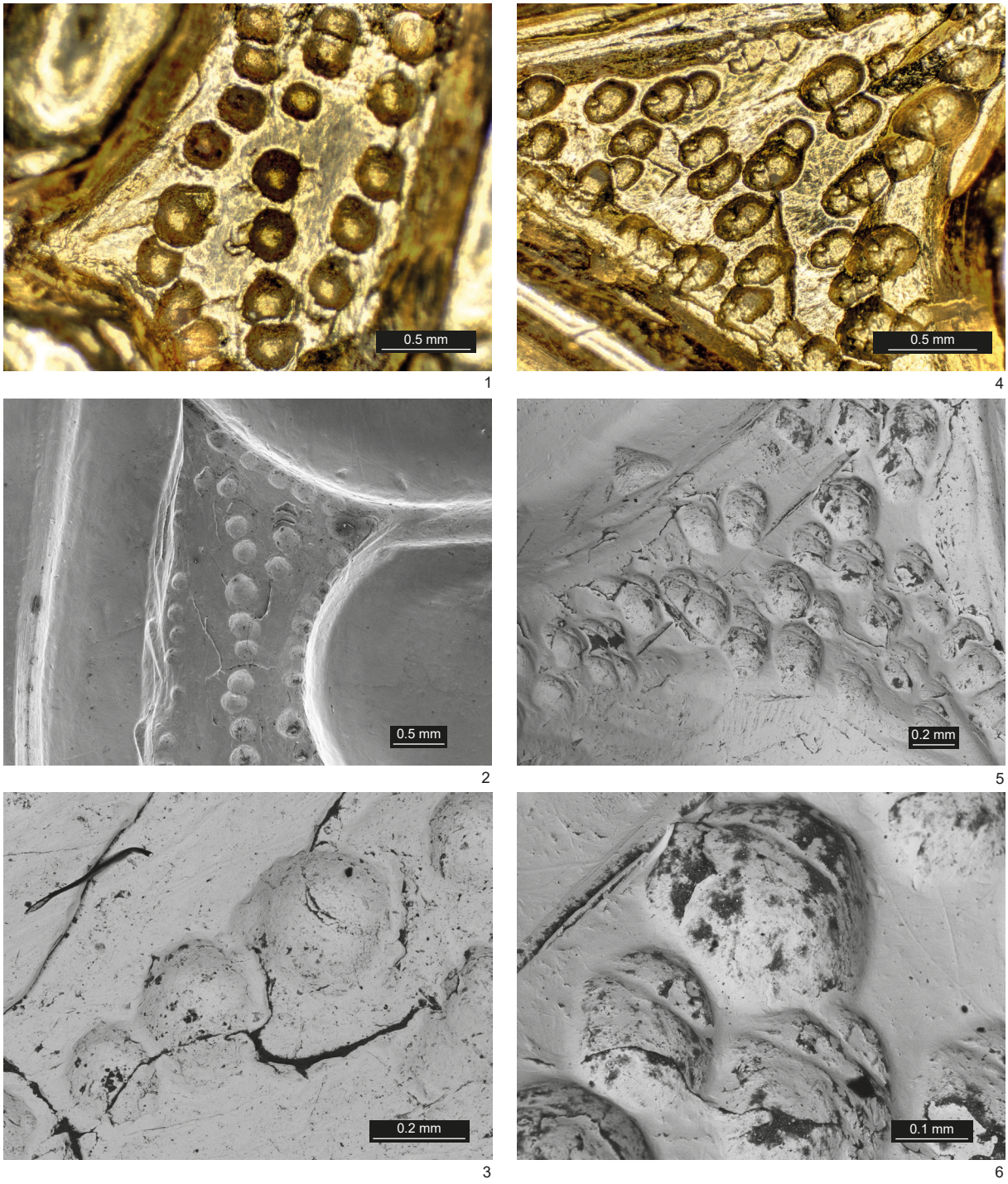


Fig. 16.14. Comparison of chasing on gombíky with plant ornament. 1–3 – gombík 1120/57, Mikulčice; 4–6 – gombík 1897/57, Mikulčice. SEM images by M. Płygawko, photos by Š. Krupičková.

(Fig. 16.13). Even the size of the impressions of the tool used to decorate the background of Mikulčice gold gombíky with chased plant ornament matches the size of the impressions measured on Romanian vessels. It is not the aim of this chapter to address issues related to the possibility of jewellers from the Carpathian Basin arriving in Great Moravia after the defeat of the Khaganate by Charlemagne, although this possibility is theoretically suggested by some publications (i.e. Galuška 2013, 218–219; 2014a, 133) and the influence of Avar jewellery on Great Moravian jewellery has been repeatedly addressed in professional circles in the past (e.g. Štefanovičová 2004, 391–395; Szőke 2010, 38–41; overview in Ungerman 2017b, 24–27; 2021, 61–64; see also Ungerman 2020b, 276–277). And we are not even suggesting

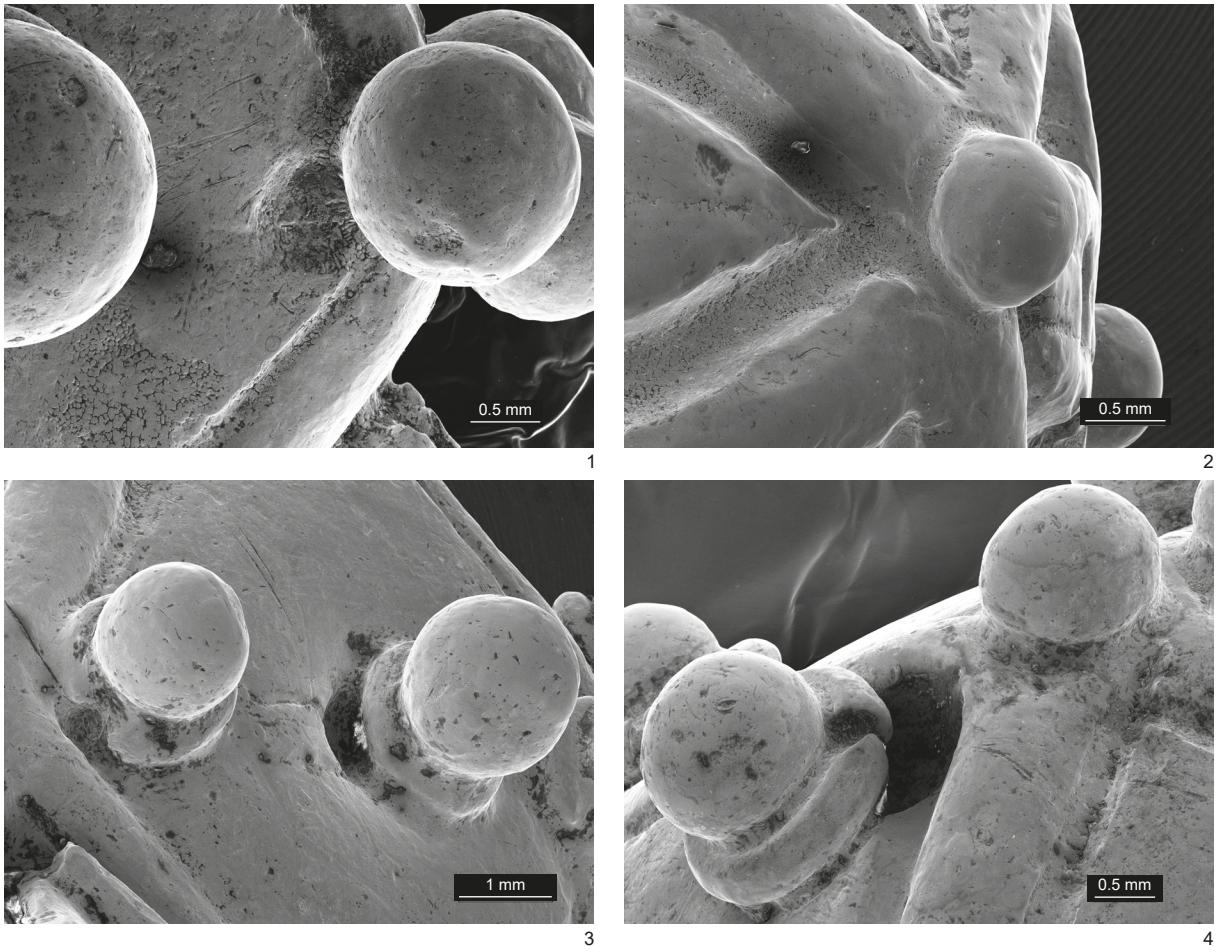


Fig. 16.15. Granules of polyhedral gombíky with combined decoration. 1 – set in a hole, 4481/57, Mikulčice; 2 – set in a hole, 1422b/57, Mikulčice; 3 – set on a smooth wire ring in a hole, 100c/57, Mikulčice; 4 – set on a smooth wire ring in a hole, 100d/57, Mikulčice. SEM images by M. Płygawko.

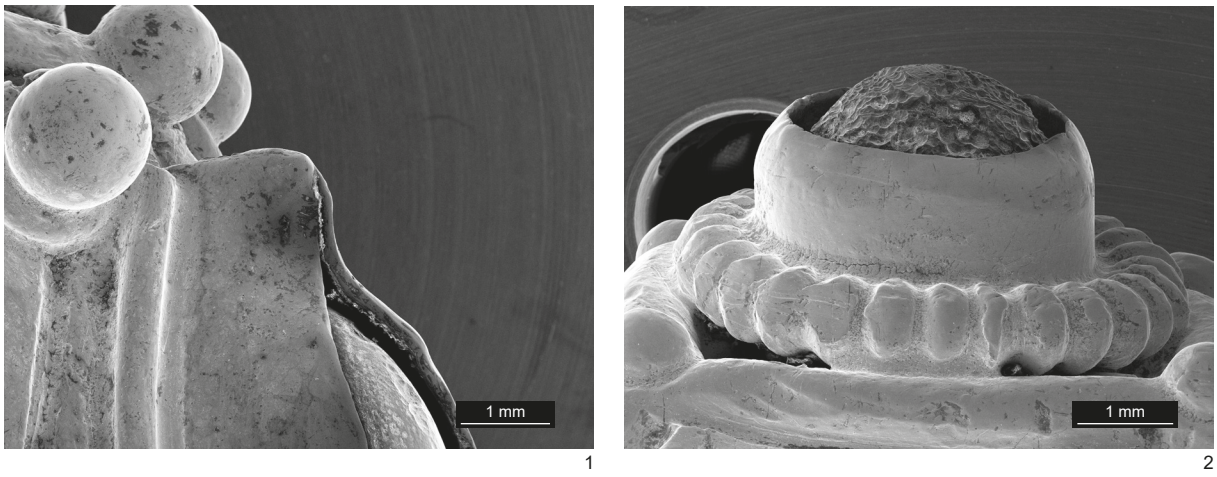


Fig. 16.16. Glass inlays set in sheet metal beds of polyhedral gombíky with combined decoration. 1 – gombík 100d/57, Mikulčice; 2 – gombík 1422b/57, Mikulčice. SEM images by M. Płygawko.



Fig. 16.17. Loops and clamps of polyhedral gombíky with combined decoration. 1 – gombík 100d/57, Mikulčice; 2 – gombík 4481/57, Mikulčice; 3 – gombík 1422a/57, Mikulčice; 4 – gombík 1422b/57, Mikulčice. Photo by Š. Krupičková.

that it would be possible to compare the imprints of specific tools between such spatially and probably temporally distant artefacts. Nevertheless, it is interesting that we have not yet encountered a similarly subtle pattern size in other material categories of gombíky – the Mikulčice gold gombíky are closer in pattern size to vessels from Nagyszentmiklós than to other material groups of gombíky.[20] The absolutely exact match in the ornamentation of the gold gombík from grave 490 in the narthex of the Mikulčice basilica (inv. No. 1120/57) with a settlement find discovered without a further find context in the vicinity of the basilica (and apparently originating from an unidentified grave, inv. No. 1897/57). Both gombíky also fall into the same body construction category – they were hammered from a single piece of sheet metal and covered with a collar. At the same time, a different style of chasing is evident, both in the production of the ornament itself and in the design of the pattern. The ornament on the gombík discovered in the settlement context is more sharply contoured, the leaves have a sharper edge, and the pattern is characterised by the occurrence of double strikes. On the contrary, the gombík from grave 490 has softer lines of ornament and the pattern is usually formed by orderly individual strikes into the surface of the object in neat rows (Fig. 16.14). The size of the punch use-wear trace is, however, very similar on both gombíky, although the shape of the traces is different – round on the gombík from grave 490 and elongated on the gombík discovered outside the grave context. In terms of an interpretation, we are inclined to believe that both gombíky were created in the same workshop, bringing together jewellers

20 In the case of silver and a gold-plated copper alloy, the size of the pattern does not depend on the material or the size of the gombíky – the traces on them are identically tenths of a millimetre larger than on gold artefacts (unpublished). However, it is possible that tools with a smaller striking surface were simply used on gold objects, even if they were significantly larger objects than gombíky – such as the vessels from Nagyszentmiklós.

familiar with the given form of ornament and mastering the production of gombíky from a single piece of sheet metal, but the two artefacts were decorated with chasing from a different craftsman with a specific style. The two gombíky were also made of gold of a different composition – the gombík from the grave inside the basilica, strangely enough, again shows low purity; the second gombík was of higher purity, but still below the average gold content of Mikulčice gombíky made of this metal. This generally below-average gold content could also be related to the effort to achieve the optimal hardness of the metal for ornamental chasing, as already noted above.

Gombíky with combined chased and soldered decoration represent a very specific group (inv. No. 100c/57, 100d/57, 4481/57, 1422a/57, 1422b/57). At first glance, they are distinguishable by their polyhedral shape (see the Catalogue – gombíky with combined decoration/polyhedral). Detailed documentation of the surface and subsequent experimentation proved that their production was initially carried out in the same way as most gombíky – they were hammered in the form of two hemispheres and only then adjusted to a square shape. Another characteristic element is the method of chasing – either linear around the edges or in the form of more complex (stylised plant?) decoration – combined with the application of large soldered granules. The granules are either soldered directly onto the surface of the gombíky, into prepared beds created by one larger, rounded punch (Fig. 16.15: 1, 2; in two cases creating a 'sunken' impression, or they are inserted into underlays in the form of smooth wire rings. Interestingly, sometimes the rings are combined with depressions (at the same time with one granule), as if the craftsman had decided to use a different technique during the work (Fig. 16.15: 3, 4). An alternative interpretation is also offered in the form of cooperation between multiple individuals working on a single artefact, which resulted in the implementation of a redundant or disparate procedure. Another characteristic detail of this group is the application of glass inlays. These are identically set in sheet metal beds, soldered to the surface of the gombíky and reinforced around the perimeter by applying smooth wire. The glass was not secured with claws, but was prevented from falling by the mechanical narrowing of the sheet metal socket, by pressing it against the glass surface (Fig. 16.16).[21] Another very characteristic feature of this group is the presence of a clamp securing the split loop (Fig. 16.17). These characteristics make the five gold gombíky from Mikulčice a highly specific group that clearly stands out among the other artefacts. Similar to gombíky with vertical ribbing, we also know of other similar examples of polyhedral gombíky with combined chased and soldered decoration made of less noble metal. These are two gombíky made of gilded copper alloy discovered at church 2 in Mikulčice, a pair of gombíky from grave 205 from church 1 in Pohansko near Břeclav, and one artefact from grave 119 at the Rajhradice cemetery (Krupičková 2020, 296). These gombíky also have completely identical characteristic details as the five made of gold, i.e. the same method of inserting glass inlays, the presence of a loop running into the shell and a depression preceding the setting of granules without underlays. The overall character of the decoration is identical and all gombíky from this group, regardless of the metal from which they are made, were most likely created in a common workshop.

4. Discussion

4.1 Were some gold gombíky imports?

The main questions of this chapter are related to the workshop provenance of the gombíky and the connection between the two largest Great Moravian centres. The actual production of gombíky in Great Moravia is also related to the origin of this clothing trend and its supra-regional reach. Elite clothing ornaments, especially those made of gold, can be considered potential diplomatic gifts that could have reached Great Moravia as well as other territories within the framework of the 'gift-giving economy'. Alternatively, the imports could have had a market origin and reached the territory of Great Moravia through supra-regional trade. Therefore, in the discussion we also try to consider this variant, even though there are relatively few finds of gombík-shaped clothing ornaments from other regions (see Subchapter 1). The group of gold gombíky discovered in the Mikulčice–Kopčany agglomeration represents a typologically diverse find unit. There are gombíky of exceptionally high quality and demanding

21 This system proved to be more or less functional – with only one exception, the glass did not fall out. However, mechanical manipulation of the socket causes it to bend unsightly, giving the impression of a lower level of craftsmanship than when using claws, which were common in the Frankish environment (though on larger objects with larger stone or glass inlays – i.e. three-finger claws on Imperial Crown (unpublished, Crown project), or 'Talisman of Charlemagne', Panczer et al. 2019).

craftsmanship that could hypothetically become some kind of 'model artefacts' for the entire typological group, such as gombíky with soldered filigree rings from grave 440 (inv. No. 862a/57 and 862b/57) and the polyhedral gombíky with combined decoration from grave 318 (inv. No. 100c/57, 100d/57, 4481/57; see Krupičková 2024, 63–65; for the issue of pattern imitation in general, see Ungerman 2023a, 77). There are also artefacts that have no direct analogues in other find inventories and are masterpieces (double-shelled gombíky inv. No. 1122a/57 and 122b/57 from grave 505, polyhedral gombíky inv. No. 1422a/57 and 1422b/57 from grave 553). These gombíky could be the first products of experienced immigrant craftsmen, or they could be considered exclusive imports. However, there are currently no clearer clues for their designation as imports. First, we are missing close analogies from other territories. Another argument for their local production is the finding that for all the exclusive pieces, other specimens that could come from the same workshop have been documented in the Great Moravian material. For example, the unique double-shelled gombíky inv. No. 1122a/57 and 122b/57 from grave 505 show a close resemblance to another gold gombík with soldered decoration inv. No. 4883/65 from grave 827, with which they match in the unique way of covering the hole in the shell at the loop of the gombík, as well as in the cross-section of the loop wire. This directly points to joint production in the same workshop, perhaps even using the same tool (see the cross-section of the loop wire on Fig. 16.11 – details in Subchapter 3.4 of this chapter). Based on the identification of characteristic details, a seemingly unique pair of gombíky with a combination of chased and soldered decoration with stylised plant ornament inv. No. 1422a/57 and 1422b/57 from grave 553 is very close to the polyhedral gombíky inv. No. 100c/57, 100d/57, 4481/57 from grave 318 (details in Subchapter 3.4). And these polyhedral gombíky ('lantern' gombíky) have other analogies made of gilded copper alloy at another Mikulčice burial site, but also at other Great Moravian locations (again, see Subchapter 3.4). A similar view can be taken of the gombíky from the Staré Město – Uherské Hradiště agglomeration. Some of the local gold gombíky also show exceptional technological and material quality. First, gombíky with vertical ribbing should be mentioned. Their design is simple and the execution is not particularly complex, but does require technological know-how that may not be common knowledge among craftsmen.[22] The masterful quality consists of hammering out a sheet of metal to three-quarters or four-fifths of the height of the sphere without piercing it. Gombíky with vertical ribbing have certain analogies in the Byzantine cultural sphere, and these gombíky have therefore previously been discussed as possible imports (Galuška 1996, 100). However, the majority of finds from the Staré Město – Uherské Hradiště agglomeration show signs of being created at a single workshop (reasoning in Subchapter 3.4) and we also know of a pair of gilded copper alloy gombíky from grave 209/59 in Sady which very accurately imitates gold products. Gombík inv. No. 105651 could theoretically be designated as an exclusive import, as it stands out from the aforementioned group for its fine execution (for more details, see Subchapter 3.4). On the other hand, the closest analogies to this artefact are still other finds from Moravia, not remotely similar ornaments from the area around Preslav or Thessaloniki (Krupičková 2025, 129–131). Although the entire assemblage of gold gombíky with vertical ribbing could theoretically have been imported from workshops outside the Great Moravian region (and, similarly, the other aforementioned artefacts with the same production characteristics), we are lacking clearer evidence for this.

At the beginning of the discussion we asked whether some Great Moravian gold gombíky could have been imports, and the answer is yes, but based on the current state of knowledge, this cannot be proven. Still, some of the above arguments speak in favour of their production directly in Great Moravia. As a compromise, it is possible to consider the arrival of craftsmen who adapted their craft skills to the needs of the Great Moravian elites.[23]

4.2 Can the representation of major elements in the composition of the gold alloy be used as a guide to the distribution of gold in Great Moravia?

The above analysis of gold gombíky at both central Great Moravian sites (especially Subchapter 3.3 and 3.4) shows that each centre probably had its own (at least one) jewellery workshop, the typological spectrum and partial procedures of which partially

22 These findings are supported by the experimental production of a reconstruction of gombík 1616/57 from grave 580 carried out by Martin Fořt in 2024 (unpublished).

23 On the issue of the difficulty of distinguishing imports from local imitations, see Ungerman 2020c, 281–282.

differed from each other. But can the characteristic details of the production technology tell us more about the principles of gold flow and the functioning of jewellery workshops in Great Moravia? We have already indicated above that resolving the provenance of gold for the Great Moravian period using the detection of minor elements of gold alloys is somewhat problematic, given the invasiveness of currently used methods suitable for the given purpose.[24] However, if we want to focus on the handling of gold within Great Moravia, comparing the content of major elements also seems relevant. We focused in particular on studying the amount of gold in the alloy used to make the gombíky. As for the pair of Great Moravian agglomerations compared here, Mikulčice is associated with a higher purity of gold in all typological groups of gombíky compared to Staré Město – Uherské Hradiště. This could indicate a preferential approach by Mikulčice clients to a source of gold, e.g. Byzantine gold coins. Considering that solidi were made from gold of the highest purity, several Mikulčice jewels could refer to the direct use of such material as a source, as their purity in this period was also close to 100% (see also Oddy, La Niece 1986).[25] A person with preferential access to exclusive products and raw materials (including gold) must have been primarily a prince, who could also control the further redistribution of raw materials or regulate the purity of gold. These conclusions are consistent with a socio-economic model that has been widely discussed in recent years. Mikulčice represents the primary power centre, the seat of the central power authority (the prince), to which exclusive imports were primarily sent and where deliveries of luxury goods or diplomatic gifts were directed before being subsequently redistributed (Štefan 2011, 340–344; Macháček 2012, 15–16; 2015, 473–476; Hlavica, Procházka 2020b, 76–78; Hlavica 2023, 22–23, 26–31).[26]

Further findings can be added to the above argument based on a comparison of the elemental composition of gold gombíky. Three gombíky from grave 19/59 in Uherské Hradiště – Sady present a comparison of a technological highlight, i.e. the gold pair inv. No. 105695 and 105696 with almost absolute purity and perfect craftsmanship, with the third specimen inv. No. 105697, which shows signs of a failed production process, visible at first glance and also with the help of a microscope and X-ray. These include a noticeably burnt surface, unevenly hammered and in places extremely thinned sheet metal, incomplete covering of the body by the collar, uncertain layout of the chased decoration and the use of decorative branch-like ornament to mask chasing errors. At the same time, this third gombík was made of a significantly below-average gold alloy (67%). The simultaneous deposition of artefacts of exceptional quality and one of considerably lower quality is a specific feature of this grave, but it is not the only case of unbalanced quality of gombíky deposited in a single grave. Even in paired specimens, significant qualitative differences in material composition, as well as other technological inconsistencies, such as in the dimensions of the wires used, may appear. Another pair of gombíky with vertical ribbing discovered in grave 173/59 at Na Valách in Staré Město is one example. While the gombík with inv. No. 105702 reached 90% purity, the paired artefact contained only 78% gold. A comparison of the gold purity of 11 pairs and one trio of gold gombíky from both agglomerations yields an interesting finding, i.e. that the artefacts from Mikulčice showed a smaller difference in the purity of paired gombíky (an average of 4.4% compared to 8.36% difference in gold for gombíky from Staré Město – Uherské Hradiště). The reason for the uneven purity of the gold alloy in paired gombíky from both agglomerations may again be the production from source gold in Mikulčice and, conversely, the use of more diverse (or recycled) material in Staré Město – Uherské Hradiště. This explanation supports the idea of preferential access to gold resources in Mikulčice (or the central position of the Mikulčice–Kopčany agglomeration). The results of comparing the dimensions of gombík components from both agglomerations are consistent with the findings of differences in elemental composition. The diameters of smooth wires for making loops and beaded wires for making rings fluctuated more significantly within pairs from

24 The Mikulčice Jewellery Fund was declared a National Cultural Monument in 2005 and all conservation, restoration and analytical procedures must be approved by the state administration (South Moravian Region), which requires the opinion of conservationists (National Heritage Institute) for all decisions.

25 However, to confirm such considerations, it would be necessary to perform a trace element analysis, as mentioned above. In the past, partial analyses of trace elements were carried out using the XRF method, but it is not accurate enough for similar processing. In any case, the determined gold content values did not rule out the melting of coins (Krupičková et al. 2024).

26 In general, on redistribution strategies, e.g. Schortman, Urban 2004, 190–195, Earle 2011; on gift-giving strategies in the Merovingian and Frankish Empires, e.g. Curta 2006; on vassal relations in the Frankish Empire, e.g. Althoff 2004.

one grave for gombíky from Staré Město – Uherské Hradiště than for gombíky from Mikulčice. This fact evokes the use of ready-made stocks with more limited access to primary raw materials and a smaller share of complex 'custom' production from a single exclusive material source. This is a situation similar to the aforementioned metal purity. However, other possible explanations for both phenomena cannot be ruled out, such as a higher degree of professionalisation and long-term stable operation of jewellery workshops in Staré Město – Uherské Hradiště, which processed larger volumes of material. However, it is questionable to what extent such an important commodity as gold objects were traded on the market within Great Moravia or whether it was a prestigious commodity distributed on the basis of client/vassal relationships (see Poláček 2007, 502–511; Macháček 2012, 14–16; Hlavica, Procházka 2020b, 76–78; Hlavica 2023, 34–35).

5. Conclusion

The introduction posed the question as to whether it is possible to distinguish jewellery products from the central Great Moravian agglomerations – Mikulčice and Staré Město – Uherské Hradiště – based on typology, material composition and the use of characteristic production techniques, using the example of gold gombíky and with the aim of determining whether the production of gold gombíky in both agglomerations corresponds to different manufacturers or workshops, or different clients with distinct demands on the appearance and properties of the resulting object.

The gold gombíky from the two centres show a slightly different typological composition. Gombíky with vertical ribbing are highly significant for Staré Město – Uherské Hradiště, and at least five of these gombíky were made in the same way, probably in the same jewellery workshop. On the contrary, two gombíky with vertical ribbing discovered at the Mikulčice site are distinctive in their characteristic details and correspond to each other (especially the form of the chased circle on the lower pole). Gombíky with vertical ribbing were found predominantly in burial grounds in Staré Město – Uherské Hradiště, but the independent and distinctive production of this typological group in Mikulčice testifies to the general popularity of these gombíky. This could possibly be evidence of their specific importance for Great Moravian society, as might be indicated by the occurrence of this type of gombík in an elite male grave at the Mikulčice basilica (grave 425), or in the most important male grave directly in the main nave of the basilica (grave 580). In addition to the actual gold finds, the popularity of gombíky with vertical ribbing is also evidenced by a few imitations made of gilded copper alloy found in the grave 209/59 in Uherské Hradiště, and their construction completely corresponds to the gold specimens from this agglomeration.

In the burial grounds of the Mikulčice–Kopčany agglomeration, we encounter two typological groups of gold gombíky that have no preserved analogies. Gombíky in both groups feature chased surface decoration. In the first case, these are gold gombíky with chased plant ornament. Two artefacts have a completely identical motif and shell construction, so we cannot rule out that they come from the same workshop, albeit with a different chasing style (probably from two different craftsmen). Gold gombíky of a polyhedral shape and combining soldered and chased decoration were found exclusively in Mikulčice. They always have at least one glass inlay in a metal socket inserted into the shell and they also share other characteristic details – chased holes beneath the granules and a loop extending into the body of the gombík. The five gold gombíky that made up the furnishings of grave 380 and 553 could have been made in the same workshop. We know of two more pairs and one solitary piece of similar gombíky made of gilded copper alloy from three different burial grounds (Mikulčice, Břeclav-Pohansko, Rajhradice). These artefacts can be described as imitations of gold originals, but they could have been made in the same workshop as the gold gombíky, as they match them in every detail except for the material.

Gombíky with soldered decoration represent a relatively disparate group among gold gombíky, and individual artefacts or pairs differ considerably from each other. This includes both double-shelled gombíky with applied filigree strips, bosses and granules, as well as gombíky with soldered poppyseed granulation or full-surface granulation on round wire underlays. Nevertheless, based on several common details that emerged, we believe that the three gombíky from Mikulčice (from graves 505 and 827) could have been made in the same workshop. The unifying element is the identically profiled loop with a distinctive relief rib, which appeared on a pair of double-shelled artefacts and also on a solitary gombík with poppyseed granulation. At the same time, these gombíky also had an identical application covering the hole for the loop in the gombík shell in the form of a 'clamp'.

Gombíky without decoration, on which there is less opportunity to observe technological details, provided finds that can be considered to have been produced jointly within the same workshop, although they come from both agglomerations. Two paired gombíky from Mikulčice and one solitary piece from Staré Město (graves 2032 and 16/59) had a similar size and, in particular, an atypical lenticular shape of the shell, which had a relief rib at the joint of the hemispheres. It is therefore possible that they were made in the same workshop, perhaps even in the same mould, and that the soldering of both hemispheres to each other took place in a similar way, creating a relief projection.

Based on the analysis of 39 gold gombíky, we believe that in each of the central Great Moravian agglomerations (Mikulčice and Staré Město – Uherské Hradiště) there was a distinctive jewellery workshop (or workshops) that had a different character of production. Staré Město is characterised by gombíky with vertical ribbing with a protruding circle on the lower pole, legs of split loops splayed to the sides inside the shell, more pronounced disparity of paired specimens (both in the form of components used for production and in material composition), and a gold purity that is lower on average. The Mikulčice agglomeration shows a more diverse typological and structural composition of gombíky and their individual components, knowledge of setting glass inlays and a purity of gold metal that is higher on average. The workshop(s) here probably had more specialists with better access to source gold or gold semi-finished products. Some typological groups of gold gombíky were produced at both locations, but each in a distinctive way, as is evident on gombíky with vertical ribbing. In exceptional cases, we encounter the potential production of a single workshop in the burial grounds of both agglomerations, as indicated by a strikingly similar trio of undecorated gombíky.

We realise that we are attempting a rather broad interpretation based on a smaller group of gold gombíky. Moreover, this group represents a selective sample that the survivors placed in the graves of their deceased. However, we do not have more material and most likely never will. It would be appropriate in the future to expand the results obtained from the analysis of gold gombíky by analysing other typological and material groups of artefacts, as well as by experimental production to possibly verify some of the aforementioned production similarities and characteristic details.

Acknowledgements

This chapter was written on the basis of the results of the project entitled 'Into the Great Moravian Jewellery. Interdisciplinary Research, Analytical Conservation and Documentation of Jewellery Production from Mikulčice and Staré Město' (Czech Ministry of Culture, NAKI III programme, 2023–2027, reg. No. DH23P03OVV020).

Thanks go to Lumír Poláček, the main researcher of the aforementioned project, who is also its spiritual father, the compiler of the project team, the person holding project life together and a mentor in moments when the main author of this text (and others) are at wits' end.

Catalogue

Catalogue of gold gombíky from the Mikulčice–Kopčany agglomeration and the Staré Město – Uherské Hradiště agglomeration. Photos by M. Bárta. Scale 1 : 1.

1 Undecorated

Without inv. No. **Find No. 84/187** Mikulčice Church 2 Grave 2032			
Without inv. No. **Find No. 84/187** Mikulčice Church 2 Grave 2032			
Inv. No. 4450/57 Mikulčice Church 2 Grave 71			
Inv. No. 4451/57 Mikulčice Church 2 Grave 71			
Inv. No. 105660 Staré Město – Na Valách Grave 145/51			
Inv. No. 105661 Staré Město – Na Valách Grave 145/51			
Inv. No. 105662 Staré Město – Na Valách Grave 145/51			
Inv. No. 105667 Staré Město – Na Valách Grave 167/51			
Inv. No. 105668 Staré Město – Na Valách Grave 167/51			
Inv. No. 105694 Uherské Hradiště – Sady Grave 16/59			

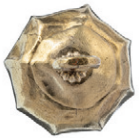
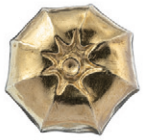
2 Chased decoration – vertical ribbing

Inv. No. 781/57
Mikulčice
Church 3
Grave 425





Inv. No. 1616/57
Mikulčice
Church 3
Grave 580

Inv. No. 105628
Staré Město – Na Valách
Grave 78/48



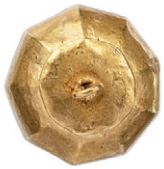


Inv. No. 105651
Staré Město – Na Valách
Grave 50/50





Inv. No. 105652
Staré Město – Na Valách
Grave 51/50

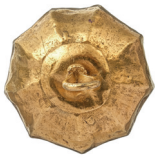




Inv. No. 105695
Uherské Hradiště – Sady
Grave 19/59

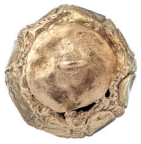




Inv. No. 105696
Uherské Hradiště – Sady
Grave 19/59


Inv. No. 105697
Uherské Hradiště – Sady
Grave 19/59


Inv. No. 105702
Uherské Hradiště – Sady
Grave 173/59



Inv. No. 105703
Uherské Hradiště – Sady
Grave 173/59



3 Chased decoration – plant ornament

Inv. No. 606/57
Mikulčice
Church 3
Grave 380



Inv. No. 1120/57
Mikulčice
Church 3
Grave 490



Inv. No. 1897/57
Mikulčice
location unknown



4 Combined decoration – granulation, chasing and glass inlays (polyhedral)

Inv. No. 100c/57
Mikulčice
Church 3
Grave 318



Inv. No. 100d/57
Mikulčice
Church 3
Grave 318



Inv. No. 4481/57
Mikulčice
Church 3
Grave 318





Inv. No. 1422a/57
Mikulčice
Church 3
Grave 553





Inv. No. 1422b/57
Mikulčice
Church 3
Grave 553





5 Soldered decoration

Inv. No. 294/57
Mikulčice
Church 3
Grave 300





Inv. No. 862a/57
Mikulčice
Church 3
Grave 440





Inv. No. 862b/57
Mikulčice
Church 3
Grave 440





Inv. No. 1122a/57
Mikulčice
Church 3
Grave 505





Inv. No. 1122b/57
Mikulčice
Church 3
Grave 505



Inv. No. 4883/65
Mikulčice
Church 11
Grave 827



Inv. No. 105633
Staré Město – Na Valách
Grave 282/49



Inv. No. 105634
Staré Město – Na Valách
Grave 282/49



Inv. No. 105683
Staré Město – Na Valách
Grave 193/51



Inv. No. 105684
Staré Město – Na Valách
Grave 193/51



Without inv. No.
Staré Město – Na Valách
Grave 2/08



Chapter 17

A luxury button/gombík and the elite in the Chrudim region in the Middle Ages

Jan Frolík, Drahomíra Frolíková, Ludmila Barčáková

1. Introduction

The Chrudim region belonged to one of the provinces of the Přemyslid administrative system in Bohemia in the Early Middle Ages. Its centre was the eponymous hillfort located in the area of today's historical town centre. The origins of the early medieval hillfort date back to the 9th century, as documented by rescue archaeological excavations carried out since the 1990s (Frolík, Sigl 1998; Frolík, Musil 2010). The existence of the fortress also implies the presence of the princely administrative apparatus (officials), military garrison and Church officials, i.e. representatives of the contemporary elite. The movement of the members of the contemporary elite can also be assumed on the basis of Chrudim's location on the so-called Trstenice Trail, the most important link between Bohemia and Moravia. Its route is not clearly known over its entire length, but in the Chrudim region there is no doubt that it crossed the Železné hory [Iron Mountains], heading to Chrudim and from there probably in accordance with today's road system (Chrudim – Hrochův Týnec – Čankovice – Holešovice – Stradouň and Vraclav; Severin 2000). Among other things, it is documented by the customs house in Stradouň (as of 1160; Profous, Svoboda 1957, 178). The existence of this trail may be related to a report from 1134, when Chrudim residents are mentioned as participants in a military invasion of Poland (Frolík, Sigl 1998, 23). In the 13th century (before 1276), Chrudim transformed into a medieval town and continued to serve as an important centre, occasionally hosting the monarch (Frolík, Sigl 1998; Frolík 2016).

2. Globular button/gombik

2.1 Find circumstances

In 2009, a small jewel typologically corresponding to a button/gombík was found during a detector survey in the cadastre of Holešovice (now part of the village of Chroustovice). The object was subsequently acquired and the location of the find was specified by David Vích from the Regionální muzeum ve Vysokém Mýtě [Regional Museum in Vysoké Mýto]. The location of the find is a large field in the municipality of Holešovice, about 300 m north of the Holešovice – Městec road and approximately in the middle between the U Hájku and Městecký háj forests (Fig. 17.1; coordinates ZM10 13-42-15, 440:244 with an accuracy of 50 m). Subsequently, the find was transferred to the Regionální muzeum v Chrudimi [Regional Museum in Chrudim], where it belongs territorially. It was lent by this museum for conservation and restoration to the laboratories of the Institute of Archaeology of the Czech Academy of Sciences, Prague (Tab. 17.1; Ottenwelter 2012).

Metal	Sheet	Loop	Ring 1	Ring 2
Au	71.57	33.95	68.86	53.22
Ag	25.39	62.52	28.26	42.84

Tab. 17.1. Holešovice, municipality of Chroustovice, Chrudim District. The ratio of gold to silver measured on the surface of the button/gombík (in wt. %).

2.2 Description

The artefact is a spherical, slightly flattened button/gombík, 16 mm in circumference and 13 mm high, height with loop 20 mm, and the lower part of the lower hemisphere is damaged (Fig. 17.2). The

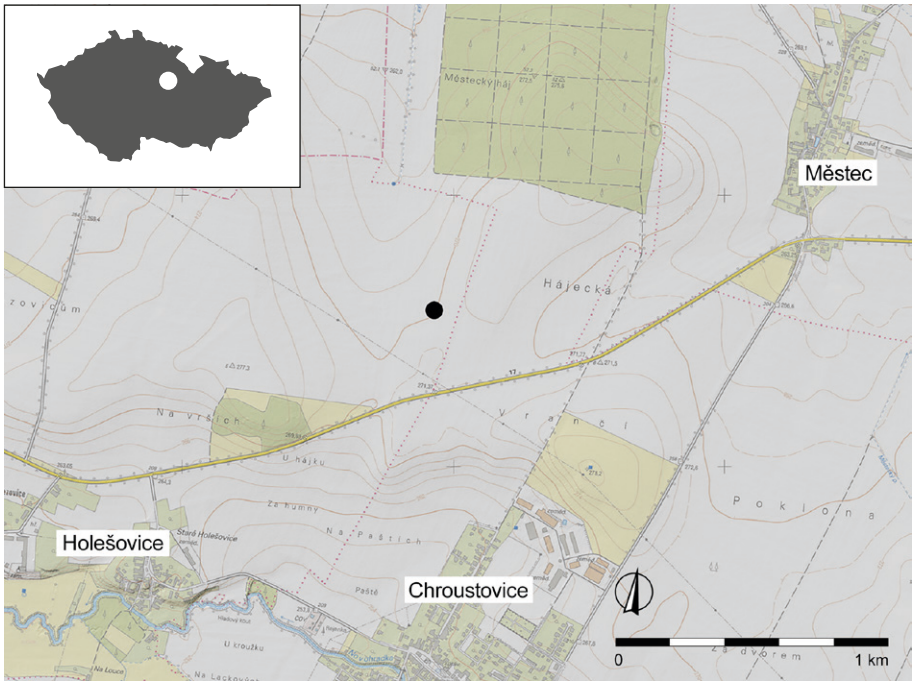


Fig. 17.1. Map with the location of the find. Author J. Musil



Fig. 17.2. Holešovice, municipality of Chroustovice, Chrudim District. Button/gombík. Drawing by M. Housková, photo by E. Ottenwelter.

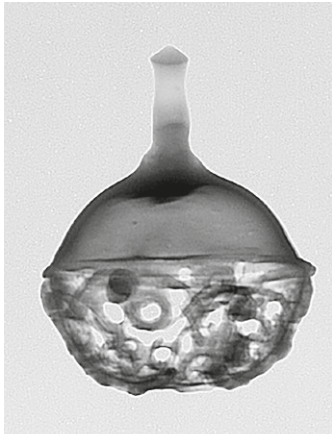


Fig. 17.3. Holešovice, municipality of Chroustovice, Chrudim District. X-ray photo of the button/gombík. Photo by L. Barčáková. Without scale.

upper hemisphere is plain, the lower one richly decorated with fused rings of filigree wire made by grooving, complemented by small granules set into the plain ring border made of plain wire. The loop is relatively massive, 3 mm thick, shaped into a raised central ridge. The connection between the loop and the upper hemisphere is fluid, smooth. The X-ray image shows the thickening of the plate caused by the melting of the tab wire inside the upper hemisphere (Fig. 17.3). The hemispheres are connected by a thin circumferential wire. The ornament on the lower hemisphere consists of four larger circles of pairs of wire dividing the hemisphere into four decorative fields, with the damaged bottom of the button apparently forming a smaller fifth field (Fig. 17.4). Within the circles are four small rings of the same filigree wire each, and a granule is set in the centre, creating the impression of a quatrefoil. The granules were also placed at the junctions of the four circles and the junctions of the circles with the circumferential ring connecting the two hemispheres. The triangular sections between the circles and the circumferential wire are filled with rings with embedded granules, and as the only surviving ring shows, the lower field was filled with four small rings, probably also with embedded granules. The relief impression is enhanced by the puncturing or piercing of holes in the small rings and triple holes in the corners of the triangles around the granules between the rings and the perimeter wire (Fig. 17.5).



Fig. 17.4. Holešovice, municipality of Chroustovice, Chrudim District. Detail of the bottom with the only preserved ring of the quartet. Visible in the holes are abrasions after the hole was pierced from the outside inwards. Photo by E. Ottenwelter. Without scale.

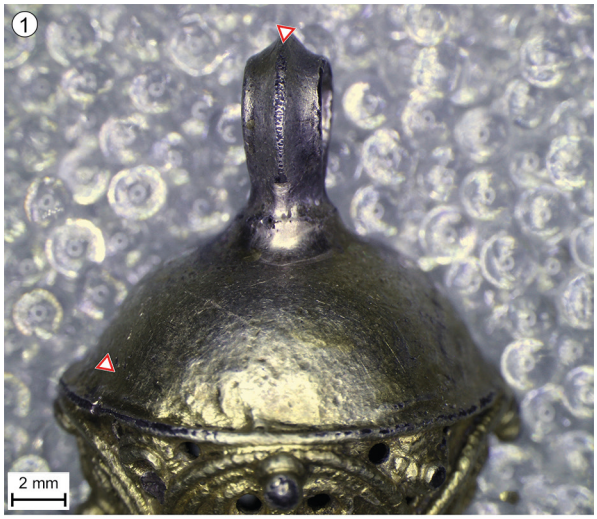




Fig. 17.5. Holešovice, municipality of Chroustovice, Chrudim District. 1 – upper hemisphere of the button with marked measurement points on the shell and on the ear; 2 – detail with a measured rings on the lower half of the button. Photo by L. Barčáková.

In connection with its publication, the find was again subjected to XRF analysis of the surface[1] (Fig. 17.5, Tab. 17.1). The analysis showed the use of silver and gold plating on the surface, but no material research was conducted on the sheet metal or components. Given the opposite ratio of gold to silver on the loop compared to other measured parts of the button, we believe that this is the result of abrasion caused by attaching (probably sewing) the loop to the fabric.

2.3 Production procedure

The shape of the button was created by working a silver plate in a die with a pre-formed concave pit into two identical hemispheres. In one of the hemispheres, a hole was punched from the inside outwards for the insertion of the loop. The irregularities were left after the hole was punched and a bent wire loop was inserted into the hole. The neck of the loop was narrowed by pressing it with pliers (the pliers left barely visible marks on the surface of the loop, Fig. 17.6) and the loop was soldered. The halves of the button were joined together, probably with silver solder, and gradually decorated by soldering filigree grooved wires to the surface. First the circumferential wire was soldered at the junction of the hemispheres, followed by the successive soldering of large circles of grooved wire. Then small rings were soldered inside the circles and the sheet metal inside them was perforated. The smallest rings were then placed in the centres of the large circles, after which the granules were soldered where the circles made

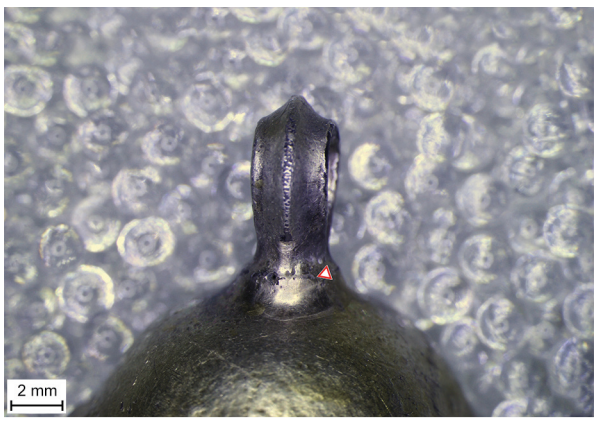


Fig. 17.6. Holešovice, municipality of Chroustovice, Chrudim District. Imprint of pliers on the loop. Photo by L. Barčáková.

1 The analysis was performed by restorer and jeweller L. Barčáková using the Thermoscientific Niton XL3t GOLDD+ analyser.



Fig. 17.7. Holešovice, municipality of Chroustovice, Chrudim District. Button/gombík – manufacturing imperfections: 1 – granule seating (now dropped, a trace of silver solder remained) next to the ring; 2 – granule ring seating in the wrong place; 3 – holes not perforated; 4 – hole filled with solder. Photo by E. Ottenwelter.



Fig. 17.8. A pair of gold buttons/gombík from Trilj (Croatia). After Petrinec 2009, 160, Bild 55. Height 2.1 cm.

contact. It can be assumed that the ring and granules were also placed at the bottom of the button, at the points of contact of the four rings in the lower decorative field and their contact with the four circular fields. Manufacturing imperfections, such as the incorrect seating of the granule instead of the ring next to it (Fig. 17.7: 1), the incorrect seating of both the ring and the granule (Fig. 17.7: 2), the triangle below the circumferential circle with unpunched holes (Fig. 17.7: 3), and another triangle with only two perforated holes or one soldered (Fig. 17.7: 4) were unnoticeable when wearing the small item on a garment. Finally, the button was gilded.

2.4 Interpretation and dating

When examining the object, it is striking that the decoration is concentrated exclusively on the lower half. It could therefore serve both as decoration and as a wardrobe fastener, which has been debated, especially for the large, fragile Great Moravian buttons/gombíky that are covered with decoration (Chorvátová 2009, 13; Krupičková, Ottenwelter, Březinová 2019; Krupičková 2024, 93–99; 2024, 93–95; Frolíková-Kaliszová 2023, 92). Apart from a pair of gold buttons decorated with dense granulation on the lower half (Fig. 17.8) from the Trilj hoard (Croatia), dated by Byzantine coins to the second half of the 8th century (Petrinec 2009, 313–314), small buttons decorated only on the lower hemisphere rarely appear among Great Moravian finds in the burial grounds of both central places, Staré Město – Uherské Hradiště and Mikulčice. Grave 299/49 at the Na Valách burial site in Staré Město near Uherské Hradiště contained two silver gilt buttons/*gombíky* with a diameter of 1.6 cm, slightly flattened and decorated with '*an extruded ornament composed of arches*' (Fig. 17.9; Hrubý 1955, 214). At Mikulčice,[2] buttons/*gombíky* decorated with granules soldered in varying numbers on the lower hemisphere were found (Fig. 17.10) in grave 141 at church 2, in graves 364, 465, 472 and 531 at church 3, and in grave 889 at the so-called church 11 (Krupičková 2024, 167, 179, 185, 186, 193, 204). The second significant difference between the Great Moravian and the Czech buttons/gombíky derived from them is the method of decoration, where the ornament consisting of filigree and granulation is further accentuated by the piercing of the holes. The absence of analogies from the 9th and 10th centuries led us to doubt the millennial age of the object and to search for analogies in later periods. The only (yet almost exact) analogy is known from Grochów in Mazovia in northeastern Poland. It is a bronze silver-plated button measuring 21 × 125 mm (Fig. 17.11). Hanna Kóčka-Krenz, referring to 'East Slavic stylistics', links it to a button from Kiev (Fig. 17.12), which, however, also lacks any find circumstances, and

2 We would like to thank Šárka Krupičková for pointing out the buttons/*gombíky* from Mikulčice and the buttons from the exhibition in Warsaw 2007.



Fig. 17.9. Staré Město, Na Valách cemetery. Button/*gombík* from grave 299/49. Photo by Š. Krupičková.

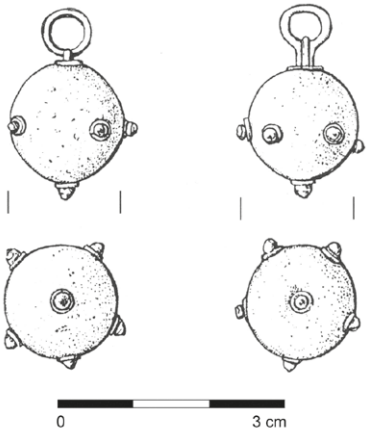


Fig. 17.10. Mikulčice, buttons/gombíky from the grave 364 by the three-nave basilica. After Klanica et al. 2019, 215.



Fig. 17.11. Grochów (Poland). Button/gombík. After Kóčka-Krenz 2007, 142, Fig. 215. Without scale.



Fig. 17.12. Kiev. Button/gombík. After Kóčka-Krenz 2007, 141, Fig. 214. Without scale.



Fig. 17.13. Karlštejn Castle, Beroun District. Buttons/gombíky from the so-called Karlštejn treasure. After Kubů, Koenigsmarková, Panenková 2016, 6. Without scale.

dates both to the 12th and 13th centuries (Kóčka-Krenz 2007, 37; 2011, 28). The obvious connection with the aforementioned campaign to Poland in 1134 remains on the hypothetical level due to a lack of specific data.

A later date cannot be ruled out, as French fashion, which favoured narrow, tight-fitting garments, also prevailed in our country in the 14th century. Those wearing such clothing had to squeeze themselves into it with the help of lacing or fasten the dresses with numerous small metal buttons. Naděžda Kubů states that they were fastened on bodices, jackets, narrow sleeves, and as an ornament, buttons made of worked metal were sewn on the sleeves or hems of the dresses densely side by side. An example of this can be seen in the buttons (Fig. 17.13) from the so-called Karlštejn treasure. These are the products of goldsmiths' workshops from the time of Charles IV, when French fashion reigned at the Prague court. The entire treasure was probably hidden during the Hussite wars (Kubů 2017, 41–44).

We cannot yet determine either the origin or a provisional broad dating of the button/gombík from Holešovice in the Chrudim region, which ranges from the end of the Early to the entire High Middle Ages. Nor can their origin be determined from the occurrence of only two artefacts in places as far apart as east Bohemia and northeastern Poland. However, we can hope that more pieces will be found and that they will also be published, thus helping our research progress.

3. Early and high middle age finds of elite objects in Chrudim region

The presence of elites is assumed at the Chrudim hillfort (and also at the hillfort in Vraclav), but there is a minimum of specific evidence (finds). The reason for this is the lack of archaeological excavations. Extensive rescue excavations have been carried out in the urban core of Chrudim (Filištínská Street – four urban plots; Hradební Street – three urban plots, Frolík, Sigl 1998; Frolík, Musil 2010). They proved the existence of the local fortification from the 9th century onwards but did not cover the areas inside the fortification, where contemporary settlement finds could be identified. The only evidence of an exclusive object is an iron tinned cross, probably originating outside Bohemia and originally mounted on some kind of wooden box or book-boards. It is dated to the 10th century (Frolík, Sigl 1998, 21, 76–77).

Other evidence comes from isolated finds obtained in various contexts in the wider surroundings of the route of the Trstenice Trail. The category of jewellery includes a cast (?) earring found in the garden of house No. 41 in the village of Orel. Its classification as early medieval is based only on a poor-quality photograph, and the artefact itself is missing (Frolík, Sigl 1995, 92). More numerous, especially thanks to detector finds, are belt fittings or fittings from horse harnesses. Among them, the oldest is a cast bronze counter-plate belt fitting with three rivets dated as early as the 7th century and of eastern Alpine or northern Italian origin from Stradouň (Jílek, Schenk, Vích 2015). The same site yielded a Carolingian cast three-armed sword hinge fitting with embossed floral decoration, dated for east Bohemia to the second half of the 9th and first half of the 10th century (Vích et al. 2021, 373, 392–393). Other small fittings, not yet evaluated in detail, are known from Blato, Heřmanův Městec – Nákle and Úhřetice (one piece each, Janošek Kašpárek 2015). A numerical exception is the Stíčany site, where up to 12 of these fittings of Carolingian or Byzantine-Avar origin have been documented (Janošek Kašpárek 2015; Hasil, Profantová, Levá 2020). A collection of randomly acquired items from the defunct Benedictine monastery in Podlažice is noteworthy: a cross originally from Limoges, another cross probably of Kievan-Russian provenance, and a ring with a Greek inscription (Frolík 1984, 17, 79). They date back to the 12th–13th centuries. Part of an enkolpion of the same age comes from Chrudim (Frolík, Sigl 1998, 78–79).

Another category is militaria. These are finds without more precise find circumstances or single lost objects in all cases. An example of the former is the discovery of a damaged sword in the former brickyard in Rosice near Chrast (Frolík, Sigl 1995, 65), for which a grave origin is considered. However, it may not be an early medieval find. We also know of two isolated finds of iron plate spurs with an elongated shank, from Hlinsko and Přelouč, both without definite find circumstances and both dated to the 9th century (Frolík 1984; Profantová 2016, 29). The number of axe finds is gradually increasing, but mostly in the forest terrains of the Železné hory Mountains. The oldest of them are dated as early as the second half of the 8th century to the second third of the 9th century, namely Kovářov near Seč – Holín (Musil 2021, 122–123), Smrček (Janovská, Musil 2021), Turov (Kašpárek 2018), some even to the 10th century – Skuteč-Štěpánov, Zdislav (Musil 2015). In the archaeological collection of the Chrudim Museum is an axe dated to the 10th or 11th centuries, brought '*from somewhere in the Chrudim region*' (Musil 2020, 119). The only stratified finds are two axes from Filištínská Street in Chrudim, discovered in the backfill of the ditch of the fortification and dated to the 12th–13th centuries. They have analogies in grave finds from the 10th and 11th centuries (Musil 2020, 123). The sites of most of the axes indicate that they were used in timber harvesting rather than as weapons.

Contacts with distant places are also documented by ceramic finds. For the 11th and 12th centuries, these are fragments of pottery from the Prague area and graphite pottery from south Bohemia (Frolík, Sigl 1998, 29, 38, 84–85), and in connection with the button in question, it is necessary to highlight pottery with a cylindrical rim, which is thought to be of Polish origin (Frolík, Sigl 1998, 84–85).

4. Conclusion

The button/gombík from Holešovice is still a unique example of a sumptuous piece of clothing. The search for analogies has led to a possible long temporal classification (from the 12th century until at least the 14th century). The button was apparently removed from the clothing of a person belonging to an elite part of society or, in the High Middle Ages, someone from the circle of the highest nobility or directly from the royal court travelling along the Trstenice Trail. It is a unique example of a medieval clothing decoration (not only in the Chrudim region) and completes the mosaic of small finds and written references documenting the gradual expansion of long-distance trade contacts and the movement of people from the highest social strata.

Acknowledgement

This chapter was supported by the project MŠMT No. 8J24FR019 'Raně středověké elitní šperky v Čechách: multidisciplinární a srovnávací studie materiálů, konstrukce, typologie, chronologie a provenience' / 'Early Medieval elite silver jewellery in Bohemia: a multidisciplinary and comparative study on materials, construction, typology, chronology and provenance'.

References

AB: *Annales de Saint-Bertin*. F. Grat, J. Vielliard, S. Clémencet (eds.). Paris: C. Klincksieck, 1964.

AF: *Annales Fuldenses*. F. Kurze (ed.). Monumenta Germaniae Historica, Scriptores rerum Germanic 7. G. H. Pertz (ed.). Hannover: Hahn, 1891.

Agarwal, S. C. 2016: Bone morphologies and histories. Life course approaches in bioarchaeology. *American Journal of Physical Anthropology* 159(S61), 130–149. DOI: 10.1002/ajpa.22905. Available also from: https://doi.org/10.1002/ajpa.22905.

Airlie, S. 2006: ‹Sad stories of the dead of kings›. Narrative Patterns and Structures of Authority in Regino of Prüm's Chronicle. In: E. M. Tyler, R. Balzaretti (eds.): *Narrative and History in the Early Medieval West*. Studies in the Early Middle Ages 16. Turnhout: Brepols, 105–131. DOI: 10.1484/M.SEM-EB.3.3765. Available also from: https://www.brepolsonline.net/doi/abs/10.1484/M.SEM-EB.3.3765.

Alapy, G. 1933: Lovasnomád sírok a Vágduna alsócsallóközi jobbpartján. *Nemzeti kultúra* I, 36–43.

Althoff, G. 2004: *Family, friends and followers. Political and Social Bonds in Early Medieval Europe*. Cambridge: Cambridge University Press.

Ambrose, S. H., Norr, L. 1993: Experimental evidence for the relationship of the carbon isotope ratios of whole diet and dietary protein to those of bone collagen and carbonate. In: J. B. Lambert, G. Grupe (eds.): *Prehistoric human bone archaeology at the molecular level*. Berlin: Springer-Verlag, 1–37. DOI: 10.1007/978-3-662-02894-0_1. Available also from: https://doi.org/10.1007/978-3-662-02894-0_1.

Ament, H. 1993: *Siedlung und Gräberfeld des frühen Mittelalters von Mertloch, Künzerhof (Kreis Mayen-Koblenz)*. Wissenschaftliche Beibände zum Anzeiger des Germanischen Nationalmuseums 9. Nürnberg: Germanisches Nationalmuseum Abt. Verlag.

Ament, H., Sage, W., Weimann, U. 1968: Die Ausgrabungen in der Pfalz zu Ingelheim am Rhein in den Jahren 1963 und 1965. *Germania* 46(2), 291–312.

Ando, C. 2017: Introduction. States and State Power in Antiquity. In: C. Ando, S. Richardson (eds.): *Ancient States and Infrastructural Power. Europe, Asia, and America*. Empire and after. Philadelphia: University of Pennsylvania Press, 1–16.

Andrási, R. 2015: A 10–11. századi fülesgombok tipokronológiája Hajdú-Bihar megye és a Rétköz területén. Újabb adatok a honfoglalás kori viselet kérdéséhez. *Acta iuvenum. Sectio archaeologica* 2, 153–175.

Andreska, J. 1975: Archeologické nálezy rybářského nářadí v Mikulčicích. *Archeologické rozhledy* XXVII(1), 132–139. Available also from: https://1url.cz/qJdO0.

Angenendt, A. 1984: *Kaiserherrschaft und Königstaufe. Kaiser, Könige und Päpste als geistliche Patrone in der abendländischen Missionsgeschichte*. Arbeiten zur Frühmittelalterforschung 15. Berlin, New York: Walter de Gruyter.

Angers BM 817: *« Incipit vita sancti ac beatissimi patris Benedicti, cujus transitus celebratur festivitas XII kal. aprilis (titre en capitales de couleur, mêlées d'onciales). — Fuit vir vitae venerabilis… » Livre II des Dialogues de S. Grégoire* [online]. [Accessed 2025-02-09]. Available from: https://ccfr.bnf.fr/portailccfr/jsp/index_view_direct_anonymous.jsp?record=eadcgm:EADC:D34102345.

Ann. Naz.: Annales Nazariani, 43. In: *Annales et chronica aevi Carolini*. Monumenta Germaniae Historica, Scriptores 1. Ed. G. H. Pertz. Hannover 1826.

Ann. Xant.: Annales Xantenses. In: *Annalen van Egmond. De Annales Egmundenses tezamen met de Annales Xantenses en het Egmondse Leven van Thomas Becket*. M. Gumbert-Hepp, J. P. Gumbert (eds.). Middeleeuwse Studies en Bronnen, 107. Hilversum: Verloren, 2007.

Annals of Fulda 1992: *The Annals of Fulda. Ninth-century Histories. Vol 2*. T. Reuter (trl.). Manchester Medieval Sources series. Manchester, New York: Manchester University Press.

Antapodosis: *Antapodosis*. J. Becker (ed.). Monumenta Germaniae Historica, Scriptores rerum Germanicarum 41. Hannover, Leipzig: Hahn, 1915.

Antonín, R., Macháček, J. (eds.) in print: *The Emergence of the Nobility in East Central Europe between the Eighth and Thirteenth Centuries*. London, New York: Routledge.

ARF: *Annales regni Francorum*. F. Kurze (ed.). Monumenta Germaniae Historica, Scriptores rerum Germanicarum 6. G. H. Pertz (ed.). Hannover: Hahn, 1895.

Arthur, N. A., Gowland, R. L., Redfern, R. C. 2016: Coming of age in Roman Britain. Osteological evidence for pubertal timing. *American Journal of Physical Anthropology* 159(4), 698–713. DOI: 10.1002/ajpa.22929. Available also from: https://doi.org/10.1002/ajpa.22929.

ASC: *Anglo-Saxon Chronicles*. M. Swanton (ed. et trans.). London: Barnes & Noble, 2000.

Aurell, J. 2005: From Genealogies to Chronicles. The Power of the Form in Medieval Catalan Historiography. *Viator* 36, 235–264.

Aurell, M. 1998: Pouvoir et parenté des comtes de la marche hispanique (801–911). In: R. Le Jan (ed.): *La Royauté et les Élites dans l'Europe Carolingienne (début IXe aux environs de 900)*. Centre d'Histoire d'Europe du Nord-Ouest 17. Lille: Centre d'Histoire de l'Europe du Nord-Ouest, 467–486. Available also from : https://books.openedition.org/irhis/2591.

Bachrach, D. S. 2012: *Warfare in Tenth-Century Germany*. Woodbridge: Boydell & Brewer.

Bahrfeldt, E. 1889: *Das Münzwesen der Mark Brandenburg von den ältesten Zeiten bis zum Anfange der Regierung der Hohenzollern*. Berlin: W. H. Kühl.

Balcárková, A. 2010: Raně středověké osídlení na lokalitě Olomouc-Slavonín, „Horní lán". *Přehled výzkumů* 51, 157–196. Available also from: https://www.arub.cz/prehled-vydanych-cisel/PV51_studie_10.pdf.

Bálint, C. 2010: Avar Goldsmiths' Work from the Perspective of Cultural History. In: C. Entwistle, N. Adams (eds.): *'Intelligible Beauty'. Recent Research on Byzantine Jewellery*. British Museum research publication 178. London: British Museum Press, 146–160.

Bárdos, E., Garam, É. 2009: *Das awarenzeitliche Gräberfeld in Zamárdi-Rétiföldek. Teil I*. Monumenta Avarorum Archaeologica 9. Budapest: Magyar Nemzeti Múzeum. DOI: 10.62150/MAA.9.2009. Available also from: https://doi.org/10.62150/MAA.9.2009.

Bárdos, E., Garam, É. 2014: *Das awarenzeitliche Gräberfeld in Zamárdi-Rétiföldek. Teil II*. Monumenta Avarorum Archaeologica 10. Budapest: Magyar Nemzeti Múzeum. DOI: 10.62150/MAA.10.2014. Available also from: https://doi.org/10.62150/MAA.10.2014.

Bareggi, A., Pellegrino, C., Giuffra, V., Riccomi, G. 2022: Puberty in pre-Roman times. A bioarchaeological study of Etruscan-Samnite adolescents from Pontecagnano (southern Italy). *International Journal of Osteoarchaeology* 32(5), 1114–1129. DOI: 10.1002/oa.3137. Available also from: https://doi.org/10.1002/oa.3137.

Barna, M., Jarčuška, B. 2011: Prirodzená obnova buka. In: M. Barna, J. Kulfan, E. Bublinec (eds.): *Buk a bukové ekosystémy Slovenska*. Bratislava: Veda, 227–248.

Bartoňková, D., Haderka, K., Havlík, L., Ludvíkovský, J., Vašica, J., Večerka, R. 1971: *Magnae Moraviae Fontes Historici IV. Leges, textus, iuridici, supplementa*. Opera Universitatis Purkynianae Brunensis. Facultas Philosophica 156. Brno: Universita J. E. Purkyně. Available also from: https://1url.cz/PJRIj.

Bartoňková, D., Havlík, L., Hrbek, I., Ludvíkovský, J., Večerka, R. eds. 1969: *Magnae Moraviae fontes historici III. Diplomata, epistolae, textus historici vari*. Brno: Universita J. E. Purkyně.

Bartošková, A. 2003: Kostěná a parohová industrie ze Staré Boleslavi. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 227–266. Available also from: https://1url.cz/rJlaK.

Básti, Z. 2022: Textile remains of the Avar cemetery at Tiszafüred-Majoros. *Communicationes Archaeologicae Hungariae* 2020, 145–195. DOI: 10.54640/CAH.2020.145. Available also from: https://ojs.elte.hu/comarchhung/article/view/3015.

Batelka, J. 1941: *Popis stavu hradiště „Stará Kouřim" za účelem evidence lokality, zmínky o starších významných nálezech v Kouřimi a okolí* [online]. Manuscript of the excavation report, C-TX-194100182 [Accessed 2025-04-21]. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Sciences, Praha. DOI: 10.60585/C-TX-194100182. Available also from: Digital Archive of the AMCR https://doi.org/10.60585/C-TX-194100182.

Baumhauer, M. 2001: „Grubenhaus" oder „Erdkeller"? Bemerkungen zu ihrer Unterscheidbarkeit anhand ausgewählter mittelalterlicher Befunde. In: J. Pfrommer, B. Scholkmann (Hrsg.): *Zwischen den Zeiten. Archäologische Beiträge zur Geschichte des Mittelalters in Mitteleuropa. Festschrift für Barbara Scholkmann*. Internationale Archäologie. Studia honoraria 15. Rahden/Westf.: Leidorf, 349–362.

Baumhauer, M. 2003: *Archäologische Studie zu ausgewählten Aspekten der mittelalterlichen Handwerkstopographie im deutschsprachigen Raum. Bestandsaufnahme der Handwerksbefunde vom 6.-14. Jahrhundert und vergleichende Analyse* [online]. Manuscript of the dissertation. Eberhard Karls Universität Tübingen. Stored in: Universitätsbibliothek Publikatinssystem [Accessed 2025-01-15]. Available from: http://hdl.handle.net/10900/46233.

Beaudet, A. 2024: Les artisans et la terre: réflexions sur les concessions foncières aux artisans altomédiévaux (IX^{e}XI^{e} siècles). *Frontières* 10, 53–66. DOI: 10.4000/135o7. Available also from: https://doi.org/10.4000/135o7.

Beaumont, J. 2020: The Whole Tooth and Nothing but the Tooth. Or why Temporal Resolution of Bone Collagen May Be Unreliable. *Archaeometry* 62(3), 626–645. DOI: 10.1111/arcm.12544. Available also from: https://doi.org/10.1111/arcm.12544.

Behla, R. 1888: *Die vorgeschichtlichen Rundwälle im östlichen Deutschland. Eine vergleichend-archäologische Studie*. Berlin: A. Asher & Co.

Behrens, G. 1949: Ingelheims Vor- und Frühgeschichte. In: G. Bernhard et al. (Hrsg.): *Ingelheim. Rheinhessen in seiner Vergangenheit 9*. Mainz: E. Schneider Verlag, 8–42.

Behrens, G. 1984: Ingelheims Vor- und Frühgeschichte. In: G. Bernhard et al. (Hrsg.): *Ingelheim. Beiträge zur Ingelheimer Geschichte 34*. Ingelheim: Historischer Verein Ingelheim, 17–53.

Beilke-Voigt, I. 1998: *Frühgeschichtliche Miniaturobjekte mit Amulettcharakter zwischen Britischen Inseln und Schwarzem Meer*. Universitätsforschungen zur prähistorischen Archäologie 51. Schriften zur Archäologie der germanischen und slawischen Frühgeschichte 3. Bonn: Dr. Rudolf Habelt.

Bendlin, A. 2006: Phylakterion. In: H. Cancik, H. Schneider (eds.): *Brill's New Pauly Online* [online]. Leiden: Brill [Accessed 2025-01-15]. DOI: 10.1163/1574-9347_bnp_e924540. Available from: https://doi.org/10.1163/1574-9347_bnp_e924540.

Beňko, J. 1996: *Starý Turiec*. Martin: Vydavateľstvo Osveta.

Beranová, M. 1980: *Zemědělství starých Slovanů*. Praha: Academia. Available also from: https://1url.cz/uJdO5.

Bernat, J., Štědra, M. 2003: Čertova Brázda. *Sázavsko* X, 16–33.

Berranger, M., Leroy, M., Hervé, L. 2023: Les zones de production du fer en Bourgogne-Franche-Comté. Une approche sur la longue durée par le radiocarbone. *Gallia* 80(2), 15–48. DOI: 10.4000/gallia.6954. Available also from: https://doi.org/10.4000/gallia.6954.

Bestehorn, F., Hoffmann, R. 1930: Fundnachrichten Brandenburg. *Nachrichtenblatt für deutsche Vorzeit* 6, 138–141.

Betti, M. 2014: *The making of Christian Moravia (858–882). Papal power and political reality*. East Central and Eastern Europe in the Middle Ages, 450–1450, Vol. 24. Boston, Leiden: Brill.

Biermann, F. 1999: Dendrochronologie und Keramikforschung zwischen Elbe und Oder vom 8.–12. Jahrhundert. In: L. Poláček, J. Dvorská (Hrsg.): *Probleme der mitteleuropäischen Dendrochronologie und naturwissenschaftliche Beiträge zur Talaue der March*. Internationale Tagungen in Mikulčice V. Spisy Archeologického ústavu AV ČR Brno 15. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno, 97–123. Available also from: https://1url.cz/4JTe9.

Biermann, F. 2000: *Slawische Besiedlung zwischen Elbe, Neiße und Lubsza. Archäologische Studien zum Siedlungswesen und zur Sachkultur des frühen und hohen Mittelalters*. Universitätsforschungen zur prähistorischen Archäologie 65. Schriften zur Archäologie der germanischen und slawischen Frühgeschichte 5. Bonn: Dr. Rudolf Habelt.

Biermann, F. 2001: Siedlungstätigkeit und Befestigungsbau auf dem Pennigsberg. In: F. Biermann (Hrsg.): *Pennigsberg. Untersuchungen zu der slawischen Burg bei Mittenwalde und zum Siedlungswesen des 7./8. bis 12. Jahrhunderts am Teltow und im Berliner Raum*. Beiträge zur Ur- und Frühgeschichte Mitteleuropas 26. Weißbach: Beier & Beran, 31–111.

Biermann, F. 2003: Die Keramik der Ausgrabung Altstädtische Fischerstraße 5/6 zu Brandenburg an der Havel. *Veröffentlichungen zur Brandenburgischen Landesarchäologie* 33, 1999, 179–268.

Biermann, F. 2007: Motten im nördlichen Ostdeutschland. *Beiträge zur Mittelalterarchäologie in Österreich* 23, 111–134.

Biermann, F. 2008: Mittelslawische Vorburgsiedlungen (9./10. Jahrhundert) im nördlichen elbslawischen Gebiet – Gestalt und Funktion. In: I. Boháčová, L. Poláček (Hrsg.): *Burg – Vorburg – Suburbium. Zur Problematik der Nebenareale frühmittelalterlicher Zentren*. Internationale Tagungen in Mikulčice VII. Spisy Archeologického ústavu AV ČR Brno 35. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 35–77. Available also from: https://arub.cz/wp-content/uploads/Burg-Vorburg-Suburbium.pdf.

Biermann, F. 2009: *Bootsgrab – Brandgrab – Kammergrab. Die slawischen Gräberfelder von Usedom im Kontext der früh- und hochmittelalterlichen Bestattungssitten in Mecklenburg und Pommern*. Archäologie und Geschichte im Ostseeraum 7. Rahden/Westf.: Leidorf.

Biermann, F. 2010: *Archäologische Studien zum Dorf der Ostsiedlungszeit. Die Wüstungen Miltendorf und Damsdorf in Brandenburg und das ländliche Siedlungswesen des 12. bis 15. Jahrhunderts in Ostmitteleuropa*. Forschungen zur Archäologie im Land Brandenburg 12. Wünsdorf: BLDAM.

Biermann, F. 2011: Functions of the large Feldberg type strongholds from the 8th/9th century in Mecklenburg and Pomerania. *Sprawozdania archeologiczne* 63, 149–174. Available also from: http://journals.iaepan.pl/sa/article/view/1134.

Biermann, F. 2017: Kult, Sklaverei, Mord und Totschlag – menschliche Knochen aus slawischen Siedlungsbefunden. In: F. Biermann, T. Kersting, A. Klammt (Hrsg.): *Religion und Gesellschaft im nördlichen westslawischen Raum. Beiträge der Sektion zur slawischen Frühgeschichte der 22. Jahrestagung des Mittel- und Ostdeutschen Verbandes für Altertumsforschung in Chemnitz, 29.–31. März 2016*. Beiträge zur Ur- und Frühgeschichte Mitteleuropas 82. Weißbach: Beier & Beran, 97–119.

Biermann, F. 2020: Sozialgeschichte aus Metall – Detektorprospektionen auf Brandenburger hoch- und spätmittelalterlichen Burgen. In: P. Ettel, A.-M. Flambard Héricher, K. O'Connor (eds.): *Vivre au château. Actes du colloque international de Château-Thierry (France, 26 août-1er septembre 2018)*. Chateau Gaillard 29. Caen: Presses Universitaires de Caen, 49–52.

Biermann, F. 2021: Archaeological Evidence for Slavery Among the Early Medieval North-Western Slavs. In: F. Biermann, M. Jankowiak (eds.): *The Archaeology of Slavery in Early Medieval Northern Europe. The Invisible Commodity*. Themes in Contemporary Archaeology. Cham: Springer, 141–160. DOI: 10.1007/978-3-030-73291-2_11.

Biermann, F. 2022: Silber bei den frühmittelalterlichen polabischen Slawen – zwischen „Fremdwährung" und Elitenrepräsentation. In: F. Biermann et al. (Hrsg.): *Frühmittelalterliches Hacksilber im nördlichen westslawischen Raum. Archäologie und Archäometallurgie. Beiträge der internationalen Konferenz im Kulturhistorischen Museum Görlitz, 18./19. Oktober 2019*. Studien zur Archäologie Europas 36. Bonn: Dr. Rudolf Habelt, 105–138.

Biermann, F., Kersting, T. 2017: Archäologie der Slawenzeit – 25 Jahre nach der Wende. In: M. Meyer, F. Schopper, M. Wemhoff (Hrsg.): *Feuerstein, Fibel, Fluchttunnel. Archäologie in Berlin und Brandenburg seit der Wende*. Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum. Arbeitshefte 5. Petersberg: Michael Imhof, 101–120.

Biermann, F., Kersting, T. 2020: Im Land der Burgwälle – Brandenburg. *Archäologie in Deutschland* 2020(3), 26–29.

Biermann, F., Kersting, T., Lobinger, C., Trappen, H.-J. 2018: Kultureller Schmelztiegel Havelland. Ungewöhnliche germanische, awarische und slawische Funde von Weseram, Lkr. Potsdam-Mittelmark. *Archäologie in Berlin und Brandenburg* 2016, 74–75.

Biermann, F., Kieseler, A., Pernicka, E., von Richthofen, J. (Hrsg.) 2022: *Frühmittelalterliches Hacksilber im nördlichen westslawischen Raum. Archäologie und Archäometallurgie. Beiträge der internationalen Konferenz im Kulturhistorischen Museum Görlitz, 18./19. Oktober 2019*. Studien zur Archäologie Europas 36. Bonn: Dr. Rudolf Habel.

Biermann, F., Posselt, N. 2022: *Burgen vom Typ Motte zwischen Altmark und Niederschlesien. Archäologische Forschungen zum hoch- und spätmittelalterlichen Befestigungswesen*. Studien zur Archäologie Europas 35. Bonn: Dr. Rudolf Habelt.

Bilogrivić, G. 2019: Medieval Reality or a Modern Construct? Old Croatian Culture in Medieval Studies Between the 19th and the 21st Century. *Südost-Forschungen* 78(1), 191–225. DOI: 10.1515/sofo-2019-780111.

Bisson, T. N. 1984: L'essor de la Catalogne. Identité, pouvoir et idéologie dans une société du XIIe siècle. *Annales. Histoire, Sciences Sociales* 39(3), 454–479. DOI: 10.3406/ahess.1984.283071. Available also from: https://1url.cz/3JqXs.

Bitterwolf, J. 2020: *Das Terra Sigillata Inventar eines möglichen Bustums in Ingelheim am Rhein*. Manuscript of the thesis. Johannes Gutenberg-University of Mainz. Pre- and Early Historical Archaeology. Stored in: The library of the Department of Pre- and Early Historical Archaeology.

Bláha, J. 2001a: Archeologické poznatky k vývoji a významu Olomouce v období Velkomoravské říše. In: L. Galuška, P. Kouřil, Z. Měřínský (eds.): *Velká Morava mezi východem a západem*. Brno: Archeologický ústav Akademie věd České republiky Brno, 41–68.

Bláha, J. 2001b: Olomouc im 10.–11. Jahrhundert. Topographie und die Frage der Kontinuität eines frühmittelalterlichen Zentrums. In: P. Sommer (ed.): *Boleslav II. Der tschechische Staat um das Jahr 1000*. Praha: Filosofia, 325–361.

Bláha, R., Frolík, J., Musil, J., Sehnoutková, P. 2021: Schránka na svaté oleje z Chrudimi, Hradební ulice. *Archeologie východních Čech* 21, 114–127.

Bláhová, M. 1993: ... kako jest koruna z Moravy vyšla... (Translatio regni› ve Staročeské kronice tzv. Dalimila). *Mediaevalia Historica Bohemica* 3, 165–176. Available also from: https://1url.cz/kJqX9.

Bloch, M. 1973: *The Royal Touch. Sacred Monarchy and Scrofula in France and England*. London: Routledge & Kegan Paul.

BNF 1458: Grec 1458 [online]. [Acessed 2025-09-02]. Available from: https://gallica.bnf.fr/ark:/12148/btv1b10722849m.image.

Bocherens, H. 2009: Neanderthal Dietary Habits. Review of the Isotopic Evidence. In: J.-J. Hublin, M. P. Richards (eds): *The Evolution of Hominin Diets: Integrating Approaches to the Study of Palaeolithic Subsistence*. Dordrecht: Springer, Netherlands, 241–250. DOI: 10.1007/978-1-4020-9699-0_19.

Boeck, E. N. 2021: *The Bronze Horseman of Justinian in Constantinople. The Cross-Cultural Biography of a Mediterranean Monument*. Cambridge: Cambridge University Press.

Bogin, B. 2002: The evolution of human growth. In: N. Cameron, B. Bogin (eds.): *Human Growth and Development*. Amsterdam: Academic Press, 287–324.

Boháčová, I. 1993: Nové prameny k přemyslovskému hradišti ve Staré Boleslavi, předběžná informace. In: S. Moździoch (ed.): *Lokalne ośrodki władzy państwowej w XI–XII w Europie Środkowo-Wschodniej*. Spotkania Bytomskie 1. Wrocław: Instytut Archeologii i Etnologii PAN, 201–218.

Boháčová, I. 2003a: Stará Boleslav v raném přemyslovském státě. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 471–478. Available also from: https://1url.cz/7Jlae.

Boháčová, I. 2003b: Stavební podoba, nálezové kontexty a chronologie sakrálních staveb. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 195–198. Available also from: https://1url.cz/RJlaw.

Boháčová, I. 2003c: Sídlištní zástavba. Přehled základních typů staveb a objektů. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 211–219. Available also from: https://1url.cz/bJlao.

Boháčová, I. 2003d: Předměty každodenního života v areálu přemyslovského hradu ve Staré Boleslavi. Poznámky k výpovědním možnostem archeologických movitých nálezů. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 293–310. Available also from: https://1url.cz/QJlaN.

Boháčová, I. 2006: Stará Boleslav – stav a perspektivy studia funkcí a prostorového uspořádání přemyslovského hradu. *Archeologické rozhledy* LVIII(4), 695–723. Available also from: https://1url.cz/vJlaF.

Boháčová, I. 2010: Die Kirchen auf dem Burgwall von Stará Boleslav. Ein Beitrag der Archäologie zur Erforschung der frühmittelalterlichen Sakralarchitektur in Böhmen. In: L. Poláček, J. Maříková-Kubková (Hrsg.): *Frühmittelalterliche Kirchen als archäologische und historische Quelle*. Internationale Tagungen in Mikulčice VIII. Spisy Archeologického ústavu AV ČR Brno 41. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 243–261, Taf. 18–23. Available also from: https://arub.cz/wp-content/uploads/Fruhmittelalterliche_Kirchen_m.pdf.

Boháčová, I. 2011: Pohřebiště na Loretánském náměstí v Praze – Hradčanech. In: I. Boháčová, G. Blažková: *Pohřebiště na Loretánském náměstí v Praze – Hradčanech. Archeologický výzkum Ivana Borkovského a jeho výsledky. I – Textová část*. Castrum Pragense 11(1). Praha: Archeologický ústav AV ČR, Praha, v. v. i., 55–73. Available also from: https://www.arup.cas.cz/wp-content/uploads/2020/05/CP_11_1_2011.pdf.

Boháčová, I. 2023: Bavaria and Bohemia. Reflection of supra-regional contacts in the archaeological sources from the Přemyslid castle in Stará Boleslav (Central Bohemia). *Zeitschrift für Archäologie des Mittelalters* 50 (2022), 199–212.

Boháčová, I., Hošek, J. 2009: Raně středověké nože ze Staré Boleslavi. *Archaeologia historica* 34, 367–392. Available also from: https://digilib.phil.muni.cz/cs/handle/11222.digilib/140817.

Boháčová, I., Hrušková, I. 2025: Stará Boleslav. Pohřbívání v areálu staroboleslavské kapituly a při kostele neznámého zasvěcení v jeho sousedství v raném a vrcholném středověku. *Archaeologia historica* 50(1), 7–50. DOI: 10.5817/AH2025-1-1.Available also from: https://digilib.phil.muni.cz/cs/handle/11222.digilib/digilib.82345.

Boháčová, I., Koštová, N. 2024: Vývoj raně středověkého centra ve Staré Boleslavi optikou radiouhlíkového datování etážového pohřebiště při bazilice sv. Václava a v kostele sv. Klimenta. *Archeologické rozhledy* LXXVI(3–4), 333–360. DOI: 10.35686/AR.2024.244. Available also from: https://doi.org/10.35686/AR.2024.244.

Boháčová, I., Profantová, N., Špaček, J. 1998: Kování avarského původu ze Staré Boleslavi. *Archeologie ve středních Čechách* 2, 341–348.

Böhner, K. 1958: *Die fränkischen Altertümer des Trieres Landes. Teil 1 Textband, Teil 2 Katalog und Tafeln*. Germanische Denkmäler der Völkerwanderungszeit. Serie B. Die fränkischen Altertümer des Rheinlandes 1. Berlin: Gebr. Mann Verlag.

Böhner, K. 1964: Aus der Vor- und Frühgeschichte des Ingelheimer Landes. In: J. Autenrieth (Hrsg.): *Ingelheim am Rhein. Forschungen und Studien zur Geschichte Ingelheims*. Ingelheim am Rhein: C. H. Boehringer Sohn, 9–64.

Böhner, K. 1974: Ingelheim in vor- und frühgeschichtlicher Zeit. In: F. Lachenal, H. T. Weise (Hrsg.): *Ingelheim am Rhein 774–1974. Geschichte und Gegenwart*. Ingelheim am Rhein: C. H. Boehringer Sohn, 17–36.

Bollók, Á. 2014: From Carolingian Europe to Its Periphery and Back Again. A Brief Contribution to the Study of the Last Phases of Carolingian Metalwork and the Western European Booty of the Ancient Hungarians. *Zeitschrift für Archäologie des Mittelalters* 42, 77–116.

Bosselmann-Ruickbie, A., Daim, F., Greiff, S. (eds.) 2025: *The Preslav Treasure from Bulgaria (Tenth Century). Historical Context, Excavations, Objects and Technology*. Byzanz zwischen Orient und Okzident 29. Mainz: LEIZA Verlag. DOI: 10.11588/propylaeum.1618. Available also from: https://doi.org/10.11588/propylaeum.1618.

Bougard, F., Goetz, H.-W., Le Jan, R. (eds.) 2011: *Théorie et pratiques des élites au Haut Moyen Âge. Conception, perception et réalisation sociale / Theorie und Praxis frühmittelalterlicher Eliten. Konzepte, Wahrnehmung und soziale Umsetzung*. Collection Haut Moyen Âge 13. Turnhout: Brepols. DOI: 10.1484/M.HAMA-EB.6.09070802050003050402020603.

Bougard, F., Iogna-Prat, D., Le Jan, R. (eds.) 2008: *Hiérarchie et stratification sociale dans l'Occident médiéval 400–1100*. Collection Haut Moyen Âge 6. Turnhout: Brepols.

Bougard, F., La Rocca, C., Le Jan, R. (eds.) 2005: *Sauver son âme et se perpétuer. Transmission du patrimoine et mémoire au haut Moyen-Âge*. Collection de l'École française de Rome 351. Rome: Publications de l'École française de Rome. DOI: 10.4000/books.efr.2251.

Bougard, F., Le Jan, R., Lienhard, T. (eds.) 2012: *Agôn. La competition. Ve-XIIe siècle*. Collection Haut Moyen Âge 17. Turnhout: Brepols.

Bougard, F., Le Jan, R., McKitterick, R. (eds.) 2009: *La culture au haut Moyen Âge. Une question d'élites ?* Collection Haut Moyen Âge 7. Turnhout: Brepols.

Bourbou, C. 2020: "The greatest of treasures". Advances in the bioarchaeology of Byzantine children. In: L. A. Beaumont, M. Dillon, N. Harrington (eds.): *Children in Antiquity Perspectives and Experiences of Childhood in the Ancient Mediterranean*. London: Routledge, 594–607.

Bourbou, C., Arenz, G., Dasen, V., Lösch, S. 2019: Babes, bones, and isotopes. A stable isotope investigation on nonadults from Aventicum, Roman Switzerland (first–third century CE). *International Journal of Osteoarchaeology* 29(6), 974-985. DOI: 10.1002/oa.2811.

Bourbou, C., Fuller, B. T., Garvie-Lok, S. J., Richards, M. P. 2013: Nursing Mothers and Feeding Bottles. Reconstructing

Breastfeeding and Weaning Patterns in Greek Byzantine Populations (6th–15th Centuries AD) Using Carbon and Nitrogen Stable Isotope Ratios. *Journal of Archaeological Science* 40(11), 3903–3913. DOI: 10.1016/j.jas.2013.04.020. Available also from: https://doi.org/10.1016/j.jas.2013.04.020.

Bourbou, C., Garvie-Lok, S. J. 2009: Breastfeeding and Weaning Patterns in Byzantine Times. Evidence from Human Remains and Written Sources. In: A. Papaconstantinou, A. M. M. Talbot (eds.): *Becoming Byzantine. Children and Childhood in Byzantium*. Dumbarton Oaks Byzantine Symposia and Colloquia 1. Washington, D. C.: Dumbarton Oaks Research Library and Collection, Harvard University Press, 65–83.

Bowman, J. A. 2004: *Shifting Landmarks. Property, Proof, and Dispute in Catalonia Around the Year 1000*. Conjunctions of religion and power in the medieval past. Ithaca, London: Cornell University Press.

Brather, S. 1998: Karolingerzeitlicher Befestigungsbau im wilzisch-abodritischen Raum. Die sogenannten Feldberger Höhenburgen. In: J. Henning, A. T. Ruttkay (Hrsg.): *Frühmittelalterlicher Burgenbau in Mittel- und Osteuropa. Tagung, Nitra vom 7. bis 10. Oktober 1996*. Bonn: Dr. Rudolf Habelt, 115–126.

Brather, S. 2019: Frühmittelalterliche Siedlungen und ihr Umfeld: »Kleine Welten« aus archäologischer Sicht. In: T. Kohl, S. Patzold, B. Zeller (Hrsg.): *Kleine Welten. Ländliche Gesellschaften im Karolingerreich*. Vorträge und Forschungen LXXXVII. Ostfildern: Jan Thorbecke, 21–66. DOI: 10.11588/vuf.2019.0.85072. Available also from: https://doi.org/10.11588/vuf.2019.0.85072.

Braunstein, P. 1999: Eisen. In: *Lexikon des Mittelalters 3. Codex Wintonienses bis Erziehungs- und Bildungswesen*. Stuttgart, Weimar: Metzler, 1750–1754.

Bravermanová, M. 2011: The so-called armour of St. Wenceslaus – a historical introduction. *Acta Militaria Mediaevalia* VIII, 213–220. Available also from: http://amm.sanok.pl/wp-content/uploads/2017/06/VIII.6_Bravermanova.pdf.

Bretholz, B. 1896: *Dějiny Moravy I/1*. Brno: Winiker. Available also from: https://1url.cz/zJqdB.

Brett, C. 2011: Soldiers, Saints, and States? The Breton Migrations Revisited. *Cambrian medieval Celtic studies* 61, 1–56.

Brett, C. 2015: In the margins of history?› The Breton March from Dagobert to Charlemagne. In: H. Bouget et al. (eds.): *Histoires des Bretagnes 5. En marge*. Brest: CRBC, 31–46.

Bronk Ramsey, C. 2021: *OxCal 4.4 Manual* [online]. Last Updated 7/11/2024. Research Lab for Archaeology and the History of Art. [Accessed 2025-04-19]. Available from: https://c14.arch.ox.ac.uk/oxcalhelp/hlp_contents.html.

Brühl, C. 1962: Fränkischer Krönungsbrauch und das Problem „Festkrönungen". *Historische Zeitschrift* 194(2), 265–326. Available also from: https://www.jstor.org/stable/27613183.

Brühl, C. 1982: Kronen- und Königsbrauch im frühen und hohen Mittelalter. *Historische Zeitschrift* 234(1), 1–31. Available also from: https://www.jstor.org/stable/27622631.

Brumfiel, E. M., Earle, T. K. 1987: Specialization, exchange and complex societies. An introduction. In: E. M. Brumfiel, T. K. Earle (eds.): *Specialization, exchange and complex societies*. New Direction in Archaeology. Cambridge: Cambridge University Press, 1–9.

Brunner, K. 1973: Der fränkische Fürstentitel im neunten und zehnten Jahrhundert. In: H. Wolfram (Hrsg.): *Intitulatio II. Lateinische Herrscher- und Fürstentitel im neunten und zehnten Jahrhundert*. Mitteilungen des Instituts für Österreichische Geschichtsforschung. Ergänzungsband 24. Wien, Köln, Graz: Hermann Böhlau, 179–340.

Brůžek, J., Mikšík, I., Kotěrová, A. P., Morvan, M., Drtikolová Kaupová, S., Santos, F., Danielisová, A., Zazvonilová, E., Maureille, B., Velemínský, P. 2024: Undertaking the biological sex assessment of human remains. The applicability of minimally-invasive methods for proteomic sex estimation from enamel peptides. *Journal of Cultural Heritage* 66, 204–214. DOI: 10.1016/j.culher.2023.11.021. Available also from: https://doi.org/10.1016/j.culher.2023.11.021.

Brzobohatá, H., Mazač, Z., Tvrdík, R. 1999: Středověké pohřebiště v Kouřimi, okr. Kolín. *Archeologie ve středních Čechách* 3(2), 547–556. Available also from: https://1url.cz/QJVd1.

Budaváry, V. 1938–1939: Staroslovanské mohyly v Krasňanoch pri Varíne (okres Žilina). *Sborník Muzeálnej slovenskej spoločnosti* XXXII–XXXIII(1–8), 85–105.

Budinský-Krička, V. 1948–1949: Výskumy Štátneho archeologického ústavu v Turč. Sv. Martine r. 1964 a 1947. *Historica Slovaca* VI–VII, 269–279.

Budinský-Krička, V. 1956: Pohrebisko z neskorej doby avarskej v Žitavskej Tôni na Slovensku. *Slovenská archeológia* IV(1), 5–131. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1956_1.pdf.

Budinský-Krička, V. 1957: Zpráva o pokusnom výskume na slovanskom mohylníku v Bitarovej (okr. Žilina). *Slovenská archeológia* V(2), 456–464. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1957_2.pdf.

Budinský-Krička, V. 1960: *Krásno nad Kysucou, okr. Čadca*. Manuscript of the excavation report, No. 198/60.Stored in: Archeologický ústav SAV, v. v. i.

Bühler, B. 2014: *Der „Schatz" von Brestovac, Kroatien. Seine kulturellen Beziehungen und technologischen Aspekte*. Monographien des Römisch-Germanischen Zentralmuseums 85. Mainz: Römisch-Germanisches Zentralmuseum.

Bühler, B., Kirchengast, S. 2022: Horse-riding as a habitual activity among the early medieval Avar population of the cemetery of Csokorgasse (Vienna). Sex and chronological differences. *International Journal of Osteoarchaeology* 32(4). DOI: 10.1002/oa.3107. Available also from: https://doi.org/10.1002/oa.3107.

Bührer-Thierry, G., Patzold, S., Schneider, J. (eds.) 2018: *Genèse des espaces politiques (IXe-XIIe siècle). Autour de la question spatiale dans les royaumes francs et post-carolingiens*. Collection Haut Moyen Âge 28. Turnhout: Brepols. DOI: 10.1484/M.HAMA-EB.5.112890.

Buikstra, J. E., Konigsberg, L. W., Bullington, J. 1986: Fertility and Development of Agriculture in the Prehistoric Midwest. *American Antiquity* 51(3), 528–546. DOI: 10.2307/281750. Available also from: https://www.jstor.org/stable/281750.

Burger, D., Haupt, P., Klenner, I. 2013: *Die römerzeitlichen Funde aus den Grabungen im Bereich der Königspfalz Ingelheim*. Manuscript finished in 2013, intended for publication in Archäologie und Bauforschung in der Pfalz Ingelheim am Rhein.Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Callmer, J., Gustin, I., Roslund, M. 2024: Baltic, Finnic and Scandinavian Social Interaction in the Fur-hunting North, c AD 700–1200. *Medieval Archaeology* 68(2), 331–357. DOI: 10.1080/00766097.2024.2427530. Available also from: https://doi.org/10.1080/00766097.2024.2427530.

Capitulare Quierzy: Capitulary of Quierzy 879. *Monumenta Germaniae Historica*. Capitularia regum Francorum 2. A. Boretius, V. Krause (eds.). Hannover: Hahn, 1897.

Čaplovič, D. 1998: *Včasnostredoveké osídlenie Slovenska*. Bratislava: Academic Eletronic Press.

Čaplovič, P. 1987: *Orava v praveku, vo včasnej dobe dejinnej a na začiatku stredoveku*. Martin: Vydavateľstvo Osveta.

Cardoso, H. F. V. 2008: Sample-specific (universal) metric approaches for determining the sex of immature human skeletal remains using permanent tooth dimensions. *Journal of Archaeological Science* 35(1), 158–168. DOI: 10.1016/j.jas.2007.02.013. Available also from: https://doi.org/10.1016/j.jas.2007.02.013.

Carruthers, B. G. 2005: The Sociology of Money and Credit. In: J. S. Neil, S. Richard (eds.): *The Handbook of Economic Sociology*. 2nd edition. Princeton: Princeton University Press, 355–378.

Cartulaire Redon: *Cartulaire de l'Abbaye de Redon en Bretagne*. A. de Courson (ed.). Paris: Imprimerie Imperiale, 1863.

Cassard, J-Ch. 1989: La tradition royale en Bretagne armorique. *Revue historique* 281(1), 15–45. Available also from: https://www.jstor.org/stable/40954837.

Černá, E., Podliska, J. 2008: Sklo – indikátor kulturních a obchodních kontaktů středověkých Čech. In: P. Sommer, V. Liščák (eds.): *Odorik z Pordenone. Z Benátek do Pekingu a zpět. Setkávání na cestách Starého světa ve 13.–14. století. Sborník příspěvků z mezinárodní konference. Plzeň, 13.-14. listopadu 2006*. Colloquia mediaevalia Pragensia 10. Praha: Filosofia, 237–256.

Černá, E., Tomková, K., Hulínský, V. 2015: Proměny skel od 11. do konce 13. století v Čechách. *Archeologické rozhledy* LXVII(1), 78–108. Available also from: https://1url.cz/kJlaD.

Červinka, L. I. 1928: *Slované na Moravě a říše Velkomoravská*. Brno: Pravěk.

Chandler, C. 2018: *Carolingian Catalonia. Politics, Culture, and Identity in an Imperial Province, 778–987*. Cambridge Studies in Medieval Life and Thought, Fourth series, 111. Cambridge: Cambridge University Press. DOI: 10.1017/9781108565745.

Chorvátová, H. 2009: Kultúrno-historický význam gombíkov. *Studia mediaevalia Bohemica* 1, 7–19. Available also from: https://1url.cz/KJs39.

Chron. Aquitanicum: Chronicon Aquitanicum. In: *Études critiques sur divers textes des Xe et XIe siècles 2*. J.-A. Lair (ed.). Paris: A. Picard, 1899.

Chron. Nantes: *La Chronique de Nantes*. R. Merlet (ed.). Collection de Textes pour servir à l´Enseignement de l'histoire 19. Paris: Alphonse Picard et fils, 1896.

Chytil, J. (ed.) 1860: *Codex diplomaticus et epistolaris Moraviae. Svazek VII, Díl 2*. Brno: A. Nitsch.

Chytrý, M. (ed.) 2013: *Vegetace České republiky 4. Lesní a křovinná vegetace*. Praha: Academia.

Čilinská, Z. 1963: Slovansko-avarské pohrebisko v Žitavskej Tôni. *Slovenská archeológia* XI(1), 87–120. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1963_1.pdf.

Čilinská, Z. 1966: *Slawisch-awarisches Gräberfeld in Nové Zámky*. Archaeologia slovaca, Fontes 7. Bratislava: Vydavateľstvo SAV.

Čilinská, Z. 1982: Dve pohrebiská z 8.–9. storočia v Komárne. *Slovenská archeológia* XXX(2), 347–393. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1982_2.pdf.

Čilinská, Z. 1990: Die awarenzeitlichen Frauengräber mit Pferdebestattung in der Slowakei. *A Wosinsky Mór múzeum évkönyve* XV, 135–146. Available also from: https://1url.cz/WJRK5.

Čilinská, Z. 1991: Postavenie žien v avarskom kaganáte. In: Z. Čilinská (ed.): *K problematike osídlenia stredodunajskej oblasti vo včasnom stredoveku*. Nitra: Archeologický ústav SAV.

Cleere, H., Crossley, D. 1995: *The Iron Industry of the Weald*. 2nd edition. Cardiff: Merton Priory Press.

Clemen, P. 1890: Der karolingische Kaiserpalast zu Ingelheim. *Westdeutsche Zeitschrift für Geschichte und Kunst* IX, 54–92, 97–148.

CNS 1.1: Malmer, B., Rasmusson, N. L. (eds.) 1975: *Corpus Nummorum Saeculorum IX - XI qui in Suecia reperti sunt 1. Gotland, Akebäck–Atlingbo*. Stockholm: Almqvist & Wiksell.

CNS 1.2: Malmer, B. (ed.) 1977: *Corpus Nummorum Saeculorum IX - XI qui in Suecia reperti sunt 1. Gotland, 2. Bäl – Buttle*. Stockholm: Almqvist & Wiksell.

CNS 3.4: Malmer, B., Lagerqvist, L. O. (eds.): 1987 *Corpus Nummorum Saeculorum IX - XI qui in Suecia reperti sunt 3. Skåne, 4. Maglarp – Ystad*. Stockholm: Almqvist & Wiksell.

Cocozza, C., Fernandes, R., Ughi, A., Groß, M., Alexander, M. M. 2021: Investigating infant feeding strategies at Roman Bainesse through Bayesian modelling of incremental dentine isotopic data. *International Journal of Osteoarchaeology* 31(3), 429–439. DOI: 10.1002/oa.2962. Available also from: https://onlinelibrary.wiley.com/doi/full/10.1002/oa.2962.

Cohausen, A. von 1853: Zwei Restaurationsversuche der Festhalle in der Kaiserpfalz zu Ingelheim. *Jahrbücher des Vereins von Alterthumsfreunden im Rheinlande* 20, 140–146. DOI: 10.11588/bjb.1853.0.28402. Available also from: https://doi.org/10.11588/bjb.1853.0.28402.

Colecció Besalú 15: *Colecció diplomática del Condadu de Besalú 15*. F. Monsalvatje y Fossas (ed.). Olot: Libréria de Juan Bonet, 1907.

Collins, R. 1981: Charles the Bald and Wifred the Hairy. In: M. T. Gibson, J. N. Nelson (eds.): *Charles the Bald. Court and Kingdom. Papers based on a Colloquium held in London in April 1979*. BAR International Series 101. Oxford: Oxford University Press, 169–189.

Conc. Tol. XII: Concilium toletanum duodecimum. In: *Colección de cánones y de todos los concilios de la Iglesia de Espana*. F. A. Gonzales (ed.). Madrid: Pedro Montero, 1850.

Concilia 2.2: *Concilia aevi Karolini, 2 (819–842)*. A. Werminghoff (ed.). Monumenta Germaniae Historica, Concilia 2.2. Hannover, Leipzig: Hahn, 1908.

Concilia Saxonica 6.1: *Concilia aevi Saxonici DCCCCXVI-MI, 1. DCCCCXVI-DCCCCLX*. E.-D. Hehl, H. Fuhrmann (eds.). Monumenta Germaniae Historica, Concilia 6.1. Hannover: Hahn, 1987.

Conversio: *Die Conversio Bagoariorum et Carantanorum und der Brief des Erzbischofs Theotmar von Salzburg*. F. Lošek (ed.). Monumenta Germaniae Historica. Studien und Texte 15. Hannover: Hahn, 1997.

Corpus 3: Herrmann, J., Donat, P. 1979: *Corpus archäologischer Quellen zur Frühgeschichte auf dem Gebiet der Deutschen Demokratischen Republik (7. bis 12. Jahrhundert), 3*. Berlin: Akademie der Wissenschaften.

Corradini, R. 2006: Die Annales Fuldenses – Identitätskonstruktionen im ostfränkischen Raum am Ende der Karolingerzeit. In: R. Corradini et al. (Hrsg.): *Texts and Identities in the Early Middle Ages*. Österreichische Akademie der Wissenschaften, Philosophisch-historische Klasse. Denkschriften 344. Forschungen zur Geschichte des Mittelalters 12. Wien: Verlag der Österreichischen Akademie der Wissschenschaften, 121–136.

Correspondance: *Loup de Ferrières. Correspondance II*. Ed. L. Levillain. Paris 1964.

Corron, L. K., McPherson, C. B., Hill, E. C., O'Donnell, L. 2025: Analyzing Patterns of Skeletal Indicators of Developmental Stress Through the Double Lens of Ontogeny and the Life Course Approach in a Contemporary Reference Sample. *American Journal of Biological Anthropology* 186(1), 25052. DOI: 10.1002/ajpa.25052.

Costin, C. L. 1991: Craft Specialization. Issues in Defining, Documenting, and Explaining the Organization of Production. *Archaeological Method and Theory* 3, 1–56.

Costin, C. L. 2001: Craft Production Systems. In: G. M. Feinman, T. D. Price (eds.): *Archaeology at the Millennium: A Sourcebook*. Boston: Springer, 273–327. DOI: 10.1007/978-0-387-72611-3_8.

Crew, P. 1991: The Experimental Production of Prehistoric Bar Iron. *Historical Metallurgy* 25, 21–36.

Crews, D. E., Gerber, L. M. 2003: Reconstructing life history of hominids and humans. *Collegium antropologicum* 27(1), 7–22. Available also from: https://hrcak.srce.hr/file/44187.

Crown project: *Crown. A research project on the materiality, technology and state of preservation of the Imperial Crown in Vienna* [online]. Kaiserliche Schatzkammer Wien. KHM-Museumverband, ©2022 [acessed 2025-11-01]. Available from: https://www.projekt-reichskrone.at/en/#activities.

Crummy, N. 2010: Bears and Coins. The Iconography of Protection in Late Roman Infant Burials. *Britannia* 41, 37–93. DOI: 10.1017/S0068113X1000005X. Available also from: https://www.jstor.org/stable/41725157.

Čtverák, V., Lutovský, M., Slabina, M., Smejtek, L. 2003: *Encyklopedie hradišť v Čechách*. Praha: Libri. Available also from: https://1url.cz/hJL97.

Curta, F. 2006: Merovingian and Carolingian Gift Giving. *Speculum* 81(3), 671–699. Available also from: https://www.jstor.org/stable/20463826.

d'Abadal i de Vinyals, R. 1962: La fundació del monastir de Ripoll. *Analecta Montserratensia* 9, 25–49.

d'Abadal i de Vinyals, R. 1991: *Els primers comtes catalans. Historia de Catalanya*. Biografes Catalanes 1. Barcelona: El Observador de la Actualidad.

Dabal, D. D. 2018: How experimental archaeology can answer questions artefacts cannot. Iron smelting experiments with use of slag-tapping bloomery furnaces. *ArheoVest* 6(2), 795–805.

Dailey, E. T. 2015: *Queens, Consorts, Concubines. Gregory of Tours and Women of the Merovingian Elite*. Mnemosyne Supplements 381. Leiden, Boston: Brill. DOI: 10.1163/9789004294660. Available also from: https://brill.com/display/title/31519.

Daim, F. 1987: *Das awarische Gräberfeld von Leobersdorf, NÖ 1*. Österreichische Akademie der Wissenschaften, Philosophisch-historische Klasse, Denkschriften 194. Studien zur Archäologie der Awaren 3. Veröffentlichungen der Komission für Frühmittelalterforschung 10. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Daim, F. (Hrsg.) 2012: *Das goldene Byzanz und der Orient. Schallaburg, 30. März bis 4. November 2012*. Schallaburg: Schallaburg Kulturbetriebsgesellschaft.

Daim, F., Chameroy, J., Greiff, S., Patscher, S., Stadler, P., Tobias, B. 2010: Kaiser, Vögel, Rankenwerk – byzantinischer Gürteldekor des 8. Jahrhunderts und ein Neufund aus Südungarn. In: F. Daim, J. Drauschke (Hrsg.): *Byzanz – das Römerreich im Mittelalter. Teil 3. Peripherie und Nachbarschaft*. Monographien des Römisch-Germanischen Zentralmuseums 84(3). Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 277–330.

Daim, F., Stadler, P., Pohl, W., Sauer, R., Blay, A., Eichert, S., Berner, M., Pany-Kucera, D., Tobias, B., Hofmanová, Z., Wang, K., Richter, K., Herbig, A., Hiss, A., Wiltschke-Schrotta, K. 2023: Auf der Suche nach den feinen Unterschieden. Die awarischen Gräberfelder von Leobersdorf und Mödling - An der Goldenen Stiege. In: H. Meller et al. (Hrsg.): *Kinship, Sex, and Biological Relatedness. The contribution of archaeogenetics to the understanding of social and biological relations. 15. Mitteldeutscher Archäologentag vom 6. bis 8. Oktober 2022 in Halle (Saale)*. Tagungen des Landesmuseums für Vorgeschichte 28. Halle [Saale]: Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte, 307–340. DOI: 10.11588/propylaeum.1280.c18014. Available also from: https://doi.org/10.11588/propylaeum.1280.c18014.

Daim, F., Stadler, P., Schwammenhöfer, H. (Hrsg.) in preparation: *Die awarische Nekropole von Mödling – An der Goldenen Stiege*.

Dalewski, Z. 2004: Vivat princeps in eternum! Sacrality of ducal power in Poland in the earlier Middle Ages. In: A. Al-Azmeh, J. M. Bak (eds.): *Monotheistic Kingship. The medieval variants*. CEU Medievalia 7. Budapest: Central European University Press, 215–230.

Dalimil: *Kronika tak řečeného Dalimila*. M. Krčmářová (ed.). Praha: Svoboda 1977. Available also from: https://1url.cz/pJVdp.

D'Altroy, T. N., Earle, T. K., Browman, D. L., La Lone, D., Moseley, M. E., Murra, J. V., Myers, T. P., Salomon, F., Schreiber, K. J., Topic, J. R. 1985: Staple Finance, Wealth Finance, and Storage in the Inka Political Economy [and Comments and Reply]. *Current Anthropology* 26(2), 187–206.

Dannenberg, H.-D. 1997: *Die brandenburgischen Denare des 13. und 14. Jahrhunderts. Typenkatalog – Prägezeiten – historische Zusammenhänge*. Berlin: Numismatische Gesellschaft.

Dartmann, C. 2010: Die Sakralisierung König Wambas. Zur Debatte um frühmittelalterliche Sakralherrschaft. *Frühmittelalterliche Studien* 44(1), 39–58.

Daveau, I., Goustard, V., Bahain, J.-J. 2000: Un complexe métallurgique et minier du haut Moyen Age. Le site des Fourneaux à Vert-Saint-Denis (Seine-et-Marne). *Gallia* 57, 77–99. DOI: 10.3406/galia.2000.3211. Available also from: https://hal.science/hal-01902622v1.

Davies, W. 1981: On the Distribution of Political Power in Brittany in the Mid-Ninth Century. In: M. T. Gibson, J. N. Nelson (eds.): *Charles the Bald. Court and Kingdom. Papers based on a Colloquium held in London in April 1979*. BAR International Series 101. Oxford: Oxford University Press, 98–114.

Davies, W. 2007: *Acts of Giving. Individual, Community, and Church in Tenth-Century Christian Spain*. Oxford: Oxford University Press.

Davies, W., Fouracre, P. (eds.) 2010: *The Languages of Gift in the Early Middle Ages*. Cambridge: Cambridge University Press.

Davis, J. R. 2015: *Charlemagne's Practice of Empire*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9781139924726.

Dehio, G. 1985: *Handbuch der deutschen Kunstdenkmäler. Rheinland-Pfalz, Saarland*. 2. bearbeitete und erweiterte Auflage. Berlin: Deutscher Kunstverlag.

Dekan, J. 1972: Herkunft und Ethnizität der gegossenen Bronzeindustrie des 8. Jahrhunderts. *Slovenská archeológia* XX(2), 317–452. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1972_2.pdf.

Dekan, J. 1981: *Moravia Magna. The great Moravian Empire: its art and times*. Minneapolis: Control Data Arts.

Delatouche, R. 1977: Regards sur l›agriculture aux temps carolingiens. *Journal des Savants* 2, 73–100. Available also from: https://www.persee.fr/doc/jds_0021-8103_1977_num_2_1_1352.

Demek, J. (ed.) a kol. 1987: *Zeměpisný lexikon ČSR. Hory a nížiny*. Praha: Academia. Available also from: https://1url.cz/k1pEn.

Demirjian, A., Goldstein, H., Tanner, J. M. 1973: A New System of Dental Age Assessment. *Human Biology* 45(2), 211–227. Available also from: https://1url.cz/LJRI8.

DeNiro, M. J., Epstein, S. 1978: Carbon isotopic evidence for different feeding patterns in two hyrax species occupying the same habitat. *Science* 201(4359), 906–908. DOI: 10.1126/science.201.4359.906. Available also from: https://www.science.org/doi/abs/10.1126/science.201.4359.906.

DeNiro, M. J., Epstein, S. 1981: Influence of diet on the distribution of nitrogen isotopes in animals. *Geochimica et Cosmochimica Acta* 45(3), 341–351. DOI: 10.1016/0016-7037(81)90244-1. Available also from: https://1url.cz/FJRIy.

Depreux, P. 2006: L'intégration des élites aristocratiques de Bavière et de Saxe au royaume des Francs – crise ou opportunité? In: F. Bougard, L. Feller, R. Le Jan (eds.): *Les élites au haut Moyen Âge. Crises et renouvellements*. Collection Haut Moyen Âge 1. Turnhout: Brepols, 225–252. DOI: 10.1484/M.HAMA-EB.3.496. Available also from: https://www.brepolsonline.net/doi/abs/10.1484/M.HAMA-EB.3.496.

Depreux, P., Bougard, F., Le Jan, R. (eds.) 2007: *Les élites et leurs espaces. Mobilité, rayonnement, domination (du VIe au XIe siècle)*. Collection Haut Moyen Âge 5. Turnhout: Brepols. DOI: 10.1484/M.HAMA-EB.6.090708020500030502060 10109.

Depreux, P., Patzold, S. (Hrsg.) 2023: *Versammlungen im Frühmittelalter*. Ergänzungsbände zum Reallexikon der Germanischen Altertumskunde 141. Berlin, Boston: Walter de Gruyter.

Dettwyler, K. A. 2004: When to wean. Biological versus cultural perspectives. *Clinical Obstetrics and Gynecology* 47(3), 712–723. DOI: 10.1097/01.grf.0000137217.97573.01.

Devroey, J.-P. 1979: Les services de transport à l'abbaye de Prum au IXème siècle. *Revue du Nord* 61(242), 543–569. DOI: 10.3406/rnord.1979.3603. Available also from: https://www.persee.fr/doc/rnord_0035-2624_1979_num_61_242_3603.

Devroey, J.-P. 2019: Le petit monde des seigneuries domaniales. Seigneurs, notables et officiers dans les seigneuries royales et ecclésiastiques à l'époque carolingienne. In: T. Kohl, S. Patzold, B. Zeller (Hrsg.): *Kleine Welten. Ländliche Gesellschaften im Karolingerreich*. Vorträge und Forschungen LXXXVII. Ostfildern: Jan Thorbecke, 165–203. DOI: 10.11588/vuf.2019.0.85077. Available also from: https://doi.org/10.11588/vuf.2019.0.85077.

Devroey, J.-P., Feller, L., Le Jan, R. (eds.) 2010: *Les élites et la richesse au haut Moyen Âge*. Collection Haut Moyen Âge 10. Turnhout: Brepols. DOI: 10.1484/M.HAMA-EB.6.090708020 50003050305080502.

Devroey, J.-P., Nissen, A. 2015: Early Middle Ages, 500-1000. In: E. Thoen, T. Soens (eds.): *Struggling with the Environment. Land Use and Productivity*. Rural economy and society in north-western Europe, 500-2000. Turnhout: Brepols, 11–68. DOI: 10.1484/M.RES-EB.5.108034.

Devroey, J.-P., Nissen Jaubert, A. 2011: Family, income and labour around the North Sea, 500-1000. In: E. Vanhaute, I. Devos, T. Lambrecht (eds.): *Making a Living. Family, Income and Labour*. Rural economy and society in north-western Europe, 500-2000. Turnhout: Brepols, 5–44. DOI: 10.1484/M.RES-EB.4.00003.

DeWitte, S. N., Stojanowski, C. M. 2015: The Osteological Paradox 20 Years Later. Past Perspectives, Future Directions. *Journal of Archaeological Research* 23(4), 397–450. DOI: 10.1007/s10814-015-9084-1.

Diatel, B. 1962: *Pravěk Rudimova a jeho blízkého okolí z archeologických pramenů (do konce r. 1961)*. Report. Bojkovsko Museum: Bojkovice. Available from: http://doi.org/10.60585/M-TX-196200798.

Diesenberger, M., Reimitz, M. 2005: Zwischen Vergangenheit und Zukunft: Momente des Königtums in der merowingischen Historiographie. In: F.-R. Erkens (Hrsg.): *Das frühmittelalterliche Königtum: Ideelle und religiöse Grundlagen*. Ergänzungsbände zum Reallexikon der germanischen Altertumskunde 49. Berlin, New York: Walter de Gruyter, 214–269.

Diettrich, Z. R. 1962: *Christianity in Great-Moravia*. Bijdragen van het Instituut voor middeleeuwse Geschiedenis der Rijsuniversiteit te Utrecht 33. Groningen: Wolters.

Disser, A., Dillmann, P., Leroy, M., Merluzzo, P., Leroya, S. 2016: The bridge of Dieulouard (Meurthe-et-Moselle, France). A fresh perspective on metal supply strategies in Carolingian economy. *ArchéoSciences* 40(1), 149–161. DOI: 10.4000/archeosciences.4830. Available also from: https://doi.org/10.4000/archeosciences.4830.

Distelberger, A. 2004: *Österreichs Awarinnen: Frauen aus Gräbern des 7. und 8. Jahrhunderts*. Archäologische Forschungen in Niederösterreich 3. St. Pölten: NÖ Institut für Landeskunde.

Dittmann, K., Grupe, G. 2000: Biochemical and palaeopathological investigations on weaning and infant mortality in the early Middle Ages. *Anthropologischer Anzeiger* 58(4), 345–355.

Dobos, A., Nyulas, D. 2022: Souvenirs from the past. Roman objects as grave-goods in the Avar Age cemetery at Noşlac (Alba County). In: S. Mustaţă et al. (eds.): *Faber. Studies in Honour of Sorin Cociş at his 65th Anniversary*. Cluj-Napoca: Mega Publishing House, 165–186.

Doe, D. M., Perez, J. R., Cambra-Moo, O., Martin, M. C., Martin, A. G. 2019: Assessing pubertal stage in adolescent remains. An investigation of the San Nicolas Maqbara burial site (Murcia, Spain). *Archaeological and Anthropological Sciences* 11(2), 541–554. DOI: 10.1007/s12520-017-0543-0.

Dohnal, V. 1963: Slovanský mohylník u Slavičína, okr. Gottwaldov. In: Poulík, J. (ed.): *Sborník II. Františku Vildomcovi k pětaosmdesátinám*. Brno: ČSAV – Archeologický ústav, pobočka Brno.

Dohnal, V. 1980: Slovanské žárové mohyly na východní Moravě. In: B. Dostál, J. Vignatiová, J. (eds.): *Slované 6. - 10. století. Sborník referátů ze sympozia Břeclav-Pohansko 1978*. Brno: Univerzita J. E. Purkyně v Brně, 63–76.

Dohnalová, A. 2014: Pollen analysis of river and flood sediments from excavation B 2012. In: L. Poláček (ed.): *Mikulčice river archaeology: new interdisciplinary research into bridge no. 1*. Internationale Tagungen in Mikulčice X. Spisy Archeologického ústavu AV ČR Brno 51. Brno: Archeologický ústav AV ČR, 117–143.

Doležalová, E., Meduna, P. (eds.): *Co můj kostel dnes má, nemůže kníže odníti. Věnováno Petru Sommerovi k životnímu jubileu*. Praha: Lidové noviny, 61–66. Available also from: https://1url.cz/AJVXc.

Donat, P. 1980: *Haus, Hof und Dorf in Mitteleuropa vom 7. bis 12. Jahrhundert. Archäologische Beiträge zur Entwicklung und Struktur der bäuerlichen Siedlung*. Schriften zur Ur- und Frühgeschichte 33. Berlin: Akademie-Verlag.

Doneus, N. 2010: The Roman Child and the Jewish Amulet. *Journal of Ancient Judaism* 1(2), 146–153. DOI: 10.13109/jaju.2010.1.2.146.

Doneus, N. (Hrsg.) 2014: *Das kaiserzeitliche Gräberfeld von Halbturn, Burgenland. Teil 1. Archäologie, Geschichte und Grabbrauch*. Monographien des Römisch-Germanischen Zentralmuseums 122, 1. Mainz: Verlag des Römisch-Germanischen Zentralmuseums. DOI: 10.11588/propylaeum.520. Available also from: https://doi.org/10.11588/propylaeum.520.

Dopsch, A. 1922: *Die Wirtschaftsentwicklung der Karolingerzeit vornehmlich in Deutschland. 2. Teil*. Weimar: Hermann Boehlaus Nachfolger.

Dopsch, A. 1932: Wirtschaft und Gesellschaft im frühen Mittelalter. *Tijdschrift voor Rechtsgeschiedenis* 11(4), 359–434.

Dopsch, H. 1971: Die Stifterfamilie des Klosters Gurk und ihre Verwandtschaft. *Carinthia I* 161, 95–123. Available also from: https://is.muni.cz/el/phil/jaro2017/AEA_16/um/54996027/Dopsch_Stifterfamilie_Gurk_1971.pdf.

Dostál, B. 1966: *Slovanská pohřebiště ze střední doby hradištní na Moravě*. Praha: Academia.

Dresler, P. 2016: *Břeclav–Pohansko VIII. Hospodářské zázemí centra nebo jen osady v blízkosti centra?* Brno: Masarykova univerzita.

Dresler, P., Macháček, J. 2008: The Hinterland of an Early Mediaeval centre at Pohansko near Břeclav. In: L. Poláček (Hrsg.): *Das wirtschaftliche Hinterland der frühmittelalterlichen Zentren*. Internationale Tagungen in Mikulčice VI. Spisy Archeologického ústavu AV ČR Brno 31. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 313–325, 403–406. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/ITM_6_web.pdf.

Drtikolová Kaupová, S., Brůžek, J., Hadrava, J., Mikšík, I., Morvan, M., Poláček, L., Půtová, L., Velemínský, P. 2024: Early life histories at medieval Mikulčice (ninth–tenth centuries AD, Czechia) based on carbon and nitrogen profiles of tooth dentine. *Archaeological and Anthropological Sciences* 16(1), 1–31. DOI: 10.1007/s12520-023-01923-0. Available also from: https://hal.science/hal-04950402.

Drtikolová Kaupová, S., Vytlačil, Z., Kovačiková, L., Látková, M., Poláček, L., Velemínský, P. 2022: Stav izotopových výzkumů stravy, rezidenční mobility a zemědělského hospodaření populace Velké Moravy (9.–10. století). *Archeologické rozhledy* LXXIV(2), 203–240. DOI: 10.35686/AR.2022.9. Available also from: https://doi.org/10.35686/AR.2022.9.

Duby, G. 1968: *Rural Economy and Country Life in the Medieval West*. Alva: Edward Arnold Ltd.

Duby, G. 1993: *The Knight, the Lady and the Priest. The Making of Modern Marriage in Medieval France*. Chicago: University of Chicago Press.

Duczko, W. 1985: *The Filigree and Granulation Work of the Viking Period. An Analyses of the material from Björkö*. Birka Untersuchungen und Studien 5. Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien.

Dufek, J. 2018: Kouřim, okr. Kolín. *Archeologie ve středních Čechách* 22(2), 759. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/11/ASC_22_2_14_Lutovsk%C3%BD_et_al.pdf.

Dufek, J. 2025a: Klášterní Skalice, okr. Kolín. *Archeologie ve středních Čechách* 29(2), 623.

Dufek, J. 2025b: Kouřim, okr. Kolín. *Archeologie ve středních Čechách* 29(2), 625–628.

Duncker, H. 1903: *Das mittelalterliche Dorfgewerbe (mit Ausschuss der Nahrungsmittel-Industrie) nach den Weistumsüberlieferungen*. Leipzig: Oswald Schmidt.

Dungworth, D., Wilkes, R. 2009: Understanding hammerscale. The use of high-speed film and electron microscopy. *Historical Metallurgy* 43(1), 33–46. Available also from: https://www.hmsjournal.org/index.php/home/article/view/177.

Dupras, T. L., Schwarcz, H. P., Fairgrieve, S. I. 2001: Infant feeding and weaning practices in Roman Egypt. *American Journal of Physical Anthropology* 115(3), 204–212. DOI: 10.1002/ajpa.1075.

Dupras, T. L., Tocheri, M. W. 2007: Reconstructing Infant Weaning Histories at Roman Period Kellis, Egypt Using Stable Isotope Analysis of Dentition. *American Journal of Physical Anthropology* 134(1), 63–74. DOI: 10.1002/ajpa.20639.

Dvořáček, D. 2013: *Zázemí Kouřimi v době přemyslovské* [online]. Manuscript of the thesis. Charles University. Faculty of Arts. Department of Archaeology. Stored in: Digital Repository, Charles University [Accessed 2025-04-15]. Available from: https://dspace.cuni.cz/handle/20.500.11956/54232.

Dvořáček, D. 2015: Nové archeologické poznatky z Třebovle, okr. Kolín. *Archeologie ve středních Čechách* 19(2), 759–768. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/12/ASC19_2_23_Dvo%C5%99%C3%A1%C4%8Dek.pdf.

Dvořáček, D. 2020a: Archeologický výzkum na Staré Kouřimi v letech 1948–1957. *Archaeologia historica* 45(2), 733–743. DOI: 10.5817/AH2020-2-10. Available also from: http://hdl.handle.net/11222.digilib/143426.

Dvořáček, D. 2020b: Revize středního opevnění na Staré Kouřimi. *Studia archaeologica Brunensia* 25(1), 21–45. DOI: 10.5817/SAB2020-1-4. Available also from: http://hdl.handle.net/11222.digilib/142802.

Dvořáček, D. 2021: Povrchové sběry v poloze nad Dolnicí v blízkém zázemí hradiště Kouřim–sv. Jiří. *Archeologie ve středních Čechách* 25(1), 189–199. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/09/ASC25_1_Dvo%C5%99%C3%A1%C4%8Dek.pdf.

Dvořáček, D. 2023: Raně středověké osídlení Kouřimi před založením vrcholně středověkého města. *Archeologie ve středních Čechách* 27(2), 557–570. Available also from: https://www.uappsc.cz/wp-content/uploads/2023/12/ASC27_2_05_Dvoracek.pdf.

Dvořáček, D., Burešová, H. 2024: *Kouřim - úprava plochy pro agility park v jižním předpolí hradiště na ostrožně sv. Jiří, na parc.č.: 970/2*. Manuscript of the excavation report, C-TX-202400368 [Accessed 2025-04-15]. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Sciences, Praha. DOI: 10.60585/C-TX-202400368. Available also from: Digital Archive of the AMCR https://doi.org/10.60585/C-TX-202400368.

Dvořák, F. 1936: *Pravěk Kolínska. Soupis archeologických památek Kolínska a Kouřimska*. Kolín: Učitelstvo školního okresu kolínského.

Earle, T. 1997: *How Chiefs Come to Power. The Political Economy in Prehistory*. Stanford: Stanford University Press.

Earle, T. K. 2011: Redistribution and the Political Economy. The Evolution of an Idea. *American Journal of Archaeology* 115(2), 237–244. DOI: 10.3764/aja.115.2.0237. Available also from: https://www.ajaonline.org/forum/874.

Eddison, E. R. 1930: *Egil's Saga. Done into English out of the Icelandic with an Introduction, Notes, and an Essay on Some Principles of Translation*. Cambridge: Cambridge University Press.

Ehlers, C. 2014: «Auch herrliche Paläste baute er ...» - Karl der Große in Ingelheim nach den Schriftquellen. In: H. Grewe (Hrsg.): *Auf den Spuren Karls des Großen in Ingelheim. Entdeckungen – Deutungen – Wandlungen*. Petersberg: Michael Imhof Verlag, 20–29.

Ehlers, C., Grewe, H., Ristow, S. 2013: Eine archäologisch entdeckte, bisher unbekannte Taufpiscina in Ingelheim. Perspektiven zur Erforschung der Dualität königlicher und bischöflicher Siedlungstätigkeit im Frühmittelalter. *Rechtsgeschichte / Legal History* 21, 285–290. DOI: 10.12946/rg21/285-290. Available also from: https://doi.org/10.12946/rg21/285-290.

Ellenberg, H. 2009: *Vegetation ecology of Central Europe*. 4th edition. Cambridge: Cambridge University Press.

Ellison, P. T. 2003: Energetics and reproductive effort. *American Journal of Human Biology* 15(3), 342–351. DOI: 10.1002/ajhb.10152.

Engels, O. 1989: Abhängigkeit und Unabhängigkeit der Spanischen Mark. In: *Reconquista und Landesherrschaft. Studien zur Rechts- und Verfassungsgeschichte Spaniens im Mittelalter.* Rechts- und Staatswissenschaftliche. Veröffentlichungen der Görres-Gesellschaft, Neue Folge 53. Paderborn, München, Wien, Zürich: Ferdinand Schöningh, 3–50. Available also from: https://1url.cz/KJqXe.

Enright, M. 1985: *Iona, Tara, and Soissons. The Origin of the Royal Anointing Ritual*. Arbeiten zur Frühmittelalterforschung. Schriftenreihe des Instituts für Frühmittelalterforschung der Universität Münster 17. Berlin, New York: Walter de Gruyter.

Ep. Karol. V (Ioh. VIII): Iohannis VIII. papae epistolae. In: *Epistolae Karolini aevi V.* E. Caspar (ed.). Monumenta Germaniae Historica, Epistolae 7. Berlin: Weidmann, 1928.

Ep. Karol. V (Steph. V): Stephani V. papae epistolae. In: *Epistolae Karolini aevi V.* G. Laehr (ed.). Monumenta Germaniae Historica, Epistolae 7. Berlin: Weidmann, 1928.

Epp, V., Meyer, C. H. F. (Hrsg.) 2017: *Recht und Konsens im frühen Mittelalter.* Vorträge und Forschungen LXXXII. Ostfildern: Jan Thorbecke Verlag. Available also from: https://journals.ub.uni-heidelberg.de/index.php/vuf/issue/view/2576.

Erkens, F.-R. 2006: *Herrschersakralität im Mittelalter. Von den Anfängen bis zum Investiturstreit*. Stuttgart: Kohlhammer.

Eschenlohr, L., Friedli, V., Robert-Charrue Lindner, C., Senn, M. 2007: *Develier-Courtételle, un habitat rural mérovingien 2. Métallurgie du fer et mobilier métallique*. Cahiers archéologie jurassienne 14. Porrentruy: Office de la culture Société jurassienne d'Emulation.

Fancsalszky, G. 2007: *Állat- és emberábrázolás a késő avar kori öntött bronz övvereteken*. Opitz Archaeologica 1. Budapest: Martin Opitz Kiadó.

Fecko, P. 2016: Vymedzenie horskej oblasti Slovenska a jeho význam pre archeologické bádanie. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 59, 25–64. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_59.pdf.

Feinman, G. M., Garraty, C. P. 2010: Preindustrial Markets and Marketing. Archaeological Perspectives. *Annual Review of Anthropology* 39, 167–191. DOI: 10.1146/annurev.anthro.012809.105118. Available also from: https://doi.org/10.1146/annurev.anthro.012809.105118.

Fettich, N. 1937: *A honfoglaló magyarság fémművessége*. Archaeologia Hungarica 21. Budapest: Magyar Tőrténeti Muzeum.

Fewtrell, M. S., Morgan, J. B., Duggan, C., Gunnlaugsson, G., Hibberd, P. L., Lucas, A., Kleinman, R. E. 2007: Optimal duration of exclusive breastfeeding. What is the evidence to support current recommendations? *The American Journal Clinical Nutrition* 85(2), 635S–638S. DOI: 10.1093/ajcn/85.2.635S. Available also from: https://doi.org/10.1093/ajcn/85.2.635S.

Fiala, Z., Třeštík, D. 1959: O „koruně králů moravských". *Československý časopis historický* VII, 483–488.

Fildes, V. 1995: The culture and biology of breastfeeding. An historical review of Western Europe. In: P. Stuart-Macadam, K. A. Dettwyler (eds.): *Breastfeeding. Biocultural Perspective*. New York: Aldine de Gruyter, 75–99.

Fogel, M. L., Tuross, N., Owsley, D. W. 1989: Nitrogen isotope tracers of human lactation in modern and archaeological populations. *Annual Report of the Director Geophysical Laboratory* 1899–1989, 111–117.

Foltýn, D., Kovář, M. 2006: Ke stavebním dějinám proboštství sv. Martina v Kouřimi v období rané gotiky. *Památky středních Čech* 20(1), 1–8.

Fons. Cathal.: *Fons Cathalaunia. Fons documental sobre l›Alta Edat Mitjana Catalana* [online].[Accessed 2018-07-05]. Available from: http://cathalaunia.org/Documentia/D00105.

Fossier, R. 2007: *The Axe and the Oath. Ordinary Life in the Middle Ages*. Princeton, Oxford: Princeton University Press.

Fragm. Chron. Fontanellensis: *Fragmentum Chronici Fontanellensis*. G. H Pertz (ed.). Monumenta Germaniae Historica, Scriptores 2. Hannover: Hahn 1829.

Fredegar: *Chronicarum quae dicuntur Fredegarii Scholastici Liber IV*. B. Brusch (ed.). Monumenta Germaniae Historica, Scriptores rerum Merovingicarum 2. Hannover: Hahn, 1888.

Freedman, P. 1983: *Diocese of Vic. Tradition and Regeneration in Medieval Catalonia*. New Brunswick: Rutgers University Press.

Freedman, P. 1991: Implicacions simbòliques dels esdeveniments de 985-988. In: *Symposium Internacional sobre els orígens de Catalunya (Segles VIII-IX) Vol. 1.* Memorias de la Real Academia de Buenas Letras de Barcelona 23. Barcelona: Real Academia de Buenas Letras de Barcelona, 117–129. Available also from: https://raco.cat/index.php/MemoriasRABL/article/view/202486.

Frencl, I. A. 1857: *Liturgika čili Vysvětlení služeb Božích a obřadů svaté katolické církve*. Praha: Nákladem Karla Bellmanna.

Friedel, E. 1873: Archäologische Streifzüge durch die Mark Brandenburg. *Zeitschrift für Ethnologie* 5, 245–258.

Friedrich, S. 2015: Die römischen Töpfereien von Weißenthurm am Rhein – archäologische Ergebnisse. In: L. Grunwald (Hrsg.): *Den Töpfern auf der Spur. Orte der Keramikherstellung im Licht der neuesten Forschung. 46. Internationales Symposium Keramikforschung des Arbeitskreises für Keramikforschung und des Römisch-Germanischen Zentralmuseums Mainz vom 16. bis zum 20. September 2013 in Mayen*. RGZM – Tagungen 21. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 27–35.

Friesinger, H. 1971–1974: *Studien zur Archäologie der Slawen in Niederösterreich*. Mitteilungen der Prähistorischen Kommission, XV. und XVI. Band. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Fröhlich, F., Rose, D., Endlicher, G. 1987: Mineralogische Typisierung mittelalterlicher Eisenschlacken aus der Grabung im Regensburger Dom. In: *Die Oberpfalz, ein europäisches Eisenzentrum. 600 Jahre Große Hammereinung*. Schriftenreihe des Bergbau- und Industriemuseums Ostbayern 12. Theuern: Bergbau- und Industriemuseum Ostbayern, 59–70.

Frolík, J. 1984: *Archeologické nálezy. Chrudimsko /k–t/*. Sbírky Okresního muzea v Chrudimi. Historická řada 1/II. Chrudim: Okresní muzeum.

Frolík, J. 2016: Chrudim v době Karla IV. Archeologie k podobě a vývoji města. In: J. Frolík et al.: *Chrudim v době Karla IV*. Chrudim: Město Chrudim, 5–31.

Frolík, J., Dvořáčková Hendrychová, S. 2021: The Church of St Wenceslas in Žabonosy (Kolín District, Central Bohemian Region) in Romanesque and pre-Romanesque times. In: P. Gorazd-Dziuban, P. Kocańda, A. Rozwałka (eds.): *Studia z historii i archeologii architektury. Księga jubileuszowa ofiarowana Profesorowi Zbigniewowi Pianowskiemu w 70. rocznicę urodzin*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego, 157–182.

Frolík, J., Musil, J. 2010: Záchranný archeologický výzkum v Hradební ulici v roce 2006. *Chrudimský vlastivědný sborník* 14, 3–28.

Frolík, J., Sigl, J. 1995: *Chrudimsko v raném středověku. Vývoj osídlení a jeho proměny*. Hradec Králové: Muzeum východních Čech. Available also from: https://1url.cz/4Js3N.

Frolík, J., Sigl, J. 1998: *Chrudim v pravěku a středověku. Obrazy každodenního života*. Chrudim: Okresní muzeum Chrudim. Available also from: https://1url.cz/GJs3D.

Frolíková-Kaliszová, D. 2016: K významu Klášťova v době Velké Moravy – místo kultu nebo útočiště? *Pravěk. Nová řada* 23, 195–218.

Frolíková-Kaliszová, D. 2023: *Raně středověké pohřebiště Triangl v Praze-Střešovicích*. Praha: Archeologický ústav AV ČR, Praha, v. v. i.

Fulda Traditions: *Traditiones et Antiquitates Fuldenses*. Ed. E. F. J. Dronke. Fulda 1844.

Fuller, B. T., Fuller, J. L., Harris, D. A., Hedges, R. E. 2006: Detection of breastfeeding and weaning in modern human infants with carbon and nitrogen stable isotope ratios. *American Journal of Physical Anthropology* 129(2), 279–293. DOI: 10.1002/ajpa.20249.

Fusek, G. 1994: *Slovensko vo včasnoslovanskom období*. Archaeologica Slovaca Monographiae. Studia III. Nitra: Archeologický ústav SAV.

Fusek, G. 2007a: Okov korica knjige iz groba u Nitri-Šindolki. *Prilozi Instituta za arheologiju u Zagrebu* 24, 437–442. Available also from: https://hrcak.srce.hr/25861.

Fusek, G. 2007b: Výnimočný nález kovania väzby knihy z Nitry. *Historická revue: časopis o dejinách spoločnosti* 18(2), 12–15.

Fusek, G. 2008: Keramika predveľkomoravského horizontu z Nitry-Šindolky a otázka jej datovania. In: M. Guštin (Hrsg.): *Srednji vek. Arheološke raziskave med Jadranskim morjem in Panonsko nižine / Mittelalter. Archäologische Forschungen zwischen der Adria und der Pannonischen Tiefebene*. Ljubljana: Narodni muzej Slovenije, 21–34.

Fusek, G. 2012: Chronologische Fragen der Nitraer Gräberfelder des 10.-11. Jahrhunderts. Das Fallbeispiel Nitra-Šindolka. In: B. Tobias (Hrsg.): *Die Archäologie der frühen Ungarn. Chronologie, Technologie und Methodik. Internationaler Workshop des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften und des Römisch-Germanischen Zentralmuseums Mainz in Budapest am 4. und 5. Dezember 2009*. RGZM – Tagungen 17. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 89–112.

Fusek, G. 2016: Eine karolingische Prunkschnalle von Nitra-Šindolka, Grab F246. In: Á. Bollók, G. Csiky, T. Vida (eds.): *Zwischen Byzanz und der Steppe. Archäologische und historische Studien. Festschrift für Csanád Bálint zum 70. Geburtstag*. Budapest: Institute of Archaeology, Research Centre of the Humanities, Hungarian Academy of Sciences, 623–629.

Fusek, G., Holeščák, M. 2019: Der Burgwall Großer Berg bei Divinka. Vorbericht. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 66, 161–171. DOI: 10.31577/szausav.2019.66.9. Available also from: https://doi.org/10.31577/szausav.2019.66.9.

Fusek, G., Samuel, M. 2013: Včasnostredoveká zásobná jama z Mostnej ulice v Nitre. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 53, 39–75. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_53.pdf.

Fusek, G., Slaná, A. 2020: *Slovanské hradisko na Veľkom vrchu. Katalóg výstavy / Slavic Hillfort on Big Hill. Exhibition Catalogue*. Žilina, Nitra: Považské múzeum v Žiline, Archeologický ústav SAV Nitra. Available also from: https://archeol.sav.sk/files/Fusek-Slan%C3%A1-2020.pdf.

Galuška, L. 1996: *Uherské Hradiště-Sady. Křesťanské centrum Říše velkomoravské*. Brno: Moravské zemské muzeum.

Galuška, L. 2001: Neznámé slovanské pohřebiště u Vranovic (okr. Břeclav) a jediné nálezy z něj pocházející. In: Z. Měřínský (ed.): *Konference Pohansko 1999. 40 let od zahájení výzkumu slovanského hradiska Břeclav-Pohansko. Břeclav-Pohansko 3.–4.6. 1999*. Archaeologia mediaevalis Moravica et Silesiana 1/2000. Brno: Masarykova univerzita, 185–197.

Galuška, L. 2004: *Slované. Doteky předků. O životě na Moravě v 6.–10. století*. Brno: Moravské zemské muzeum.

Galuška, L. 2008: A contribution to the structure and character of the landscape of the Great Moravian agglomeration Staré Město – Uherské Hradiště. In: L. Poláček (Hrsg.): *Das wirtschaftliche Hinterland der frühmittelalterlichen Zentren*. Internationale Tagungen in Mikulčice VI. Spisy Archeologického ústavu AV ČR Brno 31. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 249–256. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/ITM_6_web.pdf.

Galuška, L. 2013: *Hledání původu. Od avarských bronzů ke zlatu Velké Moravy / Search for the origin. From Avar bronze items to Great Moravian gold*. Brno: Moravské zemské muzeum.

Galuška, L. 2014a: Jewellery and jewellery making in Great Moravia. In: P. Kouřil (ed.): *Great Moravia and the Beginnings of Christianity*. Brno: The Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno, 132–142. Available also from: https://www.arub.cz/wp-content/uploads/Great_Moravia_and_the_Beginnings_of_Christianity_kompr.pdf.

Galuška, L. 2014b: Staré Město – Uherské Hradiště. In: P. Kouřil (ed.): *Great Moravia and the Beginnings of Christianity*. Brno: The Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno, 189–195. Available also from: https://www.arub.cz/wp-content/uploads/Great_Moravia_and_the_Beginnings_of_Christianity_kompr.pdf.

Galuška, L. 2017: *Slované. Stopy předků. O Moravě v 6.–10. století*. Brno: Moravské zemské muzeum.

Galuška, L., Hochmanová-Vávrová, V., Hrubý, V., Mitáček, J. 2018: *Uherské Hradiště-Sady 500 let křesťanství ve střední Evropě I. Katalog pohřebiště*. Brno: Moravské zemské muzeum.

Galuška, L., Chrástek, T. 2024: Radiocarbon Dating of Selected Great Moravian and Late Hillfort Graves in Uherské Hradiště-Sady and Its Comparison with Their Archaeological Dating. In: J. Mitáček, L. Galuška et al. (eds.): *Uherské Hradiště-Sady. 500 Years of Christianity in Central Europe. III. Analysis*. Brno: Moravian Museum Brno, 97–143.

Ganiatsou, E., Vika, E., Georgiadou, A., Protopsalti, T., Papageorgopoulou, C. 2022: Breastfeeding and weaning in Roman Thessaloniki. An investigation of infant diet based on incremental analysis of human dentine [online]. *Environmental Archaeology* 1–19. [Accessed 2025-05-15] DOI: 10.1080/14614103.2022.2083925. Available from: https://www.tandfonline.com/doi/abs/10.1080/14614103.2022.2083925.

Ganshof, F. L. 1968: *Frankish Institutions under Charlemagne*. Providence: Brown University Press.

Garam, É. 2010: Kugeln – Kapseln – Taschen – Scheiben in awarenzeitlichen Gräbern. In: R. Gebhard (Hrsg.): *Festschrift für Hermann Dannheimer zum 80. Geburtstag*. Bayerische Vorgeschichtsblätter 75. München: Beck, 148–167.

Garault, C. 2011: L'abbaye Saint-Sauveur de Redon. Entre centre et confins. Débats historiographiques et enjeux identitaires. In: H. Bouget et al. (eds.): *Histoires des Bretagnes 2. Itinéraires et confins*. Brest: CRBC, 37–53. Available also from: https://books.openedition.org/crbc/209.

Gardner, A. R., Willis, K. J. 1999: Prehistoric farming and the postglacial expansion of beech and hornbeam: a comment on Küster. *The Holocene* 9(1), 119–121. DOI: 10.1191/095968399668254353. Available also from: https://journals.sagepub.com/doi/10.1191/095968399668254353.

Gartrell, A. 2021: The Responsibilities of Castor and Pollux. In: *The Cult of Castor and Pollux in Ancient Rome: Myth, Ritual, and Society*. Cambridge: Cambridge University Press, 113–144. DOI: 10.1017/9781108763837.004.

Garver, V. L. 2009: *Women and Aristocratic Culture in the Carolingian World*. Ithaca, London: Cornell University Press.

Gassmann, G. 2004: „Schmiedeabfälle" – Aspekte ihrer naturwissenschaftlichen Untersuchung. In: W. Melzer (Hrsg.): *Schmiedehandwerk in Mittelalter und Neuzeit. Beiträge des 6. Kolloquiums des Arbeitskreises zur archäologischen Erforschung des mittelalterlichen Handwerks*. Soester Beiträge zur Archäologie 5. Soest: Mocker & Jahn, 71–80. Available also from: https://1url.cz/oJpaQ.

Geary, P. J. 2012: Ethnic Identity as a Situational Construct in the Early Middle Ages. In: F. Curta, C. Spinei (eds.): *Writing History. Identity, Conflict, and Memory in the Middle Ages*. Bucureşti, Brăila: Editura Academiei Române, 1–18.

Geisler, H. 1996: Haus und Hof der Franken. In: *Die Franken, Wegbereiter Europas. Vor 1500 Jahren. König Chlodwig und seine Erben*. Mainz: Verlag Philipp von Zabern, 769–773.

Geisler, M., Kohoutek, J. 2014: *Vysoké Pole – Klášťov. Inventář hromadných nálezů železných předmětů a shrnutí terénních výzkumů sezon 2005 – 2007*. Pravěk. Supplementum 28. Brno: Ústav archeologické památkové péče, v. v. i.

Geißler, H. 2018: Engelharts Pläne und der Grundrissplan. In: *Das Bild des Ingelheimer Saals vom 16. bis zum 18. Jahrhundert und Kartografische Quellen als relevanter Bestandteil archäologischer Forschung*. Beiträge zur Ingelheimer Geschichte 58. Historischer Verein Ingelheim e. V., 20–75.

Geißler, H. 2023: Karl der Große in Ingelheim. In: C. Ehlers, H. Grewe, K. Ibragimow-Schönfelder (Hrsg.): *Schriftquellen zur Pfalz Ingelheim. Lateinische Texte der karolingischen Epoche gesammelt*. Archäologie und Bauforschung in der Pfalz Ingelheim am Rhein 3.1. Petersberg: Michael Imhof Verlag, 15–42.

Gendry, M. 2022: Identité, peuple et nation dans la Bretagne médiévale. Évolution de l'historiographie. *Annales de Bretagne et des Pays de l'Ouest* 129, 11–45. DOI: 10.4000/abpo.7303. Available also from: https://journals.openedition.org/abpo/7303.

Gennep, A. van 1960: *The Rites of Passage*. Chicago: University of Chicago Press.

Gesta Comitum Barcinonensium: Gesta Comitum Barcinonensium. In: *Cróniques Catalanes 2*. L. Barrau-Dihigo, J. Massó Torrents (eds.). Barcelona: Institut d'Estudis Catalans, 1925.

Gierszewska, M. 2009: Grabungen in der mittelalterlichen Siedlung in Ingelheim – Anwendung des Programms Quantum-GIS zur archäologischen Auswertung. *Berichte zur Archäologie in Rheinhessen und Umgebung* 2, 66–73. Available also from: https://www.archaeologie-rheinhessen.de/files/ARU%202-2009.pdf.

Gierszewska-Noszczyńska, M. 2018: Archäologische Untersuchung des mittelalterlichen Grabens in Nieder-Ingelheim. Eine Referenzstudie zur Auswertung der Keramik aus der Kaiserpfalz und ihrer Peripherie. In: H. Stadler, L. Obojes (Hrsg.): *Keramik zwischen Werbung, Propaganda und praktischem Gebrauch. Beiträge vom 50. Internationalen Symposium Keramikforschung in Innsbruck 2017*. Nearchos 23. Innsbruck: Institut für Archäologien, Verlag A. Weger, 231–251.

Gierszewska-Noszczyńska, M. 2019: Frühmittelalter. Die merowingerzeitlichen Siedlungsanfänge. In: H. Berkessel et al. (Hrsg.): *Ingelheim am Rhein. Geschichte der Stadt von den Anfängen bis in die Gegenwart*. Oppenheim am Rhein: Nünnerich-Asmus Verlag & Media, 34–49.

Gierszewska-Noszczyńska, M. 2020a: Forschungsgrabungen am Gräberfeld an der Rotweinstraße. Schwerter, Schmuck und Wegzehrung – auf gepackten Koffern ins Grab. Keramik. *Kaiserpfalz Journal* 2020, 12–13.

Gierszewska-Noszczyńska, M. 2020b: Ingelheimer Raum im 7. und 8. Jahrhundert. In: C. Ehlers, H. Grewe (Hrsg.): *„Rechtsräume". Historische und archäologische Annäherungen*. Studien zur europäischen Rechtsgeschichte 323. Rechtsräume 4. Frankfurt am Main: Vittorio Klostermann GmbH, 235–262.

Gierszewska-Noszczyńska, M. 2021: Archäologie der Siedlungen und Höfe. Ingelheim am Rhein – Von der Merowingerzeit bis zum Palast Karls des Großen. In: M. Gierszewska-Noszczyńska, L. Grunwald (Hrsg.): *Zwischen Machtzentren und Produktionsorten. Wirtschaftsaspekte von der römischen Epoche bis in das Hochmittelalter am Rhein und seinen Nachbarregionen. 1. und 2. Tagung der Kooperation Römisch-Germanisches Zentralmuseum und Ingelheim am Rhein, Forschungsstelle Kaiserpfalz Ingelheim am Rhein am 12. und 13. November 2018 sowie Mayen am 28. und 29. November 2019*. RGZM – Tagungen 45. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 227–246. DOI: 10.11588/propylaeum.996.c13288.

Gierszewska-Noszczyńska, M. 2022: Von der Spätantike bis zum Hochmittelalter – Ingelheimer Siedlungstopographie und -dynamik. In: S. Felgenhauser-Schmiedt et al. (Hrsg.) *Zwischen Spätantike und Jahrtausendwende – Eine Zeit der Neuorientierung und Neukonstituierung. Das archäologische Bild aufgrund von Siedlungen. Beiträge der internationalen Tagung, abgehalten im März 2021*. Beiträge zur Mittelalterarchäologie in Österreich 38. Wien: Österreichische Gesellschaft für Mittelalterarchäologie, 193–215.

Gierszewska-Noszczyńska, M. in preparation : *Siedlungs- und landschaftsarchäologische Untersuchung zur Raumnutzung und Siedlungsdynamik in Ingelheim im Früh- und Hochmittelalter. GIS-gestützte Analysen des Siedlungsbildes und räumliche Verteilung des Fundmaterials*. Dissertation. Martin-Luther-Universität Halle-Wittenberg, 31.03.2025.

Gierszewska-Noszczyńska, M., Noszczyński, P. 2018: Kartographische Quellen als ein relevanter Bestandteil archäologischer Forschung. In: *Das Bild des Ingelheimer Saals vom 16. bis zum 18. Jahrhundert und Kartografische Quellen als relevanter Bestandteil archäologischer Forschung*. Beiträge zur Ingelheimer Geschichte 58. Ingelheim: Historischer Verein Ingelheim e. V., 151–208.

Gierszewska-Noszczyńska, M., Noszczyński, P. 2019: Entwicklung der Pfalz Karls des Großen bis in die Stauferzeit. In: H. Berkessel et al. (Hrsg.): *Ingelheim am Rhein. Geschichte der Stadt von den Anfängen bis in die Gegenwart*. Oppenheim am Rhein: Nünnerich-Asmus Verlag & Media, 56–79.

Gierszewska-Noszczyńska, M., Peisker, K. 2020: Das Palatium in Ingelheim. Aktuelle Ergebnisse zur Vorbesiedlung und architektonischen Entwicklung der Pfalzanlage. In: C. Ehlers, H. Grewe (Hrsg.): *Mittelalterliche Paläste und die Reisewege der Kaiser. Neue Entdeckungen in den Orten der Macht an Rhein und Main*. Oppenheim am Rhein: Nünnerich-Asmus Verlag & Media, 98–121.

Gierszewska-Noszczyńska, M., Peisker K. 2023: Frühmittelalterliche Fundamente in Ingelheim. Die Pfalz und ihre Peripherie. In: M. Kleiner, C. Mohn (Hrsg.): *Frühmittelalterliche Fundamente. Tagung des Landesamts für Denkmalpflege Baden-Württemberg im Regierungspräsidium Stuttgart in Zusammenarbeit mit der Stadt Esslingen am Neckar und der Zukunftsstiftung Heinz*

Weiler, Salemer Pflegehof Esslingen, 28.–29. März 2019. Arbeitsheft. Landesdenkmalamt Baden-Württemberg 47. Ostfildern: Jan Thorbecke Verlag, 47–62.

Gierszewska-Noszczyńska, M., Wilke D. 2021: Warenkundliche und zerstörungsfreie geochemische Untersuchungen ausgewählter frühmittelalterlicher Keramik aus der Pfalz zu Ingelheim und ihrer Peripherie. In: M. Gierszewska-Noszczyńska, L. Grunwald (Hrsg.): *Zwischen Machtzentren und Produktionsorten. Wirtschaftsaspekte von der römischen Epoche bis in das Hochmittelalter am Rhein und seinen Nachbarregionen. 1. und 2. Tagung der Kooperation Römisch-Germanisches Zentralmuseum und Ingelheim am Rhein, Forschungsstelle Kaiserpfalz Ingelheim am Rhein am 12. und 13. November 2018 sowie Mayen am 28. und 29. November 2019*. RGZM – Tagungen 45. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 267–287. DOI: 10.11588/propylaeum.996.c13290. Available also from: https://doi.org/10.11588/propylaeum.996.c13290.

Giese, W. 1993: Ensis sine capulo. Der ungesalbte König Heinrich I. und die an ihm geübte Kritik. In: K. R. Schnith, R. Pauler (Hrsg.): *Festschrift für Eduard Hlawitschka zum 65. Geburtstag*. Münchener Historische Studien. Abteilung Mittelalterliche Geschichte 5. Kallmünz: Verlag Michael Laßleben, 151–164.

Giesecke, T., Hickler, T., Kunkel, T., Sykes, M. T., Bradshaw, R. H. W. 2007: Towards an understanding of the Holocene distribution of Fagus sylvatica L. *Journal of Biogeography* 34 (1), 118–131. DOI: 10.1111/j.1365-2699.2006.01580.x. Available also from: https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2699.2006.01580.x.

Giljohann, R. 2021: Funde der Axialvilla von Mending, „Lungenkärchen" – Fundkatalog. In: S. Wenzel, M. Grünewald, R. Giljohann (Hrsg.): *Römische Landnutzung im antiken Industrierevier der Osteifel*. Monographien RGZM 155. Vulkanpark-Forschungen 13. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 255–297. DOI: 10.11588/propylaeum.768.c10346. Available also from: https://doi.org/10.11588/propylaeum.768.c10346.

Gilles, B. 1968: L'organisation de la production du fer au moyen âge. *Revue d›histoire de la sidérurgie* 9, 95–121.

Gilomen, H.-J. 2014: *Wirtschaftsgeschichte des Mittelalters*. Beck'sche Reihe 2781. München: Verlag C.H. Beck.

Giry, A. 1897/1898: Sur la date de deux diplômes de l'église de Nantes et de l'alliance de Charles le Chauve avec Erispoé. *Annales Bretagne* 13, 485–502.

Godłowski, K. 1980: Zur Frage des Miniaturgeräts in der Przeworsk-Kultur. *Materialhefte Ur- und Frühgeschichte Niedersachsen* 16, 85–100. DOI: 10.11588/diglit.65795#0113. Available also from: https://digi.ub.uni-heidelberg.de/diglit/man_16/0113/image,info.

Goetz, H.-W. 1987: Regnum. Zum politischen Denken der Karolingerzeit. *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte. Germanistische Abteilung* 104 (1), 110–189.

Goetz, H.-W. 2001: Frühmittelalterliche Grundherrschaften und ihre Erforschung im europäischen Vergleich. In: M. Borgolte (Hrsg.): *Das europäische Mittelalter im Spannungsbogen des Vergleichs. Zwanzig internationale Beiträge zu Praxis, Problemen und Perspektiven der historischen Komparatistik*. Europa im Mittelalter 1. Berlin: Akademie Verlag, 65–87.

Golemikhov, A. V. 2023a: *Ispol'zovaniye fragmentirovannykh shtempeley v chekanke kuficheskikh monet kontsa IX – X v.* [online]. Academia ©2025. [Accessed 2025-05-15]. Available from: https://www.academia.edu/108549900.

Golemikhov, A. V. 2023b: *Klad kuficheskikh dirkhemov Makushki 2018 iz Kaluzhskoĭ oblasti, 268 monet, trq 300* g.kh. (*912–913*) [online]. Academia ©2025. [Accessed 2025-05-15]. Available from: https://www.academia.edu/99533411.

Gorecki, J. 2000: Helm. In: A. Wieczorek, H.-M. Hinz (Hrsg.): *Europas Mitte um 1000. Katalog*. Stuttgart: Konrad Theiss, 392.

Granovetter, M. 1985: Economic Action and Social Structure. The Problem of Embeddedness. *American Journal of Sociology* 91(3), 481–510. Available also from: https://1url.cz/ZJpaB.

Graus, F. 1960: Rex-dux Moraviae. *Sborník prací Filosofické fakulty brněnské university C* 7, 181–190. Available also from: https://hdl.handle.net/11222.digilib/102122.

Grebe, K., Hoffmann, R. 1964: Slawische Grabfunde von Fahrland, Ketzin und Phöben. Ein Beitrag zur Kenntnis der slawischen Bestattungssitten im Havelland. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 3, 102–151.

Grewe, H. 1998: Der Neubeginn archäologischer Ausgrabungen in der Königspfalz Ingelheim. In: *Karl der Große in Ingelheim. Bauherr der Pfalz und europäischer Staatsmann. Katalog zur Ausstellung im Alten Rathaus Nieder-Ingelheim, 29. August bis 27. September 1998*. Beiträge zur Ingelheimer Geschichte 43. Ingelheim: Historischer Verein Ingelheim e. V., 25–36.

Grewe, H. 1999: Die Königspfalz zu Ingelheim am Rhein. In: Ch. Stiegemann, M. Wemhoff (Hrsg.): *799 – Kunst und Kultur der Karolinger Zeit. Karl der Große und Papst Leo III. in Paderborn 3*. Paderborn: Philipp von Zabern Verlag, 142–151.

Grewe, H. 2001: Die Ausgrabungen in der Königspfalz zu Ingelheim am Rhein. In: L. Fenske, J. Jarnut, M. Wemhoff (Hrsg.): *Deutsche Königspfalze 5. Splendor palatii. Neue Forschungen zu Paderborn und anderen Pfalzen der Karolingerzeit*. Veröffentlichungen des Max-Planck-Instituts für Geschichte 11. Göttingen: Vandenhoeck & Ruprecht Verlage, 155–174.

Grewe, H. 2006: Kontinuität – Diskontinuität. Neue Beobachtungen zur Sakraltopographie der Pfalz Ingelheim im Früh- und Hochmittelalter. *Mitteilungen der DGAMN: Kontinuität und Diskontinuität im archäologischen Befund* 17, 37–42. DOI: 10.11588/dgamn.2006.0.18352. Available also from: http://nbn-resolving.de/urn:nbn:de:bsz:16-dgamn-183520.

Grewe, H. 2007: Die Wasserversorgung der Kaiserpfalz Ingelheim am Rhein im 8./9. Jahrhundert. In: *Wasser auf Burgen im Mittelalter*. Geschichte der Wasserversorgung 7. Mainz: Verlag Philipp von Zabern, 191–199.

Grewe, H. 2010: Visualisierung von Herrschaft in der Architektur. Die Pfalz Ingelheim als Bedeutungsträger im 12. und 13. Jahrhundert. In: S. Burkhardt et al. (Hrsg.): *Staufisches Kaisertum im 12. Jahrhundert. Konzepte – Netzwerke – Politische Praxis*. Regensburg: Schnell & Steiner, 383–403.

Grewe, H. 2014a: Archäologie der Architektur. In: H. Grewe (Hrsg.): *Auf den Spuren Karls des Grossen in Ingelheim. Entdeckungen – Deutungen – Wandlungen*. Petersberg: Michael Imhof Verlag, 31–43.

Grewe, H. 2014b: Die Pfalz zu Ingelheim am Rhein. Ausgewählte Baubefunde und ihre Interpretation. In: F. Pohle (Hrsg.): *Karl der Große – Charlemagne. Orte der Macht. Essays*. Dresden: Sandstein Kommunikation, 188–197.

Grewe, H. 2016: Die Pfalz Karls des Großen in Ingelheim und ihre Entwicklung aus merowingerzeitlichen Anfängen. In: E. Wamers (Hrsg.): *814 Karl der Große 2014. Archäologische und historische Beiträge zu Pfalzen, Herrschaft und Recht um 800*. Schriften des archäologischen Museums Frankfurt 27. Regensburg: Schnell & Steiner, 47–67.

Grierson, P. 1993: *Catalogue of the Byzantine coins in the Dumbarton Oaks collection and in the Whittemore collection. Volume 2. Phocas to Theodosius III 602–717. Part 2. Heraclius Constantine to Theodosius III (641–717)*. Dumbarton Oaks Collection Series. 2nd edition. Washington, D.C.: Dumbarton Oaks Research Library and Collection.

Grigorov, V. 2007: *Metalni nakiti ot srednovekovna Balgaria (VII–XI v.)*. Sofija: Nacionalen arheologičeski institut s muzej na Balgarskata akademia na naukite.

Gringmuth-Dallmer, E. 1985: Der frühgeschichtliche Landesausbau als Element der Produktivkraftentwicklung. In: F. Horst, B. Krüger (Hrsg.): *Produktivkräfte und Produktionsverhältnisse in ur- und frühgeschichtlicher Zeit. XI. Tagung der Fachgruppe Ur- und Frühgeschichte vom 14. bis 16. Dezember 1981 in Berlin*. Berlin: Akademie Verlag, 311–323.

Gringmuth-Dallmer, E. 1990: *Vergleichende Untersuchungen zum frühmittelalterlichen Landesausbau im westlichen Mitteleuropa*. Berlin: Akademie der Wissenschaften der DDR.

Grüninger, K. M. 1924: *Das ältere deutsche Schmiedehandwerk auf dem Lande*. Bonndorf: Verlag des Landesverbandes bad. Schmiedemeister.

Grunwald, L. 1998: *Grabfunde des Neuwieder Beckens von der Völkerwanderungszeit bis zum frühen Mittelalter. Der Raum von Bendorf bis Engers*. Internationale Archäologie 44. Rahden/Westf.: Verlag Marie Leidorf GmbH.

Gudeman, S. 2001: *The Anthropology of Economy. Community, Market, and Culture*. Malden, Oxford: Blackwell Publishers. Available also from: https://1url.cz/AJpa4.

Guillotel, H. 1975–1976: L'action de Charles le Chauve vis à vis de la Bretagne de 843 à 851. *Mémoires de la Société d'Histoire et d'Archéologie de Bretagne* 53, 5–32. Available also from: https://m.shabretagne.com/scripts/files/6699372a0de328.64783183/1975_01.pdf.

Guy, B. 2014: The Breton migration. A new synthesis. *Zeitschrift für celtische Philologie* 61(1), 101–156. DOI: 10.1515/zcph.2014.006.

Haas, J. N., Karg, S., Rasmussen, P. 1998: Beech Leaves and Twigs used as Winter Fodder: Examples from Historic and Prehistoric Times. *Environmental Archaeology* 1(1), 81–86. DOI: 10.1179/env.1996.1.1.81. Available also from: https://www.tandfonline.com/doi/abs/10.1179/env.1996.1.1.81.

Hága, T. 2022: Auf Eisen gebettet. In: H. Meller, F. Daim, T. Puttkammer (Hrsg.): *Reiternomaden in Europa: Hunnen, Awaren, Ungarn*. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte Halle, 186–192.

Hägermann, D. 1975: Reichseinheit und Reichsteilung. Bemerkungen zur Divisio regnorum 806 und zur Ordinatio Imperii 817. *Historisches Jahrbuch* 95, 278–307.

Hägermann, D., Schneider, H. 2003: *Propyläen Technikgeschichte. 1. Landbau und Handwerk. 750 v. Chr. bis 1000 n. Chr*. Berlin: Propyläen-Verlag.

Hahn, W. 1981: *Moneta Imperii Byzantini: Rekonstruktion des Prägeaufbaues auf synoptisch-tabellarischer Grundlage. Teil 3. Von Heraclius bis Leo III. / Alleinregierung (610–720): mit Nachträgen zum 1. und 2. Band*. Veröffentlichungen der Numismatischen Kommission 10. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Hájková, P., Jamrichová, E., Horsák, M., Hájek, M. 2013: Holocene history of a Cladium mariscus-dominated calcareous fen in Slovakia: vegetation stability and landscape development. *Preslia* 85, 289–315. Available also from: https://www.preslia.cz/P133Hajkova.pdf.

Halsall, G. 2003: *Warfare and Society in the Barbarian West, 450-900*. Warfare and history. London, New York: Routledge.

Ham, A. C., DeWitte, S. N. 2023: Pubertal Timing as a Measure of Health and Well-Being and a Bridge Between Past and Present. *Bioarchaeology International* 7(2). DOI: 10.5744/bi.2022.0012. Available also from: https://1url.cz/yJRgY.

Hanuliak, M. 1992: Okres Žilina. In: D. Bialeková (ed.): *Pramene k dejinám osídlenia Slovenska z konca 5. až z 13. storočia. II. zväzok. Stredoslovenský kraj*. Nitra: Archeologický ústav SAV, 185–200.

Hanuliak, M. 2014: Pohrebný rítus na Veľkej Morave. In: P. Kouřil (ed.): *Velká Morava a počátky křesťanství*. Brno: Archeologický ústav Akademie věd, Brno, v. v. i., 92–97. Available also from: https://www.arub.cz/wp-content/uploads/Katalog_CZ-sl2_26Mb.pdf.

Hanuliak, M. 2015: Včasnostredoveké osídlenie v Beckove. *Slovenská archeológia* LXIII(1), 115–149. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_2015_1.pdf.

Hanuliak, M., Mináč, V., Pavúk, J. 2008: Vrcholnostredoveká dedina zo Slovenskej Novej Vsi a Zelenča. *Slovenská archeológia* LVI(1), 103–146. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_2008_1.pdf.

Harrison, R. M. et al. 1986: *Excavations at Saraçhane in Istanbul. Volume 1. The excavations, structures, architectural decoration, small finds, coins, rones, and molluscs*. Princeton Legacy Library 442. Princeton: Princeton University Press, Dumberton Oaks Research Library and Collection.

Haruštiak, J. 2010: Olovené predmety zo slovanského hradiska Bojná-Valy. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 47, 25–39. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_47.pdf.

Hasil, J. 2011: Les élites franques de l'oues comme des chefs de clans dans l'environnment slave. In: D. Buschinger (ed.): *Tolérance et intolérance. Actes du Colloque international des 1er, 2 et 3 mars 2011 à Amiens*. Medievales 50. Amiens: Presse du Centre d'Etudes Médievales, Université de Picardie – Jules Verne, 50–61.

Hasil, J., Ottenwelter, E., Barčáková, L. 2020: Dubious Early Medieval Jewels from Matzhausen (Bavaria). New Material and Technological Investigations. *Studies in Conservation* 65(6), 333–345. DOI: 10.1080/00393630.2019.1677082. Available also from: https://www.tandfonline.com/doi/full/10.1080/00393630.2019.1677082.

Hasil, J., Profantová, N., Levá, K. 2020: Kovové artefakty jako klíč ke krajině a společnosti předpřemyslovských Čech. *Archaeologia historica* 45(1), 7–42. DOI: 10.5817/AH2020-1-1. Available also from: https://hdl.handle.net/11222.digilib/142956.

Hásková, J. 1990a: Scandinavian influences on the denarius coins of Bohemia. In: K. Jonsson, B. Malmer (eds.): *Commentationes de nummis saeculorum IX–XI in Suecia repertis. Sigtuna Papers. Proceedings of the Sigtuna symposium on Viking-age coinage 1-4 June 1989*. In suecia repertis. Nova series 6. Stockholm: Kungl. vitterhets historie och Antikvitets adakemien, London: Spink & Son, 87–90.

Hásková, J. 1990b: Skandinávské vlivy na české denáry. *Numismatické listy* 45(4), 99–110.

Haupt, P. 1996: *Vicus, villae, vinum. Der Ingelheimer Raum in der Römerzeit. Katalog zur Ausstellung im Alten Rathaus Nieder-Ingelheim vom 31. August bis 29. September 1996*. Ingelheim am Rhein: Museum bei der Kaiserpfalz der Stadt Ingelheim am Rhein.

Haupt, P. 2019: Die Vor- und Frühgeschichte Ingelheims und seiner Umgebung. In: H. Berkessel et al. (Hrsg.): *Ingelheim am Rhein. Geschichte der Stadt von den Anfängen bis in die Gegenwart*. Oppenheim am Rhein: Nünnerich-Asmus Verlag & Media, 18–31.

Haupt, P. 2021a: *Aufarbeitung der ausgewählten Funde aus der Grabung „Am gebrannten Hof“*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Haupt, P. 2021b: Lokale römerzeitliche Einflüsse auf den karolingischen Pfalzbau in Ingelheim – tatsächliche Ursachen oder nachträgliche Konstrukte? In: M. Gierszewska-Noszczyńska, L. Grunwald (Hrsg.): *Zwischen Machtzentren und Produktionsorten. Wirtschaftsaspekte von der römischen Epoche bis in das Hochmittelalter am Rhein und seinen Nachbarregionen. 1. und 2. Tagung der Kooperation Römisch-Germanisches Zentralmuseum und Ingelheim am Rhein, Forschungsstelle Kaiserpfalz Ingelheim am Rhein am 12. und 13. November 2018 sowie Mayen am 28. und 29. November 2019*. RGZM – Tagungen 45. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 213–225. DOI: 10.11588/propylaeum.996.c13287. Available also from: https://doi.org/10.11588/propylaeum.996.c13287.

Hauptmann, A. 2020: *Archaeometallurgy - Materials science aspects*. Natural Science in Archaeology. Cham: Springer. DOI: 10.1007/978-3-030-50367-3.

Havel, D., Kalhous, D. 2019: Heiligenkreuz 217 und die Anfänge der Schriftkultur in Böhmen um 1000. Die Prager Kirche im Zeitalter Bischofs Thiddag. *Acta Universitatis Carolinae. Philosophica et historica* 1, 159–167. DOI : 10.14712/24647055.2019.9. Available also from: https://doi.org/10.14712/24647055.2019.9.

Havlík, L. E. 1983: The Roman Privilege ‹Industriae tuae› for Moravia (1100th Anniversary). *Cyrillomethodianum* 7, 23–37.

Havlík, L. E. 1987: On the Dating in the Old Slav Literary Monuments and the Primary Slav Chronography. *Studia Źrodloznawcze* 30, 1–36.

Havrda, J., Tomková, K. 2020: Skleněné kroužky a prstýnky z archeologických výzkumů v Praze. Prameny. In: K. Tomková, N. Venclová (eds.): *Krajinou archeologie, krajinou skla. Studie věnované PhDr. Evě Černé*. Praha, Most: Archeologický ústav AV ČR, Praha, v. v. i., Ústav archeologické památkové péče severozápadních Čech, v. v. i., 255–281.

Havrda, J., Tryml, M. 2021: Pohřbívání na sklonku raného středověku. Pohřební areály v pražské předlokační aglomeraci v 11. až 1. polovině 13. století. *Archeologie ve středních Čechách* 25(1), 217–236. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/09/ASC25_1_Havrda_Tryml.pdf.

Hawthorne, J. G., Stanley Smith, C. 2020: *Theophilus. On divers arts. The Foremost Medieval Treatise on Painting, Glassmaking and Metalwork*. New York: Dover publications, Inc.

Heindel, I. 1990: *Riemen- und Gürtelteile im westslawischen Siedlungsgebiet*. Beiträge zur Ur- und Frühgeschichte der Bezirke Rostock, Schwerin und Neubrandenburg 23. Berlin: Deutscher Verlag der Wissenschaften.

Hejna, A. 1961: Slovanská hradiště a počátky měst v Čechách. *Památky archeologické* LII(2), 563–572. Available also from: https://1url.cz/WJVvE.

Hen, Y. 2004: The christianisation of kingship. In: M. Becher, J. Jarnut (Hrsg.): *Der Dynastiewechsel von 751. Vorgeschichte, Legitimationsstrategien und Erinnerung*. Münster: Scriptorium, 163–177.

Henderson, C. Y., Padez, C. 2017: Testing times. Identifying puberty in an identified skeletal sample. *Annals of Human Biology* 44(4), 332–337. DOI: 10.1080/03014460.2016.1250949. Available also from: https://1url.cz/QJRg6.

Hendrychová, S., Frolík, J. 2016: Kostel sv. Václava v Žabonosech (okres Kolín) a jeho počátky. *Archaeologia historica* 41(1), 229–240. DOI: 10.5817/AH2016-1-13. Available also from: https://hdl.handle.net/11222.digilib/135211.

Hendrychová, S., Frolík, J. 2020: Kirche und Friedhof in Žabonosy (Bez. Kolín). Zu den Anfängen feudaler Landsitze in Mittelböhmen. In: F. Biermann, T. Kersting, A. Klammt (Hrsg.): *Burg, Herrschaft und Zentralörtlichkeit im nördlichen westslawischen Raum. Beiträge der Sektion zur slawischen Frühgeschichte der 23. Jahrestagung des Mittel- und Ostdeutschen Verbandes für Altertumsforschung in Halle (Saale), 19-21. März 2018*. Beiträge zur Ur- und Frühgeschichte Mitteleuropas 92. Langenweissbach: Beier & Beran, 139–149.

Henning, J. 1992: Gefangenenfesseln im slawischen Siedlungsraum und der europäische Sklavenhandel vom 6. bis 12. Jahrhundert. Archäologisches zum Bedeutungswandel von „sklābos – sakāliba – sclavus“. *Germania* 70(2), 403–426.

Henning, J. 1998: Archäologische Forschungen an Ringwällen in Niederungslage. Die Niederlausitz als Burgenlandschaft des östlichen Mitteleuropas im frühen Mittelalter. In: J. Henning, A. T. Ruttkay (Hrsg.): *Frühmittelalterlicher Burgenbau in Mittel- und Osteuropa. Tagung, Nitra vom 7. bis 10. Oktober 1996*. Bonn: Dr. Rudolf Habelt, 9–30.

Henning, J. 2002: Der slawische Siedlungsraum und die ottonische Expansion östlich der Elbe. Ereignisgeschichte – Archäologie – Dendrochronologie. In: J. Henning (Hrsg.): *Europa im 10. Jahrhundert. Archäologie einer Aufbruchszeit. Internationale Tagung in Vorbereitung der Ausstellung „Otto der Große, Magdeburg und Europa“*. Mainz: Philipp von Zabern, 131–146.

Henning, J. 2007: Early European towns. The development of the economy in the Frankish realm between dynamism and deceleration AD 500-1100. In: J. Henning (ed.): *Post-Roman Towns, Trade and Settlement in Europe and Byzantium 1. The Heirs of the Roman West*. Millennium-Studien zu Kultur und Geschichte des ersten Jahrtausends n. Chr. 5/1. Berlin, New York: De Gruyter, 3–40. Available also from: https://www.mgh-bibliothek.de/dokumente/a/a150503+0001.pdf.

Henning, J. 2009: Revolution or Relapse? Technology, Agriculture and Early Medieval Archaeology in Germanic Central Europe. In: G. Ausenda, D. Paolo, C. Wickham (eds.): *The Langobards before the Frankish conquest. An ethnographic perspective*. Studies in historical archaeoethnology 8. Woodbridge: Boydell Press, 149–173.

Hensch, M. 2018a: Archäologisch-historische Aspekte zum früh- und hochmittelalterlichen Montanwesen in der westlichen Oberpfalz. *Bericht der bayerischen Bodendenkmalpflege* 59, 271–302.

Hensch, M. 2018b: *Erz - Feuer - Eisen. Eine kleine Geschichte des frühen Montanwesens in der mittleren Oberpfalz*. Berlin: Culturcon Medien.

Hensel, W. 1956: *Słowiańszczyzna wczesnośredniowieczna. Zarys kultury materialnej*. Warszawa: Państwowe wydawnictwo naukowe.

Herdick, M. 2015: *Ökonomie der Eliten. Eine Studie zur Interpretation wirtschaftsarchäologischer Funde und Befunde von mittelalterlichen Herrschaftssitzen*. Römisch-Germanisches Zentralmuseum. Monographien 124. Mainz: Verlag des Römisch-Germanischen Zentralmuseums. DOI: 10.11588/propylaeumdok.00005297. Available also from: https://archiv.ub.uni-heidelberg.de/propylaeumdok/volltexte/2022/5297.

Herrmann, J. 1959: Wasserstand und Siedlung im Spree-Havel-Gebiet in frühgeschichtlicher Zeit. *Ausgrabungen und Funde* 4, 90–106.

Herrmann, J. 1960: *Die vor- und frühgeschichtlichen Burgwälle Groß-Berlins und des Bezirkes Potsdam*. Handbuch vor- und frühgeschichtlicher Wall- und Wehranlagen 2. Schriften der Sektion für Vor- und Frühgeschichte 9. Berlin: Akademie der Wissenschaften.

Herrmann, J. 1961: Wasserstand und frühgeschichtliche Siedlung im Brandenburger Spree-Havelgebiet. In: G. Bersu (Hrsg.): *Bericht über den V. Internationalen Kongress für Vor- und Frühgeschichte Hamburg vom 24. bis 30. August 1958*. Berlin: Mann, 385–387.

Herrmann, J. 1963: Magdeburg – Lebus. Zur Geschichte einer Straße und ihrer Orte. *Veröffentlichungen des Museums für Ur- und Frühgeschichte Potsdam* 2, 89–106.

Herrmann, J. 2005: *Ralswiek auf Rügen. Die slawisch-wikingischen Siedlungen und deren Hinterland. Teil III. Die Funde aus der Hauptsiedlung.* Beiträge zur Ur- und Frühgeschichte Mecklenburg-Vorpommerns 37. Schwerin: Archäologisches Landesmuseum und Landesamt für Bodendenkmalpflege Mecklenburg-Vorpommern.

Herrmann, J., Heußner, K.-U. 1991: Dendrochronologie, Archäologie und Frühgeschichte vom 6. bis 12. Jahrhundert in den Gebieten zwischen Saale, Elbe und Oder. *Ausgrabungen und Funde* 36(6), 255–291.

Herrmann, J., Hoffmann, R. 1959: Neue Forschungen zum slawischen und frühdeutschen Burgwall „Räuberberg" von Phöben, Kr. Potsdam-Land. *Ausgrabungen und Funde* 4(6), 294–306.

Herrmann, V. 2008: Die frühmittelalterliche Burg „Greuth" in der Schwarzachaue bei Greding-Obermässing, Lkr. Roth. *Beiträge zur Archäologie in Mittelfranken* 8, 209–232.

Hewitt, J. 1855: *Ancient armour and weapons in Europe. From the Iron Period of the Northern Nations to the end of the Thirteenth Century.* Oxford, London: John Henry, James Parker.

Hinkmari epistolae: Hinkmari archiepiscopi Remensis epistolae. In: *Epistolae Karolini aevi 6*. E. Perels (ed.). Monumenta Germaniae Historica, Epistolae 8.1. Berlin: Weidmann, 1939.

Hirth, K. G. 1996: Political Economy and Archaeology. Perspectives on Exchange and Production. *Journal of Archaeological Research* 4(3), 203–239. Available also from: https://www.jstor.org/stable/41053132.

Hist. Wambae: *Iulianus Toledanensis. Historia Wambae regis.* W. Levison (ed.). Monumenta Germaniae Historica, Scriotores Rerum Merovingicarum 5. Hannover: Hahn, 1910.

Hladík, M. 2014: *Hospodárske zázemie Mikulčíc. Sídelná štruktura na strednom toku rieky Morava v 9.–1. polovici 13. storočia*. Spisy Archeologického ústavu AV ČR Brno 48. Brno: Archeologický ústav AV ČR, Brno, v. v. i. Available also from: https://www.forumhistoriae.sk/sites/default/files/hladik.pdf.

Hladík, M. 2020: *Mikulčice and its Hinterland. An Archaeological Model for Medieval Settlement Patterns on the Middle Course of the Morava River (7th to Mid-13th Centuries)*. East Central and Eastern Europe in the Middle Ages, 450–1450, 61. Leiden, Boston: Brill.

Hladík, M., Mazuch, M., Látková, M. 2022: *Great Moravian settlement in Mikulčice-Trapíkov and economic hinterland of the power centre. Rural economy, centres and organisational and functional principles of Great Moravia*. Studien zum Burgwall von Mikulčice XIII. Spisy Archeologického ústavu AV ČR Brno 62. Brno: Czech Academy of Science, Insitute of Archaeology, Brno. Available also from: https://www.arub.cz/produkt/great-moravian-settlement-in-mikulcice-trapikov-and-economic-hinterland-of-the-power-centre/.

Hlásny, T., Turčáni, M., Fabrika, M., Baláž, P., Sedmák, R. 2011: Očakávané dopady zmeny klímy na bukové porasty Slovenska. In: M. Barna, J. Kulfan, E. Bublinec (eds.): *Buk a bukové ekosystémy Slovenska*. Bratislava: Veda, 621–633.

Hlavica, M. 2023: *Fragmenty Velké Moravy. Hrnčířské značky jako nástroj výzkumu společenské a politické komplexity Moravy 9. století*. Spisy Archeologického ústavu AV ČR Brno 75. Brno: Archeologický ústav AV ČR, Brno, v. v. i. DOI: 10.47382/arub2023-05. Available also from: https://www.arub.cz/wp-content/uploads/Spisy_75.pdf; https://zenodo.org/records/7965768.

Hlavica, M., Kouřil, P., Mikulec, R. 2022: Moravian iron money: Model of the 9th-century axe-shaped bars' genesis and its testing with the assemblage from Staré Zámky near Brno-Líšeň. *Slovenská archeológia* 70(2), 327–350. DOI: 10.31577/slovarch.2022.70.14. Available also from: https://doi.org/10.31577/slovarch.2022.70.14.

Hlavica, M., Merta, O., Slavíček, K., Všianský, D., Štulířová, J. 2025: Archaeometry of early medieval tuyeres questions the chronology of smelting sites in the Moravian Karst[online]. *Journal of Archaeological Science: Reports* 66, art. no. 105322. [Accessed 2025-05-15]. DOI: 10.1016/j.jasrep.2025.105322. Available also from: https://doi.org/10.1016/j.jasrep.2025.105322.

Hlavica, M., Procházka, R. 2020a: Basic Principles of the Great Moravian Economy. In: L. Poláček et al.: *Great Moravian Elites from Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 75–78. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Hlavica, M., Procházka, R. 2020b: Market System. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 79–81. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Hlubek, L., Šlézar, P. 2014: Doklady zpracování železa v raném středověku na území Uničovska a Litovelska. *Archaeologia historica* 39(2), 583–607. Avalaible from: https://hdl.handle.net/11222.digilib/130330.

Hoffmann, H. 1962: Französische Fürstenweihen des Hochmittelalters. *Deutsches Archiv für Erforschung des Mittelalters* 18, 92–119. Available also from: https://1url.cz/MJEe0.

Horák, B., Trávníček, D. 1956: *Descriptio civitatum ad septentrionalem plagam Danubii (t. zv. Bavorský geograf)*. Rozpravy Československé akademie věd. Řada společenských věd 66. Praha: Československá akademie věd.

Horňák, M., Stehlíková, J. 2017: *Pohrebisko z obdobia avarského kaganátu v Podunajských Biskupiciach. Avar Khaganate Graveyard in Podunajské Biskupice*. Vrútky: Via Magna Archeologia.

Hosák, L., Šrámek, R. 1980: *Místní jména na Moravě a ve Slezsku II, M-Ž*. Praha: Academia.

Howcroft, R. 2013: *Weaned Upon A Time. Studies of the Infant Diet in Prehistory.* Theses and Papers in Archaeological Science 14. Stockholm: Stockholm University. Available also from: https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A610999&dswid=7218.

Hrubec, I. 1980: Poveľkomoravské obdobie a stredovek. *Slovenská archeológia* XXVIII(1), 229–237. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1980_1.pdf.

Hrubý, V. 1955: *Staré Město. Velkomoravské pohřebiště „Na Valách"*. Monumenta archaeologica III. Praha: Nakladatelství Československé akademie věd. Available also from: https://1url.cz/YJRp3.

Hrubý, V., Hochmanová, V., Pavelčík, J. 1955: Kostel a pohřebiště z doby velkomoravské na Modré u Velehradu. *Časopis Moravského musea v Brně, Vědy společenské* XL, 42–126.

Hulínek, D. 2008: Funkčné členenie veľkomoravských opevnených sídlisk na základe ich spoločenského významu a kontinuita ich pretrvávania v 10. storočí (Morava a západné a stredné Slovensko). In: T. Štefanovičová, D. Hulínek (eds.): *Bitka pri Bratislave v roku 907 a jej význam pre vývoj stredného Podunajska. Zborník príspevkov z kolokvia*. Bratislava: Slovenský archeologický a historický inštitút – SAHI, 195–252.

Huntley, B. 1988: Glacial and Holocene vegetation history: Europe. In: B. Huntley, T. Webb III (eds.): *Vegetation History*. Handbook of vegetation science 7. Dordrecht, Boston, London: Kluwer Academic Publishers, 341–383.

Ierusalimskaja, A. A. 1996: *Die Gräber der Moščevaja Balka: Frühmittelalterliche Funde an der nordkaukasischen Seidenstrasse*. München: Editio Mars.

Ierusalimskaja, A. A. 2012: *Moshchevaia Balka. Neobychainyi arkheologicheskii pamiatnik na severokavkazskom shëlkovom puti*. Sankt-Peterburg: Izdatel'stvo Gosudarstvennogo Ermitazha.

Istvánovits, E. 1993: Das Gräberfeld aus dem 4.–5. Jahrhundert von Tiszadob-Sziget. *Acta Archaeologica Academiae Scientiarum Hungaricae* XLV(1–4), 92–146. Available also from: https://real-j.mtak.hu/235/1/ACTAARCHEOLOGICA_45.pdf.

Jakab, J., Vondráková, M. 1982: Antropológia kostier z 8. storočia z pohrebísk v Komárne. *Slovenská archeológia* XXX(2), 395–427. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1982_2.pdf.

Jakubčinová, M. 2018: *Výstroj jazdca a koňa v 9. storočí z územia dnešného Slovenska s prihliadnutím na nálezy z Bojnej*. Manuscript of the dissertation. Comenius University Bratislava. Faculta of Arts. Slovak Academy of Sciences. Institute o Archaeology. Stored in: Library of Slovak Academy of Sciences, Institute of Archaeology, Nitra.

Jamrichová, E., Hédl, R., Kolář, J., Tóth, P., Bobek, P., Hajnalová, M., Procházka, J., Kadlec, J., Szabó, P. 2017: Human impact on open temperate woodlands during the middle Holocene in Central Europe. *Review of Palaeobotany and Palynology* 245, 55–68. DOI: 10.1016/j.revpalbo.2017.06.002. Available also from: https://www.sciencedirect.com/science/article/pii/S0034666717300209?via%3Dihub.

Jamrichová, E., Szabó, P., Hédl, R., Kuneš, P., Bobek, P., Pelánková, B. 2013: Continuity and change in the vegetation of a Central European oakwood. *The Holocene* 23(1), 46–56. DOI: 10.1177/09596836124502. Available also from: https://journals.sagepub.com/doi/abs/10.1177/0959683612450200.

Jankowiak, M. 2021: Classifying and interpreting Viking-Age dirham imitations. *Nordisk Numismatisk Årsskrift, Ny Serie* 2, 53–76.

Jankowiak, M. 2023: The Volga Bulgar imitative coinage. In: J. Shepard, L. Treadwell (eds.): *Muslims on the Volga in the Viking Age. In the Footsteps of Ibn Fadlan*. Library of Medieval Studies. London: I. B. Tauris, 315–357.

Janocha, H. 1963: Badania archeologiczno-architektoniczne na zamku w Starym Drawsku (Drahimiu), pow. Szczecinek. *Materiały Zachodniopomorskie* IX, 315–332.

Janošek Kašpárek, F. 2015: Doba hradištní. In: J. Jílek (ed.): *Proti proudu času. Pardubicko v pravěku a raném středověku*. Pardubice: Východočeské muzeum v Pardubicích, 61–66.

Janovská, N., Musil, J. 2021: Raně středověká sekera ze Smrčku (okres Chrudim, Pardubický kraj). *Archeologie východních Čech* 22, 165–172.

Janowski, A. 2019: Fishing tackle. In: M. Rębkowski (ed.): *Wolin – the Old Town II. Studies on Finds*. Szczecin: Institute of Archaeology and Ethnology of the Polish Academy of Science, Centre for Medieval Archaeology of the Baltic Region in Szczecin, 313–317.

Janssen, W. 1983: Gewerbliche Produktion des Mittelalters als Wirtschaftsfaktor im ländlichen Raum. In: H. Jankuhn et al. (Hrsg.): *Das Handwerk in vor- und frühgeschichtlicher Zeit. Teil II. Archäologische und philologische Beiträge. Bericht über die Kolloquien der Kommission für die Altertumskunde Mittel- und Nordeuropas in den Jahren 1977 bis 1980*. Abhandlungen der Akademie der Wissenschaften in Göttingen, Philologisch-historische Klasse. Dritte Folge, Nr. 123. Göttingen: Vandehoeck & Ruprecht, 317–394.

Jarrett, J. 2010a: Archbishop Ató of Osona. False Metropolitans on the Marca Hispanica. *Archiv für Diplomatik* 56, 1–42.

Jarrett, J. 2010b: *Rulers and Ruled in Frontier Catalonia, 880-1010. Pathways of power*. Royal Historical Society Studies in History. New Series 75. Woodbridge: Boydell & Brewer, Royal Historical Society.

Jarrett, J. 2011a: Caliph, King, or Grandfather: Strategies of Legitimization on the Spanish March in the Reign of Lothar III. *The Mediaeval Journal* 1, 1–22. DOI: 10.1484/J.TMJ.1.102535. Available also from: https://www.brepolsonline.net/doi/10.1484/J.TMJ.1.102535?mobileUi=0.

Jarrett, J. 2011b: Theodulf, Goths and Garrisons [online]. In: *A Corner of Tenth-Century Europe. Early medievalist's thoughts and ponderings*. [Accessed 2018-07-08] Available from: https://tenthmedieval.wordpress.com/2011/07/21/theodulf-goths-and-garrisons/.

Jay, M. 2009: Breastfeeding and Weaning Behaviour in Archaeological Populations. Evidence from the Isotopic Analysis of Skeletal Materials. *Childhood in the Past* 2(1), 163–178. DOI: 10.1179/cip.2009.2.1.163.

Jędrzejewska, S. 2022: Naczynie z VI–VII w. z wielofazowego stanowiska Hruszowice-Gaje 2 w południowo-wschodniej Polsce. In: M. Dzik et al. (eds.): *W świecie bogów, ludzi i zwierząt. Studia ofiarowane Profesorowi Leszkowi Pawłowi Słupeckiemu*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego, 327–336.

Jeroussalimskaja, A. 1978: Le cafetan aux simourghs du tombeau de Mochtchevaja Balka (Caucase septentrional). *Studia Iranica* 7(2), 183–211.

Jílek, J., Schenk, Z., Vích, D. 2015: Nové nálezy kovových součástí opasku cizího původu z raného středověku z východních Čech a střední Moravy. In: L. Tyszler, E. Droberjar (eds.): *Barbari Superiores et Inferiores. Archeologia Barbarzyńców 2014. Procesy integracji środkowoeuropejskiego Barbaricum. Polska, Czechy, Morawy, Słowacja*. Łódź: Instytut Archeologii Uniwersytetu Łódzkiego, 547–558.

Jiřík, J., Blažková, K., Bezáková, J., Ager, B. et al. (eds.) 2023: *Royal insignia of Late Antiquity from Mšec and Řevničov. Magnificent finds from the Migration period from Central Bohemia*. Rakovník: Museum T. G. M. in Rakovník.

Johanek, P. 1987: Der fränkische Handel der Karolingerzeit im Spiegel der Schriftquellen. In: K. Düwel et al. (Hrsg.): *Untersuchungen zu Handel und Verkehr der vor- und frühgeschichtlichen Zeit in Mittel- und Nordeuropa. Teil IV. Der Handel der Karolinger- und Wikingerzeit. Bericht über die Kolloquien der Kommission für die Altertumskunde Mittel- und Nordeuropas in den Jahren 1980 bis 1983*. Abhandlungen der Akademie der Wissenschaften in Göttingen. Philologisch-historische Klasse. Dritte Folge, Nr. 156. Göttingen: Vandehoeck & Ruprecht, 7–68.

Joosten, I. 2004: *Technology of early historical iron production in the Netherlands*. Geoarchaeological and Bioarchaeological Studies 2. Amsterdam: Institute for Geo- and Bioarchaeology, Vrije Universiteit.

Jost, C. 2011: Gräber der endenden Merowingerzeit in Kruft, Kreis Mayen-Koblenz. *Berichte zur Archäologie an Mittelrhein und Mosel* 17, 355–380.

Junyent, E. 1975: *El monestir romanic de Santa Maria de Ripoll*. Barcelona: Impresió Rieusser, a.s.

Kaiser, R. 2021: Aspekte der frühmittelalterlichen Bevölkerung Ingelheims anhand ausgewählter Fundobjekte aus Metall. In: M. Gierszewska-Noszczyńska, L. Grunwald (Hrsg.): *Zwischen Machtzentren und Produktionsorten. Wirtschaftsaspekte von der römischen Epoche bis in das Hochmittelalter am Rhein und seinen Nachbarregionen. 1. und 2. Tagung der Kooperation Römisch-Germanisches Zentralmuseum und Ingelheim am Rhein, Forschungsstelle Kaiserpfalz Ingelheim am Rhein am 12. und 13. November 2018 sowie Mayen am 28. und 29. November 2019*. RGZM – Tagungen 45. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 247–265. DOI: 10.11588/propylaeum.996.c13289. Available also from: https://doi.org/10.11588/propylaeum.996.c13289.

Kalhous, D. 2012: *Anatomy of a Duchy. The Political and Ecclesiastical Structures of Early Přemyslid Bohemia*. East Central and Eastern Europe in the Middle Ages, 450–1450, Vol. 19. Leiden, Boston: Brill.

Kalhous, D. 2018: *Bohemi. Prozesse der Identitätsbildung im frühpřemyslidischen Böhmen (bis 1200)*. Forschungen zur Geschichte des Mittelalters 24. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Kardaras, G. 2018: The Byzantine Finds and the Possible Channels of Communication between Byzantium and the Avars after 626. In: G. Kardaras (ed.): *Byzantium and the Avars, 6th-9th Century AD. Political, Diplomatic and Cultural Relations*. East Central and Eastern Europe in the Middle Ages, 450–1450, 51. Leiden: Brill, 135–155. DOI: 10.1163/9789004382268_007.

Karlsson, C. 2015: *Förlorat järn. Det medeltida jordbrukets behov och förbrukning av järn och stål*. Jernkontorets Bergshistoriska Skriftserie 49. Acta Universitatis Agriculturae Sueciae 38. Stockholm: Jernkontoret.

Karpf, E. 1984: Königserhebung ohne Salbung. Zur politischen Bedeutung von Heinrichs I. ungewöhnlichem Verzicht in Fritzlar (919). *Hessisches Jahrbuch für Landesgeschichte* 34, 1–24.

Kašpárek, F. 2018: Raně středověká sekera z pomezí katastrů Turova a Uherska, okr. Pardubice. In: K. Kapustka (ed.): *Profil archeologie středověku. Studie věnované Janu Frolíkovi*. Praha: Archeologický ústav AV ČR, Praha, v. v. i., 265–273.

Katzenberg, M. A. 2008: Stable isotope analysis: a tool for studying past diet, demography, and life history. In: M. A. Katzenberg, S. R. Saunders (eds.): *Biological Anthropology of the Human Skeleton*. 2nd edition. Hoboken: John Wiley & Sons, 467–504. DOI: 10.1002/9780470245842.ch13.

Katzenberg, M. A., Herring, A., Saunders, S. R. 1996: Weaning and infant mortality. Evaluating the skeletal evidence. *Yearbook of Physical Anthropology* 39, 177–199. DOI: 10.1002/(SICI)1096-8644(1996)23+%3C177::AID-AJPA7%3E3.0.CO;2-2. Available also from: https://doi.org/10.1002/(SICI)1096-8644(1996)23+%3C177::AID-AJPA7%3E3.0.CO;2-2.

Kaupová, S., Herrscher, E., Velemínský, P., Cabut, S., Poláček, L., Brůžek, J. 2014: Urban and rural infant-feeding practices and health in early medieval Central Europe (9th–10th century, Czech Republic). *American Journal of Physical Anthropology* 155(4), 635–651. DOI: 10.1002/ajpa.22620.

Kaupová Drtikolová, S., Stránská, P., Velemínský, P., Boháčová, I. 2025: The medieval dietary transition in the ecclesiastical centre of Stará Boleslav (9th-15th centuries AD, Czechia)[online]. *Journal of Archaeological Science: Reports* 66, art. no. 105299. [Accessed 2025-05-15]. DOI: 10.1016/j.jasrep.2025.105299. Available from: https://doi.org/10.1016/j.jasrep.2025.105299.

Kazhdan, A. 1991: Toupha. In: A. Kazdhdan (ed.): *Oxford dictionary of Byzantium III*. New York: Oxford University Press, 2100.

Kaźmierczak, R. 2014: Fishing equipment. In: W. Chudziak, R. Kaźmierczak (eds.): *The Island in Żółte on Lake Zarańskie. Early Medieval Gateway into West Pomerania*. Toruń: Institute of Archaeology, Nicolaus Copernicus University, 239–242.

Keenleyside, A., Schwarcz, H., Stirling, L., Lazreg, N. B. 2009: Stable isotopic evidence for diet in a Roman and Late Roman population from Leptiminus, Tunisia. *Journal of Archaeological Science* 36(1), 51–63. DOI: 10.1016/j.jas.2008.07.008. Available also from: https://www.sciencedirect.com/science/article/pii/S0305440308001714.

Kempa, M. 2003: Archäologische Untersuchungen an früh- und hochmittelalterlichen Verhüttungsplätzen. In: *Abbau und Verhüttung von Eisenerzen im Vorland der mittleren Schwäbischen Alb. Mit einem Anhang. Die Eisenproduktion im frühen und hohen Mittelalter: Archäologie, Metallurgie, Landesgeschichte. Internationales Kolloquium am 4.-5. November 1994 in Schwäbisch Gmünd*. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 86. Stuttgart: Konrad Theiss, 9–115.

Kendall, E., Millard, A., Beaumont, J. 2021: The "weanling's dilemma" revisited. Evolving bodies of evidence and the problem of infant paleodietary interpretation. *American Journal of Physical Anthropology* 175(S72), 57–78. DOI: 10.1002/ajpa.24207. Available also from: https://doi.org/10.1002/ajpa.24207.

Kerig, T. 2013: Wirtschaft. Struktur und Leistung in frühen Gesellschaften. In: M. K. H. Eggert, U. Veit (Hrsg.): *Theorie in der Archäologie. Zur jüngeren Diskussion in Deutschland*. Tübinger Archäologische Taschenbücher 10. Münster: Waxmann, 139–190.

Kersting, T. 2004: „Vebene Vort". Spätslawische Siedlung an der Furt in Phöben, Lkr. Potsdam-Mittelmark. *Archäologie in Berlin und Brandenburg* 2003, 116–118.

Kibic, K. ml. 2015: Dvě středověké kostelní věže na Kolínsku. In: J. Anderle (ed.): *Dějiny staveb. Sborník příspěvků z konference Dějiny staveb 2015*. Plzeň: Klub Augusta Sedláčka, Sdružení pro stavebněhistorický průzkum, 42–52.

King, C. L., Halcrow, S. E., Millard, A. R., Gröcke, D. R., Standen, V. G., Portilla, M., Arriaza, B. T. 2018: Let's talk about stress, baby! Infant-feeding practices and stress in the ancient Atacama desert, Northern Chile. *American Journal of Physical Anthropology* 166(1), 139–155. DOI: 10.1002/ajpa.23411. Available also from: https://doi.org/10.1002/ajpa.23411.

Klanica, Z. 1972: *Předvelkomoravské pohřebiště v Dolních Dunajovicích. Příspěvek k otázce vzájemných vztahů Slovanů a Avarů v Podunají*. Studie Archeologického ústavu ČSAV v Brně 1972(1). Praha: Academia.

Klanica, Z. 1995: Počátky a původ moravského etnosu. In: J. Drápela (ed.): *Moravský historický sborník. Ročenka Moravského národního kongresu 1993/94*. Brno: Moravský národní kongres, 43–73.

Klanica, Z., Kavánová, B., Kouřil, P., Ungerman, Š. 2019: *Mikulčice – Die Nekropole an der dreischiffigen Basilika*. Studien zum Burgwall von Mikulčice XII. Spisy Archeologického ústavu AV ČR Brno 58. Brno: Archeologický ústav Akademie věd České republiky, Brno, v. v. i. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2019/04/SBM12_nahled.pdf.

Klápště, J. 1994: *Paměť krajiny středověkého Mostecka*. Praha, Most: Archeologický ústav AV ČR, Praha, Státní galerie výtvarného umění Most, Ústav archeologické památkové péče severozápadních Čech. Available also from: https://1url.cz/LJlgB.

Klápště, J. 2005: *Proměna českých zemí ve středověku*. Česká historie 15. Praha: Lidové noviny. Available also from: https://1url.cz/dJVX9.

Klápště, J. 2011: O rané šlechtě v českých zemích. Malý náčrt velkého tématu. In: E. Doležalová, P. Meduna (eds.): *Co můj kostel dnes má, nemůže kníže odníti. Věnováno Petru Sommerovi k životnímu jubileu*. Praha: Lidové noviny, 61–66. Available also from: https://1url.cz/AJVXc.

Kočár, P., Šlézar, P., Kočárová, R. 2016: Vegetace a ekonomika předvelkomoravské centrální lokality v Olomouci-Povelu. *Archeologické rozhledy* 68(4), 544–575. DOI: 10.35686/AR.2016.25. Available also from: https://archeologickerozhledy.cz/index.php/ar/article/view/146.

Koch, R. 1967: *Bodenfunde der Völkerwanderungszeit aus dem Main-Tauber-Gebiet*. Germanische Denkmäler der Völkerwanderungszeit, Serie A 8. Berlin: De Gruyter.

Koch, U. 1982: *Die fränkischen Gräberfelder von Bargen und Berghausen in Nordbaden*. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 12. Stuttgart: Konrad Theiss Verlag.

Koch, U. 2011: *Das frühmittelalterliche Gräberfeld von Mainz-Hechtsheim*. Mainzer Archäologische Schriften 11. Publikation der Reiss-Engelhorn-Museen 51. Mainz: Generaldirektion Kulturelles Erbe.

Kocka, J. 2003: Comparison and Beyond. *History and Theory* 42, 39–44. Available also from: https://www.jstor.org/stable/3590801.

Kóčka-Krenz, H. 2007: Wczesnośredniowieczna biżuteria metalowa ze zbiorów Państwowego Muzeum Archeologicznego. In: W. Brzeziński (ed.): *Skarby wieków średnich. Katalog wystawy / Treasures of the Middle Ages. Catalogue of the exhibition*. Warszawa: Państwowe Muzeum Archeologiczne w Warszawie, 20–51.

Kóčka-Krenz, H. 2011: Frühmittelalterliche Metallschmuck. In: M. Kroker (Hrsg.): *Schätze des Mittelalters. Schmuck aus dem Staatlichen Archäologischen Museum Warschau. Katalog zur Austellung.* Bönen: Kettler, 18–39.

Köhler, S., Scholl, C., Skambraks, T., Steinbach, S. 2019: Introduction into the Study of Money and Credit. In: U. Kypta, J. Bruch, T. Skambraks (eds.): *Methods in Premodern Economic History. Case studies from the Holy Roman Empire, c.1300–c.1600.* Palgrave Studies in Economic History. Cham: Palgrave Macmillan, Springer Nature, 131–185.

Kohoutek, J. 1995: Slovanské a středověké osídlení. In: V. Nekuda (ed.): *Zlínsko*. Brno: Muzejní a vlastivědná společnost v Brně, 131–146.

Kohoutek, J. 2003: Průzkum slovanských mohylníků na Uherskobrodsku a Slavičínsku. *Slovácko* 45, 95–107.

Kohoutek, J., Plášek, K. 1993: Průzkum slovanského mohylníku na katastru Slavičína. *Přehled výzkumů* 1989, 78–79. Available also from: https://www.arub.cz/wp-content/uploads/pv_34_1989.pdf.

Kollautz, A. 1970: *Denkmäler byzantinischen Christentums aus der Awarenzeit der Donauländer*. Zetemata Byzantina. Studien und Vorträge zur byzantinischen Geschichte 2. Amsterdam: Verlag Adolf M. Hakkert.

Koller, H. 1963: Der „mons Comagenus". *Mitteilungen des Instituts für Österreichische Geschichtsforschung* 71, 237–245. DOI: 10.7767/miog.1963.71.jg.237.

Kollwitz, J. 1941: *Oströmische Plastik der Theodosianischen Zeit*. Studien zur spätantiken Kunstgeschichte 12. Berlin: Walter de Gruyter.

Kolosov, I. A., Kalinin, V. A. 2022: *Catalogue of Samanid Dirhams 279–394 A.H*. St. Petersburg, Moscow.

Komárno_City: *The City of Komárno. History* [online]. ©1998–2025. [Accessed 2025-09-08]. Available from: https://komarno.sk/en/city/history/.

Konzilien der Karolingischen 843–859: *Die Konzilien der Karolingischen Teilreiche, 843-859*. W. Hartmann (ed.). Monumenta Germaniae Historica, Concilia. 3. Hannover: Hahn, 1984.

Kopták, T. 2015: Kysuce od praveku k vrcholnému stredoveku. *Terra Kisucensis* 6, 27–47.

Korošec, P. 1999: *Nekropola na ptujskem gradu. Turnirski prostor*. Ptuj: Pokrajinski muzej Ptuj.

Kortüm, H.-H. 2002: "Multi reguli in Europa ... excrevere.". Das ostfränkische Reich und seine Nachbarn. In: F. Fuchs, P. Schmid (Hrsg.): *Kaiser Arnolf. Das ostfränkische Reich am Ende des 9. Jahrhunderts. Regensburger Kolloquium 9.-11.12.1999*. Zeitschrift für bayerische Landesgeschichte. Beiheft. Reihe B 19. München: Verlag C.H. Beck, 68–88.

Košta, J., Barčáková, L. 2023: *Šperk za časů gombíků. Příběh luxusních ženských ozdob 9. a 10. století v Čechách*. Praha: Národní muzeum.

Košta, J., Hošek, J. 2014: *Early medieval swords from Mikulčice*. Studien zum Burgwall von Mikulčice X. Spisy Archeologického ústavu AV ČR Brno 42. Brno: Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno.

Kostelníková, M. 1973: Síťovací jehly z Mikulčic. *Archeologické rozhledy* XXV(6), 680–682. Available also from: https://1url.cz/XJdOX.

Kotansky, R. 1994: *Greek Magical Amulets. The Inscribed Gold, Silver, Copper, and Bronze Lamellae. Part I. Published Texts of Known Provenance*. Papyrologica Coloniensia XXII(1). Opladen: Westdeutscher Verlag. DOI: 10.1007/978-3-663-20312-4.

Kouřil, P. 1994: *Slovanské osídlení českého Slezska*. Brno, Český Těšín: Archeologický ústav AV ČR Brno, Muzeum Těšínska v Českém Těšíně.

Kouřil, P. 2017: Metallfunde aus dem Burgwall Víno bei Slezské Rudoltice (Schlesien) und ihre Bedeutung. In: G. Fusek (Hrsg.): *Archäologische Studien zum frühen Mittelalter*. Archaeologica Slovaca Monographiae. Communicationes XIX. Nitra: Archeologický ústav Slovenskej akadémie vied, 53–80.

Kouřil, P. 2019: The Magyars and Their Contribution to the Collapse and Fall of Great Moravia: Allies, Neighbours, Enemies. In: J. Macháček, M. Wihoda (eds.): *The Fall of Great Moravia. Who Was Buried in Grave H153 at Pohansko near Břeclav?* Leiden, Boston: Brill, 62–93. DOI: 10.1163/9789004392878_004. Available also from: https://doi.org/10.1163/9789004392878_004.

Kouřil, P. 2021a: Archeologie opomíjeného regionu. Hradiště Chotěbuz-Podobora. In: L. Poláček et al.: *Jdeme pod povrch. Příběhy Archeologického ústavu Akademie věd ČR v Brně 1920 – 1970 – 2020*. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 196–202.

Kouřil, P. 2021b: Klášťov Hill - An Exceptional Case of Religious Customs and Notions in the Slavic World (Eastern Moravia, Czech Republic). In: Z. Robak, M. Ruttkay (eds.): *Celts – Germans – Slavs. A Tribute Anthology to Karol Pieta*. Slovenská archeológia, Supplementum 2. Nitra: Institute of Archaeology SAS 431–439. DOI: 10.31577/slovarch.2021.suppl.2.42. Available also from: https://doi.org/10.31577/slovarch.2021.suppl.2.42.

Kouřil, P., Gryc, J. 2011: Der Burgwall in Chotěbuz-Podobora und seine Stellung in der Siedlungsstruktur des oberen Odergebietes vom 8. bis zum 9./10. Jahrhundert. In: J. Macháček, Š. Ungerman (Hrsg.): *Frühgeschichtliche Zentralorte in Mitteleuropa*. Studien zur Mitteleuropas 14. Bonn: Dr. Rudolf Habelt, 217–243.

Kouřil, P., Gryc, J. 2014: Hradiska 10. – 12. století na severní Moravě a ve Slezsku. In: K. Chrzan, K. Czapla, S. Moździoch (eds.): *Funkcje grodów w państwach wczesnośredniowiecznej Europy środkowej. Społeczeństwo, gospodarka, ideologia*. Wrocław, Głogów: Instytut Archeologii i Etnologii PAN, Ośrodek Badań nad Kulturą Późnego Antyku i Wczesnego Średniowiecza, Państwowa Wyższa Szkoła Zawodowa w Głogowie, 99–171.

Kouřil, P., Gryc, J. 2019: Czech Silesia in the Early Middle Ages. *Přehled výzkumů* 60(2), 93–143. Available also from: https://www.arub.cz/prehled-vydanych-cisel/pv_60_2_kouril_gryc.pdf.

Kouřil, P., Poláček, L. 2013: Goldfunde von Mikulčice. Probleme und Perspektiven. In: M. Hardt, O. Heinrich-Tamáska (Hrsg.): *Macht des Goldes, Gold der Macht. Herrschafts- und Jenseitsrepräsentation zwischen Antike und Frühmittelalter im mittleren Donauraum. Akten des 23. Internationalen Symposiums der Grundprobleme des frühgeschichtlichen Entwicklung im mittleren Donauraum, Tengelic 16. – 19. 11. 2011*. Forschungen zu Spätantike und Mittelalter 2. Weinstadt: Greiner, 407–422.

Kouřil, P., Prix, D., Wihoda, M. 2000: *Hrady českého Slezska*. Brno, Opava: Archeologický ústav Akademie věd ČR Brno. Available also from: https://arub.cz/wp-content/uploads/2020/11/Hrady_ceskeho_Slezska.pdf.

Kouřil, P. (ed.) 2014: *Great Moravia and the Beginnings of Christianity*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno. Available also from: https://www.arub.cz/wp-content/uploads/Great_Moravia_and_the_Beginnings_of_Christianity_kompr.pdf.

Kovačević, J. 1977: *Avarski kaganat*. Beograd: Srpska književna zadruga.

Kováčová, L., Kovár, B., Milo, P. 2015: Hradisko Pružina-Mesciská a jeho okolie. In: P. Jenčík, V. Struhár (eds.): *Hradiská – svedkovia dávnych čias. Zborník odborných príspevkov o hradiskách a ich obyvateľoch*. Dolná Mariková: Občianske združenie Hradiská, 175–185, 264–265.

Kovalchuk, O., Stefaniak, K., Barkaszi, Z., Kotusz, J., Pankiewicz, A., Wiśniewski, A., Zarzecka-Szubińska, K., Volynskyi, T., Socha, P. 2024: Fish and fishing in the medieval Wrocław (Poland): New insights based on archaeozoological data [online]. *Journal of Archaeological Science: Reports* 54, art. no. 104450, DOI: 10.1016/j.jasrep.2024.104450. [Accessed 2025-05-18]. Available from: https://www.sciencedirect.com/science/article/pii/S2352409X24000786.

Kovář, M., Vaněk, V. 2021: Zpráva o nálezu raně gotického portálu v kostele Všech svatých v Olešce. *Památky středních Čech* 35(2), 67–72. Available also from: https://pamatkysc.cz/artkey/psc-202102-0004_a-report-on-the-discovery-of-the-early-gothic-portal-in-all-saints-church-in-oleska.php.

Kovář, M., Vaněk, V., Hlaváčková, H., Macek, P. 2010: Kostel sv. Bartoloměje v Třebovli ve středověku. *Průzkumy památek* XVII(1), 107–120. Available also from: https://www.pruzkumypamatek.cz/en/artkey/prp-201001-0007_kostel-sv-bartolomeje-v-trebovli-ve-stredoveku.php.

Kovrig, I. 1963: *Das awarenzeitliche Gräberfeld von Alattyán*. Archaeologia Hungarica. Series Nova 40. Budapest: Akadémiai Kiadó / Verlag der Ungarischen Akademie der Wissenschaften.

Kowalewska, B., Kaźmierczak, R. (eds.) 2014: Objects made of flint, stone, amber antler, and clay. In: W. Chudziak, R. Kaźmierczak (eds.): *The Island in Żółte on Lake Zarańskie. Early Medieval Gateway into West Pomerania*. Toruń: Institute of Archaeology, Nicolaus Copernicus University, 302–310.

Krabath, S. 2001: *Die hoch- und spätmittelalterlichen Buntmetallfunde nördlich der Alpen. Eine archäologisch-kunsthistorische Untersuchung zu ihrer Herstellungstechnik, funktionalen und zeitlichen Bestimmung*. Internationale Archäologie 63. Rahden/Westf.: Leidorf.

Kramer, M. S., Kakuma, R. 2012: Optimal duration of exclusive breastfeeding (Review). *Cochrane Database of Systematic Reviews* 8, CD003517. DOI: 10.1002/14651858.CD003517.pub2. Available also from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7154583/pdf/CD003517.pdf.

Krämer, P. 1960: Die Burgkirche zu Ober-Ingelheim. In: D. Pfarrer Seyerle (Hrsg.): *Zum 70. Geburtstag des Heimatforschers und Gliedes der Burgkirchengemeinde Philipp Krämer, geb. am 29. Juli 1890 in Ober-Ingelheim, im Auftrage des Vorstandes der Burgkirche*. Ingelheim am Rhein: [Publisher unknown].

Krämer, P. J. 2018: Eine römische Aschengrube aus Ingelheim. *Berichte zur Archäologie in Rheinhessen und Umgebung* 11, 41–65.

Kraskovská, L. 1972: K otázke lovu a rybolovu u Slovanov. *Časopis Moravského musea v Brně, Vědy společenské* LVII(1), 147–156.

Kremla, J. 1903: Předhistorická hradiště v okresu kouřimském. *Památky archeologické a místopisné* XX(VI), 395–406. Available also from: https://1url.cz/pJVvp.

Křivánek, R. 2000: Způsoby využití geofyzikálních měření jako metody průzkumu hradišť. *Archeologie ve středních Čechách* 4(2), 489–503. Available also from: https://1url.cz/nJV80.

Křížová, Š. 2024: *Zpráva o chemickém složení vzorků skel ze Staré Boleslavi*. Manuscript of the expert report. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Science, Praha.

Kropp, C., Meier, T. 2010: Entwurf einer Archäologie der Grundherrschaft im älteren Mittelalter. *Beiträge zur Mittelalterarchäologie in Österreich* 26, 97–124.

Kroupa, P. 1993: Středověké jádro kostela sv. Havla ve Ždánicích (okres Kolín). *Památky středních Čech* 6, 96–97. Available also from: https://1url.cz/uJV8g.

Krüger, B. 1962: *Die Kietzsiedlungen im nördlichen Mitteleuropa. Beiträge der Archäologie zu ihrer Alterbestimmung und Wesensdeutung*. Schriften der Sektion Vor- und Frühgeschichte 11. Berlin: Akademie der Wissenschaften.

Krupičková, Š. 2020: Gombíky: Unique Symbol of the Great Moravian Elites. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 295–308. Available also from: https://www.arub.cz/produkt/great-moravian-elites-from-mikulcice/.

Krupičková, Š. 2022: *Velkomoravské gombíky. Původ, účel a vývoj artefaktů v živé kultuře 9. století* [online]. Manuscript of the dissertation. Masaryk University. Faculty of Arts. Department of Archaeology and Museology. Stored in: Archive of Theses [Accessed 2025-04-19]. Available from: https://is.muni.cz/th/x59wl/.

Krupičková, Š. 2024: *Gombíky from Mikulčice and their regional and supraregional Context*. Studien zum Burgwall von Mikulčice XIV. Spisy Archeologického ústavu AV ČR Brno 80. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno. DOI: 10.47382/arub2024-02. Available also from: https://www.arub.cz/wp-content/uploads/spisy_arub_80_SBM_XIV.pdf.

Krupičková, Š. 2025: Where Did the Spherical Hollow Buttons Come From? Comparing Great Moravian Gombíky with Examples from the Preslav Treasure. In: A. Bosselmann-Ruickbie, F. Daim, S. Greiff (eds.): *The Preslav Treasure from Bulgaria (Tenth Century). Historical Context, Excavations, Objects and Technology*.

Byzanz zwischen Orient und Okzident 29. Mainz: LEIZA, 149–166. DOI: 10.11588/propylaeum.1618.c23332. Available also from: https://books.ub.uni-heidelberg.de/propylaeum/catalog/book/1618/chapter/23332.

Krupičková, Š., Fořt, M., Fořtová Torňošová, J., Poláček, L., Pługawko, M. 2025: Konzervátorsko-restaurátorské výzvy včera a dnes: zpracování raně středověkých šperků a oděvních součástí z hradiště Mikulčice-Valy. *Fórum pro konzervátory-restaurátory* XV(2), 69–84. DOI: 10.61574/FKR.2025.2.069. Available also from: https://mck.technicalmuseum.cz/wp-content/uploads/2025/10/069-Krupickova.pdf.

Krupičková, Š., Ottenwelter, E., Březinová, H. 2019: Exact evidences of the use of spherical buttons (gombíky): two case studies from Moravian finds. *Přehled výzkumů* 60(2), 57–77. Available also from: https://www.arub.cz/prehled-vydanych-cisel/pv_60_2_krupickova_et_al.f.pdf.

Krupičková, Š., Ottenwelter, E., Poláček, L. 2024: Where does Great Moravian gold come from? Byzantine coins as a source of raw material. In: O. Heinrich-Tamáska, M. Becker, M. Hardt, H. Meller (Hrsg.): *Verwerten – Verarbeiten – Verformen: Recycling von Bunt- und Edelmetall von der Bronzezeit bis zum Mittelalter. 4. Internationaler Workshop des Netzwerks Archäologisch Historisches Metallhandwerk, 15–17.05.2019 in Leipzig/Halle (Saale)*. Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt, Landesmuseum für Vorgeschichte. Tagungen des Landesmuseums für Vorgeschichte Halle 30, 345–354.

Kruťa, T. 1966: *Moravské nerosty a jejich literatura*. Brno: Moravské museum v Brně.

Kubů, N. 2017: Karlštejnský poklad. Unikátní soubor zachovaných středověkých textilních doplňků. In: A. Nachtmanová, O. Klapetková (eds.): *Oděv a textil v životě člověka doby lucemburské. Sborník příspěvků ze specializované konference, uspořádané Národním památkovým ústavem, územním odborným pracovištěm středních Čech v Praze 6. října 2016*. Praha: Národní památkový ústav, územní odborné pracoviště středních Čech, 41–53.

Kubů, N., Koenigsmarková, H., Panenková, D. 2016: *Karlštejnský poklad. Kultura císařského dvora Karla IV*. Praha: Národní památkový ústav.

Kuča, K. 1998: *Města a městečka v Čechách, na Moravě a ve Slezsku. III. díl. Kolín – Miro*. Praha: Libri. Available also from: https://1url.cz/wJV8v.

Kučerová, M., Soják, M., Kušnierová, A., Fecko, P. 2012: Prvé včasnoslovanské nálezy zo Spiša (lokalita Spišský Štvrtok, okr. Levoča). In: F. Fetko, M. Števík (eds.): *Pocta Ivanovi Chalupeckému. Zborník príspevkov k slovenským dejinám vydaný pri príležitosti osemdesiatin doc. PhDr. Ivana Chalupeckého*. Levoča: Spišský dejepisný spolok v Levoči, 19–31.

Kuchenbuch, L. 1978: *Bäuerliche Gesellschaft und Klosterherrschaft im 9. Jahrhundert: Studien zur Sozialstruktur der Familia der Abtei Prüm*. Vierteljahrschrift für Sozial- und Wirtschaftsgeschicht Beihefte 66. Wiesbaden: Franz Steiner.

Kuhn, A. 1843: *Märkische Sagen und Märchen. Nebst einem Anhange von Gebräuchen und Aberglauben*. Berlin: Reimer.

Kundera, L. 1989: Slovanské sídliště v Bojkovicích. *Přehled výzkumů* 1986, 56–57. Available also from: https://www.arub.cz/wp-content/uploads/pv_31_1986.pdf.

Kundera, L. 1990: Záchranný výzkum na velkomoravském sídlišti v Bojkovicích. *Přehled výzkumů* 1987, 54. Available also from: https://www.arub.cz/wp-content/uploads/pv_32_1987.pdf.

Kuneš, P., Svobodová-Svitavská, H., Kolář, J., Hajnalová, M., Abraham, V., Macek, M., Tkáč, P., Szabó, P. 2015: The origin of grasslands in the temperate forest zone of east-central Europe: long-term legacy of climate and human impact. *Quaternary Science Reviews* 116, 15–27. DOI: 10.1016/j.quascirev.2015.03.014. Available also from: https://www.sciencedirect.com/science/article/pii/S0277379115001213?via%3Dihub.

Kurka, J. 1915: *Archidiakonáty Kouřimský, Boleslavský, Hradecký a diecése Litomyšlská. Místopis církevní do roku 1421*. Praha: Československá akciová tiskárna.

Lacoste Jeanson, A., Santos, F., Bruzek, J., Urzel, V. 2016: Detecting menarcheal status through dental mineralization stages? *American Journal of Physical Anthropology* 161(2), 367–73. DOI: 10.1002/ajpa.23027.

Ladenbauer-Orel, H. 1960: *Linz-Zizlau. Das baierische Gräberfeld an der Traunmündung. Die Ausgrabungen auf dem Werksgelände der Vöest*. Wien: Schroll.

Laehr, G. 1928: Das Schreiben Stephans V. an Sventopulk von Mähren. *Neues Archiv der Gesellschaft für ältere deutsche Geschichtskunde* 47, 159–173. Available also from: https://1url.cz/GJqXA.

Lamberti, L. M., Fischer Walker, C. L., Noiman, A., Victora, C., Black, R. E. 2011: Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health* 11, Supplementum 3, 1–12. DOI: 10.1186/1471-2458-11-S3-S15. Available also from: https://doi.org/10.1186/1471-2458-11-S3-S15.

Landgraf, E. 1993: *Ornamentierte Bodenfliesen des Mittelalters in Süd- und Westdeutschland 1150–1550. 2 Musterkatalog*. Forschungen und Berichte der Archäologie des Mittelalters in Baden-Württemberg 14(2). Stuttgart: Konrad Theiss.

Lapčák, L. 2022: *Analýza částic na archeologických kostech FT-IR spektroskopií*. Manuscript of the expert report. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Science, Praha.

Larsen, C. S. 2002: *Skeletons in Our Closet. Revealing Our Past Through Bioarchaeology*. Princeton: Princeton University Press.

Later, C. 2015: Siedlungsarchäologische Beobachtungen zur systematischen Erschließung einer Durchgangsregion in der jüngeren Merowinger- und Karolingerzeit am Beispiel des Altmühltals. In: C. Later, M. Helmbrecht, U. Jecklin-Tischhauser (Hrsg.): *Infrastruktur und Distribution zwischen Antike und Mittelalter. Tagungsbeiträge der Arbeitsgemeinschaft Spätantike und Frühmittelalter 8. Stadt, Land, Fluss – Infrastruktur und Distributionssysteme in Spätantike und Frühmittelalter (Lübeck, 2. – 3. September 2013)*. Studien zu Spätantike und Frühmittelalter 8. Hamburg: Verlag Dr. Kovač, 37–82.

Látková, M. 2017: *The Archaeobotany of Mikulčice. Food Supply to the Early Medieval Stronghold*. Studien zum Burgwall von Mikulčice XI. Spisy Archeologického ústavu AV ČR Brno 55. Brno: Czech Academy of Science, Insitute of Archaeology, Brno. Available also from: https://mikulcice.arub.cz/publikace/mikulcicke-edicni-rady/studien-zum-burgwall-von-mikulcice-sbm/publikace-1/.

Le Goff, J. 1971: Travail, techniques et artisans dans les systèmes de valeur du Haut Moyen Âge (Ve-Xe siècles). In: *Artigianato e tecnica nella società dell›alto medioevo occidentale. 2-8 aprile 1970*. Settimane di studio del Centro Italiano di Studi sull‘alto Medioevo XVIII. Spoleto: Presso la sede del centro, 239–266.

Lebsak, M. 2020: *Bergbau und Eisenverhüttung auf der nördlichen Frankenalb im Mittelalter*. Monographien zur Geschichte Oberfrankens 2. Bayreuth: Historischer Verein für Oberfranken.

Lebsak, M., Kapusta, J. 2024: Large-scale ironworking in Early Medieval proto-urban settlements. A case study from Mikulčice-Valy, Czech Republic. *Přehled výzkumů* 65(2), 51–76. DOI: 10.47382/pv0652-01. Available also from: https://www.arub.cz/wp-content/uploads/PV-65_2_03.pdf.

Lebsak, M., Petřík, J., Petr, L., Kopečná, M. M. 2024: Landscape history and ecological change of the Drahany Highlands (Czech Republic) in the Medieval and Early Modern periods: Preliminary results from geoarchaeological surveys. *Archeologia technica* 35, 60–65. DOI:https://doi.org/10.61574/AT.2024.60.

Lechterbeck, J., Edinborough, K., Kerig, T., Fyfe, R., Roberts, N., Shennan, S. 2014: Is Neolithic land use correlated with demography? An evaluation of pollen-derived land cover and radiocarbon-inferred demographic change from Central Europe. *The Holocene* 24(10). DOI: 10.1177/0959683614540952. Available also from: https://journals.sagepub.com/doi/10.1177/0959683614540952.

Legenda Christiani: *Kristiánova legenda. Život a umučení svatého Václava a jeho báby svaté Ludmily*. J. Ludvíkovský (ed.). Prague: Vyšehrad, 1978.

Leimus, I. 2007: *Sylloge of Islamic Coins 710/1 – 1013/4 AD. Estonian Public Collection*. Thesaurus Historiae II. Tallinn: Estonian History Museum.

Le Jan, R. 2006: Die Sakralität der Merowinger oder. Mehrdeutigkeiten der Geschichtsschreibung. In: S. Airlie et al. (Hrsg.): *Staat im frühen Mittelalter*. Forschungen zur Geschichte des Mittelalters 11. Österreichische Akademie der Wissenschaften. Philosophisch-historische Klasse. Denkschriften 334. Wien: Verlag der Österreichischen Akademie der Wissenschaften, 73–92.

Lendělová, P. 2008: *Sběr a určování hálek a tvorba didaktické pomůcky k této problematice*. Manuscript of master's thesis. Masaryk University. Faculty of Education. Department of Biology. Stored in: Central Library of the Faculty of Education, Masaryk University. Available also from: https://is.muni.cz/th/wzkz3/finito.pdf.

Lerche, G. 1994: *Ploughing implements and tillage practices in Denmark from the Viking period to about 1800*. The Royal Danish Academy of Sciences and Letters' Commission for Research on the History of Agricultural Implements and Field Structures 8. Herning: Poul Kristensen.

Leroy, M. 2008: Les modes de production du fer au haut Moyen Âge. L'exemple des ateliers sidérurgiques de Lorraine centrale. In: J. Guillaume, E. Peytremann (eds.): *L'Austrasie. Sociétés, économies, territoires, christianisation. Actes des XXVIe Journées internationales d'archéologie mérovingienne, Nancy, 22-25 septembre 2005*. Association Française d'Archéologie Mérovingienne XIX. Nancy: Presses Universitaires de Nancy, 177–188. Available also from: https://www.persee.fr/doc/mafam_1152-2518_2008_act_19_1_1041.

Leroy, M., Cabboï, L., Bauvais, S., Berranger, M., Blaising, J.-M., Boulanger, K., Brkojewtisch, G., Coubel, S., Deffressigne, S., Disser, A., Dunikowski, C., Dupont, R., Folzan, M., Frauciel, M., Gazenbeek, M., Georges-Leroy, M., Lagadec, J.-P., Lambert, M.-P., Lorquet, P., Merluzzo, P., Peytremann, É., Prévot, M., Prouteau, R., Riquier-Bouclet, C., Séguier, J.-M., Schembri, F., Tikonoff, N. 2019: *Produire et travailler le fer. Les ateliers de l'est du Bassin parisien du Ve siècle av. J.-C. au Xe siècle apr. J.-C*. Recherches archéologiques 16. Paris: INRAP, CNRS. Available also from: https://inrap.hal.science/RECHERCHES_ARCHEOLOGIQUES/hal-02295821v1.

Levillain, L. 1904: La translation des reliques de saint Austremoine à Mozac et le diplôme de Pépin II d'Aquitaine (863). *Le Moyen Age* 17, 294–303.

Levine, R. 1991: Liudprand of Cremona. History and Debasement in the Tenth Century. *Mittellateinisches Jahrbuch* 26, 70–84.

Levison, W., Löwe, H. 1990: *Deutschlands Geschichtsquellen im Mittelalter. Vorzeit und Karolinger VI. Die Karolinger vom Vertrag von Verdun bis zum Herrschaftsantritt der Herrscher aus dem sächsischen Hause. Das ostfränkische Reich*. Weimar: Böhlau, 671–687.

Lewis, C. 2005: Utmark, settlement, marginality and power in medieval lowland England. In: I. Holm, S. Innselset, I. Øye (eds.): *'Utmark'. The Outfield as Industry and Ideology in the Iron Age and the Middle Ages*. Bergen: University of Bergen, 119–136. Available from: https://hdl.handle.net/1956/11326.

Lewis, M., Shapland, F., Watts, R. 2016a: On the threshold of adulthood. A new approach for the use of maturation indicators to assess puberty in adolescents from medieval England. *American Journal of Human Biology* 28, 48–56. DOI: 10.1002/ajhb.22761.

Lewis, M., Shapland, F., Watts, R. 2016b: The influence of chronic conditions and the environment on pubertal development. An example from medieval England. *International Journal of Paleopathology* 12, 1–10. DOI: 10.1016/j.ijpp.2015.10.004. Available also from: https://doi.org/10.1016/j.ijpp.2015.10.004.

Líbal, D. 2001: *Katalog gotické architektury v České republice do husitských válek*. Praha: Unicornis. Available also from: https://1url.cz/kJV8n.

Lienhard, T. 2006: Les combattants francs et slaves face à la paix. Crise et nouvelle définition d'une élite dans l'espace oriental carolingien au début du IXe siècle. In: F. Bougard, L. Feller, R. Le Jan (eds.): *Les élites au haut moyen âge. Crises et renouvellements*. Collection Haut Moyen Âge 1. Turnhout: Brepols, 253–266. DOI: 10.1484/M.HAMA-EB.3.497. Available also from: https://www.brepolsonline.net/doi/abs/10.1484/M.HAMA-EB.3.497.

Livingston, T. 2016: Breastfeeding in Historical and Comparative Perspective. In: *The Wiley Blackwell Encyclopedia of Gender and Sexuality Studies*. Chichester: John Wiley & Sons, Ltd., 1–3. DOI: 10.1002/9781118663219. wbegss086.

Lobinger, C. 2020: Awarisch oder byzantinisch? Bemerkungen zu einigen Funden aus Weseram im Havelland. In: F. Biermann, T. Kersting, A. Klammt (Hrsg.): *Burg, Herrschaft und Zentralörtlichkeit im nördlichen westslawischen Raum*. Beiträge zur Ur- und Frühgeschichte Mitteleuropas 92. Langenweißbach: Beier & Beran, 317–322.

Loftsgarden, K. 2020: Mass Production and Mountain Marketplaces in Norway in the Viking and Middle Ages. *Medieval Archaeology* 64(1), 94–115. DOI:10.1080/00766097.2020.1754662. Available alos from: https://doi.org/10.1080/00766097.2020.1754662.

Loftsgarden, K. 2021: Seasonal iron production in the mountains of Viking Age and medieval Scandinavia. In: P Dixon, C. Theune (eds.): *Seasonal Settlement in the Medieval and Early Modern Countryside*. Leiden: Sidestone Press, 221–228.

Lot, F. 1906: Mélanges d'histoire bretonne V. Le Schisme breton du IXe siècle. *Annales de Bretagne* 22(3), 414–452. Available also from: https://www.persee.fr/doc/abpo_0003-391x_1906_num_22_3_1252.

Loveluck, C. 2013: *Northwest Europe in the Early Middle Ages, c. AD 600–1150. A Comparative Archaeology*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9781139794725.

Loveluck, C. 2011: Problems of the definition and conceptualisation of early medieval elites, AD 450-900. The dynamics of the archaeological evidence. In: F. Bougard, H.-W. Goetz, R. Le Jan (eds.): *Théorie et pratiques des élites au Haut Moyen Âge. Conception, perception et réalisation sociale / Theorie und Praxis frühmittelalterlicher Eliten. Konzepte, Wahrnehmung und soziale Umsetzung.*

Collection Haut Moyen Âge 13. Turnhout: Brepols, 21–68. DOI: 10.1484/M.HAMA-EB.1.100110.

Löwe, H. 1952: Regino von Prüm und das historische Weltbild der Karolingerzeit. *Rheinische Vierteljahrsblätter* 17, 151–179. Available also from: https://digitale-sammlungen.ulb.uni-bonn.de/periodical/titleinfo/8137455.

Lowick, N., Savage, E. 1996: *Early 'Abbāsid Coinage. A Type Corpus 132–218 H / AD 750–833*. London: British Museum Press.

Loyn, H. R., Percival, J. 1975: *The Reign of Charlemagne*. Documents of Medieval History 2. New York: St. Martins's Press.

Łuczyński, M. 2024: Etnonimia Europy środkowo-wschodniej w IX wieku w świetle Geografa Bawarskiego. In: D. Dąbrowski, E. Siemianowska (eds.): *Przedpolska. Ziemie w czasach plemiennych*. Collectio Cathalogorum Gnesnensium 4. Gniezno, Poznań: Muzeum Początków Państwa Polskiego w Gnieźnie, Poznańskie Towarzystwo Przyjaciół Nauk, 45–67.

Ludwig, K.-H. 1999: Das Eisen in den Schriftquellen des Frühmittelalters. *Ferrum* 71, 16–26. DOI: 10.5169/seals-378335. Available also from: https://doi.org/10.5169/seals-378335.

Lukas, J., Boháčová, I. 2024: Raně středověké mince z archeologických výzkumů ve Staré Boleslavi. *Numismatický sborník* 36(1–2), 84–98.

Lupi epistolae: Lupi abbatis Ferrariensis epistolae. In: *Epistolae Karolini aevi 4*. E. Dümmler (ed.). Monumenta Germaniae Historica, Epistolae 6. Berlin: Weidmann, 1925.

Lvermgeo.de: *Landesamt für Vermessung und Geobasisinformation*. WMS [online]. Landesamt für Vermessung und Geobasisinformation, Rheinland-Pfalz [Acessed 2025-05-01]. Available from: https://lvermgeo.de/.

Lvermgeo.rlp.de: *Landesamt für Vermessung und Geobasisinformation* [online]. Landesamt für Vermessung und Geobasisinformation, Rheinland-Pfalz [Acessed 2025-05-01]. Available from: https://lvermgeo.rlp.de/.

Lysý, M. 2014: *Moravania, Mojmírovci a franská ríša. Štúdie k etnogeneze, politickým inštitúciám a ústavnímu zriadeniu na území Slovenska vo včasnom stredoveku*. Bratislava: Atticum.

Machač, K., Merta, O., Hlavica, M. in print: Olomučany (okr. Blansko). *Přehled výzkumů* 67(2).

Macháček, J. 2012a: „Great Moravian State" – a controversy in Central European medieval studies. *Studia Slavica et Balcanica Petropolitana* 11(1), 5–26. Available also from: https://1url.cz/XuRV8.

Macháček, J., Dresler, P., Přichystalová, R. 2018: Das Ende Großmährens – Überlegungen zur relativen und absoluten Chronologie des ostmitteleuropäischen Frühmittelalters. *Praehistorische Zeitschrift* 93, 307–348. DOI: 10.1515/pz-2018-0010.

Macháček, J., Měchura, R. 2013: Raně středověké olovo z jižní Moravy a hutnické centrum na Slezsko-krakovské vysočině. In: P. Boroń (ed.): *Argenti fossores et alii. Znaczenie gospodarcze wschodnich części Górnegio Śląska i zachodnich krańców Malopołski w późnej fazie wczesnego średnowiecza (X-XII wiek)*. Chronica Silesiae Superioris 1. Wrocław: Chronicon, 275–287.

Macků, P., Pilná, V. 2021: An early-medieval helmet of the Stromovka-Gnezdovo-Bojná type from the collections of the Kozel chateau. *Archeologia historica* 46(2), 445–466. DOI: 10.5817/AH2021-2-6. Available also from: https://hdl.handle.net/11222.digilib/144698.

MacLean, S. 2003: *Kingship and politics in the late ninth century. Charles the Fat and the end of the Carolingian Empire*. Cambridge Studies in Medieval Life and Thought. Fourth Series 57. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511496363.

MacLean, S. 2009: Insinuation, Censorship and the Struggle for Late Carolingian Lotharingia in Regino of Prum's Chronicle. *The English Historical Review* CXXIV(506), 1–28. DOI: 10.1093/ehr/cen362. Available also from: https://www.jstor.org/stable/20485473.

Madyda-Legutko, R., Tunia, K. 1991: Die ersten Spuren der frühslawischen Besiedlung in den West-Beskiden. In: M. Parczewski (ed.): *Archaeoslavica 1*. Kraków: Wydawnictwo i Drukarnia „Secesja", 83–93.

Magny, M., Haas, J. 2004: A major widespread climatic change around 5300 cal. yr BP at the time of the Alpine Iceman. *Journal of Quaternary Science* 19, 423–430. DOI: 10.1002/jqs.850. Available also from: https://onlinelibrary.wiley.com/doi/abs/10.1002/jqs.850.

Major, P., Gulyás, B. 2023: Side Notes to an Exhibition. Some remarks on early medieval lamellar armours. *Hungarian Archaeology* 12(4), 30–37. Available also from: https://doi.org/10.36338/ha.2023.4.4.

Mann, M. 1986: *The Sources of Social Power 1. A History of Power from the Beginning to AD 1760*. Cambridge: Cambridge University Press.

Marc R. Breitspreche: Byzantine Empire. Constantine IV Pogonatus Æ Follis. In: *Marc R. Breitspreche. Classical numismatist* [online]. VHobbies.com, © 1998–2025 [Accessed 2025-09-15]. Available from: https://www.vcoins.com/en/stores/marc_breitsprecher_classical_numismatist/8/product/byzantine_empire_constantine_iv_pogonatus_198_follis/664759/Default.aspx.

Marcinkowski, M. 2003: Średniowieczny warsztat garncarski ze Starego Miasta w Elblągu. *Pomorania Antiqua* XIX, 192–250.

Marešová, H. 2014: Příspěvek k železářské výrobě na Uničovsku v raném středověku – z archeologických výzkumů v Dolní Sukulomi a Brníčku. *Archeologia technica* 25, 3–17.

Mařík, J. 2009: *Libická sídelní aglomerace a její zázemí v raném středověku*. Dissertationes Archaeologicae Brunenses/Pragensesque 7. Praha: Univerzita Karlova. Available also from: https://hdl.handle.net/11222.digilib/127547.

Mařík, J., Roháček, J. 2013: Ještě jednou a jistě ne naposledy k tzv. libickým stélám. *Epigraphica & sepulcralia* 4, 315–330.

Marshall, W. A., Tanner, J. M. 1969: Variations in pattern of pubertal changes in girls. *Archives of Disease in Childhood* 44(235), 291–303. DOI: 10.1136/adc.44.235.291. Available also from: https://pmc.ncbi.nlm.nih.gov/articles/PMC2020314/.

Marschalleck, K. H. 1930: Die Burgwälle des Kreises Zauch-Belzig. *Heimatkalender Zauch-Belzig* 1930, 62–66.

Marsina, R. 2015: *Knieža či kráľ Svätopluk a slovenské dejiny*. Matica Slovenská 6. Available also from: https://1url.cz/IJqdD.

Mašek, M., Polanský, L. 2005: Nález denáru s opisem CVRIM na Kouřimi (okr. Kolín). *Numismatický sborník* 20, 150–155. Available also from: http://cms.flu.cas.cz/images/NS/NS20.pdf.

Mays, S., Gowland, R., Halcrow, S., Murphy, E. 2017: Child Bioarchaeology. Perspectives on the Past 10 Years. *Childhood in the Past* 10(1), 38–56. DOI: 10.1080/17585716.2017.1301066. Available also from: https://doi.org/10.1080/17585716.2017.1301066.

Mays, S., Richards, M. P., Fuller, B. T. 2002: Bone Stable Isotope Evidence for Infant Feeding in Mediaeval England. *Antiquity* 76(293), 654–656. DOI: 10.1017/S0003598X00091067.

Mazuch, M. 2003a: Fischereigerät aus Mikulčice und die Frage des Fischanteils an der Ernährung der Bowohner des Burgwalls. In: L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice V.* Spisy Archeologického ústavu AV ČR Brno 21. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik Brno, 355–399. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/SBM5_10_Mazuch.pdf.

Mazuch, M. 2003b: Zur Frage der Nutzung von Tongewichten aus Mikulčice. In: L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice V.* Spisy Archeologického ústavu AV ČR Brno 21. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik Brno, 355–399. Available also from:https://mikulcice.arub.cz/wp-content/uploads/2016/06/SBM5_11_Mazuch.pdf.

Mazuch, M. 2020: Great Moravian Ceramic Groups – Blučina and Mikulčice. In: L. Poláček at al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 377–399. Available also from: https://www.arub.cz/en/produkt/great-moravian-elites-from-mikulcice/.

McCormick, M. 2002: *Origins of the European Economy. Communications and Commerce AD 300–900*. Cambridge: Cambridge University Press.

Meier, T. 2011: A farewell to the market! Constructing a Carolingian subsistence economy east of the Rhine. In: J. Klápště, P. Sommer (eds.): *Processing, Storage, Distribution of Food. Food in the Medieval Rural Environment. Ruralia VIII 7th–12th September 2009 Lorca, Spain*. Turnhout: Brepols, 285–300. DOI: 10.1484/M.RURALIA-EB.1.100174.

Merhautová, A. 1971: *Raně středověká architektura v Čechách*. Praha: Academia. Available also from: https://1url.cz/QJV8y.

Měřínský, Z. 2002: *České země od příchodu Slovanů po Velkou Moravu I*. Dějiny českých zemí 1. Praha: Libri. Available also from: https://1url.cz/YJd9n.

Měřínský, Z. 2011: *Morava na úsvitě dějin*. Vlastivěda moravská. Nová řada Země a lid 4. Brno: Muzejní a vlastivědná společnost v Brně. Available also from: https://1url.cz/iJqdQ.

Měřínský, Z. 2014: The Staré Zámky near Brno-Líšeň. In: P. Kouřil (ed.): *Great Moravia and the Beginnings of Christianity*. Brno: The Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno, 200–208. Available also from: https://www.arub.cz/wp-content/uploads/Great_Moravia_and_the_Beginnings_of_Christianity_kompr.pdf

Merta, D., Merta, J. 2000: Archeologický výzkum raněstředověké železářské huti v Habrůvecké bučině. *Archeologia technica* 11, 33–42.

Merta, O. 2019: Známé nálezy raně středověkých železářských naseknutých lup z území Moravy. *Archeologia technica* 30, 3–13.

Merta, O., Hlavica, M., Lebsak, M., Přichystal, M., Mikulec, R. 2022: Známé nálezy raně středověkých železářských naseknutých lup z území Moravy 2. *Archeologia technica* 33, 3–8.

Mesterházy, K. 2000: Nagymorva díszgombok honfoglalás kori sírokban. *Communicationes Archaeologicae Hungariae* 2000, 211–227.

Meyer-Gebel, M. 1988: Zur annalistischen Arbeitsweise Hinkmars von Reims. *Francia* 15, 75–108. DOI: 10.11588/fr.1987.0.53003. Available also from: http://nbn-resolving.de/urn:nbn:de:bsz:16-fr-530034.

Migotti, B. 2007: Fragments of a Chain Mail as Amulets in the late Roman Cemetery at Štrbinci near Đakovo. *Contributions of Institute of Archaeology in Zagreb* 24, 203–212. Available also from: https://hrcak.srce.hr/25721.

Mikulec, R. 2022: *Železářská produkce v Boskovické brázdě jako ukazatel proměn raně středověké ekonomiky* [online]. Master's Thesis. Masaryk University, Faculty of Arts: Department of Archaeology and Museology. Stored in: Archive of Theses. Available from: https://is.muni.cz/th/za3mb/.

Mikulec, R. 2024: Habrůvecká Bučina – vyhodnocení materiálového souboru. *Archeologia technica* 35, 3–23.

Mikulec, R., Hlavica, M., Kmošek, M. 2022: Archaeological evidence of independent iron production from the 9th-century rural settlement of Bořitov (Blansko District, Czechia). *Archaeologia historica* 47(2), 763–794. DOI: https://doi.org/10.5817/AH2022-2-14. Available also from: https://digilib.phil.muni.cz/cs/handle/11222.digilib/digilib.76769.

Mikyška, R. a kol. 1972: *Geobotanická mapa ČSSR 2. České země*. Vegetace ČSSR A2. Praha: Academia.

Milner, G. R., Boldsen, J. L. 2017: Life not death. Epidemiology from skeletons. *International Journal of Paleopathology* 17, 26–39. DOI: 10.1016/j.ijpp.2017.03.007. Available also from: https://doi.org/10.1016/j.ijpp.2017.03.007.

Milo, P. 2014: *Frühmittelalterliche Siedlungen in Mitteleuropa. Eine vergleichende Strukturanalyse durch Archäologie und Geophysik*. Studien zur Archäologie Europas 21. Bonn: Dr. Rudolf Habelt.

Minagawa, M., Wada, E. 1984: Stepwise enrichment of 15N along food chain. Further evidence and the relation between d15N and animal age. *Geochim Cosmochim Acta* 48(5), 1135–1140. DOI: 10.1016/0016-7037(84)90204-7.

Minařík, O. 2020: *Pohřbívání v raném středověku v povodí Vláry, Horní Olšavy a Dřevnice*. Master's Thesis. Palacký University, Faculty of Arts: Department of History. Stored in: Theses.cz. [Accessed 2025-04-19]. Available from: https://theses.cz/id/6w9wl1/.

Mitterauer, M. 1960: Slawischer und bayrischer Adel am Ausgang der Karolingerzeit. *Carinthia* 150(4), 693–726.

Mlíkovský, J. 2000: *Kostěná a parohová industrie ze středověké lokality „Stará Boleslav"*. Manuscript of the excavation report, C-TX-200100392 [Accessed 2025-02-19]. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Science, Praha. DOI: 10.60585/C-TX-200100392. Available also from: Digital Archive of the AMCR https://doi.org/10.60585/C-TX-200100392.

MMFH NS 1: *Magnae Moraviae Fontes historici NS 1*. Eds. D. Kalhous, A. Žáková, D. Bartoňková, Z. Měřínský, J. Kroupa. 3rd edition. Praha 2019.

Modzelewski, K. 2015: *Barbarian Europe*. Frankfurt am Main: Peter Lang GmbH.

Mogren, M. 2012: The First Sparks and the Far Horizons. Stirring up the Thinking on the Earliest Scandinavian Urbanization Processes – Again. *Lund Archaeological Review* 18, 73–88. Available also from: https://journals.lub.lu.se/lar/article/view/21823.

Mohrwinkel in preparation: Auswertung der Tierknochen aus der mittelalterlichen Siedlung von Nieder-Ingelheim (Grabungszonen O1, O2, O3, O4, O7). Appendix 2 and Forschungsstelle Kaiserpfalz Ingelheim. In: M. Gierszewska-Noszczyńska: *Siedlungs- und landschaftsarchäologische Untersuchung zur Raumnutzung und Siedlungsdynamik in Ingelheim im Früh- und Hochmittelalter. GIS-gestützte Analysen des Siedlungsbildes und räumliche Verteilung des Fundmaterials*. Dissertation. Martin-Luther-Universität Halle-Wittenberg, 31.03.2025. Stored in: by the author / before the defence.

Moorrees, C. F. A., Fanning, E. A., Hunt, E. E. J. 1963: Age variation of formation stages for ten permanent teeth. *Journal of Dental Research* 42(6), 1490–1502. DOI: 10.1177/00220345630420062701. Available also from: https://1url.cz/BJaQE.

Moravčík, J. 1978: Žilina. In: B. Chropovský (ed.): *Významné slovanské náleziská na Slovensku*. Bratislava: Veda, 261–267.

Moravčík, J. 1980: Slovanské sídlisko v Púchove a Žiline-Porúbke. *Archeologické výskumy a nálezy na Slovensku v roku* 1979, 145. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1979.pdf.

Moravčík, J. 1981: Nové nálezy z Rajeckej doliny. *Archeologické výskumy a nálezy na Slovensku v roku* 1980(1), 178–179. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1980-1.pdf.

Moravčík, J. 1982: Prieskumy na lokalitách severozápadného Slovenska. *Archeologické výskumy a nálezy na Slovensku v roku* 1981(1), 191–196. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1981-1.pdf.

Moravčík, J. 1983: Prieskumy archeologických lokalít v okolí Žiliny. *Archeologické výskumy a nálezy na Slovensku v roku* 1982, 168–172. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1982.pdf.

Moravčík, J. 2000: Najstaršie osídlenie obcí v okolí Vodného diela Žilina od staršej doby kamennej po stredovek. *Vlastivedný zborník Považia* XX, 123–153. Available also from: https://1url.cz/NJFGY.

Moravčík, J. 2015: Niektoré opevnenia v centrálnej časti Žilinskej kotliny. In: P. Jenčík, V. Struhár (eds.): *Hradiská – svedkovia dávnych čias. Zborník odborných príspevkov o hradiskách a ich obyvateľoch*. Dolná Mariková: Občianske združenie Hradiská, 71–81, 264–265.

Moraviamagna.cz: *Moravia Magna* [online]. Moravia Magna, ©2019 [Accessed 2025-11-18]. Available from: https://www.moraviamagna.cz/.

Mothander, B., Kjærby, F., Havnevik, K. 1989: *Farm implements for small-scale farmers in Tanzania*. Uppsala: Scandinavian Institute of African Studies.

Moździoch, S. (ed.) 1999: *Centrum i Zaplecze we wczesnośredniowiecznej Europie Środkowej*. Spotkania Bytomskie 3. Wrocław: WERK.

Mozgai, V., Villa, I. M., Bajnóczi, B., Szenthe, G. 2024: The early medieval origins of copper ore extraction in the Carpathian Mountains. *Journal of Archaeological and Anthropological Science* 16, 1–19. DOI: 10.1007/s12520-024-02060-y. Available also from: https://doi.org/10.1007/s12520-024-02060-y.

Mrkobrad, D. 1980: *Archeološki nalazi seobe naroda u Jugoslaviji*. Beograd: Muzej grada Beograda.

Mulder-Sibanda, M., Sibanda-Mulder, F. S. 1999: Prolonged breastfeeding in Bangladesh. Indicators of inadequate feeding practices or mothers› response to children›s poor health? *Public Health* 113(2), 65–68. DOI: 10.1038/sj.ph.1900525. Available also from: https://doi.org/10.1038/sj.ph.1900525.

Müller, R. 2019: Az avarok Gyenesdiás környékén. *Gyenesdiás Nagyközség Monográfiája. VIII*. Gyenesdiás: Innovariant Nyomdaipari. Available also from: https://fliphtml5.com/opek/vafc/VIII._Monogr%C3%A1fia_-_Avarok.

Musil, J. 2015: Nález raně středověké sekery ze Zdislavi. *Archeologie východních Čech* 10, 68–79.

Musil, J. 2020: Soubor středověkých seker ze sbírek Regionálního muzea v Chrudimi. *Archeologie východních Čech* 19, 117–147.

Musil, J. 2021: Nález raně středověké sekery z Holína v Železných horách (okres Chrudim, Pardubický kraj). *Východočeský sborník historický* 39, 119–127.

Mylius, H. 1938: Fränkische Siedlung bei Gladbach. Kr. Neuwied. I.–III. *Germania* 22, 180–190. Available also from: https://journals.ub.uni-heidelberg.de/index.php/germania/issue/view/3457.

Nagy, M. 2005: Szőreg-Téglagyár (Kom. Csongrád). In: I. Bóna, É. Garam, T. Vida (Hrsg.): *Gepidische Gräberfelder im Theissgebiet II*. Monumenta Germanorum Archaeologica Hungariae 2. Budapest: Magyar Nemzeti Muzeum, 120–204. Available also from: https://ri.abtk.hu/images/kiadvanyok/monografiak/MGAH/MGAH_2_DOI.pdf.

Nechvátal, B. 1999: *Radomyšl. Raně středověké pohřebiště. S antropologickou analýzou M. Blajerové*. Praha: Archeologický ústav AV ČR.

Nelson, J. L. 1986a: Inaguration rituals. In: *Politics and ritual in early medieval Europe*. History Series 42. London, Ronceverte: The Hambledon Press, 283–307.

Nelson, J. L. 1986b: The Problem of King Alfred's Royal Anointing. In: *Politics and ritual in early medieval Europe*. History Series 42. London, Ronceverte: The Hambledon Press, 309–327.

Nelson, J. L. 1988: A Tale of Two Princes. Politics, Text and Ideology in a Carolingian Annal. *Studies in Renaissance and Medieval History* 20, 103–141.

Nelson, J. L. 1990a: Hincmar of Reims on King-making. The Evidence of the Annals of St. Bertin, 861–882. In: J. M. Bak (ed.): *Coronations. Medieval and Early Modern Monarchic Ritual*. Berkeley, Los Angeles, Oxford: University of California Press, 16–34. DOI: 10.2307/jj.13167923.5.

Nelson, J. L. 1990b: The Annals of St.-Bertin. In: M. T. Gibson, J. N. Nelson (eds.): *Charles the Bald. Court and Kingdom. Papers Based on a Colloquium Held in London in April 1979*. 2nd. revised edition. Collected studies series. Aldershot: Variorum, 23–40.

Nelson, J. L. 1994: Kingship and empire in the Carolingian world. In: R. McKitterick (ed.): *Carolingian Culture. Emulation and Innovation*. Cambridge: Cambridge University Press, 52–87.

Němec, P. 2014: *Missa chrismatis a její proměny ve dvacátém století: Porovnání změn v liturgii a v teologii* [online]. Manuscript of the thesis. Charles University. Catholic Theological Faculty. Department of Systematic and Pastoral Theology. Stored in: Digital Repository, Charles University [Accessed 2025-03-15]. Available from: http://hdl.handle.net/20.500.11956/72426.

New Pauly Online: [online]. Leiden: Brill [Accessed 2025-01-15]. DOI: 10.1163/1574-9347_bnp_e924540. Available from: https://doi.org/10.1163/1574-9347_bnp_e924540.

Newman, J. 1995: How breast milk protects newborns. *Scientific American* 273(6), 76–79.

Nicol, N. D. 2012: *Sylloge of Islamic Coins in the Ashmolean 3. Early 'Abbasid Precious metal Coinage (to 218 AH)*. Oxford: Ashmolean Museum.

Nicolai I epistolae: Nicolai I. Papae epistolae variae. In: *Epistolae Karolini aevi 4*. E. Perels (ed.). Monumenta Germaniae Historica, Epistolae 6. Berlin: Weidmann, 1925.

Nießen, I. 2023: *Donau – Ufer – Regensburg. Genese einer Ufersiedlung zum mittelalterlichen Stadtquartier. Die Ausgrabungen am Regensburger Donaumarkt / „Museum der Bayerischen Geschichte" 2009–10 und 2012–15*. Regensburger Studien 29. Regensburg: Amt für kulturelles Erbe der Stadt Regensburg.

Nilsson, S. G. 1985: Ecological and evolutionary interactions between reproduction of beech Fagus silvatica and seed eating animals. *Oikos* 44(1), 157–164. DOI: 10.2307/3544057. Available also from: https://www.jstor.org/stable/3544057.

Nodl, M. 1996: Dětství v předmoderní době. *Souvislosti. Revue pro křesťanství a kulturu* [7](4), 7–29. Available also from: https://souvislosti.cz/496/496a.pdf.

Noszczyński, P. 2013: *Dokumentation der Grabungsergebnisse „St. Remigiuskirche" 2010–2018*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Nový, P., Štuka, Č. 2021: Raně středověký (?) liniový útvar v trase „Čertovy brázdy". *Archeologie ve středních Čechách* 25(1), 201–216. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/09/ASC25_1_Nov%C3%BD_%C5%A0tuka.pdf.

Nývltová Fišáková, M. 2024: Analysis of Carbon (13C/12C), Nitrogen (15N/14N) and Strontium(87Sr/86 Sr) Isotope Rations in Graves at the Uherské Hradiště-Sady Burial Ground. In: J. Mitáček, L. Galuška et al. (eds.): *Uherské Hradiště-Sady. 500 Years of Christianity in Central Europe. III. Analysis*. Brno: Moravian Museum Brno, 85–93.

Oddy, A. 1977: The production of gold wire in antiqity. Handmaking methods before the introduction of the draw-plate. *Gold Bulletin* 10, 79–87. DOI: 10.1007/BF03215438.

Oddy, A., La Niece, S. 1986: Byzantine gold coins and jewellery – A study of gold contents. *Gold bulletin* 19(1), 19–27. DOI: 10.1007/BF03214640.

Ogden, J. M. 1991: Classical Gold wire: Some Aspects of its Manufacture and Use. *Jewellery Studies* 5, 95–105.

Oka, R., Kusimba, C. M. 2008: The Archaeology of Trading Systems, Part 1. Towards a New Trade Synthesis. *Journal of Archaeological Research* 16(4), 339–395. DOI: 10.1007/s10814-008-9023-5.

OpenStreetMap: *OpenStreetMap. Copyright and License*. WMS [online]. OpenStreetMap [Acessed 2025-05-01]. Available from: https://www.openstreetmap.org/copyright.

Opravil, E. 1972: *Rostliny z velkomoravského hradiště v Mikulčicích. Výzkum v letech 1954–1965*. Studie Archeologického ústavu ČSAV v Brně I(2). Praha: Academia.

Opravil, E. 2000: Zur Umwelt des Burgwalls von Mikulčice und zur pflanzlichen Ernährung seiner Bewohner. In: L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice IV*. Spisy archeologického ústavu AV ČR Brno 18. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 9–169. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/SBM4_01_Opravil.pdf.

Ordinatio imperii: *Ordinatio imperii*. A. Boretius (ed.). Monumenta Germaniae Historica, Capitularia 1. Hannover: Hahn, 1883.

Ottenwelter, E. 2012: *Manuscript of the Conservation and Restoration Report, No. TP-20012-1523*. Stored in: Institute of Archaeology of the CAS, Prague.

Ottenwelter, E. 2022: *Early Medieval Elite Jewellery from Great Moravia and Bohemia. Manufacturing Processes, Construction, Materials and Condition*. Monographien des Römisch-Germanischen Zentralmuseums 164. Mainz: Verlag der Römisch-Germanisches Zentralmuseums.

Ottenwelter, E., Barčáková, L., Josse, C., Robbiola, L., Krupičková, Š., Frolík, J., Poláček, L. 2020: Technological characterisation of early Medieval gilded copper hollow pendants (gombiky), from Mikulčice (Moravia) and Prague Castle (Bohemia). *Archaeological and Anthropological Sciences* 12, 145. DOI: 10.1007/s12520-020-01084-4. Available from: https://doi.org/10.1007/s12520-020-01084-4.

Øye, I. 2005: Introduction. In: I Holm, S. Innselset, I. Øye, I. (eds.): *'Utmark'. The Outfield as Industry and Ideology in the Iron Age and the Middle Ages*. Bergen: University of Bergen, 9–20. Available from: https://hdl.handle.net/1956/11320.

Özyurt, J., Tobias, B. 2021: Next Stop: Achau. An Avar period cemetery (end of the 7th to the 9th century A.D.). In: *Institut für Mittelalterforschung der Österreichische Akademie der Wissenschaften. Historical Identity Research Blog* [online]. Österreichischen Akademie der Wissenschaften, © 2025, September 1, 2021 [Accessed 2025-11-18]. Available from: https://www.oeaw.ac.at/imafo/read/next-stop-achau.

Panum Baastrup, M. 2009: Småfibler af karolingiske og ottonske typer i Danmark. *Aarbøger for nordisk Oldkyndighed og Historie* 2005, 209–255.

Papadimitriou, A. 2016: The Evolution of the Age at Menarche from Prehistorical to Modern Times. *Journal of Pediatric and Adolescent Gynecology* 29(6), 527–530. DOI: 10.1016/j.jpag.2015.12.002. Available also from: https://doi.org/10.1016/j.jpag.2015.12.002.

Paráčová, A., Majerčíková, D. 2013: Osídlenie Horného Považia a možná štruktúra obyvateľstva v 9.–11. storočí. In: *Cyril a Metod a slovanský svet. Zborník z konferencie*. Žilina: GEORG, 14–34.

Pavelčík, J. 1958: Slovanská pohřebiště u Rudimova, okr. Val. Klobouky. *Přehled výzkumů* 1958, 69. Available also from: https://www.arub.cz/wp-content/uploads/pv_3_1958.pdf.

Pavlovič, D. 2023: *Pržanj pri Ljubljani*. Arheologija na avtocestah Slovenije 107. Ljubljana: Zavod za varstvo kulturne dediščine Slovenije. Available also from: https://www.dlib.si/details/URN:NBN:SI:DOC-ODO9E38N.

Pawłata, L. 2008: Znaleziska archeologiczne Władysława Litwińczuka i ich znaczenie dla poznania specyfiki osadniczej oklic Suraża. *Podlaskie Zeszyty Archeologiczne* 4, 102–209.

Pecinovská, M., Likovský, J. 2010: Archeologické drobnosti z Kouřimi. *Archeologie ve středních Čechách* 14(1), 433–440. Available also from: https://www.uappsc.cz/wp-content/uploads/2024/09/ASC14_1_20PecinovskaLikovsky.pdf.

Peisker, K. 2016: Ingelheim, Pfalz. In: K. Papajanni, J. Ley (Hrsg.): *Karolingerzeitliche Mauertechnik in Deutschland und in der Schweiz*. Regensburg: Schnell & Steiner, 109–121.

Petr, L., Žáčková, P., Matys Grygar, T., Píšková, A., Křížek, M., Treml, V. 2013: Šúr, a former late-glacial and Holocene lake at the westernmost margin of the Carpathians. *Preslia* 85(3), 239–263. Available also from: https://www.preslia.cz/article/129.

Petrinec, M. 2009: *Gräberfelder aus dem 8. bis 11. Jahrhundert im Gebiet des frühmittelalterlichen Kroatischen Staates*. Monumenta medii aevi Croatiae 3. Split: Museum der kroatischen archäologischen Denkmäler.

Petrovský-Šichman, A. 1961: Kopce-mogiły północnej Słowacji. *Acta Archaeologica Carpathica* III, 113–134.

Petrovský-Šichman, A. 1964a: Slovanské lokality v Žilinskej kotline. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 14, 175–186. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_14.pdf.

Petrovský-Šichman, A. 1964b: Slovanské osídlenie severného Slovenska. *Vlastivedný sborník Považia* VI, 50–106. Available also from: https://1url.cz/BJFG6.

Petrovský-Šichman, A. 1970: Výskum slovanských mohylníkov v okolí Žiliny. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 18, 193–210. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_18.pdf.

Píč, J. L. 1891: Stará hradiště na středním Polabí. *Památky archeologické a místopisné* XV(VII–VIII), 353–382. Available also from: https://1url.cz/mJVvg.

Píč, J. L. 1892: Hroby s kostrami z počátku doby křesťanské. *Památky archeologické a místopisné* XV(XII), 689–728. Available also from: https://1url.cz/HJVvv.

Píč, J. L. 1893a: Archeologický výzkum ve středních Čechách, který r. 1893 společnou prací podnikli Jan Hellich, lékárník v Poděbradech, Dr. J. L. Píč, prof. v Praze a Jan Waněk, vrchní správce v Radimi. *Památky archeologické a místopisné* XVI(VI), 329–362. Available also from: https://1url.cz/sJVvR.

Píč, J. L. 1893b: Archeologický výzkum ve středních Čechách, který r. 1893 společnou prací podnikli Jan Hellich, lékárník v Poděbradech, Dr. J. L. Píč, prof. v Praze a Jan Waněk, vrchní správce v Radimi. *Památky archeologické a místopisné* XVI(VII–VIII), 418–438. Available also from: https://1url.cz/XJVvO.

Píč, J. L. 1897: Sídliště z pozdní doby slovanské u Třeboule. *Památky archeologické a místopisné* XVII(VIII), 693–694. Available also from: https://1url.cz/wJVvX.

Píč, J. L. 1908: Z výzkumu našich hradišť. *Památky archeologické a místopisné* XXII(VI), 519–532, Tab. XXIX–XXXI.

Píč, J. L. 1909: *Starožitnosti země České. Díl III. Čechy za doby knížecí 1. Část archeologická*. Praha: J. L. Píč.

Pieta, K. 2017: Včasnostredoveké mocenské centrum Bojná – výskumy v rokoch 2007-2013. In: K. Pieta, Z. Robak (eds.): *Bojná 2. Nové výsledky výskumov včasnostredovekých hradísk*. 2nd extended edition. Archaeologica Slovaca Monographiae. Fontes XXII. Nitra: Archeologický ústav SAV, 11–52.

Pieta, K. 2019: Hradiská pri Dolných Vesteniciach. *Archeologické výskumy a nálezy na Slovensku* 2014, 120–124. Available also from: https://archeol.sav.sk/files/AVANS-2014_na-net.pdf.

Pieta, K. 2024: *Archeológovia objavili na hradisku v Bojnej ďalší hromadný nález dávnych predmetov* [online]. Archeologický ústav SAV, v. v. i., ©2024 [Accessed 2025-03-14]. Available from: https://archeol.sav.sk/index.php/2024/12/10/archeologovia-objavili-na-hradisku-v-bojnej-dalsi-hromadny-nalez-davnych-predmetov/.

Pieta, K., Haruštiak, J., Jakubčinová, M., Vangľová, T. 2011: Výskum včasnostredovekého hradiska Bojná I v rokoch 2007 a 2008. *Archeologické výskumy a nálezy na Slovensku v roku* 2008, 205–210. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_2008.pdf.

Pieta, K., Robak, Z. 2017: The Early Medieval Hillfort Bojná-Valy, Slovakia, and its Defence System. *Acta Archaeologica Carpathica* LII, 329–351. Available also from: https://journals.pan.pl/Content/108974/PDF/329_AAC%202017.pdf.

Pieta, K., Robak, Z. 2023: Wczesnośredniowieczne grodziska w Bojnej - 15 lat badań archeologicznych. In: J. Gancarski (ed.): *Wczesne średniowiecze w Karpatach*. Krosno: Muzeum Podkarpackie w Krośnie, 93–122.

Pieta, K., Robak, Z., Jakubčinová, M. 2019: *Dolné Vestenice - Hradov, Palúchy, Panský diel, p.č. 1232, 1233*. Manuscript of the excavation report, No. VS 20059/2019. Stored in: Archeologický ústav SAV, Nitra, v. v. i.

Pinchetti, L. 2021: *Between Town and Monastery. Peasant economy in the first millennium AD*. Contributi di Archeologia Medievale. Premio Ottone D'Assia e Riccardo Francovich 17. Sesto Fiorentino: All'Insegna del Giglio s.a.s. Available also from: https://www.insegnadelgiglio.it/wp-content/uploads/2022/01/ott-17-pinchetti-LIBRO.pdf.

Pirenne, H. 1936: *Economic and Social History of Medieval Europe*. New York: Harcourt, Brace and Company.

Pirling, R. 1966: *Das römisch-fränkische Gräberfeld von Krefeld-Gellep. Teil 1 Text, Teil 2 Katalog und Tafeln*. Germanische Denkmäler der Völkerwanderungszeit, Serie B. Die fränkischen Altertümer des Rheinlandes 2. Berlin: De Gruyter.

PL 106: *Historia translationis corporum Ragnoberti et. Zenonis auctore Josepho sacerdote*. J.-P. Migne (ed.). Patrologiae Latinae cursus completus 106. Paris: Garnier, 1864.

Pleiner, R. 1955: *Výroba železa ve slovanské huti u Želechovic na Uničovsku*. Rozpravy ČSAV, roč. 65. Praha: Nakladatelství ČSAV.

Pleiner, R. 1958: *Základy slovanského železářského hutnictví v českých zemích. Vývoj přímé výroby železa z rud od doby halštatské do 12. věku*. Monumenta archaeologica VI. Praha: Československá akademie věd. Available also from: https://1url.cz/4JVxA.

Pleiner, R. 2000: *Iron in Archaeology. The European Bloomery Smelters*. Praha: Archeologický ústav AV ČR. Available also from: https://1url.cz/xJpfO.

Pleiner, R. 2006: *Iron in archaeology. Early European blacksmiths*. Praha: Archeologický ústav AV ČR.

Pleinerová, I. 1999: Hliněná závaží ve slovanských objektech. *Studia mediaevalia pragensia* IV, 37–42. Available also from: https://1url.cz/1JdPM.

PLS: První staroslověnská legenda o sv. Václavu. In: *Sborník staroslovanských literárních památek o sv. Václavu a sv. Lidmile*. J. Vajs (ed.). Praha, 1929.

Poche, E. 1978a: *Umělecké památky Čech 2. K–O*. Praha: Academia. Available also from: https://1url.cz/TJkVu.

Poche, E. 1978b: *Umělecké památky Čech 3. P–Š*. Praha: Academia. Available also from: https://1url.cz/HJk37.

Poche, E. 1978c: *Umělecké památky Čech 4. T–Ž*. Praha: Academia. Available also from: https://1url.cz/cJkVz.

Podhorský, J., Drnovský, P. 2017: Raně středověké náhrobníky z Čech. *Archeologie ve středních Čechách* 21(1), 373–407. Available also from: https://www.uappsc.cz/wp-content/uploads/2021/11/ASC_21_1_24Podhorsk%C3%BDDrnovsk%C3%BD.pdf.

Pohl, W. 2018: *The Avars. A steppe empire in Europe, 567–822*. Ithaca, London: Cornell University Press.

Pohl, W., Wieser, V. (Hrsg.) 2009: *Der frühmittelalterliche Staat – europäische Perspektiven*. Österreichische Akademie der Wissenschaften. Philosophisch-historische Klasse. Denkschriften 386. Forschungen zur Geschichte des Mittelalters 16. Wien: Verlag der Österreichischen Akademie der Wissenschaften. DOI: 10.1553/0x0022adca. Available also from: https://austriaca.at/6604-7inhalt.

Pokorný, P. 2005: Role of man in the development of Holocene vegetation in Central Bohemia. *Preslia* 77(1), 113–128. Available also from: https://www.preslia.cz/article/347.

Poláček, L. 2007: Ninth-century Mikulčice. The "market of Moravians"? The archaeological evidence of trade in Great Moravia. In: J. Henning (ed.): *Post-Roman Towns, Trade and Settlement in Europe and Byzantium 1. The Heirs of the Roman West*. Millennium-Studien zu Kultur und Geschichte des ersten Jahrtausends n. Chr. 5/1. Berlin, New York: Walter de Gruyter, 499–524. Available also from: https://www.degruyter.com/document/doi/10.1515/9783110218848/html.

Poláček, L. 2008a: Das Hinterland des frühmittelalterlichen Zentrums in Mikulčice. Stand und Perspektiven der Forschung. In: L. Poláček (Hrsg.): *Das wirtschaftliche Hinterland der frühmittelalterlichen Zentren*. Internationale Tagungen in Mikulčice VI. Spisy Archeologického ústavu AV ČR Brno 31. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 257–297. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/ITM_6_web.pdf.

Poláček, L. 2008b: Great Moravia, the Power Centre at Mikulčice and the Issue of the Socioeconomic Structure. In: P. Velemínský, L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice VIII*. Spisy Archeologického ústavu AV ČR Brno 27. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno, v. v. i., 11–44. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/BP-Polacek_web.pdf.

Poláček, L. 2018: *The Mikulčice-Valy Stronghold and Great Moravia*. Mikulčice-guide III. Brno: The Czech Academy of Sciences, Institute of Archaeology, Brno. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_The_Mikulcice-Valy_Stronghold_and_Great_Moravia_2018.pdf.

Poláček, L. 2020: Princely Residence and Proto-Town. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 139–147. Available also from: https://www.arub.cz/en/produkt/great-moravian-elites-from-mikulcice/.

Poláček, L. (Hrsg.) 2008: *Das wirtschaftliche Hinterland der frühmittelalterlichen Zentren*. Internationale Tagungen in Mikulčice VI. Spisy Archeologického ústavu AV ČR Brno 31. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno, v. v. i. Available also from: https://mikulcice.arub.cz/wp-content/uploads/2016/06/ITM_6_web.pdf.

Poláček, L. et al. 2022: *Velkomoravské elity z Mikulčic*. Brno: Archeologický ústav AV ČR, Brno, v. v. i. DOI: 10.47382/arub2022-03.

Poláček, L., Baxa, P., Hladík, M., Hlavica, M., Krupičková, Š., Mazuch, M., Stuchlíková, E., Šindelář, J. 2021: *Mikulčice 900. Atlas velkomoravské aglomerace*. Brno: Archeologický ústav AV ČR, Brno, v. v. i. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Mikulcice_900_Atlas_velkomoravske_aglomerace_2021.pdf.

Poláček, L., Boháčová, I. (Hrsg.) 2008: *Burg – Vorburg – Suburbium. Zur Problematik der Nebenareale frühmittelalterlicher Zentren*. Internationale Tagungen in Mikulčice VII. Spisy Archeologického ústavu AV ČR Brno 35. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno, v. v. i. Available also from: https://arub.cz/wp-content/uploads/Burg-Vorburg-Suburbium.pdf.

Poláček, L., Marek, O. 2005: Grundlagen der Topografie des Burgwalls von Mikulčice. Die Grabungsflächen 1954–1992. In: L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice VII*. Spisy archeologického ústavu AV ČR Brno 24. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 9–358. Available also from: https://mikulcice.arub.cz/publikace/mikulcicke-edicni-rady/studien-zum-burgwall-von-mikulcice-sbm/sbm-vii/.

Poláček, L., Marek, O., Skopal, R. 2000: Holzfunde aus Mikulčice. In: L. Poláček (Hrsg.): *Studien zum Burgwall von Mikulčice IV*. Spisy archeologického ústavu AV ČR Brno 18. Brno: Archeologický ústav AV ČR, Brno, v. v. i., 177–302. Available also from: https://mikulcice.arub.cz/publikace/mikulcicke-edicni-rady/studien-zum-burgwall-von-mikulcice-sbm/sbm-iv/.

Poláček, L., Mazuch, M., Hladík, M., Krupičková, Š. 2014: Between Science and Show – on the State of Research and Presentation of the early medieval Power Centre in Mikulčice (Czech Republic). In: C. von Carnap-Bornheim (ed.): *Quo vadis? Status and Future Perspectives of Long-Term Excavations in Europe*. Schriften des Archäologischen Landesmuseums 10. Neumünster, Hamburg: Wachholz Verlag, 179–208.

Poláček, L., Škojec, J. 2012: Mikulčice (okr. Hodonín). *Přehled výzkumů* 53(2), 149–150. Available also from: https://www.arub.cz/prehled-vydanych-cisel/PV53_2_stredovek_a_novovek.pdf.

Poláček, L., Ungerman, Š., Krupičková, Š., Galuška, L., Płygawko, M., Fořt, M., Valášková, L. 2024: Velkomoravský luxusní („veligradský“) šperk: současný stav výzkumu. *Přehled výzkumů* 65(2), 77–117. DOI: /10.47382/pv0652-06. Available also from: https://www.arub.cz/wp-content/uploads/PV-65_2_04_final.pdf.

Polanyi, K. 1957: The Economy as Instituted Process. In: K. Polanyi, C. M. Arensberg, H. W. Pearson (eds.): *Trade and Market in the Early Empires. Economies in History and Theory*. Glencoe: The Free Press, The Falcon's Wing Press, 243–270. Available also from: https://1url.cz/WJpfc.

Polyptychon Saint-Germain-des-Prés: *Das Polyptychon von Saint-Germain-des-Prés (Irmino)*. Ed. D. Hägermann. Köln, Weimar, Wien 1993.

Polyptychon Saint-Remi: *Polyptyque de L'Abbaye Saint-Remi de Reims*. Ed. M. P. Guérard. Paris 1853.

Pomberger, B. M., Mühlhans, J., Saunderson, K. 2023: Metallic Idiophones 800 BCE-800 CE in Central Europe. Function and Acoustic Influence - A Progress Report. *Journal of Music Archaeology* 1, 143–183. DOI: 10.1553/JMA-001-07. Available also from: https://doi.org/10.1553/JMA-001-07.

Pomberger, B. M., Mühlhans, J., Saunderson, K., Mozgai, V., Bajnóczi, B. 2023: Pellet bell finds from the Avar and Carolingian period in the Keszthely region (Hungary). Function – Sounds – Alloys – Adhering Textiles. *Archeometriai Műhely* XX(1), 37–64. DOI: 10.55023/issn.1786-271X.2023-003.Available also from: http://www.ace.hu/am/2023_1/AM-2023-1-BP.pdf.

Pomberger, B. M., Stadler, P. 2018: Sicher vor Dämonen? Musikarchäologische Forschungen zu Glocken in awarischen Gräbern. *Archaeologia Austriaca* 102, 227–249. DOI: 10.1553/archaeologia102s227. Available also from: https://www.austriaca.at/?arp=0x003a26cb.

Pomykalová, K. 2011: *Raně středověké sídliště na lokalitě Olomouc - Řepčín - Horní nivy*. [online]. Bachelor's Thesis. Palacký University Olomouc: Department of History. Stored in: Theses.cz. [Accessed 2025-05-15]. Available from: https://theses.cz/id/cukynn/.

Pospíšilová, K. 2017: *Odhad věku puberty v bioarcheologii: aplikace v populaci Velké Moravy (9.-11. století)* [online]. Manuscript of the dissertation. Charles University. Faculty of Sciences. Department of Anthropology and Human Genetics. Stored in: Digital repository, Charles University. [Accessed 2025-04-19]. Available from: http://hdl.handle.net/20.500.11956/91227.

Poston, D. 1994: *The Blacksmith and the Farmer. Rural Manufacturing in sub-Saharan Africa*. London: Intermediate Technology Publications.

Poulík, J. 1955: Nález kostela z doby říše velkomoravské v trati „Špitálky“ ve Starém Městě. *Památky archeologické* XLVI(2), 307–351. Available also from: https://1url.cz/y1HAO.

Poulík, J. 1957: Výsledky výzkumu na velkomoravském hradišti „Valy“ u Mikulčic. I. Zpráva za r. 1954–1956. *Památky archeologické* XLVIII(2), 241–388. Available also from: https://1url.cz/v1HA5.

Poulík, J. 1963: Bericht über die Ergebnisse der archäologischen Grabung auf dem Burgwall Valy bei Mikulčice im Jahre 1962. *Přehled výzkumů* 1962, 58–60. Available also from: https://www.arub.cz/wp-content/uploads/pv_7_1962.pdf.

Poulík, J. 1975: *Mikulčice. Sídlo a pevnost knížat velkomoravských*. Praha: Academia. Available also from: https://1url.cz/81qKB.

Poulík, J. 1988: K otázce vzniku předvelkomoravských hradišť. *Slovenská archeólogia* 36(1), 189–216.

Pouline, J.-C. 2009: *L'hagiographie Bretonne du Haut Moyen Âge. Répertoire raisonné*. Beihefte der Francia 69. Sigmaringen: Thorbecke.

Prášek, J. V. 1913: *Brandejs nad Labem, město, panství a okres III*. Brandýs nad Labem: Nákladem fondu samosprávného okresu Brandejského. Available also from: https://1url.cz/eJlgc.

Profantová, N. 1992: Awarische Funde aus den Gebieten nördlich der awarischen Siedlungsgrenzen. In: F. Daim (Hrsg.): *Awarenforschungen 2*. Archaeologia Austriaca Monographien 2. Studien zur Archäologie der Awaren 4. Wien: Institut für Ur- und Frühgeschichte der Universität Wien, 605–778.

Profantová, N. 1994: K nálezům ostruh z konce 7. – 9. stol. v Čechách. In: *Mediaevalia Archaeologica Bohemica 1993*. Památky archeologické. Supplementum 2. Prague: Institute of Archaeology, 60–85. Available also from: https://1url.cz/dJVvn.

Profantová, N. 2000: Slovanské výšinné sídliště z Třebovle, okr. Kolín. K problematice napodobování cizích předloh v keramice. *Archeologické rozhledy* LII(4), 647–664. Available also from: https://1url.cz/7JkVE.

Profantová, N. 2003: Mikulčice – pohřebiště u 6. kostela. Pokus o chronologické a sociální zhodnocení. In: N. Profantová, B. Kavánová: *Mikulčice – pohřebiště*

u 6. a 12. kostela. Spisy Archeologického ústavu AV ČR Brno 22. Brno: Archeologický ústav AV ČR Brno, 7–209. Available also from: https://arub.cz/wp-content/uploads/2020/11/Mikulcice_pohrebiste_u_6_a_12_kostela.pdf.

Profantová, N. 2006: Pohřebiště elity ve Staré Kouřimi. In: P. Sommer (ed.): *České země v raném středověku*. Praha: Lidové noviny, 233–242.

Profantová, N. 2010: Awarische Funde in der Tschechischen Republik. Forschungsstand und neue Erkentnisse. *Acta archaeologica Carpathica* XLV, 203–270.

Profantová, N. 2014: Raně středověký depot č. 11 z vrchu Klášťov, kat. Vysoké Pole, okr. Zlín. *Pravěk. Nová řada* 22, 327–343.

Profantová, N. 2016: Ostruhy jako doklady přítomnosti elity v 8. a 9. století v Čechách. *Archaeologia historica* 41(2), 7–40. DOI: 10.5817/AH2016-2-1. Available also from: https://hdl.handle.net/11222.digilib/135593.

Profantová, N. 2018: Fremd und örtlich. Fernkontakte und die Einbindung fremder Elemente in die lokale Kultur, Beispiel Mittelböhmen. In: K. Schmotz, P. Gruber, M. Chytráček (Hrsg.): *Fines Transire 27. Archäologische Arbeitsgemeinschaft Ostbayern, West- und Südböhmen/ Oberösterreich, 27. Treffen 21. bis 24. Juni 2017 in Schlögen*. Rahden/Westf.: Verlag Marie Leidorf, 235–251.

Profantová, N. 2020a: Early medieval depictions of falconry from eastern Central Europe in the 8th–9th centuries. In: O. Grimm (ed.): *Raptor on the fist – falconry, its imagery and similar motifs throughout the millennia on a global scale*. Advanced studies on the archaeology and history of hunting, vol. 2.1–2.2. Kiel, Hamburg: Wachholtz Verlag, 587–603.

Profantová, N. 2020b: Ozdoby koňského postroje doby avarské ze severozápadních Čech v souvislosti s nálezem ze Žerotína, okr. Louny. In: K. Tomková, N. Venclová (eds.): *Krajinou archeologie, krajinou skla*. Praha, Most: Archeologický ústav AV ČR, Praha, v. v. i.; Ústav archeologické památkové péče severozápadních Čech, v. v. i., 23–36.

Profantová, N. 2022: Avar Type Finds in Bohemia and the Traces of Their Local Production. In: A. Rapan Papeša, A. Dugonjić (eds.): *Avari i Slaveni. Dvije strane pojasnog jezičca – Avari na sjeveru i jugu kaganata / Avars and Slavs. Two Sides of a Belt Strap End – Avars on the North and South of the Khaganate. Zbornik radova s međunarodnog znanstvenog skupa održanog u Vinkovcima 2020. godine / Proceedings of the international scientific conference held in Vinkovci 2020*. Collectanea archaeologica Musei archaeologici Zagrabiensis 5. Zagreb: Arheološki muzej u Zagrebu, 180–208.

Profantová, N. 2024: Tismice i Kouřim – transformacija ranosrednjovjekovnih središta u 8. i 9. stoljeću u središnjoj Češkoj (promjena strukture moći vidljiva u lokalnoj mreži gradina?) *Starohrvatska prosvjeta* 51(3), 99–129. Available also from: https://hrcak.srce.hr/en/file/476741.

Profantová, N., Dvořáček, D., Kmječ, T. 2024: The die for the production of the hammered kaptorgas from Kouřim, central Bohemia. An example of the local adoption of a Byzantine motif. *Archeologické rozhledy* LXXV(4), 382–402. DOI: 10.35686/AR.2023.27. Available also from: https://doi.org/10.35686/AR.2023.27.

Profantová, N., Křivánek, R., Fikrle, M., Zavřel, J. 2020: Tismice jako produkční a nadregionální centrum Čech 8. a 9. století. *Památky archeologické* CXI, 193–271. DOI: 10.35686/PA2020.5. Available also from: https://www.arup.cas.cz/knihovna/publikace-on-line/pamatky-archeologicke/pa2020-5/.

Profantová, N., Militká, L., Šámal, Z. 2022: Lipany (okr. Kolín) v raném středověku: výpověď prospekce s detektory kovů. *Archeologie ve středních Čechách* 26(2), 363–380. Available also from: https://www.uappsc.cz/wp-content/uploads/2022/12/ASC26_2_07Profantova_et_al.pdf.

Profantová, N., Vích, D. 2008: Nákončí z doby avarské z Kouřimska a byzantská přezka z Čech (?). *Archeologie ve středních Čechách* 12, 619–624. Available also from: https://www.uappsc.cz/wp-content/uploads/2024/11/ASC12_38ProfantovaVich.pdf.

Profous, A., Svoboda, J. 1957: *Místní jména v Čechách. Jejich vznik, původní význam a změny. Díl IV. S–Ž*. Praha: Nakladatelství Československé akademie věd. Available also from: https://1url.cz/eJsm4.

Procházka, R. 2009: *Vývoj opevňovací techniky na Moravě a v českém Slezsku v raném středověku*. Spisy Archeologického ústavu AV ČR Brno 38. Brno: Archeologický ústav Akademie věd České republiky. Available also from: https://www.arub.cz/wp-content/uploads/Vyvoj_opevnovaci_techniky_na_Morave_a_v_ceskem_Slezsku_v_ranem_stredoveku.pdf.

Prokop, K. 1911: Zprávy z „Praehistorického odboru Sp. př. st. č“. *Obzor praehistorický* II(3), 30–32.

Prowse, T. L., Saunders, S. R., Schwarcz, H. P., Garnsey, P., Macchiarelli, R., Bondioli, L. 2008: Isotopic and dental evidence for infant and young child feeding practices in an imperial Roman skeletal sample. *American Journal of Physical Anthropology* 137(3), 294–308. DOI: 10.1002/ajpa.20870.

Prowse, T., Schwarcz, H. P., Saunders, S., Macchiarelli, R., Bondioli, L. 2004: Isotopic Paleodiet Studies of Skeletons from the Imperial Roman-age Cemetery of Isola Sacra, Rome, Italy. *Journal of Archaeological Science* 31(3), 259–272. DOI: 10.1016/j.jas.2003.08.008. Available also from: https://doi.org/10.1016/j.jas.2003.08.008.

Puchner, K. 1969: Das Banzer Reichsurbar und seine namenkundliche und siedlungsgeschichtliche Bedeutung für Oberfranken. In: D. Albrecht, A. Kraus, K. Reindel (Hrsg.): *Festschrift für Max Spindler zum 75. Geburtstag*. München: C. H. Beck'sche Verlagsbuchhandlung, 165–176.

Rademacher, H. 1902: Der Burgwall „Röverberg“ bei Phöben, Kreis Zauch-Belzig. *Nachrichten über Deutsche Altertumsfunde* 13, 54–55. Available also from: https://www.digi-hub.de/viewer/image/1614867927031/68/.

Radoměrský, P. 1958: Koruna králů moravských. *Sborník Národního musea v Praze. Řada A – Historie* XII(4–5), 183–231.

Radová-Štiková, M. 1975: Příspěvek architekta k počátkům Kouřimi. *Archeologické rozhledy* XXVII(3), 281–282. Available also from: https://1url.cz/7JkVk.

Raffensperger, C. 2024: *Rulers and rulership in the arc of medieval Europe, 1000-1200*. London, New York: Routledge, Taylor & Francis Group.

Ralska-Jasiewiczowa, M. 1964: Correlation between the Holocene history of the Carpinus betulus and prehistoric settlement in North Poland. *Acta Societatis Botanicorum Poloniae* 33(2), 461–468. DOI: 10.5586/asbp.1964.032. Available also from: https://pbsociety.org.pl/journals/index.php/asbp/article/view/asbp.1964.032.

Ralska-Jasiewiczowa, M., Nalepka, D., Goslar, T. 2003: Some problems of forest transformation at the transition to the oligocratic / Homo sapiens phase of the Holocene interglacial in northern lowlands of central Europe. *Vegetation History and Archaeobotany* 12, 233–247. DOI: 10.1007/s00334-003-0021-8.

Rapp, C. 2012: Heilige, Teufel und Dämonen. Frömmigkeit im Alltagsleben. In: F. Daim (Hrsg.): *Das goldene Byzanz und der Orient. Schallaburg, 30. März bis 4. November 2012*. Schallaburg: Schallaburg Kulturbetriebsgesellschaft, 105–117.

Rast-Eicher, A. 2016: *Fibres. Microscopy of Archaeological Textiles and Furs*. Archaeolingua 36. Budapest: Archaeolingua Alapítvány.

Rauch, Ch., Jacobi, H. J. 1976: *Die Ausgrabungen in der Königspfalz Ingelheim 1909–1914*. Studien zur Königspfalz I. Monographien des Römisch-Germanisches Zentralmuseum 2. Beiträge zur Ingelheimer Geschichte, Historischer Verein Ingelheim 24/25. Mainz: Verlag des Römisch-Germanischen Zentralmuseums.

Rębkowski, M. 1998: Przedmioty gliniane. In: M. Rębkowski (ed.): *Archeologia średniowiecznego Kołobrzegu III*. Kołobrzeg: Instytut Archeologii i Etnologii Polskiej Akademii Nauk, 137, 281–284.

Récsei, V. 1894: Néhány antik bronz-szobrocska a Nemzeti Múzeumban. *Archaeologiai Értesítő* XIV, 97–110.

Recueil Charles II: *Recueil des actes de Charles II le Chauve, Roi de France, 1 (840-860)*. F. Lot, G. Tessier (eds.). Paris: Imprimerie nationale, 1943.

Redfern, R., Gowland, R., Millard, A., Powell, L., Gröcke, D. 2018: From the mouths of babes'. A subadult dietary stable isotope perspective on Roman London (Londinium). *Journal of Archaeological Science: Reports* 19, 1030–1040. DOI: 10.1016/j.jasrep.2017.08.015. Available also from: https://doi.org/10.1016/j.jasrep.2017.08.015.

Redknap, M. 1999: Die römischen und mittelalterlichen Töpfereien in Mayen. *Berichte zur Archäologie an Mittelrhein und Mosel* 6, 11–401.

Regensburg Traditions: *Die Traditionen des Hochstifts Regensburg und des Klosters S. Emmeram*. Ed. J. Widemann. München 1943.

Regino: *Reginonis abbatis Prumiensis Chronicon*. F. Kurze (ed.). Monumenta Germaniae Historica, Scriptores rerum Germanic 50. Hannover: Hahn, 1890.

Reiches, M. W. 2019: Adolescence as a biocultural life history transition. *Annual Review of Anthropology* 48(1), 151–168. DOI: 10.1146/annurev-anthro-102218-011118. Available also from: https://doi.org/10.1146/annurev-anthro-102218-011118.

Reimer, P. J., Austin, W. E. N., Bard, E., Bayliss, A., Blackwell, P. G., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, R. L., Friedrich, M., Grootes, P. M., Guilderson, T. P., Hajdas, I., Heaton, T. J., Hogg, A. G., Hughen, K. A., Kromer, B., Manning, S. W., Muscheler, R., Palmer, J. G., Pearson, C., van der Plicht, J., Reimer, R. W., Richards, D. A., Scott, E. M., Southon, J. R., Turney, C. S. M., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S. M., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A., Talamo, S. 2020: The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP) [online]. *Radiocarbon* 62(4), 725–757. [Accessed 2025-04-24]. DOI: 10.1017/RDC.2020.41. Available from: https://doi.org/10.1017/RDC.2020.41.

Reimitz, H. 2015: *History, Frankish Identity and the Framing of Western Ethnicity, 550–850*. Cambridge Studies in Medieval Life and Thought. Fourth Series 101. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9781139505765.

Reitinger, L. 2019: Die königlichen Insignien aus dem Kloster Pegau und die „Kronenopfer". *Frühmittelalterliche Studien* 53, 115–149.

Rejholcová, M. 1971: Slovanské osídlenie Stredoslovenského kraja. *Slovenská archeológia* XIX(1), 95–133. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1971_1.pdf.

RI: *Regesta Imperii* [online]. [Accessed 2017-11-25]. Available from: http://www.regesta-imperii.de/id/0843-05-24_1_0_1_2_1_364_364.

RI I: *Die Regesten des Kaiserreichs unter den Karolingern. 751–918. Regesta Imperii 1*. Ed. J. F. Böhmer. Innsbruck 1908. Available also from: https://archive.org/details/dieregestendeska01bhme/mode/2up?q=768.

Riché, P. 1978: *Daily Life in the World of Charlemagne*. The Middle Ages. Philadelphia: University of Pennsylvenia Press.

Rišlink, V. 2010: *Památky Kouřimska*. Kouřim: Vladimír Rišlink. Available also from: https://1url.cz/rJk0y.

Rispling, G. 1990: The Volga Bulgarian Imitative Coinage of Al-Amir Yaltawar ('Barman') and Mikail b. Jafar. In: K. Jonsson, B. Malmer (eds): *Sigtuna Papers. Proceedings of the Sigtuna Symposium on Viking-Age Coinage 1–4 June 1989*. Commentationes de Nummis Saeculorum IX–XI in Suecia repertis. Nova series 6. Stockholm: Almqvist & Wiksell, 275–282.

Rispling, G. 2001: A list of coin finds relevant to the study of Early Islamic-Type Imitations. *Russian History* 28(1–4), 325–339.

Rispling, G. 2005a: Funde islamischer Nachahmungen. In: T. Mayer (Hrsg.): *Sylloge der Münzen des Kaukasus und Osteuropas im Orientalischen Münzkabinett Jena*. Orientalisches Münzkabinett Jena 1. Wiesbaden: Harrassowitz, 208–220.

Rispling, G. 2005b: Osteuropäische Nachahmungen islamischer Münzen. In: T. Mayer (Hrsg.): *Sylloge der Münzen des Kaukasus und Osteuropas im Orientalischen Münzkabinett Jena*. Orientalisches Münzkabinett Jena 1. Wiesbaden: Harrassowitz, 172–207.

Rispling, G., Jankowiak, M., Treadwell, L. in preparation: *Catalogue of Dirham Imitations from Northern European Viking-Age Finds*. Commentationes de Nummis Saeculorum IX–XI in Suecia repertis. Nova series. Stockholm: Almqvist & Wiksell.

Ristow, S. 2019: Rekonstruktion des Taufraums. In: *Der charismatische Ort. Stationen der reisenden Könige im Mittelalter vom 20.8 bis 20.11.2019 in Ingelheim am Rhein*. Ingelheim: Forschungsstelle Kaiserpfalz, 20.

Ristow, S., Roth, H. 1995: Fingerring, § 2 Merowingerzeit. In: H. Beck, D. Geuenich, H. Steuer (Hrsg.): *Reallexikon der germanischen Altertumskunde. Neunter Band. Fidel – Friedlosigkeit*. Zweite, völlig neu beabreitete und stark erweiterte Auflage. Berlin, New York: De Gruyter, 56–65.

Robak, Z. 2013: *Studia nad okuciami rzemieni w typie karolińskim. Część I*. Archaeologica Slovaca Monographiae. Studia XVIII. Nitra: Archeologický ústav SAV.

Robak, Z. 2014: *Studia nad okuciami rzemieni w typie karolińskim. Część II*. Archaeologica Slovaca Monographiae. Studia XIX. Nitra: Archeologický ústav SAV.

Robak, Z. 2016: A comparative analysis of three fittings decorated with the Carolingian plant style coming from Mikulčice, Bojná and Zalavár. In: T. Csécs, M. Takács, Sz. Merva (eds.): *Beatus homo qui invenit sapientiam. Ünnepi kötet Tomka Péter 75. születésnapjára*. Györ: Lekri Group Kft., 617–623.

Robak, Z. 2018: Chronology and periodisation of imports of Carolingian military equipment in the Carpathian Basin between the eight and the tenth centuries. *Antaeus* 35–36, 327–344. DOI: 10.62149/Antaeus.35-36.2018_15. Available also from: https://doi.org/10.62149/Antaeus.35-36.2018_15.

Robak, Z. 2021a: Garnitury okuć rzemieni i inne elementy ozdobne wielkomorawskich mieczy. *Acta Universitatis Lodziensis. Folia archaeologica* 36, 19–52. DOI: 10.18778/0208-6034.36.02. Available also from: https://doi.org/10.18778/0208-6034.36.02.

Robak, Z. 2021b: Wczesnośredniowieczne grodzisko Bojná-Valy na Słowacji. Nowe interpretacje. *Historia Slavorum Occidentis* 28(1), 36–64. DOI: 10.15804/hso210102. Available also from: https://czasopisma.marszalek.com.pl/en/10-15804/hso/7079-hso2021102.

Robak, Z., Bednár, P. 2021: Grave 1/94 and new data refining the chronology of Early Medieval Castle Hill in Nitra. In: Z. Robak, M. Ruttkay (eds.): *Celts – Germans – Slavs. A tribute anthology to Karol Pieta*. Slovenská archaeológia. Supplementum 2. Nitra: Archeologický ústav SAV, 417–430. DOI: 10.31577/slovarch.2021.suppl.2.41. Available also from: https://doi.org/10.31577/slovarch.2021.suppl.2.41.

Röber, R. 2008: Das mittelalterliche Schmiedehandwerk - Quellensituation und Forschungsstand. In: W. Melzer (Hrsg.): *Archäologie und mittelalterliches Handwerk - Eine Standortbestimmung. Beiträge des 10. Kolloquiums des Arbeitskreises zur archäologischen Erforschung des mittelalterlichen Handwerks*. Soester Beiträge zur Archäologie 9. Soest: Mocker & Jahn, 97–128.

Roesdahl, E. (Hrsg.) 1992: *Wikinger Waräger Normannen. Die Skandinavier und Europa 800 - 1200*. Kunstausstellung des Europarates 22. Berlin: Museum für Vor- und Frühgeschichte.

Rohrlach, P. 1977: *Historisches Ortslexikon für Brandenburg V. Zauch-Belzig*. Weimar: H. Böhlau.

Romanowicz, P. 2018: Finds of Bone, Antler, Amber and Clay. In: M. Rębkowski (ed.): *Lubin. Early Medieval Stronghold at the Mouth of the Oder River*. Szczecin: Institute of Archaeology and Ethnology of the Polish Academy of Science, Centre for Medieval Archaeology of the Baltic Region in Szczecin.

Rösch, F. 2022: Archäologische Zeugnisse zum mittelalterlichen Kreditwesen. *Das Mittelalter* 27(2), 452–474. DOI: 10.17885/heiup.mial.2022.2.24667. Available also from: https://doi.org/10.17885/heiup.mial.2022.2.24667.

Rösener, W. 1989a: Strukturformen der adeligen Grundherrschaft in der Karolingerzeit. In: W. Rösener (Hrsg.): *Strukturen der Grundherrschaft im frühen Mittelalter*. Veröffentlichungen des Max-Planck-Instituts für Geschichte 92. Göttingen: Vandenhoeck und Ruprecht, 126–180.

Rösener, W. 1989b: Zur Erforschung der frühmittelalterlichen Grundherrschaft. In: W. Rösener (Hrsg.): *Strukturen der Grundherrschaft im frühen Mittelalter*. Veröffentlichungen des Max-Planck-Instituts für Geschichte 92. Göttingen: Vandenhoeck und Ruprecht, 9–28.

Rösener, W. 2012: Die Grundherrschaft als Forschungskonzept. Strukturen und Wandel der Grundherrschaft im deutschen Reich (10.-13. Jahrhundert). *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte* 129, 41–75.

Rowland, M. G. M. 1986: The weanling's dilemma. Are we making progress? *Acta Paediatrica* 75, 33–42. DOI: 10.1111/j.1651-2227.1986.tb10348.x.

Rudner, E., Sümegi, P. 2001: Recurring Taiga forest-steppe habitats in the Carpathian Basin in the Upper Weichselian. *Quaternary International* 76–77, 177–189. DOI: 10.1016/S1040-6182(00)00101-4. Available also from: https://www.sciencedirect.com/science/article/pii/S1040618200001014.

Rulewicz, M. 1994: *Rybołówstwo Gdańska na tle ośrodków miejskich Pomorza od IX do XIII wieku*. Gdańskie Towarzystwo Naukowe 11. Wrocław: Zakład Narodowy Im. Ossolińskich.

Ruttkay, A. 1976: Waffen und Reiterausrüstung des 9. bis zur ersten Hälfte des 14. Jahrhunderts in der Slowakei (II). *Slovenská archeológia* XXIV(2), 246–395. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1976_2.pdf.

Ruttkay, M. 1992: Okres Čadca. In: D. Bialeková (ed.): *Pramene k dejinám osídlenia Slovenska z konca 5. až z 13. storočia. II. zväzok. Stredoslovenský kraj*. Nitra: Archeologický ústav SAV, 13–16.

Ruttkay, M., Pieta, K., Robak, Z. 2019: Nowe metody badań wczesnośredniowiecznych grodzisk zachodniej Słowacji. In: K. Chrzan, S. Rodak, S. Moździoch (eds.): *Współczesne metody badań wczesnośredniowiecznych grodów Europy Środkowo-Wschodniej*. Wrocław: Instytut Archeologii i Etnologii PAN, 133–143.

Rybníček, K. 1983: The environmental evolution and infilling process of a former lake near Vracov (Czechoslovakia). *Hydrobiologia* 103, 247–250. DOI: 10.1007/BF00028460.

Rybníček, K., Rybníčková, E. 2008: Upper Holocene dry land vegetation in the Moravian-Slovakian borderland (Czech and Slovak Republics). *Vegetation History and Archaeobotany* 17, 701–711. DOI: 10.1007/s00334-008-0160-z.

Saal, E. 2014: Das merowingerzeitliche Gräberfeld von Rhens, Landkreis Mayen-Koblenz. Beiträge zur frühmittelalterlichen Chronologie und Siedlungsgeschichte an Mittelrhein und unterer Mosel. *Berichte zur Archäologie an Mittelrhein und Mosel* 20, 157–550.

Sabaté, F. 2017: La frontière catalane (Xe-XIIe siècles). Perception, altérité, pouvoir et mémoire. In: N. Baron et al. (eds): *Ériger et borner diocèses et principautés au Moyen Âge*. Limites et frontieres 2. Lille: Presses Universitaires du Septentrion, 185–218.

Sage, W. 1960: *Bericht über die Ausgrabung in Ingelheim am Rhein im Herbst 1960*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Sage, W. 1961: *Bericht über die Fundamentuntersuchungen an der Saalkirche in Ingelheim/Rhein im Sommer 1961*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Sage, W. 1963: *Vorläufiger Bericht über die Grabung in der Saalkirche zu Ingelheim 1963*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Sage, W. 1964: Zur archäologischen und baugeschichtlichen Erforschung der Ingelheimer Pfalz. In: J. Autenrieth (Hrsg.): *Ingelheim am Rhein. Forschungen und Studien zur Geschichte Ingelheims*. Ingelheim am Rhein: C. H. Boehringer Sohn, 65–86.

Sage, W. 1969: *Die fränkische Siedlung bei Gladbach, Kreis Neuwied. En Führer zum Diorama*. Kleine Museumhefte 7. Düsseldorf: Rheinlandverlag.

Sage, W. 1976: Die Ausgrabungen in der Pfalz zu Ingelheim am Rhein 1960–1970. *Francia* 4, 141–160. DOI: 10.11588/fr.1976.0.48622. Available also from: http://nbn-resolving.de/urn:nbn:de:bsz:16-fr-486226.

Šalkovský, P. 2015: *Hrady západných Slovanov*. Archaeologica Slovaca Monographiae. Fontes XIX. Nitra: Archeologický ústav SAV.

Šámal, Z., Lukas, J. 2024: Nálezy raně středověkých mincí a obchodních závaží na hradišti Dřevíč (k. ú. Kozojedy, okr. Rakovník). *Numismatický sborník* 37(1–2), 43–68.

Santinelli-Foltz, E. 2022: *Couples et conjugalité au haut Moyen Âge (VIe–XIIe siècles)*. Collection Haut Moyen Âge 43. Turnhout: Brepols. DOI: 10.1484/M.HAMA-EB.5.123791.

Sasse, B. 1987: Die spätslawische und frühdeutsche Zeit. Der archäologische Befund. In: W. Ribbe (Hrsg.): *Das Havelland im Mittelalter. Untersuchungen zur Strukturgeschichte einer ostelbischen Landschaft in slawischer und deutscher Zeit*. Berliner Historische Studien 13. Germania Slavica V. Berlin: Ducker & Humblot, 77–176.

Saunderson, K. 2025: *Textilien der Awarenzeit: Aufnahme und Kontextualisierung archäologischer Textilfunde*. Manuscript of the thesis. Vienna: University of Vienna.

Saunderson, K. in print: Plain and Simple? Textiles of the Early Medieval Avar period. *NESAT XV Proceedings*. Warsaw: Warsaw Studies in Archaeology.

Schäfer, A. 2013: Zur Eisenverarbeitung im Oppidum von Manching. Schlacken und Herdfragmente der Ausgrabung Altenfeld 1996-1999. In: S. Sievers, M. Leicht, B. Ziegaus (Hrsg.): *Ergebnisse der Ausgrabungen in Manching-Altenfeld 1996-1999.* Die Ausgrabungen in Manching 18(2). Wiesbaden: Reichert Verlag, 295–335.

Schäfer, A., Gassmann, G. 2013: Zu den Anfängen der Eisengewinnung im bayerischen Donauraum. In: S. Sievers, M. Leicht, B. Ziegaus (Hrsg.): *Ergebnisse der Ausgrabungen in Manching-Altenfeld 1996-1999.* Die Ausgrabungen in Manching 18(2). Wiesbaden: Reichert Verlag, 337–375.

Schaller, M. 1933: *Liturgie*. Praha: Nákladem Dědictví sv. Prokopa.

Schieber, B., Bublinec, E., Janík, R., Barna, M. 2011: Svetelné a tepelné podmienky bukových porastov. In: M. Barna, J. Kulfan, E. Bublinec (eds.): *Buk a bukové ekosystémy Slovenska*. Bratislava: Veda, 65–74.

Schleidgen, W.-R. 1977: *Die Überlieferungsgeschichte der Chronik des Regino von Prüm*. Quellen und Abhandlungen zur mittelrheinischen Kirchengeschichte 31. Mainz: Gesellschaft für Mittelrheinische Kirchengeschichte. Available also from: https://www.dilibri.de/urn/urn:nbn:de:0128-1-15518.

Schmitt, J.-C. 1990: *La raison des gestes dans l'Occident médiéval*. Bibliothèque des histoires. Paris: Éditions Gallimard.

Schmitz, H. 1974: *Pfalz und Fiscus Ingelheim*. Untersuchungen und Materialien zur Verfassungs- und Landesgeschichte 2. Marburg: N. G. ELWERTsche Verlagsbuchhandlung (Kommissionsverlag). Available also from: https://archiv.ub.uni-marburg.de/ubfind/Record/urn:nbn:de:hebis:04-eb2020-0418/View.

Schneider, L., Rascalou, P., Colomer, G., Bergeret, A. 2016: Genèse d'une *villa* carolingienne de l'arrière-pays biterrois (VI^{e}-X^{e} s.). La villa plaxano du cartulaire d'Aniane et la fouille des Termes à Plaissan (Hérault). *Archéologie du Midi Médiéval* 32, 93–121. Available also from: https://www.persee.fr/doc/amime_0758-7708_2014_num_32_1_2075.

Schoenenberg, V. 2014: *Die frühmittelalterliche Siedlung in Lauchheim, Gewann „Mittelhofen", Ostalbkreis* [online]. Manuscript of the dissertation. Albert-Ludwig University of Freiburg. Department of Prehistoric and Medieval Archaeology. Stored in: Library of Albert-Ludwig University of Freiburg [Accessed: 2025-03-30]. Available from: https://freidok.uni-freiburg.de/data/175620.

Schoeninger, M. J., DeNiro, M. J. 1984: Nitrogen and carbon isotopic composition of bone collagen from marine and terrestrial animals. *Geochimica Cosmochimica Acta* 48(4), 625–639. DOI: 10.1016/0016-7037(84)90091-7.

Schortman, E. M., Urban, P. A. 2004: Modeling the Roles of Craft Production in Ancient Political Economies. *Journal of Archaeological Research* 12(2), 185–226. DOI: 10.1023/b:jare.0000023712.34302.49.

Schreg, R. 2006: *Dorfgenese in Südwestdeutschland. Das Renninger Becken im Mittelalter.* Materialhefte zur Archäologie in Baden-Württemberg 76. Stuttgart: Theiss.

Schreiner, M. 2020: *Wurmbuntschmiedetechnik – von den Anfängen bis zur Blüte im Frühmittelalter. Eine interdisziplinäre Studie zur Geschichte, zeitgenössischen Wahrnehmung und praktischen Anwendung musterbildender Schweißverbundwerkstoffe*. Arbeiten zur Archäologie Süddeutschlands 30. Büchenbach: Verlag Dr. Faustus.

Schuldt, E. 1950–1951: Die mecklenburgischen gleicharmigen Fibeln von den Friedhöfen Pritzier und Perdöhl. *Hammaburg* 2, 108–116.

Schuldt, E. 1955: *Pritzier. Ein Urnenfriedhof der späten römischen Kaiserzeit in Mecklenburg.* Schriften der Sektion für Vor- und Frühgeschichte 4. Berlin: Akademie der Wissenschaften.

Schuldt, E. 1956: *Die slawische Keramik in Mecklenburg.* Schriften der Sektion für Vor- und Frühgeschichte 5. Berlin: Akademie der Wissenschaften.

Schuldt, E. 1958: Die mittelslawische Zeit im Norden der DDR (Obodriten und Wilzen/Lutizen). *Ausgrabungen und Funde* 3(4–5), 293–300. Available also from: https://zs.thulb.uni-jena.de/receive/jportal_jparticle_00327407.

Schuldt, E. 1976: *Perdöhl. Ein Urnenfriedhof der späten Kaiserzeit und der Völkerwanderungszeit in Mecklenburg.* Beiträge zur Ur- und Frühgeschichte der Bezirke Rostock, Schwerin und Neubrandenburg 9. Berlin: Akademie der Wissenschaften.

Schulmeyer-Ahl, K. 2009: *Der Anfang vom Ende der Ottonen. Konstitutionsbedingungen historiographischer Nachrichten in der Chronik Thietmars von Merseburg.* Millennium-Studien 26. Berlin, New York: Walter de Gruyter.

Schulze, H. K. 2004: *Grundstrukturen der Verfassung im Mittelalter 1. Stammesverband, Gefolgschaft, Lehnswesen, Grundherrschaft*. 4., aktualisierte Auflage. Kohlhammer Urban Taschenbücher 371. Stuttgart: Verlag W. Kohlhammer.

Schulze-Dörrlamm, M. 1990: *Die spätrömischen und frühmittelalterlichen Gräberfelder von Gondorf, Gem. Kobern-Gondorf, Kr. Mayen-Koblenz. Teil 1. Text, Teil 2. Katalog und Tafeln*. Germanische Denkmäler der Völkerwanderungszeit, Serie B. Die fränkischen Altertümer des Rheinlandes 14. Stuttgart: Franz Steiner Verlag.

Schulze-Dörrlamm, M. 1993: Bestattungen in den Kirchen Großmährens und Böhmens während des 9. und 10. Jahrhunderts. *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz* 40(2), 557–619. DOI: 10.11588/jrgzm.1993.2.83580. Available also from: https://doi.org/10.11588/jrgzm.1993.2.83580.

Schulze-Dörrlamm, M. 2008: Zur Herrschersymbolik von Löwenreliefs auf Gürtelbeschlägen des späten 9. und 10. Jahrhunderts. *Acta Archaeologica Academiae Scientiarum Hungaricae* LIX(2), 387–404. DOI: 10.1556/aarch.59.2008.2.20. Available also from: https://doi.org/10.1556/aarch.59.2008.2.20.

Schulze-Dörrlamm, M. 2009: Zeugnisse der Selbstdarstellung von weltlichen und geistlichen Eliten der Karolingerzeit (751-911). In: M. Egg, D. Quast (Hrsg.): *Aufstieg und Untergang. Zwischenbilanz des Forschungsschwerpunktes „Studien zu Genese und Struktur von Eliten in vor- und frühgeschichtlichen Gesellschaften"*. Monographien des Römisch-Germanischen Zentralmuseums 82. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 153–215.

Schumacher, K. 1908: Archäologische Karte der Umgebung von Mainz. *Mainzer Zeitschrift* 3, 19.

Schwab, R., Senn, M. 2008: Recycling von Alteisen. *Berliner Beiträge zur Archäometrie* 21, 207–226. Available also from: https://1url.cz/91wGQ.

Schwarzländer, S., Kersting, T. 2012: Phöben: Eisenzeitliche Siedlung und slawischer Burgwall. In: F. Schopper, J. von Richthofen (Hrsg.): *Ausflüge im Südwesten Brandenburgs. Zauche, Teltow, Fläming.* Ausflüge zu Archäologie, Geschichte und Kultur in Deutschland 54. Stuttgart: Theiss, 218–223.

Schwind, F. 1984: Zu karolingerzeitlichen Klöstern als Wirtschaftsorganismen und Stätten handwerklicher Tätigkeit. In: L. Fenske (Hrsg.): *Institutionen, Kultur und Gesellschaft im Mittelalter. Festschrift für Josef Fleckenstein zu seinem 65. Geburtstag.* Sigmaringen: Thorbecke, 101–124.

Sedláčková, L., Zapletalová, D. 2012: Skleněné kroužky z Brna a problematika raně středověkého sklářství na Moravě. *Archeologické rozhledy* LXIV(3), 534–548. Available also from: https://1url.cz/yJlaf.

Šedo, O. 1977a: Ďalšie nálezy z hradu Hričov v Hričovskom podhradí. *Archeologické výskumy a nálezy na Slovensku v roku* 1976, 262–263. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1976.pdf.

Šedo, O. 1977b: Osídlenie z viacerých období v Žiline-Bánovej. *Archeologické výskumy a nálezy na Slovensku v roku* 1976, 265. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1976.pdf.

Šedo, O. 1980a: Nové archeologické nálezy v okrese Čadca. *Archeologické výskumy a nálezy na Slovensku v roku* 1978, 259–260. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1978.pdf.

Šedo, O. 1980b: Záchranný výskum v Lopušných Pažitiach. *Archeologické výskumy a nálezy na Slovensku v roku* 1979, 201–204. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1979.pdf.

Šedo, O. 1981a: Druhá sezóna výskumu v Lopušných Pažitiach. *Archeologické výskumy a nálezy na Slovensku v roku* 1980(1), 281. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1980-1.pdf.

Šedo, O. 1981b: Prieskum archeologických lokalít v okrese Čadca. *Archeologické výskumy a nálezy na Slovensku v roku* 1980(1), 282–285. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1980-1.pdf.

Šedo, O. 1983: Archeologický prieskum a záchranné akcie na Kysuciach. *Archeologické výskumy a nálezy na Slovensku v roku* 1982, 236–239. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1982.pdf.

Šedo, O. 1987: Prieskumy na trase plynovodu medzi Horným Vadičovom a Kysuckým Novým Mestom. *Archeologické výskumy a nálezy na Slovensku v roku* 1986, 100–101. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1986.pdf.

Šedo, O. 1995: Zbery v Žiline-Závodí v polohe Pod vinicou. *Archeologické výskumy a nálezy na Slovensku v roku* 1993, 126. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1993.pdf.

Šedo, O., Hajnalová, E. 2005: Využitie archeobotanických poznatkov a geobotanických máp pre predikciu a rekonštrukciu osídlenia v praveku a rannohistorickom období na príklade štúdie z Kysúc. In: V. Hašek, R. Nekuda, M. Ruttkay (eds.): *Ve službách archeologie VI. Sborník věnovaný 70. narozeninám PhDr. Dariny Bialekovej, CSc. a 60. narozeninám Prof. PhDr. Josefa Ungera, CSc.* Brno: Muzejní a vlastivědná společnost v Brně, Geodrill Brno, Archeologický ústav SAV Nitra, 255–265.

Sellen, D. W., Smay, D. B. 2001: Relationship between subsistence and age at weaning in "preindustrial" societies. *Human Nature* 12, 47–87. DOI: 10.1007/s12110-001-1013-y.

Semmler, J. 2003: *Der Dynastiewechsel von 751 und die fränkische Königssalbung.* Studia Humaniora. Series Minor 6. Düsseldorf: Droste.

Serneels, V. 1993: *Archéométrie des scories de fer. Recherches sur la sidérurgie ancienne en Suisse occidentale.* Cahiers d'archéologie romande 61. Lausanne: Cahiers d'archéologie romande.

Serneels, V. 1995: Du minéral à l'objet. Un village de sidérurgistes du IXe au XIIe siècle à Liestal-Röserntal BL. In: M. Schmaedecke (Hrsg.): *Ländliche Siedlungen zwischen Spätantike und Mittelalter. Beiträge zum Kolloquium in Liestal (Schweiz) vom 13. bis 15. März 1995.* Archäologie und Museum 33. Liestal: Archäologie und Kantonsmuseum Baselland, 35–43.

Serneels, V. 2003: La sidérurgie sur le site carolingien de Liestal Röserntal (BL). Les vestiges matériels, premiers résutats. In: *Abbau und Verhüttung von Eisenerzen im Vorland der mittleren Schwäbischen Alb. Mit einem Anhang. Die Eisenproduktion im frühen und hohen Mittelalter: Archäologie, Metallurgie, Landesgeschichte. Internationales Kolloquium am 4.-5. November 1994 in Schwäbisch Gmünd.* Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 86. Stuttgart: Konrad Theiss, 205–212.

Serneels, V., Perret, S. 2003: Quantification of smithing activities based on the investigation of slag and other material remains. In: *International conference. Archaeometallurgy in Europe 24-25-26 September 2003. Milan, Italy. Proceedings vol. 2.* Milano: Associazione italiana di metallurgia, 469–478.

Servet, J.-M. 1981: Primitive order and archaic trade Part 1. *Economy and Society* 10(4), 423–450. DOI: 10.1080/03085148100000008. Available also from: https://doi.org/10.1080/03085148100000008.

Severin, K. 2000: Trstenickou stezkou cestou necestou (K vývoji názorů na průběh středověké komunikace). *Pomezí Čech a Moravy* 4, 353–388.

Shapland, F., Lewis, M. E. 2013: Brief communication. A proposed osteological method for the estimation of pubertal stage in human skeletal remains. *American Journal of Physical Anthropology* 151(2), 302–310. DOI: 10.1002/ajpa.22268.

Shapland, F., Lewis, M. E. 2014: Brief communication. A proposed method for the assessment of pubertal stage in human skeletal remains using cervical vertebrae maturation. *American Journal of Physical Anthropology* 153(1), 144–153. DOI: 10.1002/ajpa.22416.

Sikora, M. 1967: Powiat Słupsk. *Materiały Zachodnio-pomorskie* XIII, 616–640.

Sikorski, D. A. 2024: Descriptio civitatum ad septentrionalem plagam Danubii (tzw. Geograf Bawarski jako źródło historyczne). In: D. Dąbrowski, E. Siemianowska (eds.): *Przedpolska. Ziemie w czasach plemiennych*. Collectio Cathalogorum Gnesnensium 4. Gniezno, Poznań: Muzeum Początków Państwa Polskiego w Gnieźnie, Poznańskie Towarzystwo Przyjaciół Nauk, 27–44.

Simondon, K. B., Costes, R., Delaunay, V., Diallo, A., Simondon, F. 2001: Children›s height, health and appetite influence mothers› weaning decisions in rural Senegal. *International Journal of Epidemiology* 30(3), 476–481. DOI: 10.1093/ije/30.3.476.

Sindbæk, S. M. 2001: An Object of Exchange. Brass Bars and the Routinization of Viking Age Long-Distance Exchange in the Baltic Area. *Offa* 58, 49–60.

Škorvánková, K. 2020: *Prínos nepublikovaných nálezov zo zbierok Považského múzea pre poznanie včasnostredovekého osídlenia SZ Slovenska* [online]. Manuscript of the thesis. Comenius University Bratislava. Faculty of Arts. Stored in: CRZP. [Accessed 2025-04-19]. Available from: https://opac.crzp.sk/?fn=detailBiblioForm&sid=780C5DA7522A72A298F8F4DFDA41.

Skuhravá, M., Skuhravý, V. 2010: Hálky na rostlinách. *Živa* 58(5), 219–221. Available also from: https://ziva.avcr.cz/2010-5/halky-na-rostlinach.html.

Sláma, J. 1977a: *Mittelböhmen im frühen Mittelalter. I. Katalog der Grabfunde.* Praehistorica V. Praha: Univerzita Karlova. Available also from: https://1url.cz/qJSJ1.

Sláma, J. 1977b: Svatojiřské kostely na raně středověkých hradištích v Čechách. *Archeologické rozhledy* XXIX(3), 269–280. Available also from: https://1url.cz/iJkVh.

Sláma, J. 1988: *Střední Čechy v raném středověku III. Archeologie o počátcích přemyslovského státu.* Praehistorica XIV. Praha: Univerzita Karlova.

Slaná, A. 2017: Stredoveké žacie a zberové náradie v zbierkach Považského múzea v Žiline. *Vlastivedný zborník Považia* XXVIII, 39–68. Available also from: https://1url.cz/yJFGx.

Šlézar, P. 2014: Olomouc. In: P. Kouřil (ed.): *Great Moravia and the Beginnings of Christianity*. Brno: The Institute of Archaeology of the Academy of Sciences of the Czech Republic, Brno, 214–221.Available also from: https://www.arub.cz/wp-content/uploads/Great_Moravia_and_the_Beginnings_of_Christianity_kompr.pdf.

Šlézar, P. 2018: Olomouc between the Great Moravian and Přemyslid Duchies. In: P. Kouřil, R. Procházka, (eds.): *Moravian and Silesian Strongholds of the Tenth and Eleventh Centuries in the Context of Central Europe*. Brno: The Czech Academy of Sciences, Institute of Archaeology, Brno, 115–135.

Slowikow, A. 2017: *Dokumentation der Grabungsergebnisse „Am gebrannten Hof" 2017–2020*. Manuscript of the excavation report. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

Smetánka, Z. 2003: *Archeologické etudy. Osmnáct kapitol o poznávání středověku*. Knižnice Dějin a současnosti 19. Praha: Lidové noviny. Available also from: https://1url.cz/d1qTP.

Smith, J. M. H. 1992: *Province and Empire. Brittany and the Carolingians*. Cambridge Studies in Medieval Life and Thought. Fourth Series 18. Cambridge: Cambridge University Press.

SNAT XIV a: Ramadan, A. M. M. 2012: *Sylloge Nummorum Arabicorum Tübingen. Naysābūr, Sabzawār und die Münzstätten in Ǧuwayn XIV a Ḫurāsān I*. Tübingen, Berlin: Wasmuth.

SNAT XIV b: Schwarz, F. 2002: *Sylloge Nummorum Arabicorum Tübingen. Balḫ und die Landschaften am oberen Oxus XIV c, Ḫurāsān III*. Tübingen, Berlin: Wasmuth.

SNAT XV a: Fedorov, M., Kochnev, B., Kurbanov, G., Voegeli, M. 2008: *Sylloge Nummorum Arabicorum Tübingen, Buḫārā / Samarqand, XV a Mittelasien / Central Asia I*. Tübingen, Berlin: Wasmuth.

SNAT XV b: Mayer, T. 1998: *Sylloge Nummorum Arabicorum Tübingen. Nord- und Ostzentralasien, XV b Mittelasien II*. Tübingen, Berlin: Wasmuth.

Sohn, K. 2017: Biological standards of living. Age at menarche vs. height. *Annals of Human Biology* 44(1), 21–27. DOI: 10.3109/03014460.2016.1147596.

Šolle, M. 1959: Knížecí pohřebiště na Staré Kouřimi. *Památky archeologické* L(2), 353–506. Available also from: https://1url.cz/xJVXE.

Šolle, M. 1966: *Stará Kouřim a projevy velkomoravské hmotné kultury v Čechách*. Praha: Academia.

Šolle, M. 1969: Kouřim v mladší a pozdní době hradištní. *Památky archeologické* LX(1), 1–124. Available also from: https://1url.cz/LJVXa.

Šolle, M. 1981: *Kouřim v průběhu věků*. Památníky naší minulosti 11. Praha: Academia.

Šolle, M. 1989: Kouřim - sv. Vojtěch a jeho sídlištní tradice. Výzkum 1978–1981. *Archeologické rozhledy* XLI(3), 243–257, 357–360. Available also from: https://1url.cz/fJkVf.

Šolle, M. 1993: Přemyslovská a děpoltická Kouřim podle výzkumu z let 1967–1977. *Archeologické rozhledy* XLV(2), 268–278, 360–362. Available also from: https://1url.cz/8JkVS.

Šolle, M. 2000: *Po stopách přemyslovských Děpolticů. Příspěvek ke genezi města Kouřimě*. Historica. Praha: Vyšehrad.

Sommer, J. 1987: Ke stavební historii kostela sv. Šimona a Judy ve Viticích. *Památky středních Čech* 2, 64–68.

Sommer, P., Vaněk, V. 2007: Existe-t-il une architecture Slavníkienne? In: J. K. Kroupa, V. Vaněk (eds.): *Slavníkovci v českých dějinách*. Antiqua Cuthna 2. Praha: Koniasch Latin Press, 20–34.

Sörries, R. 2003: Gräberstraßen und Nekropolen nach römischen Vorbild. Das Friedhofswesen in den germanischen Provinzen des Imperium Romanum. In: *Raum für Tote. Die Geschichte der Friedhöfe von den Gräberstraßen der Römerzeit bis zur anonymen Bestattung*. Braunschweig: Thalacker Medien, 11–26.

Souchopová, V. 1986: *Hutnictví železa v 8. – 11. století na západní Moravě*. Studie Archeologického ústavu Československé akademie věd v Brně XIII(1). Praha: Academia.

Souchopová, V. 1995: *Počátky západoslovanského hutnictví železa ve světle pramenů z Moravy*. Brno: Archeologický ústav Akademie věd České republiky v Brně.

Souchopová, V., Merta, J., Merta, O. 2011: Some aspects of the development of Great Moravian iron metallurgy. In: J Hošek, H. Cleere, Ľ. Mihok (eds.): *The Archaeometry of Iron. Recent Developments in Archaeological Research and Scientific Research*. Prague: The Institute of Archaeology of the ASCR, Prague, 73–86.

Souchopová, V., Stránský, K. 2008: *Tajemství dávného železa. Archeometalurgie objektivem mikroskopu*. Brno: Technické muzeum v Brně.

Špaček, J. 2000: Nálezy středověkého skla ze Staré Boleslavi 1. In: *Historické sklo 2. Sborník pro dějiny skla*. Čelákovice, Plzeň: Městské muzeum, Západočeské muzeum v Plzni, 101–107.

Špaček, J. 2003: Historie archeologického výzkumu před r. 1988. In: I. Boháčová (ed.): *Stará Boleslav. Přemyslovský hrad v raném středověku*. Mediaevalia archaeologica 5. Praha: Archeologický ústav AV ČR, Praha, 29–36. Available also from: https://1url.cz/bJlaq.

Sperl, G. 1980: *Über die Typologie urzeitlicher, frühgeschichtlicher und mittelalterlicher Eisenhüttenschlacken*. Studien zur Industrie-Archäologie 7. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Sprandel, R. 1968: *Das Eisengewerbe im Mittelalter*. Stuttgart: Anton Hiersemann.

Sprandel, R. 1985: Handel und Gewerbe vom 6.–11. Jahrhundert. In: B. Schwineköper (Hrsg.): *Gilden und Zünfte. Kaufmännische und gewerbliche Genossenschaften im frühen und hohen Mittelalter*. Vorträge und Forschungen Konstanzer Arbeitskreis für mittelalterliche Geschichte 29. Sigmaringen: Jan Thorbecke Verlag, 9–30. Available also from: https://journals.ub.uni-heidelberg.de/index.php/vuf/article/view/15770/9638.

Štaffl, M. 2025: Ideální rekonstrukce raně středověkého hradiště ve Staré Boleslavi a jeho okolí. *Archaeologia historica* 50(1), 51–77. DOI: 10.5817/AH2025-1-2. Available also from: https://hdl.handle.net/11222.digilib/digilib.82346.

Staňa, Č. 1964: Zjišťovací výzkum na hradisku Zelená Hora u Vyškova na Mor. *Přehled výzkumů* 8 (1963), 56–59, Tab. 31. Available also from: https://www.arub.cz/wp-content/uploads/pv_8_1963.pdf.

Staňa, Č. 1967: K poznání vývoje velkomoravských výšinných hradišť. *Archeologické rozhledy* 19(5), 699–704, tab. XII–XIII.

Staňa, Č. 2001: Osobitost velkomoravských šperků z Břeclavi-Pohanska. In: Z. Měřínský (ed.): *Konference Pohansko 1999. 40 let od zahájení výzkumu slovanského hradiska Břeclav-Pohansko*. Archaeologia mediaevalis Moravica et Silesiana I/2000. Brno: Masarykova univerzita, 91–110. Available also from: https://digilib.phil.muni.cz/cs/handle/11222.digilib/133123.

Staneková, Z. 2019: Hroby bojovníkov vo Varíne? [online] *Múza. Elektronický poznávací časopis o histórii a krásach žilinského regiónu* 7(1), 12–15. [Accessed 2025-12-01]. Available from https://pmza.sk/muza1-2019-1/muza1-2019-1.html.

Steane, J. M., Foreman, M. 1988: Medieval fishing tackle. In: M. Aston (ed.): *Medieval fish, fisheries and fishponds in England I*. BAR British series 182(1). Oxford: British archaeological reports, 137–186.

Steane, J. M., Foreman, M. 1991: The archaeology of medieval fishing tackle. In: G. L. Good, R. H. Jones, M. W. Ponsford (eds.): *Waterfront archaeology. Proceedings of the third international conference on waterfront archaeology held at Bristol 23-26 September 1988*. CBA Research Report 74. London: Council for British Archaeology, 88–101.

Štefan, I. 2010: Příspěvek k chronologii a výpovědním možnostem esovitých záušnic. *Studia mediaevalia Pragensia* 9, 171–205. Available also from: https://rukovet.cms.flu.cas.cz/static/Odkazy_upload/SMP_09_2010.pdf.

Štefan, I. 2011: Great Moravia, Statehood and Archaeology. The 'Decline and Fall' of One Early Medieval Polity. In: J. Macháček, Š. Ungerman (Hrsg.): *Frühgeschichtliche Zentralorte in Mitteleuropa. Internationale Konferenz und Kolleg der Alexander von Humboldt-Stiftung zum 50. Jahrestag des Beginns archäologischer Ausgrabungen in Pohansko bei Břeclav, 5.–9.10.2009, Břeclav, Tschechische Republik*. Studien zur Archäologie Europas 14. Bonn: Dr. Rudolf Habelt, 333–354.

Štefan, I., Varadzin, L. 2007: Počátky farní organizace v Čechách a na Moravě ve výpovědi archeologie. In: J. Hrdina, B. Zilynská (eds.): *Církevní topografie a farní síť pražské církevní provincie v pozdním středověku*. Colloquia mediaevalia Pragensia 8. Praha: Filosofia, 33–53. Available also from: https://filosofia.flu.cas.cz/upload/__files/Cirkevni_DOI.pdf.

Štefanovičová, T. 2004: K vyvoju šperku adriatickej a stredodunajskej oblasti v prvej polovici 9. storočia. In: G. Fusek (ed.): *Zbornik na počesť Dariny Bialekovej*. Archaeologica Slovaca Monographiae. Communicationes VII. Nitra: Archeologický ústav SAV, 389–395.

Stehlíková, D. 2003: *Encyklopedie českého zlatnictví, stříbrnictví a klenotnictví*. Praha: Libri. Available also from: https://1url.cz/wJsmU.

Steinhübel, J. 2003: Kaganát a tudunát. *Studia Historica Tyrnaviensia* III, 15–30.

Stoličná, R. 1997: Alternatívne zdroje rastlinnej stravy v strednej Európe. *Slovenský národopis* 45(3), 285–294.

Stöllner, T. R. 2014: Methods of Mining Archaeology (Montanarchäologie). In: B. W. Roberts, C. P. Thornton (eds.): *Archaeometallurgy in Global Perspective. Methods and Syntheses*. New York: Springer, 133–159. DOI: 10.1007/978-1-4614-9017-3_7.

Straßburger, M. 2019: Spezialisierte Eisenproduktion und -Verarbeitung in Siedlungen des ländlichen Raumes in Bayern. In: J. Haberstroh, I. Heitmeier (Hrsg.): *Gründerzeit. Siedlung in Bayern zwischen Spätantike und Frühmittelalter*. Bayerische Landesgeschichte und europäische Regionalgeschichte 3. St. Ottilien: EOS Verlag, 739–804.

Strigler, P. 1883: Mittheilung des Architekten Ph. Strigler in Frankfurt a. M. über die im Jahre 1875 zum Abbruch gelangten Baureste in dem Saale zu Nieder-Ingelheim. *Correspondenzblatt des Gesammtvereins der deutschen Geschichts- und Alterthumsvereine* 10, 73–78. Available also from: https://1url.cz/AJlwN.

Stümpel, B. 1970: Bericht des Staatlichen Amtes für Vor- und Frühgeschichte im Reg.-Bezirk Rheinhessen und im Kreis Kreuznach für die Zeit vom 1. Januar bis 31. Dezember 1967. *Mainzer Zeitschrift* 65, 152–182, Taf. 48–51.

Stümpel, B. 1975: Bericht des Staatlichen Amtes für Vor- und Frühgeschichte im Reg.-Bezirk Rheinhessen und im Kreis Kreuznach für die Zeit vom 1. Januar bis 31. Dezember 1973. *Mainzer Zeitschrift* 70, 194–235, Taf. 49–56.

Stümpel, B. 1981: Neue Ausgrabungen im merowingerzeitlichen Friedhof Langenlonsheim, Kr. Bad Kreuznach. *Mainzer Zeitschrift* 76, 143–180, Taf. 20–24.

Stümpel, B. 1982/83: Bericht der Bodendenkmalpflege Mainz für 1979. *Mainzer Zeitschrift* 77/78, 191–207.

Sutherland, J. N. 1988: *Liutprand of Cremona, bishop, diplomat, historian. Studies of the Man and his Age*. Biblioteca degli Studi medievali 14. Spoleto: Centro italiano di studi sull'Alto Medioevo.

Svensson, E. 2018: The Scandinavian shieling – between innovation and tradition. In: E. Costello, E. Svensson (eds.): *Historical Archaeologies of Transhumance across Europe*. London, New York: Routledge, 15–27.

Svensson, E., Emanuelsson, M., Johansson, A., Nilsson, S., Pettersson, S. 2008: The periphery and the market. In: M. Emanuelsson, E. Johansson, A.-K. Ekman (eds.): *Peripheral Communities. Crisis, Continuity and Long-term Survival*. Uppsala: Department of Urban and Rural Development SLU, 131–142.

Svobodová, H. 1997: Die Entwicklung der Vegetation in Südmähren (Tschechien) während des Spätglazials und Holozäns: eine palynologische Studie. *Verhandlungen der Zoologisch-Botanischen Gesellschaft Österreich* 134, 317–356. Available also from: https://www.zobodat.at/pdf/VZBG_134_0317-0356.pdf.

Szenthe, G., Gáll, E. 2022: *The Early Medieval Cemetery at Hortobágy-Árkus. The Heritage of an Elite Group from the 8th–10th Century Northern Transtisza Region / Hortobágy-Árkus kora középkori temetője. Egy elit csoport hagyatéka a 8–10. századi Észak-Tiszántúlról*. Archaeologia Hungarica 52. Budapest: Magyar Nemzeti Múzeum. Available also from: https://real.mtak.hu/174252/1/2022_SZENTHE-GALL-The_Early_Medieval_Cemetery_at_Hortobagy.pdf.

Szőke, B. M. 2007: New findings of the excavations in Mosaburg/Zalavár (Western Hungary). In: J. Henning (ed.): *Post-Roman Towns, Trade and Settlement in Europe and Byzantium 1. The Heirs of the Roman West*. Millennium Studies 5(1). Berlin, New York: De Gruyter, 411–428. DOI: 10.1515/9783110218848.2.411. Available also from: https://doi.org/10.1515/9783110218848.2.411.

Szőke, B. M. 2010: Mosaburg/Zalavar und Pannonien in der Karolingerzeit. *Antaeus* 31–32, 9–52.

Szőke, B. M. 2014: *The Carolingian Age in Carpathian Basin. Permanent Exhibition of the Hungarian National Museum*. Budapest: Hungarian National Museum. Available also from: https://real.mtak.hu/20927/1/Szokekotet_angol_u_085622.294918.pdf.

Szőke, B. M. 2021: *Die Karolingerzeit in Pannonien*. Monographien des Römisch-Germanischen Zentralmuseums 145. Mainz: Verlag des Römisch-Germanischen Zentralmuseums. DOI: 10.11588/propylaeum.1110. Available also from: https://doi.org/10.11588/propylaeum.1110.

Taeuber, H. 2014: Das Goldblech in Grab 145. Ein jüdisches Amulett. In: N. Doneus (Hrsg.): *Das kaiserzeitliche Gräberfeld von Halbturn, Burgenland. Teil 1. Archäologie, Geschichte und Grabbrauch*. Monographien des Römisch-Germanischen Zentralmuseums 122, 1. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 231–235. Available also from: https://doi.org/10.11588/propylaeum.520.

Tange, S. 2012: La paysannerie indépendante et autonome à côté du grand domaine carolingien. *Revue Belge de Philologie et d›Histoire* 90(2), 347–359. DOI: 10.3406/rbph.2012.8328. Available also from: https://www.persee.fr/doc/rbph_0035-0818_2012_num_90_2_8328.

Taylor, N. L. 2005: Inheritance of Power in the House of Guifred the Hairy. Contemporary Perspectives on the Formation of a Dynasty. In: R. F. Berkhofer III et al. (eds.): *The Experience of Power in Medieval Europe, 950–1350. Essays in Honor of Thomas N. Bisson*. Aldershot: Ashgate, 129–151.

Thorvaldsen, G. 2008: Was there a European breastfeeding pattern? *The History of the Family* 13(3), 283–295. DOI: 10.1016/j.hisfam.2008.08.001.

Tiesenhausen, V. G. 1873: *Monety Vostochnogo Khalifata*. St. Peterburg: Imperial Academy of Sciences.

Tinner, W., Lotter, A. 2006: Holocene expansion of Fagus sylvatica and Abies alba in Central Europe: Where are we after eight decades of debate? *Quaternary Science Reviews* 25(5–6), 526–549. DOI: 10.1016/j.quascirev.2005.03.017. Available also from: https://www.sciencedirect.com/science/article/pii/S0277379105001630?via%3Dihub.

Tolasz, R. et al. 2007: *Atlas podnebí Česka*. Praha, Olomouc: Český hydrometeorologický ústav, Univerzita Palackého v Olomouci.

Tomanová, P. 2012: *Kouřim – Sv. Jiří. Přemyslovské správní centrum a problematika výzkumů raně středověkých centrálních lokalit (strategie a metody)* [online]. Manuscript of the thesis. Charles University. Faculty of Arts. Department of Archaeology. Stored in: Digital Repository, Charles University [Accessed 2025-04-15]. Available from: http://hdl.handle.net/20.500.11956/41135.

Tomášek, M. 2003: *Půdy České republiky*. 3. vydání. Praha: Česká geologická služba. Available also from: https://1url.cz/fJkkO.

Tomková, K. et al. 2020: *Levý Hradec v zrcadle archeologických výzkumů. Pohřebiště. Díl II*. Praha: Archeologický ústav AV ČR, Praha, v. v. i.

Tomori, C., Palmquist, A. E. L., Quinn, E. A. (eds.) 2018: *Breastfeeding. New Anthropological Approaches*. London: Routledge. DOI: 10.4324/9781315145129.

Totelin, L. 2023: Weaning and Lactation Cessation in Late Antiquity and the Early Byzantine Period. Medical Advice in Context. In: S. Constantinou, A. Skouroumouni-Starvrinou (eds.): *Breastfeeding and Mothering in Antiquity and Early Byzantium*. London, New York: Routledge, 130–151.

Třeštík, D. 1998: Großmähren, Passau und die Ungarn um das Jahr 900. Zu den neuen Zweifeln an der Authentizität des Briefes der bayerischen Bischöfe an Papst Johann IX. aus dem Jahr 900. *Byzantinoslavica* LIX(1), 137–160. Available also from: https://1url.cz/GJHt0.

Třeštík, D. 2001: *Vznik Velké Moravy. Moravané, Čechové a střední Evropa v letech 791–871*. Česká historie 8. Praha: Nakladatelství Lidové noviny. Available also from: https://1url.cz/u125X.

Trugly, A. 1982: Pohrebisko z doby avarskej ríše v Komárne-Robotníckej štvrti. *Spravodaj Oblastného podunajského múzea v Komárne* 2, 5–48.

Trugly, A. 1987: Gräberfeld aus der Zeit des awarischen Reiches bei der Schiffswerft in Komárno. *Slovenská archeológia* XXXV(2), 251–344. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1987_2.pdf.

Trugly, A. 1993: Gräberfeld aus der Zeit des awarischen Reiches bei der Schiffswerft in Komárno II (1987–1989). *Slovenská archeológia* XLI(2), 191–307. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1993_2.pdf.

Trugly, S. 1996: A komáromi avar telep. *Communicationes Archaelogicae Hungariae* 1996, 125–150. DOI: 10.54640/CAH.1996.125. Available also from: https://doi.org/10.54640/CAH.1996.125.

Trugly, S. 2008: *A Komáromi-hajógyári avar temető és telep*. Opitz Archaeologica 2. Budapest: Martin Opitz Kiadó.

Tulp, C. 2003: Tjitsma, Wijnaldum. An Early Medieval Production Site in the Netherlands. In: T. Pestell, K. Ulmschneider (eds.): *Markets in Early Medieval Europe. Trading and 'Productive' Sites , 650–850*. Oxford, Havertown: Windgather Press, 221–233. DOI: 10.2307/j.ctv138wtdg.23.

Tůma, J. 1915: *Kolínsko a Kouřimsko. Obraz poměrů přírodních, života obyvatelstva i paměti časů minulých. Díl třetí. Paměti osad na Kouřimsku*. Kolín: Učitelstvo školní okresu kolínského. Available also from: https://1url.cz/bJkjJ.

Turčan, V. 2013: Žilinský kraj v slovanskom a veľkomoravskom období. In: *Cyril a Metod a slovanský svet. Zborník z konferencie*. Žilina: GEORG, 7–13.

Turino ms. 903: *Collectio canonum in Torino, BNU, E. V. 44, fol. 71v–86v*. Manuscript. Stored in: Torino, Biblioteca Nazionale.

Udina Martorell, F. 1974: L'évolution du titre comtal à Barcelone. Développement de L›institution (suite et fin). *Cahiers de Civilisation Médiévale* 17(67), 235–245. Available also from: https://www.persee.fr/doc/ccmed_0007-9731_1974_num_17_67_1974.

Ungerman, Š. 2001: Ikonografie velkomoravských nákončí a symbolika opasku v raném středověku. *Listy filologické* CXXIV(3–4), 223–258. Available also from: https://www.jstor.org/stable/pdf/23467770.pdf.

Ungerman, Š. 2002: Konstrukce honosných velkomoravských opasků. *Sborník prací Filozofické fakulty brněnské univerzity M* 7, 93–121. Available also from: https://hdl.handle.net/11222.digilib/113828.

Ungerman, Š. 2011: Schwertgurte des 9. bis 10. Jahrhunderts in West- und Mitteleuropa. In: J. Macháček, Š. Ungerman (Hrsg.): *Frühgeschichtliche Zentralorte in Mitteleuropa. Internationale Konferenz und Kolleg der Alexander von Humboldt-Stiftung zum 50. Jahrestag des Beginns archäologischer Ausgrabungen in Pohansko bei Břeclav, 5.–9.10.2009, Břeclav, Tschechische Republik*. Studien zur Archäologie Europas 14. Bonn: Dr. Rudolf Habelt, 575–610.

Ungerman, Š. 2017a: Mečové pásy z 9.–10. století v západní a střední Evropě (typologie, chronologie, provenience a symbolika). In: K. Pieta, Z. Robak (eds.): *Bojná 2. Nové výsledky výskumov včasnostredovekých hradísk*. 2nd extended edition. Archaeologica Slovaca Monographiae. Fontes XXII. Nitra: Archeologický ústav SAV, 253–281.

Ungerman, Š. 2017b: Prachtfingerringe im frühmittelalterlichen Mähren (9.–10. Jahrhundert). Bemerkungen zur Chronologie und Provenienz des großmährischen Luxusschmucks. *Přehled výzkumů* 58(2), 19–95. Available also from: https://www.arub.cz/prehled-vydanych-cisel/PV-58-2_Ungerman.pdf.

Ungerman, Š. 2019: Die Wadenriemengarnituren im frühmittelalterlichen Mähren. In: L. Poláček, P. Kouřil (Hrsg.): *Bewaffnung und Reiterausrüstung des 8. bis 10. Jahrhunderts in Mitteleuropa. Waffenform und Waffenbeigaben bei den mährischen Slawen und in den Nachbarländern*. Internationale Tagungen in Mikulčice IX. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno, 307–341. Available also from: https://www.arub.cz/produkt/bewaffnung-und-reiterausrustung-des-8-bis-10-jahrhunderts-in-mittelauropa/.

Ungerman, Š. 2020a: Belt and Its Parts. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno,

317–329. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Ungerman, Š. 2020b: Earrings as Typical Representants of the „International" Fashion. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 273–277. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Ungerman, Š. 2020c: Imports or Local Imitations? In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 281–286. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Ungerman, Š. 2020d: Specialised Craft Production. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences, Institute of Archaeology, Brno, 179–186. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Ungerman, Š. 2021: *Frühmittelalterliche Ohrringe mit vier Blechbeeren in Nord-, Mittel- und Südosteuropa. Eine Fallstudie zur Entstehung des großmährischen Prachtschmucks*. Spisy Archeologického ústavu AV ČR Brno 69. Brno: Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik, Brno. Available also from: https://www.arub.cz/wp-content/uploads/spisy_arub_69.pdf.

Ungerman, Š. 2023a: *Raně středověké pohřebiště v Dolních Věstonicích – Na pískách. Díl I – Analýza*. Spisy Archeologického ústavu AV ČR Brno 74(I). Brno: Archeologický ústav AV ČR, Brno, v. v. i., Masarykova univerzita. DOI: 10.47382/arub2023-04-1. Available also from: https://www.arub.cz/wp-content/uploads/Spisy_74-1_web.pdf.

Ungerman, Š. 2023b: *Raně středověké pohřebiště v Dolních Věstonicích – Na pískách. Díl II – Katalog*. Spisy Archeologického ústavu AV ČR Brno 74(II). Brno: Archeologický ústav AV ČR, Brno, v. v. i., Masarykova univerzita. DOI: 10.47382/arub2023-04-2. Available also from: https://www.arub.cz/wp-content/uploads/Spisy_74-2_web.pdf.

Urk Her I: *Breviarium sancti Lulli = Urkundenbuch der Reichsabtei Hersfeld 1, Nr. 38, 68*. H. Weirich (ed.). Marburg 1936.

Urkundenbuch Coblenz und Trier 1: *Urkundenbuch zur Geschichte der jetzt die Preussischen Regierungsbezirke Coblenz und Trier bildenden mittelrheinischen Territorien, 1. Von den ältesten Zeiten bis 1169*. H. Beyer (ed.). Koblenz: Hölscher, 1860.

Vachek, M., Ambrozek, L., Kučera, Z., Paličková, M., Jongepierová, I., Čmelík, P. 1997: *Příroda okresu Hodonín*. Hodonín: Okresní úřad Hodonín – referát životního prostředí.

Vaďurová, K. 2019: Středověké skleněné kroužky z Opavy. *Časopis Slezského muzea. B, Vědy historické* LXVIII(1), 11–23. Available also from: https://cszmb.cz/wp-content/uploads/CSZMB_1_2019_2.pdf.

Valls i Taberner, F. 1936: *Estudi sobre els documents del comte Guifre I de Barcelona*. Barcelona: Estudis Universitaris Catalans.

Vangľová, T. 2010: Stredoveká keramika na severozápadnom Slovensku. *Študijné zvesti Archeologického ústavu Slovenskej akadémie vied* 48, 91–140. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_48.pdf.

Vavák, J. 2015: Koniec moravského démona? Príspevok k identifikácii výjavu na včasnostredovekom honosnom opasku z Břeclavi – Pohanska. *Zborník Slovenského národného múzea CIX, Archeológia* 25, 239–255. Available also from: https://1url.cz/oJRdL.

Vavřínek, V. 1964: Uglъskyi korolь dans la Vie vieux-slave de Méthode. *Byzantinoslavica* 25, 288–301.

VC: Vita Conwoionis II. In: *The Monks of Redon. Gesta Sanctorum Rotonensium and Vita Conwoionis*. C. Brett (ed. et trans.). Studies in Celtic History 10. Woodbridge: Boydell Press, 1989.

Velemínský, P., Bejdová, Š., Bigoni, L., Brzobohatá, H., Drtikolová Kaupová, S., Havelková, P., Ibrová, A., Sládek, V., Stránská, P., Velemínská, J., Zazvonilová, E., Brůžek, J. 2020: Read from the Bones. The Anthropological, Demographic, and Health Consequences of Living in Early Medieval Great Moravia. In: L. Poláček et al.: *Great Moravian Elites From Mikulčice*. Brno: Czech Academy of Sciences Institute of Archaeology, Brno, 387–416. Available also from: https://www.arub.cz/wp-content/uploads/ARUB_Great_Moravian_Elites_From_Mikulcice_2020.pdf.

Velkomoravskysperk.cz: *Velkomoravský šperk* [online]. Archeologický ústav AV ČR, Brno, v. v. i.; Moravské zemské muzeum [Accessed 2025-11-20]. Available from: https://www.velkomoravskysperk.cz/en/.

Vélová, L. 2018: Úvod do archeologie dětství. *Acta Musei Nationalis Pragae – Historia* 72(1–2), 62–77. DOI: 10.1515/amnh-2018-0006. Available also from: https://doi.org/10.1515/amnh-2018-0006.

Verhulst, A. E. 2002: *The Carolingian economy*. Cambridge medieval textbooks. Cambridge: Cambridge University Press.

Viage literario: *Villaneuva, de J. Viage literario a las iglesias de España 8*. Valencia: Olivers, 1821.

Vích, D., Profantová, N., Křivánek, R., Jarůšková, Z., Zavřel, J. 2021: Hradiště u Mařína (okr. Svitavy) a jeho širší zázemí ve světle kovových artefaktů z 6.–10. století. *Archeologické rozhledy* LXXIII(3), 359–422. DOI: 10.35686/AR.2021.12. Available also from: https://doi.org/10.35686/AR.2021.12.

Vida, T. 1995: Frühmittelalterliche scheiben- und kugelförmige Amulettkapseln zwischen Kaukasus, Kastilien und Picardie. *Bericht der Römisch-Germanischen Kommission* 76, 220–288.

Vida, T. 2002: Heidnische und christliche Elemente der awarenzeitlichen Glaubenswelt, Amulette in der Awarenzeit. *Zalai Múzeum* 11, 179–209.

Vida, T. 2009: Herkunft und Funktion von Privatreliquiaren und Amulettkapseln in frühgeschichtlichen Europa. In: U. von Freeden, H. Friesinger, E. Wamers (Hrsg.): *Glaube, Kult und Herrschaft. Phänomene des Religiösen im 1. Jahrtausend n. Chr. in Mittel- und Nordeuropa*. Kolloquien zur Vor- und Frühgeschichte 12. Frankfurt, 261–280.

Vida, T. 2025: Amulet as Gift in Graves: Examples from the Avar Period. O. Heinrich-Tamáska et al. (Hrsg.): *Goldene Wege. Macht, Mobilität und Grenzen zwischen Antike und Mittelalter. Festschrift für Matthias Hardt zu seinem 65. Geburtstag*. Studien zu Spätantike und Frühmittelalter, Serie B, Band 1. Hamburg: Verlag Dr. Kovačc, 77–94.

Vignatiová, J. 1992: *Břeclav-Pohansko II. Slovanské osídlení jižního předhradí*. Opera Universitatis Masarykianae Brunensis. Facultas Philosophica 291. Brno: Masarykova univerzita. Available also from: https://hdl.handle.net/11222.digilib/103563.

Villing, A. 2002: For whom did the bell toll in Ancient Greece? Archaic and classical Greek bells at Sparta and beyond. *The Annual of the British School at Athens* 97, 223–295.

Vita Constantini-Cyrilli: Vita Constantini-Cyrilli cum translatione s. Clementi. In: *Magnae Moraviae Fontes Historici II. Textus Bibliographici, Hagiographici, Liturgici*. D. Bartoňková et al. (eds.). Spisy University J. E. Purkyně v Brně 118. Brno: Universita J. E. Purkyně, 1967.

Vita Hludowici: Astronomus. Vita Hludowici imperatoris. E. Tremp (ed.). *Monumenta Germaniae Historica*, Scriptores rerum Germanicarum 64. Hannover: Hahn, 1995.

Vita Uodalrici: *Gerhard. Vita Uodalrici*. H. G. Pertz (ed.). Monumenta Germaniae Historica, Scriptores 4. Hannover: Hahn, 1844.

Vlček, P., Sommer, P., Foltýn, D. 1998: *Encyklopedie českých klášterů*. Praha: Libri.

Vlček, V. (ed.) 1984: *Zeměpisný lexikon ČSR. Vodní toky a nádrže*. Praha: Academia.

Volkova, N. G., Javakhishvili, G. N. 1982: *Bytovaya kul'tura Gruzii XIX-XX vekov. Traditsii i innovatsii*. Moskva: Nauka.

Voss, I. 1987: *Herrschertreffen im frühen und hohen Mittelalter. Untersuchungen zu den Begegnungen der ostfränkischen und westfränkischen Herrscher im 9. und 10. Jahrhundert sowie der deutschen und französischen Könige vom 11. bis 13. Jahrhundert*. Köln: Böhlau.

Vykypěl, B. 2011: *Studie k šlechtickým titulům v germánských, slovanských a baltských jazycích. Etymologie jako pomocná věda historická*. Studia etymologica Brunensia 11. Praha: Nakladatelství Lidové noviny.

Wachowski, K. 1992: *Kultura karolińska a Słowiańszczyzna zachodnia*. Acta Universitatis Wratislaviensis. Studia archeologiczne 23. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.

Wamers, E. 1994: *Die frühmitelalterlichen Lesefunde aus der Löhrstrasse (Baustelle Hilton II) in Mainz*. Mainzer Archäologische Schriften 1. Mainz: Archäologische Denkmalpflege, Amt Mainz.

Wamers, E. 2005: Aus Onkel Emlius' Schublade. Ein neuer kontinentaler Beschlag aus Lolland. In: H. Eilbracht, V. Brieske, B. Grodde (Hrsg.): *Itinera Archaeologica. Vom Neolithikum bis in die frühe Neuzeit. Festschrift für Torsten Capelle zum 65. Geburtstag*. Internationale Archäologie. Studia honoraria 22. Rahden/Westf.: Verlag Marie Leidorf, 303–313.

Wamers, E. 2008: Glaubesboten. „Aristokratische" Kunststile des 8. bis 10. Jahrhunderts n. Chr. In: G. Eggenstein et al. (Hrsg.): *Eine Welt in Bewegung. Unterwegs zu Zentren des frühen Mittelalters. Begleitbuch zur Gemeinschaftsausstellung. Historischen Museum im Marstall Paderborn – Schloss Neuhaus, 26.4. – 20.7.2008. Mainfränkischen Museum Würzburg, Festung Marienberg 12.8. – 16.11.2008*. München: Deutscher Kunstverlag, 37–50.

Wang, K., Tobias, B., Pany-Kucera, D., Berner, M., Eggers, S., Gnechi-Ruscone, G. A., Zlámalová, D., Gretzinger, J., Ingrová, P., Rohrlach, A. B., Tuke, J., Traverso, L., Klostermann, P., Koger, R., Friedrich, R., Wiltschke-Schrotta, K., Kirschengast, S., Liccardo, S., Wabnitz, S., Vida, T., Geary, P. J., Daim, F., Pohl, W., Krause, J., Hofmanová, Z. 2025: Ancient DNA reveals reproductive barrier despite shared Avar-period culture. *Nature* 638, 1007–1014. DOI: 10.1038/s41586-024-08418-5. Available also from: https://www.nature.com/articles/s41586-024-08418-5.

Watzlawick, W. 1976: *Wie wirklich ist die Wirklichkeit? Wahn, Täuschung, Verstehen*. Munich: Piper.

Wehner, D. 2012: *Das Land Stodor. Eine Studie zu Struktur und Wandel der slawenzeitlichen Siedlungsräume im Havelland und in der nördlichen Zauche*. Materialien zur Archäologie in Brandenburg 5. Rahden/Westf.: Verlag Marie Leidorf.

Weid, E. 2000: *Die Kleinfunde der mittelalterlichen Siedlung von Zuchering bei Ingolstadt*. Arbeiten zur Archäologie Süddeutschlands 10. Büchenbach: Verlag Dr. Faustus.

Wengenroth-Weimann, U. 1973: Die Grabungen an der Königspfalz zu Nieder-Ingelheim in den Jahren 1960–1970. *Beiträge zur Ingelheimer Geschichte* 23. Ingelheim am Rhein: Historischer Verein Ingelheim e. V., E. Emmerling.

Wenzel, A. 1997: *Zwischen Childerich und Karl dem Grossen. Der Ingelheimer Raum in fränkischer Zeit (5.–7. Jahrhundert). Katalog zur Ausstellung im Alten Rathaus Nieder-Ingelheim vom 30. August bis 28. September 1997*. Ingelheim am Rhein: Museum bei der Kaiserpfalz der Stadt Ingelheim am Rhein.

Werner, J. 1986: *Der Schatzfund von Vrap in Albanien*. Studien zur Archäologie der Awaren 2. Österreichische Akademie der Wissenschaften. Philosophisch-historische Klasse. Denkschriften 184. Wien: Verlag der Österreichischen Akademie der Wissseschaften.

Werner, K.-F. 1980: Missus – Marchio – Comes. Entre l'administration centrale et d'administration locale de l'Empire carolingien. In: W. Paravicini, K. F. Werner (Hrsg.): *Histoire comparée de l'Administration (IVe-XVIIIe siècles). Actes du XIVe colloque historique franco-allemand de l'Institut Historique Allemand de Paris*. Beihefte der Francia. Forschungen zur westeuropäischen Geschichte 9. Zürich, München: Artemis, 191–241. Available also from: https://perspectivia.net/receive/ploneimport_mods_00010143.

Werther, L. 2010: Schlacken, Scherben, Schlachtabfälle – archäologische Untersuchungen zu Ökonomie, Ökologie und Konsum im frühmittelalterlichen Nordbayern. *Siedlungsforschung. Archäologie – Geschichte – Geographie* 28, 237–272. Available also from: https://www.uni-bamberg.de/fileadmin/histgeo/ARKUM/Arkum_Zeitschrift_Siedlungsforschung/SF28-2010.pdf.

Westphalen, P. 1989: *Die Eisenschlacken von Haithabu. Ein Beitrag zur Geschichte des Schmiedehandwerks in Nordeuropa*. Berichte über die Ausgrabungen in Haithabu 26. Neumünster: Wachholtz Verlag.

Westphalen, P. 2002: *Die Eisenfunde von Haithabu*. Die Ausgrabungen von Haithabu 10. Neumünster: Wachholtz Verlag.

Whitfield, N. 1998: The Manufacture of Ancient Beaded Wire: Experiments and Observations. *Jewellery Studies* 8, 57–86.

WHO 2002: *Expert consultation on the optimal duration of exclusive breastfeeding*. Geneva: World Health Organisation.

WHO 2009: *Nutrition for Health. WHO child growth standards: growth velocity based on weight, length and head circumference. Methods and development*. Geneva: World Health Organization. Available also from: https://www.who.int/publications/i/item/9789241547635.

Wickham, C. 2005: *Framing the Early Middle Ages: Europe and the Mediterranean 400–800*. Oxford: Oxford University Press.

Wickham, C. 2011: The Changing Composition of early élites. In: F. Bougard, H.-W. Goetz, R. Le Jan (eds.): *Théorie et pratiques des élites au Haut Moyen Âge. Conception, perception et réalisation sociale / Theorie und Praxis frühmittelalterlicher Eliten. Konzepte, Wahrnehmung und soziale Umsetzung*. Collection Haut Moyen Âge 13. Turnhout: Brepols, 5–18. DOI: 10.1484/M.HAMA-EB.1.100109.

Wihoda, M. 2016: Druhý život mojmírovských knížat. In: J. Macháček, M. Wihoda (eds.): *Pád Velké Moravy aneb Kdo byl pohřben v hrobu 153 na Pohansku u Břeclavi?* Prameny české historie 2. Praha: Nakladatelství Lidové noviny, 144–165.

Wiki: Frankfurter Silberinschrift. In: *Wikipedia* [online]. [Accessed 2025-01-15] Available from: https://de.wikipedia.org/wiki/Frankfurter_Silberinschrift.

Willis, K. J., Rudner, Z. E., Sümegi, P. 2000: The full-glacial forest of Central and South Eastern Europe. *Quaernary Research* 53(2), 203–213. DOI: 10.1006/qres.1999.2119.

Available also from: https://www.cambridge.org/core/journals/quaternary-research/article/abs/fullglacial-forests-of-central-and-southeastern-europe/9B361BBEFE7D190EAE92C13C3254564C.

Wilson, W., Milner, J., Bulkan, J., Ehlers, P. 2006: Weaning practices of the Makushi of Guyana and their relationship to infant and child mortality. A preliminary assessment of international recommendations. *American Journal of Human Biology* 18(3), 312–324. DOI: 10.1002/ajhb.20500.

Winter, H. 1997: *Awarische Grab- und Streufunde aus Österreich. Ein Beitrage zur Siedlungsgeschichte*. Monographien zur Frühgeschichte und Mittelalterarchäologie 4. Innsbruck: Universitätsverlag Wagner.

Wissembourg Traditions: *Traditiones possesionesque Wizenburgenses*. Ed. C. Zeuss. Speyer 1842.

Wolf, P. A. 1970: Das Werk des Mainzer Hofschreiners Franz Anton Herrmann (1711–1770). *Mainzer Zeitschrift* 65, 1–35, Taf. 1–21.

Wolfram, H. 1967: *Intitulatio I. Lateinische Königs- und Fürstentiel bis zum Ende des 8. Jahrhunderts*. Mitteilungen des Instituts für Österreichische Geschichtsforschung. Ergänzungsband XXI. Wien, Köln, Graz: Hermann Böhlaus Nachfolger.

Wolfram, H. 1995: *Salzburg, Bayern, Österreich. Die Conversio Bagoariorum et Carantanorum und die Quellen ihrer Zeit*. Mitteilungen des Instituts für Österreichische Geschichtsforschung. Ergänzungsband 31. Wien, Köln, Graz: R. Oldenbourg Verlag. Available also from: https://www.vr-elibrary.de/doi/book/10.7767/boehlau.9783205159803.

Wolfram, H. 2010: D. Arnolf 32. Wortbruch II. In: A. Thaller et al. (Hrsg.): *Nulla historia sine fontibus. Festschrift für Reinhard Härtel zum 65. Geburtstag*. Schriftenreihe des Instituts für Geschichte 18. Graz: Leykam, 530–541.

Wood, I. N. 2001: *The missionary life. Saints and the evangelisation of Europe, 400–1050*. Harlow: Longman.

Wood, J. W., Milner, G. R., Harpending, H. C., Weiss, K. M. 1992: The osteological paradox. Problems of inferring prehistoric health from skeletal samples. *Current Anthropology* 33(4), 343–370. Available also from: https://1url.cz/DJ8lf.

YouTube 1: *Archeologický ústav AV ČR, Praha, v. v. i. Za tajemstvím tismického zlatníka. Dokument*. In: YouTube [online]. December 19, 2024 [Accessed 2025-11-18]. Available from: https://www.youtube.com/watch?v=njS-RrfmD8w.

YouTube 2: *Archeologický ústav AV ČR, Praha, v. v. i. Secret of Tismice Goldsmith. Document*. In: YouTube [online]. December 19, 2024 [Accessed 2025-11-18]. Available from: https://youtu.be/DDak20ZFcSY.

Zábojník, J. 1995: Soziale Problematik der Gräberfelder des nördlichen und nordwestlichen Randgebietes des Awarischen Kaganats. *Slovenská archeológia* XLIII(2), 205–344. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1995_2.pdf.

Zábojník, J. 1999: Materiálna kultúra nálezísk z obdobia avarského kaganátu na Slovensku. In: A. Avenarius, Z. Ševčíková (eds.): *Slovensko a európsky juhovýchod. Medzikultúrne vzťahy a kontexty* (*Zborník k životnému jubileu Tatiany Štefanovičovej*). Studia Archaeologica et Medievalia V. Bratislava: Filozofická fakulta Univerzity Komenského v Bratislave, 189–222.

Zábojník, J. 2009: *Slovensko a avarský kaganát*. Druhé prepracované a doplnené vydanie. Studia Archaeologica et Medievalia IX. Bratislava: Filozofická fakulta Univerzity Komenského v Bratislave.

Zábojník, J. 2012: Chamtivosť, nenávisť, bázeň, strach alebo úcta? K problematike sekundárnych zásahov do hrobov na pohrebiskách z obdobia avarského kaganátu na území Slovenska. *Acta Historica Neosoliensia* XV, 35–46. Available also from: https://ahn.umb.sk/wp-content/uploads/2020/06/AHN-tomus-15.pdf.

Zachar, J., Mácelová, M., Furman, M. 2011: Archeologický výskum v Hornom Hričove. *Archeologické výskumy a nálezy na Slovensku v roku* 2008, 277. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_2008.pdf.

Zavřel, J. 2023: *Stará Boleslav – petrografické posouzení kamenného nálezu 12191, ul. Maxe Švabinského ppč. 1665, vrstva 14202*. Manuscript of the expert report. Stored in: Archive of the Institute of Archaeology of the Czech Academy of Science, Praha.

Zeiler, M., Garner, J., Golze, R. 2022: Des sey ein alt werck. Die Montanregion zwischen Rhein, Lippe und Lahn bis zum 14. Jahrhundert. *Ausgrabungen und Funde in Westfalen-Lippe* 16, 113–244. DOI: 10.11588/afwl.2022.1.93775. Available also from: https://doi.org/10.11588/afwl.2022.1.93775.

Zeller, G. 1990: Das fränkische Gräberfeld von Ingelheim, Rotweinstrasse, Grabungskampagne 1978–79. *Mainzer Zeitschrift* 84/85 (1989/1990), 305–367.

Zeller, G. 1992: *Die fränkischen Altertümer des nördlichen Rheinhessens. Teil 1. Text, Teil 2. Katalog und Tafeln*. Germanische Denkmäler der Völkerwanderungszeit, Serie B. Die fränkischen Altertümer des Rheinlandes 15. Stuttgart: Franz Steiner Verlag.

Zeller, G. 2008: Das fränkische Gräberfeld von Ingelheim, Rotweinstraße, Grabung 1990. *Mainzer Archäologische Schriften* 8, 269–276.

Žemlička, J. 1978: Přemyslovská hradská centra a počátky měst v Čechách. *Československý časopis historický* XXVI, 559–586. Available also from: https://1url.cz/TJkjb.

Zeno: *Oriental Coins Database* [online]. © 2002-2025 Vladimir Belyaev [Accessed 2025-03-19]. Available from: https://www.zeno.ru/.

Zenodo Gold gombíky: Pługawko, M.: *Gold gombíky from Mikulčice and Staré Město - Uherské Hradiště: EDS spectra* [Data set]. Zenodo. 2025. DOI 10.5281/zenodo.18482083. Available from: https://doi.org/10.5281/zenodo.18482083.

Zhu, J., Lowen, S. B., Anderson, C. M., Ohashi, K., Khan, A., Teicher, M. H. 2019: Association of prepubertal and postpubertal exposure to childhood maltreatment with adult amygdala function. *JAMA psychiatry* 76(8), 843–853. DOI: 10.1001/jamapsychiatry.2019.0931.

Zimmermann, M. 1981: La datation des documents catalans du IXe au XIIe siècle. Un itinéraire politique. *Annales du Midi* 93, 345–375. Available also from: https://www.persee.fr/doc/anami_0003-4398_1981_num_93_154_1971.

Zimmermann, M. 1982: Un formulaire du Xe siècle conservé à Ripoll. *Faventia*, 4(2), 25–86. Available also from: https://raco.cat/index.php/Faventia/article/view/49770/60609.

Zimmermann, M. 1991: Catalogne et Regnum Francorum. Les enseignements de la titulature comtale. In: *Symposium Internacional sobre els orígens de Catalunya* (*Segles VIII-IX*). *Vol. 2*. Memorias de la Real Academia de Buenas Letras de Barcelona 24. Barcelona: Real Academia de Buenas Letras de Barcelona, 209–263. Available also from: https://raco.cat/index.php/MemoriasRABL/article/view/202484.

Zimmermann, M. 1999: West Francia. The southern principalities. In: T. Reuter (ed.): *New Cambridge Medieval history III, c. 900– c. 1024*. Cambridge: Cambridge University Press, 420–455.

Zipp, K. 2014: *Anthropologisches Gutachten zu. Mittelalterliche Skelettfunde aus der katholischen Pfarrkirche St. Remigius in Ingelheim, Arbeitsbericht*. Manuscript on evaluation of anthropological material. Stored in: Forschungsstelle Kaiserpfalz Ingelheim.

ŽK: Žitije Konstantina. In: *Magnae Moraviae fontes historici 2*. R. Večerka (ed.). Brno: Státní nakladatelství krásné literatury, 1967.

ŽM: Žitije Mefodija. In: *Magnae Moraviae fontes historici 2*. R. Večerka (ed.). Brno: Státní nakladatelství krásné literatury, 1967.

Znamierowska-Prüfferowa, M. 1988: *Tradycyjne rybołówstwo ludowe w Polsce na tle zbiorów i badań terenowych Muzeum Etnograficznego w Toruniu*. Toruń: Muzeum Etnograficzne w Toruniu.

Zotz, T. 1993: Schriftquellen zum Bergbau im frühen Mittelalter. In: H. Steuer, U. Zimmermann (Hrsg.): *Montanarchäologie in Europa. Berichte zum Internationalen Kolloquium »Frühe Erzgewinnung und Verhüttung in Europa« in Freiburg im Breisgau vom 4. bis 7. Oktober 1990*. Archäologie und Geschichte 4. Sigmaringen: Jan Thorbecke Verlag, 183–199. DOI: 10.11588/propylaeum.1030.c14273. Available also from: https://doi.org/10.11588/propylaeum.1030.c14273.

Zúbrik, M., Kunca, A. 2011: *Hmyz a huby našich lesov. Atlas škôd na drevinách spôsobených hubami a škodlivým hmyzom*. Zvolen: Národné lesnícke centrum.

List of authors

Ludmila Barčáková, DiS.
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
barcakova@arup.cas.cz
ORCID: 0009-0002-5006-3096

Prof. US Dr. hab. Felix Biermann
University of Szczecin
Institute of History
Krakowska 71-79
PL-71-017 Szczecin

The State Office for Heritage Management
and Archaeology Saxony-Anhalt
State Museum of Prehistory
Richard-Wagner-Straße 9
DE-06114 Halle (Saale)
FBiermann@lda.stk.sachsen-anhalt.de
ORCID: 0000-0001-9616-0620

PhDr. Ivana Boháčová, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
bohacova@arup.cas.cz
ORCID: 0009-0001-9881-5982

† **Prof. RNDr. Jaroslav Brůžek, CSc., Ph.D.**
Charles University
Faculty of Science
Department of Anthropology and Human Genetics
Viničná 1594/7
CZ-12800 Prague
ORCID: 0000-0002-2478-9662

Univ.-Prof. Doz. Dr. Falko Daim
University of Vienna
Department of Prehistoric and
Historical Archaeology
Franz-Klein-Gasse 1
A-1190 Vienna
falko.daim@univie.ac.at
ORCID: 0000-0003-2873-2361

Mgr. Sylva Drtikolová Kaupová, Ph.D.
National Museum
Department of Anthropology
Václavské náměstí 1700/68
CZ-11000 Prague 1
sylva.kaupova@nm.cz
ORCID: 0000-0002-7050-3573

Mgr. Daniel Dvořáček
Czech Academy of Sciences
Institute of Philosophy
Jilská 361/1
CZ-11000 Prague
E-mail: dvoracek@flu.cas.cz
ORCID: 0000-0003-3101-0159

University of Leipzig
Faculty of History, Art and Area Studies
Department of History
Ritterstraße 14
DE-04109 Leipzig

Regionální muzeum v Kolíně, p. o.
Oddělení archeologické
Karlovo náměstí 8
CZ-28002 Kolín

PhDr. Soňa Dvořáčková
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
hendrychova@arup.cas.cz
ORCID: 0000-0002-5810-174X

Martin Fořt, DiS.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
fort@arub.cz
ORCID: 0009-0000-9522-7010

Mgr. Jana Fořtová Torňošová
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
fortova@arub.cz

PhDr. Jan Frolík, CSc.
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
frolik@arup.cas.cz
ORCID: 0000-0002-1776-1311

PhDr. Drahomíra Frolíková, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
frolikova@arup.cas.cz
ORCID: 0009-0004-3190-9951

PhDr. Gabriel Fusek, CSc.
Slovak Academy of Sciences
Institute of Archaeology
Akademická 2
SK-94921 Nitra
gabriel.fusek@savba.sk
ORCID: 0000-0002-6665-1987

doc. PhDr. Luděk Galuška, CSc.
Moravian Museum
Centre for Slavonic Archaeology
Velehradská třída 537
CZ-68601 Uherské Hradiště
lgaluska@mzm.cz
ORCID: 0000-0002-1374-651X

Mgr. Matylda Gierszewska-Noszczyńska, M.Sc.
Forschungsstelle Kaiserpfalz Ingelheim
Mainzer Straße 68
DE-55218 Ingelheim am Rhein
matylda.gierszewska-noszczynska@ingelheim.de
ORCID: 0009-0005-8478-511X

Mgr. Michal Hlavica, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
hlavica@arub.cz
ORCID: 0000-0002-6850-9933

RNDr. Eva Jamrichová, Ph.D.
Czech Academy of Sciences
Institute of Botany, Department of Paleoecology
Lidická 25/27
CZ-60200 Brno
eva.jamrichova@ibot.cas.cz
ORCID: 0000-0003-1259-9463

doc. Mgr. David Kalhous, Ph.D.
Masaryk University
Faculty of Arts
Department of Auxiliary Historical
Sciences and Archive Studies
Arna Nováka 1/1
CZ-60200 Brno
david.kalhous@phil.muni.cz
ORCID: 0000-0002-6903-9371

doc. PhDr. Pavel Kouřil, CSc.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
kouril@arub.cz
ORCID: 0000-0003-0880-3281

Mgr. Šárka Krupičková, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
krupickova@arub.cz
ORCID: 0000-0002-4834-1061

Bc. Jakub Langr
Moravian Museum
Centre for Slavonic Archaeology
Velehradská třída 537
CZ-68601 Uherské Hradiště
jlangr@mzm.cz

Mgr. Michaela Látková, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
latkova@arub.cz
ORCID: 0000-0002-8855-3165

Michael Lebsak, M.A.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
lebsak@arub.cz
ORCID: 0000-0003-4836-6071

Dorota Malarczyk, M. A.
Muzeum Narodowe w Krakowie
Gabinet Numizmatyczny
Marszałka Józefa Piłsudskiego 12
PL-31-109 Kraków
dmalarczyk@mnk.pl
ORCID: 0000-0002-7415-7049

Mgr. Piotr Noszczyński, M.Sc.
Forschungsstelle Kaiserpfalz Ingelheim
Mainzer Straße 68
DE-55218 Ingelheim am Rhein
piotr.noszczynski@ingelheim.de

PhDr. Karol Pieta, DrSc.
Slovak Academy of Sciences
Institute of Archaeology
Akademická 2
SK-94921 Nitra
karol.pieta@savba.sk
ORCID: 0000-0002-7415-7049

Michał Płygawko, M.Sc.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
plygawko@arub.cz
ORCID: 0009-0008-9458-5252

doc. PhDr. Rudolf Procházka, CSc.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
prochazka@arub.cz
ORCID: 0000-0001-5872-4106

PhDr. Naďa Profantová, CSc.
Czech Academy of Sciences
Institute of Archaeology, Prague
Letenská 123/4
CZ-11801 Prague 1
profantova@arup.cas.cz
ORCID: 0000-0002-5033-272X

Mgr. Zbigniew Robak, PhD.
Masaryk University
Faculty of Arts
Department of Archaeology and Museology
Arna Nováka 1/1
CZ-60200 Brno
zbigniew.robak@mail.muni.cz
ORCID: 0000-0002-4819-468X

Kayleigh Saunderson, BA MA
University of Vienna
Department of Prehistoric and
Historical Archaeology
Franz-Klein-Gasse 1
A-1190 Wien
kayleigh.saunderson@univie.ac.at
ORCID: 0000-0002-8561-6204

Mgr. Šimon Ungerman, Ph.D.
Czech Academy of Sciences
Institute of Archaeology, Brno
Čechyňská 363/19
CZ-60200 Brno
ungerman@arub.cz
ORCID: 0009-0000-8198-3800

Mgr. Lucie Valášková
Moravian Museum
Centre for Slavonic Archaeology
Velehradská třída 537
CZ-68601 Uherské Hradiště
lvalaskova@mzm.cz
ORCID: 0000-0002-3076-5384

prof. RNDr. Jana Velemínská, Ph.D.
Charles University
Faculty of Science
Department of Anthropology
and Human Genetics
Viničná 1594/7
CZ-12800 Prague
jana.veleminska@natur.cuni.cz
ORCID: 0000-0002-5213-951X

RNDr. Petr Velemínský, Ph.D.
National Museum
Department of Anthropology
Václavské náměstí 1700/68
CZ-11000 Prague 1
petr_veleminsky@nm.cz
ORCID: 0000-0003-3691-7817

doc. PhDr. Jozef Zábojník, CSc.
Slovak Academy of Sciences
Institute of Archaeology
Akademická 2
SK-94921 Nitra
jozef.zabojnik@savba.sk
ORCID: 0000-0002-2376-5167

Spisy Archeologického ústavu AV ČR Brno 85
ISSN 1804-1345

Early medieval elite culture in supra-regional perspective: Society, centres, artefacts

Šárka Krupičková, Rudolf Procházka, Šimon Ungerman et al.

Authors in alphabetical order:
Ludmila Barčáková, Felix Biermann, Ivana Boháčová, † Jaroslav Brůžek, Falko Daim, Sylva Drtikolová Kaupová, Daniel Dvořáček, Soňa Dvořáčková, Martin Fořt, Jana Fořtová Torňošová, Jan Frolík, Drahomíra Frolíková, Gabriel Fusek, Luděk Galuška, Matylda Gierszewska-Noszczyńska, Michal Hlavica, Eva Jamrichová, David Kalhous, Pavel Kouřil, Šárka Krupičková, Jakub Langr, Michaela Látková, Michael Lebsak, Dorota Malarczyk, Piotr Noszczyński, Karol Pieta, Michał Pługawko, Rudolf Procházka, Naďa Profantová, Zbigniew Robak, Kayleigh Saunderson, Šimon Ungerman, Lucie Valášková, Jana Velemínská, Petr Velemínský, Jozef Zábojník

Editor-in-chief: Balázs Komoróczy
Editors: Martina Kudlíková, Markéta Kamenská

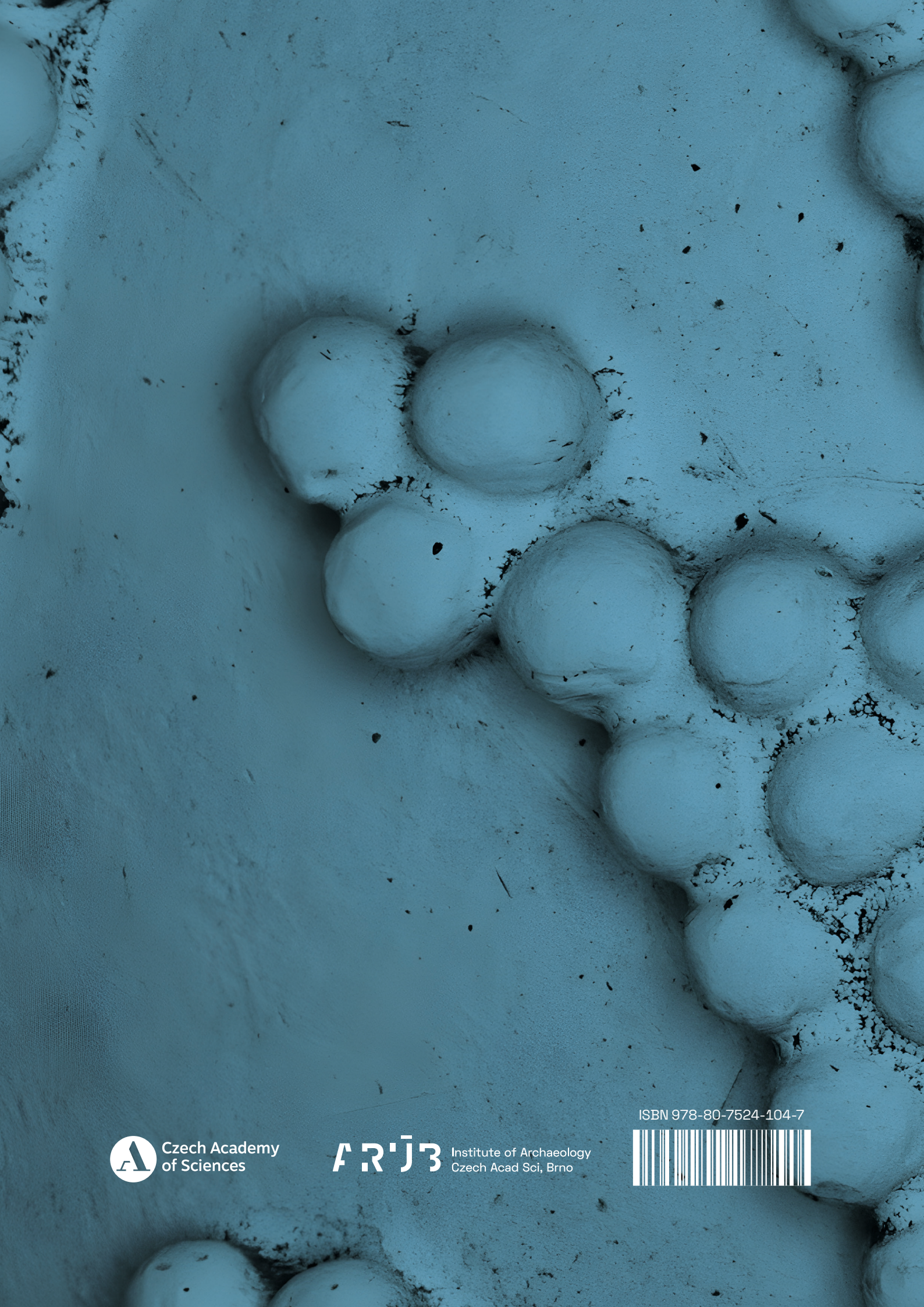
Editorial support: Hedvika Břínková, Jakub Knobloch, Jan Šimek
Translation and proofreading: David Joseph Gaul, Milan Rydvan
Cover design and typesetting: Milan Filip, Markéta Kamenská
Print: Tiskárna Helbich, a. s., Valchařská 36, 614 00 Brno, Czech Republic
First edition

Publisher: Czech Academy of Sciences, Institute of Archaeology, Brno
Čechyňská 363/19, 602 00 Brno, Czech Republic, www.arub.cz

Brno 2025

ISBN 978-80-7524-104-7 (print)
ISBN 978-80-7524-105-4 (online ; pdf)

DOI: 10.47382/arub2025-05



ISBN 978-80-7524-104-7

Czech Academy of Sciences

ARÚB Institute of Archaeology Czech Acad Sci, Brno