

X

INTERNATIONALE TAGUNGEN IN MIKULČICE



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MIKULČICE RIVER ARCHAEOLOGY
NEW INTERDISCIPLINARY RESEARCH
INTO BRIDGE No. 1

Lumír Poláček (ed.)

Mikulčice River Archaeology.
New Interdisciplinary Research into Bridge No. 1

SPIŠY ARCHEOLOGICKÉHO ÚSTAVU AV ČR BRNO
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INTERNATIONALE TAGUNGEN IN MIKULČICE
(ITM)

herausgegeben von
Lumír Poláček • Pavel Kouřil

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Band X

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Edited by
LUMÍR POLÁČEK

THE INSTITUTE OF ARCHAEOLOGY
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List of contributors

Mgr. Peter Barta, Ph.D.
Katedra archeológie UK
Gondova 2
SK-814 99 Bratislava
peterbarta@chello.sk

Mgr. Alena Dohnalová
Ústav geologických věd PřF MU Brno
Kotlářská 2
CZ-611 37 Brno
alena16@seznam.cz

Doc. Mária Hajnalová, PhD.
Katedra Archeológie FF UKF Nitra
Hodžova 1
Nitra 949 01
mhajnalova@ukf.sk

RNDr. Pavel Havlíček, CSc.
Česká geologická služba
Klárov 3
CZ-118 21 Praha-1
pavel.havlicek@geology.cz

Mgr. Marek Hladík, Ph.D.
Archeologický ústav AV ČR, Brno, v. v. i.
Detašované pracoviště Mikulčice
CZ-696 19 Mikulčice 736
hladik@aurb.cz

Ing. Tomáš Kolář, Ph.D.
Ústav nauky o dřevě
Lesnická a dřevařská fakulta
MENDELU v Brně
Zemědělská 3
CZ-613 00 Brno
koldatom@gmail.com

Mgr. Michaela Látková
Katedra Archeológie FF UKF Nitra
Hodžova 1
Nitra 949 01
michaelalatкова@gmail.com

Doc. RNDr. Slavomír Nehyba, Dr.
Ústav geologických věd
Přírodovědecká fakulta MU
Kotlářská 2
CZ-611 37 Brno
slavek@sci.muni.cz

PhDr. Lumír Poláček, CSc.
Archeologický ústav AV ČR, Brno, v. v. i.
Čechyňská 363/19
602 00 Brno
polacek@arub.cz

Ing. Michal Rybníček, Ph.D.
Ústav nauky o dřevě
Lesnická a dřevařská fakulta
MENDELU v Brně
Zemědělská 3
CZ-613 00 Brno
michalryb@post.cz

Prof. Dr. Libuše Smolíková, DrSc.
Ústav geologie a paleontologie
Přírodovědecká fakulta UK
Albertov 6
CZ-128 43 Praha 2

Jaroslav Škojec
Archeologický ústav AV ČR, Brno, v. v. i.
Detašované pracoviště Mikulčice
CZ-696 19 Mikulčice 736
skojec@arub.cz

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Foreword

On the 24 and 25 September 2012 the Institute of Archaeology in Brno – together with two German partners, Archäologisches Landesmuseum Schleswig and Geisteswissenschaftliches Zentrum Geschichte und Kultur Ostmitteleuropas Leipzig – organised an international colloquium called *Usus aquarum – Wasser und Wasserbauten im Leben der frühmittelalterlichen Gesellschaften Mitteleuropas* which was part of the series of conferences *Internationale Tagungen in Mikulčice*. The conference took place in the Panon Hotel in Hodonín. Twenty-five researchers from the Czech Republic, Slovakia, Slovenia, Croatia, Austria, Germany and the USA took part and 14 papers were presented. The conference, as well as the planned anthology *ITM-X*, are outcomes of a Czech Science Foundation project called “Ninth-Century Bridges in Mikulčice – River Archaeology and Palaeoarchaeology” (No. P405/11/2258).

Because the editors of the “*Usus aquarum*” anthology that was originally planned received only five contributions, these were published by the *Přehled výzkumů* journal instead (year 55/2014, No. 2), which is edited by the Institute of Archaeology in Brno; they filled the “studies” block. Planned issue No. X of the series published by *Internationale Tagungen in Mikulčice*, which was rendered blank, published this collective monograph “Mikulčice River Archaeology. New Interdisciplinary Research into Bridge No. 1” instead of the originally intended content. Both the publications – the block of contributions in *Přehled výzkumů* and issue X of the *ITM* series – are the output of the aforementioned grant, No. P405/11/2258.

The present volume contains a complex interdisciplinary assessment of excavation B 2012. Its aim

was to finalise the excavation into bridge No. 1 in Mikulčice and to check the situation of the adjacent river channel. The excavation and the post-excavation analysis were part of the work funded by the aforementioned grant. This book is divided into chapters with contributions from the specialisations involved: archaeology, dendrochronology, geology and pedology, sedimentology, botanical analysis of plant macro-remains, radiocarbon dating and palynology. In this book we present the latest findings of Mikulčice river archaeology.

The impulse to prepare this publication came from a working team meeting that took place on 24 June 2013 in Mikulčice. Contributions by various archaeologists and natural scientists dealing with excavation B 2012 were discussed there. It was a new form of work meeting, which differs from the existing tradition of *ITM* colloquiums. The thematic scope is narrowed down, the number of participants lower, and in-depth discussion and joint formulation of the results is preferred. The form of the book has been modified to suit this. Instead of anthologies, such as have been published so far, some of the *ITM* volumes will take the form of collective monographs, joint studies and articles. This fits not only the changing requirements that have to be fulfilled by scientific publications within the evaluation criteria for science and research in the Czech Republic, but also the needs of the research itself: the need for a focus on intensive team solutions when addressing key research issues. The language used depends on the contents of a given publication – English, in the case of this volume, corresponds with the majority of natural scientific papers.

It is my pleasant duty to thank all the members of the team of authors for their collaboration on the research and the preparation of this volume. I am obliged to Miriam Nývltová-Fišáková for her analysis of osteological material and arranging the radiocarbon dating and to Michal Horsák for the assessment of malacological finds. In addition, I would like to thank Pavel Kouřil, Director of the Institute

of Archaeology of the Academy of Sciences of the Czech Republic in Brno for his support during the preparation of this book. I would also like to thank Tereza Bartošková, Richard Skolek, Libuše Jilemnická and Dana Markova for their translation of part of the content and Paul Maddocks for proofreading all the present texts.

Lumír Poláček

CHAPTER I

Notes on river archaeology in Mikulčice

LUMÍR POLÁČEK

Introduction

In the 9th century, Mikulčice was one of the most prominent fortified settlements of the Slavic state usually referred to as Great Moravia and which was located to the north of the middle section of the Danube. This state was characterised by its tendency to put its main centres of power on the floodplains of great rivers – namely, the Morava and Dyje. These centres consisted of island castles built on small hills, either in river meanders or between forked river branches. In the flatlands of South Moravia, the islands constituted perfect locations that were sought after for their inherent strategic value. They derived their geopolitical significance mainly from the river itself – the Morava was linked to the Danube, which was a very important and far-reaching trade route. To the inhabitants of the castle, the river offered some economic advantages, but it also meant the permanent danger of floods, even though living standards on the floodplains in the 9th century must have been optimal (POLÁČEK 1999; 2001; 2007).

However, Great Moravia existed for less than a century; the descendants of Mojmir I were defeated by the Hungarians at the beginning of the 10th century and the main centres of power were wiped out along with the state itself, including Mikulčice. The site of the former castle continued to be occupied by a small group of people, but it was completely abandoned during the 13th century, probably because of periodic floods that became more frequent and common. Researchers often ask

themselves if Mikulčice's downfall was at least partly caused by the environmental changes that started occurring in the 10th century; this question is also at the centre of Mikulčice's contemporary river archaeology.

River archaeology is relatively new in the Czech Republic.¹ Archaeological excavations within the space of existing or filled-up Czech rivers are quite rare and research in this area is confined to isolated and limited efforts. The only major archaeological research into Czech river systems to date was carried out by Z. Klanica between 1966 and 1984 and took place in Mikulčice.² This research is as yet unmatched by any other in the Czech Republic both in its scope and its significance, and even in its technological backing. Unfortunately, it was carried out in an era when interdisciplinary research was not advanced enough to provide adequate solutions to

1 See the main topic of the journal *Živá archeologie* 9, 2008 "Water and Archaeology" (Voda a archeologie). The Czech Republic is not represented in *Archéologie fluviale en Europe, Dossiers d'archéologie* N° 331, 2009.

2 See preliminary reports on the excavations, mainly in the form of brief reports or mere references: KLANICA 1967, 44–45, Tab. 22–23, 45–47; KLANICA 1968, 61–63, Tab. 45–49, 56–58; KLANICA 1970, 47–49, Tab. 39–40; KLANICA 1973; KLANICA 1974, 56–57, Tab. 66–72; KLANICA 1977, 49, Tab. 14–16; KLANICA 1980a, 56; KLANICA 1980b, 27; KLANICA 1981; KLANICA 1982, 19–20; KLANICA 1985, 40; KLANICA 1987, 35. Relevant information is only in KLANICA 1968, 61–63; KLANICA 1973; KLANICA 1977, 49; KLANICA 1985, 40; KLANICA 1987, 35.

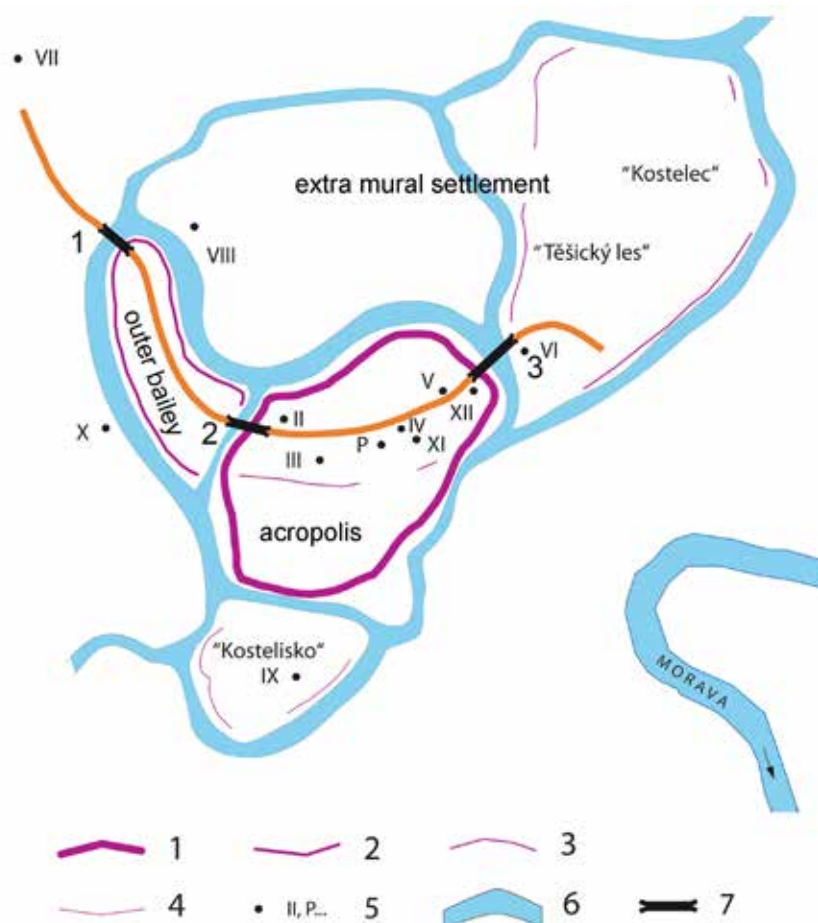


Fig. 1.1 The Mikulčice-Valy stronghold. A schematic depiction of its topography including presumed locations of the main road and the three bridges. Notes: fortification of the acropolis, 2 – archaeologically proven fortification of the outer bailey, 3 – earthen dike along the perimeter of Těšice Forest in the extra-mural settlement, 4 – terrain borders of elevated parts of the acropolis and the extra-mural settlement, 5 – officially accepted order of churches (II, III, ...) and the palace (P), 6 – presumed location of the river branches, 7 – bridges. After POLÁČEK 2011.

a range of archaeological and environmental problems. Even so, its contribution was absolutely crucial and it is only fair to say that it is “irreproducible”.

The new excavation of the river branch in Mikulčice from 2012 (some 30 years after the end of the large-scale excavations) was initiated to confirm questions derived from analyses of the original river systems research (see POLÁČEK 2012; HLADÍK/POLÁČEK 2013). A complete post-excavation interdisciplinary analysis of the B 2012 space is included in this volume. All excavated areas connected to filled-up river branches in Mikulčice are now being systematically processed.³

Mikulčice – topography of the Early Middle Ages agglomeration

In the 9th century, Mikulčice was a large and complex urban agglomeration. It was located on both banks of the – nowadays regulated – River Morava: it spread from today's Mikulčice on the Czech side to Kopčany on the Slovak side. A fortified core that was situated in Mikulčice-Valy occupied an area of approximately 25 acres and consisted of an acropolis and an outer bailey (Fig. 1.1, 1.3). This core was ringed by approximately 75 acres of small disconnected settlements. The locations of three gates and their respective three wooden bridges indicate the

3 All these works are part of the Czech Republic grant agency project called “Mosty 9. století v Mikulčicích. Říční archeologie a paleoekologie” (Mikulčice's bridges

of the 9th century. River archaeology and palaeoecology), No. P405/11/2258.

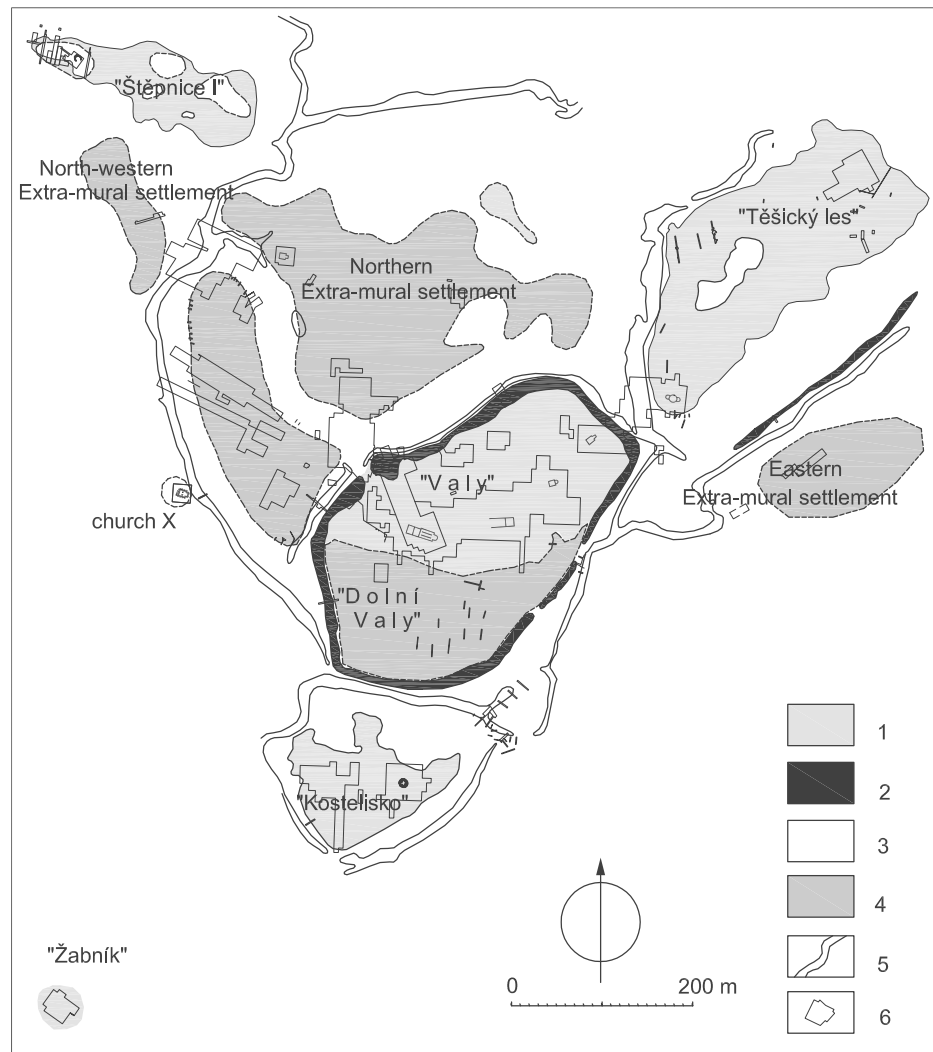


Fig. 1.2 The Mikulčice-Valy stronghold. Compound diagram including geological situation and extent of settlement. 1 – sand dunes, 2 – anthropogenic elements (the acropolis' dike), 3 – flood sediments, 4 – settlements on flood sediments, 5 – dried-up branches and recent gutters, 6 – area excavated. After POLÁČEK/MAREK 2005.

main communication route within the castle. This **route** was probably connected to the far-reaching trade route that went through the valley of the River Morava within the Mikulčice area (for the topography of this locality see POLÁČEK/MAREK 2005, 33–36; further information in POLÁČEK/MAZUCH/BAXA 2006, 624–627). In terms of settlement agglomeration structure, the bridges and the gates can be regarded as key elements (POLÁČEK 2011; 2012). When determining how high the main route went outside the fortified core, we have to rely on landscape reconstruction, especially on terrain relief. In those times, routes that led through regularly flooded areas were usually set on elevated terrain, the same rule of thumb that we have observed in floodplains over the past centuries.

The core of this settlement agglomeration was located on the River Morava floodplains and it originally included several islands between the river's branches. The whole fortified core was probably protected by an unbroken circle of river branches (Fig. 1.2, 1.3).⁴ The islands were linked via the three **bridges** mentioned earlier, so that the extra-mural settlement, the acropolis and the outer bailey were all connected. It is more than probable that there

4 The fact that the Mikulčice castle (as it was in the 9th century) was located on the river islands was only discovered in 1964, a good 10 years after work had begun. It was discovered because of the P 1963-64 excavation which went through the front gate fortification and discovered a 9th century river bed filling on the other side.

were other bridges as well, allowing the inhabitants to move from one part of the castle to another. Whether we will be able to locate these bridges or not depends on further archaeological excavations and on a general reconstruction of Mikulčice's historical landscape.

Thanks to mechanical probing carried out in 1961, we know **the extent and structure of settlement areas** in the lower parts of the castle surroundings (i.e. with the exception of the sand dune) (POULÍK 1962, 84; POLÁČEK 1996, 219, Abb. 4). The settlement was not one continuous area encircling the fortified core, but rather several smaller scattered areas labelled the north-western, northern and eastern castle surroundings; we have yet to find any major traces of settlement on the western side in the vicinity of the tenth church (Fig. 1.2, 1.3; POLÁČEK/MAREK 2005, 33–36; HLADÍK/MAZUCH/POLÁČEK 2008). The location and segmentation of these settlement areas is probably the result of the given environmental conditions in the vicinity of the castle, mainly the geomorphological and hydrographic ones. Therefore, we need to reconstruct the network of river branches in the lower part of the castle surroundings so that we can better understand the settlement structure (POLÁČEK 2001, 318).

Geomorphological and geological conditions at the Mikulčice agglomeration

The 9th century landscape differed vastly from the current one, levelled with flood loams. The original landscape was more ragged – it included small sand dune hills and river terraces filled with clay, and it was crossed by a network of both filled-up and active **river branches** (OPRAVIL 1983, 23–33). Botanical research has discovered that the water in the river channel that ringed the castle flowed slowly and was even stagnant at times. We know for a fact that it did not flood the large surrounding areas (as was recorded numerous times throughout the Late Middle Ages and the modern era, and as we experienced before it was regulated in 1971). The river branches and pools were key floodplain elements that delineated the borders of various islands and peninsulas that were ideal either for settlement, agriculture or other

activities. The channels represented a natural (albeit sometimes rather symbolic) line of defence for the castle and its surroundings (POLÁČEK 1997, 38; HAVLÍČEK/POLÁČEK/VACHEK 2003, 16–18).

Sand dunes were one of the prominent geomorphological elements of the Mikulčice landscape – they are visible in the levelled terrain of the floodplains even today and local inhabitants call them “hrúdy” (Fig. 1.2).⁵ These small elevations had bases of fluvial sands, which grew less coarse higher up and their tops betrayed traces of sand movement (HAVLÍČEK/NEHYBA 1998). During the prehistoric era and the Early Middle Ages, sand dunes were highly prized as ideal settlement spots. They were used for founding and delineating individual castle parts, and also to build fortifications on, make new roads and find places for important buildings. These areas had optimal living conditions, and so sand dune regions had the highest concentrations of people and the longest continuity of settlement. Sand elevations were also preferred as burial grounds. In the central part of our agglomeration, the maximum height disparity between the highest places on the dunes and at the bottom of the river ranged between 5 and 6 meters (the difference was greater in the case of the fortified core because it was artificially raised by the wall) (POLÁČEK 2012, 25–26).

The most recent and most widespread sediments within the area of the early Mikulčice agglomeration are clayey and clayey-sandy **flood loams** (POLÁČEK 1997, 39–40; HAVLÍČEK/POLÁČEK/VACHEK 2003, 18–19). They cover the lowest areas and fill out most depressions, including the upper part of filled-up river branches (Fig. 1.2). The only significantly elevated area of the fortified core that was created by an accumulation of flood loams is the outer bailey. It is also the only known flood loam area within Mikulčice that was settled in the prehistoric era during the European Iron Age (these soils are called “older flood loams”; see POLÁČEK 1997, 39–40). Other flood loams, or their upper parts, come mainly from the Late Middle Ages and the modern era (these are called “younger flood loams”). These more recent flood loams probably started to accumulate

5 POLÁČEK 1997, 33–37; HAVLÍČEK/POLÁČEK/VACHEK 2003, 14–16, Abb. 4–9, 11; POLÁČEK/MAREK 2005, 13–14.



Fig. 1.3 The Mikulčice-Valy stronghold. A – Orthophotomap of the stronghold area; B – Orthophotomap of the stronghold area. Blue: filled-up river channels; white-red: – fortified core (acropolis and outer bailey); red – inhabited areas in the extramural area; white – excavated area; II, III ... Churches No. I, II...; P – “palace”. Photo and graphics by Geo-cz.

in the 13th century and their sedimentation process ended only once the River Morava was regulated (if we disregard sediments from the 1997 and 2006 floods when cofferdams proved inadequate). Floods brought about a change in both hydrographical regime and the vegetation cover of the valley floodplains. The vegetation of the 9th century (typical of so-called hardwood floodplains) gave way to the modern type, which is associated with periodically flooded softwood floodplains (OPRAVIL 1983).

Hydrographical conditions at the Mikulčice agglomeration

There are two main problems to be solved – reconstructing the river network and better understanding the water regime in the channels surrounding the castle. **The reconstruction of the historical river network** over the wider area of the castle surroundings is a complicated task. To map the current terrain and water relief is of limited use here. We can guess at the historical situation by studying the filled-up branches, smaller streams and active river channels, but this will only lead to rough estimates. The results of recent geophysical measurements carried out within the space of the extra-mural settlement tell us that the situation was complicated and that we are, at least for now, unable to delineate the medieval river network with any great certainty.⁶ The most promising results are obtained through archaeological excavations, especially those that cover large areas. Only with these methods have we been able to ascertain the exact position of the river channel on the western and northern sides of the fortified area. The channel used to meander here. Other reconstructed locations of the original river network (see Fig. 1.4) are more or less hypothetical (POLÁČEK 1996, 227; POLÁČEK 1997, 38; HAVLÍČEK/POLÁČEK/VACHEK 2003, 16).

The River Morava probably meandered within the space that we are interested in; we do not know if it had only one major branch or more. There are indications of two main streams: see for instance J. A. Komenský's map of Moravia from 1627.⁷ Whether the archaeologically proven river branch that bordered the castle from the western and northern sides was (at least for a time) the main branch of the River Morava cannot be proven or disproven at the moment.

The water regime is reconstructed on the basis of macro-remains from an organic layer on the bottom of the river. The archaeobotanical analysis results hint at a slow or even periodically stagnant flow (OPRAVIL 1983, 23). Malacological findings support this conclusion (HORSÁK/MAREK/POLÁČEK 2003, 100), as do the fishing pots found on the bottom – they were designed to catch a specific kind of fish that lives in the muddy environment of slow or stagnant water.⁸ However, the whole archaeological situation is more complicated – layers of fluvial sands found above the bottom show this slow flow occasionally transformed into a strong current, maybe during spring melts or other sudden changes in water quantity. The strength of the current can also be observed in the anti-erosion soil protection, which is notable in almost all the places excavated including the castle surroundings. Therefore, it is clear that although the current was usually slow or even periodically stagnant, the river must occasionally have experienced significant increases in its flow. As the small objects (mainly ceramics) found on the river bottom show, the situation that we have described pertains to the castle which existed in the 9th century.

The channel filling (above the bottom layer with organic remains and archaeological findings) consisted of a large (1 to 2 meters wide) mass of fluvial sands. We believe that these sediments must have accumulated quite quickly, soon after the fall of the power centre (KLANICA 1972, 38; OPRAVIL 1983, 23, 33). Because we were almost sure that this centre ceased to exist at the same time as Great Moravia itself (perhaps in 906, certainly very early in

6 Various methods were applied here, including magnetometry, electrical resistance profiling, and GPR. You can see unpublished reports by V. Hašek and others (Zpráva o archeogeofyzikální prospekci na akci Mikulčice, Geodril Brno 2000), or those by J. Hruška (Valy u Mikulčic. Lokalizace pohřbených říčních ramen. Georadarové měření. Koleč consult & servis Brno 2011).

7 <http://mapy.mzk.cz/mzk03/000/903/895/2619267599/>

8 ANDRESKA 1975, 135; POLÁČEK/MAREK/SKOPAL 2000, 202–203, Karte 6; MAZUCH 2003, 366–374; POLÁČEK 2007, 71.

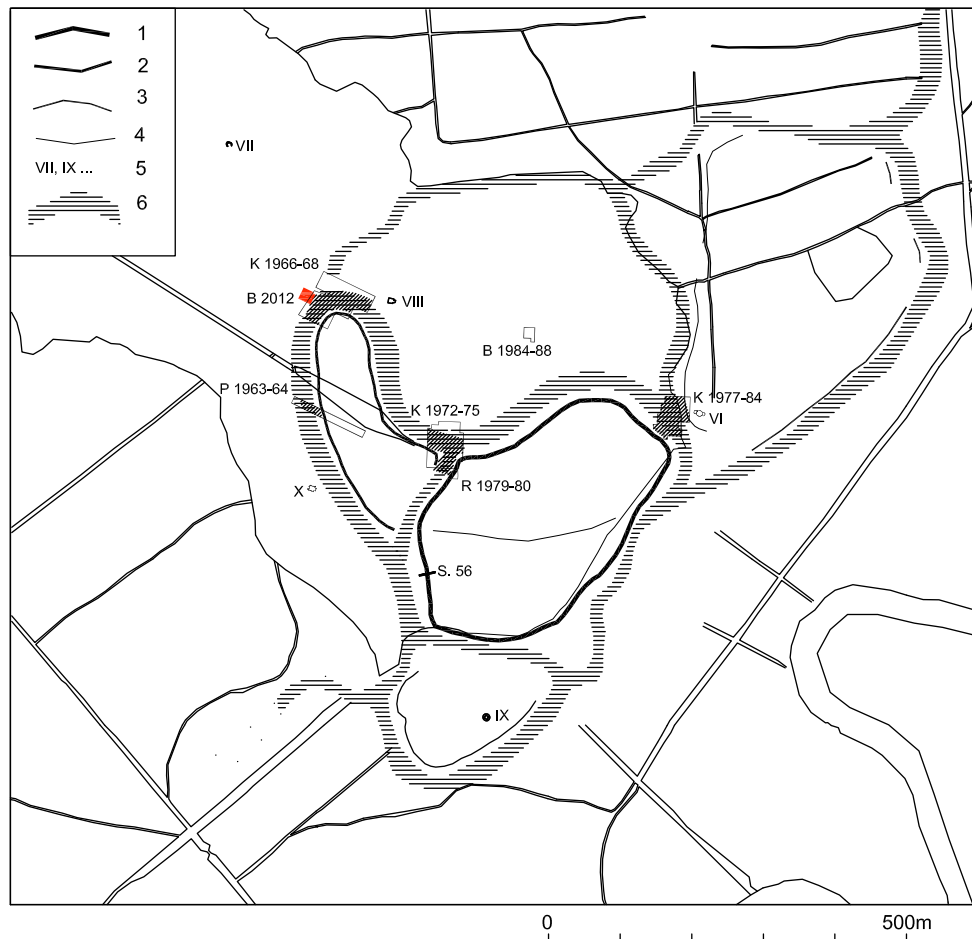


Fig. 1.4 The Mikulčice-Valy stronghold. Topographic situation of the castle and the extra-mural settlement in the 9th century including the presumed location of the river branches. Large-scale excavations of the riverbeds and other dig sites, which partly uncovered the filled-up riverbeds. Notes: 1 – fortification of the acropolis, 2 – archaeologically proven fortification of the outer bailey, 3 – earthen dike on a perimeter of “Těšický les” (Těšice Forest) in the extra-mural settlement, 4 – terrain borders of elevated parts of the acropolis and the extra-mural settlement, 5 – locations of temples, 6 – presumed location of the river branches. After POLÁČEK 1996, amended.

the 10th century), sand sedimentation was thought to have originated at the same moment. This claim was based mainly on the fact that the flood loam layer that was above the fluvial sand layer contained the same findings as the bottom one, only in much smaller quantities (KLANICA 1972, 38). We know today that these findings might have arrived here by re-sedimentation, and so they cannot be used as evidence (HLADÍK/POLÁČEK 2013, 15–22; see chapter II, this vol.), but we have another supporting argument – the remains of the stone front acropolis wall and the outer bailey which fell into the river were not found in the fluvial sand layer, but above it, in the flood loam one. And because it is believed that the wall collapsed quite quickly once the power centre vanished, it is only logical to put the sand

sedimentation in the 10th century, or even in its first few decades.⁹ However, this is only a hypothesis at the moment; we have no hard evidence.

The crucial question is this: why were the channels around the castle relatively quickly filled by this massive layer of fluvial sands? Was it a natural evolution of a river system, or was it caused by humans? We have to realise that the filling of the channels caused the castle to lose a significant part of its natural strategic defences, and we should not rule

⁹ E.g. PROCHÁZKA 1986; PROCHÁZKA 2009, 162, 169, 171; POLÁČEK 2001, 320; JANKOVSKÁ/KAPLAN/POLÁČEK 2003, 61–62; POLÁČEK 2007, 72; HLADÍK et al, in print; compare the situation in Břeclav-Pohansko: MACHÁČEK et al 2007, 307–308.

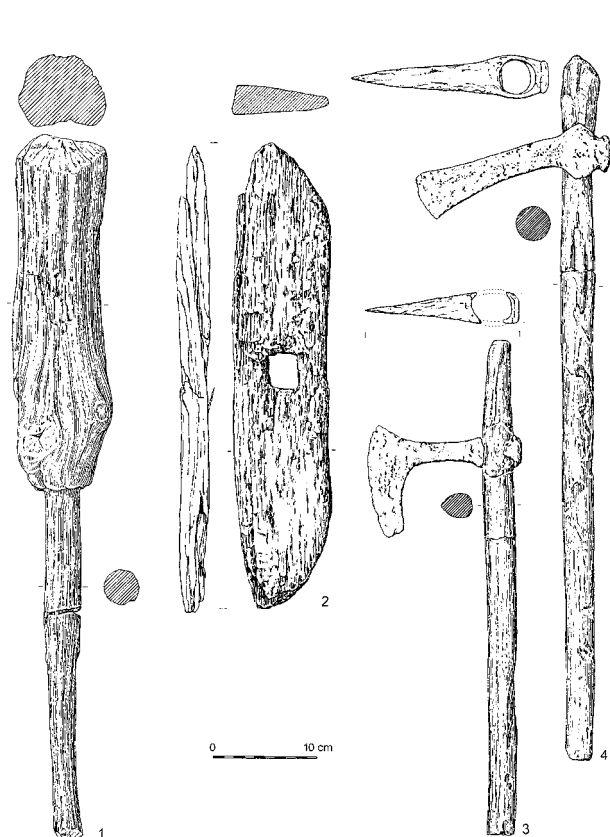


Fig. 1.5 The Mikulčice-Valy stronghold, selection of wooden artefacts from the river branches. 1 – maul, 2 – ember rake, 3, 4 – axes. After POLÁČEK/MAREK/SKOPAL 2000.

out the possibility of human intervention in the river branches' water regime, particularly as it would have occurred at the same time as the violent fall of this power centre early in the 10th century. Connecting the active river channel with the meander ringing the castle would have been sufficient to achieve this goal, but at this point we enter the realm of speculations and theories.

Another important issue is the dating of fluvial sand sedimentation and when it ended, as well as discovering when the sandy-clayey sediments (resembling flood loams) began to accumulate. Once again, we lack any direct chronological evidence, but we can revert to the argument of the castle wall and its "speedy" destruction. As we have stated before, its remnants fell into flood loams, so these sediments must have started to accumulate soon after the castle was destroyed. However, there are more ways to interpret these sediments: is it evidence of the first

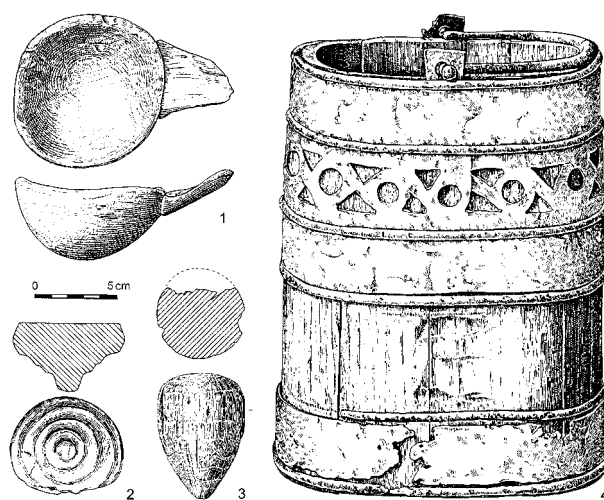


Fig. 1.6 The Mikulčice-Valy stronghold, selection of wooden artefacts from the river branches, 1 – ladle, 2 – wood scraps, 3 – spinning top, 4 – pail. After POLÁČEK/MAREK/SKOPAL 2000.

Early Middle Ages floods, or the most recent phase of usual river sedimentation? The well-known flood-plain work written by archaeobotanist E. Opravil (1983) argues that periodic flooding and flood loam sedimentation occurred only in the 13th century. The B 2012 excavation brought forth new clues that might shed more light on the problem (for more information, see chapter II).

Reconstructing the water regime and corresponding river sedimentation is a difficult task. With the exception of the bottom layer, we lack any reliable evidence with regards to the dating of sediments; even exact methods are of no use here. Furthermore, we are working with incomplete data – for all we know, whole packets of sediments might be missing from the documented stratigraphies. The whole river system changes dynamically, and so it might be more beneficial to study it through theoretical models rather than through empirical observation. However, we should carefully analyse all the terrain documentation from all excavations within the area of Mikulčice's filled-up river branches before we arrive at these theoretical considerations – or rather, we should do both at the same time. The B 2012 interdisciplinary research helped to find answers to many questions that river archaeologists had about this region (see chapter II, this vol.), but there is still a need for more such projects.



Fig. 1.7 The Mikulčice-Valy stronghold, “channel 0” (the P 1963-64 area). The filled-up river branch in front of the outer bailey fortification which was excavated in 1964. Photo Archive IARB (Institute of Archaeology of the ASCR, Brno, v. v. i.).



Fig. 1.8 The Mikulčice-Valy stronghold, “Štěpnice” area. Construction of wells for water extraction during the first large-scale river branch excavation (the K 1966-68 area). Photo Archive IARB.

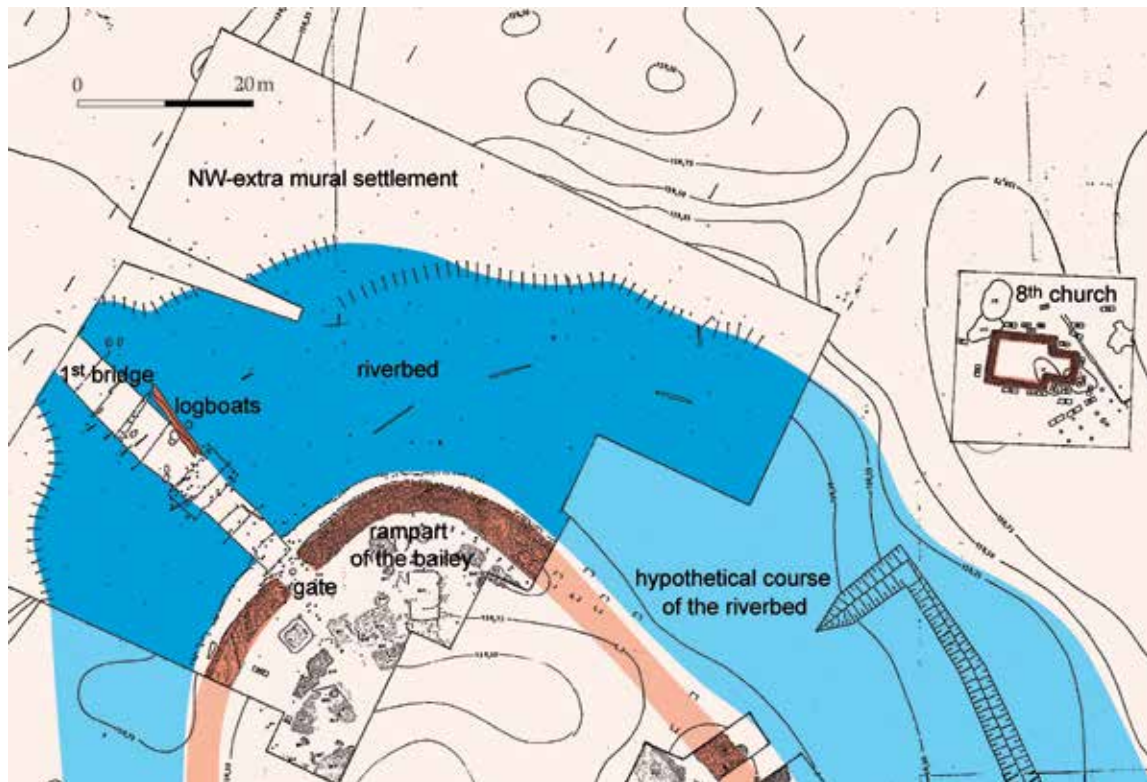


Fig. 1.9 The Mikulčice-Valy stronghold, “channel 1” (the K 1966-68 area). The situation around bridge No. 1 in front of the north-western gate of the outer bailey. After POLÁČEK 2008.

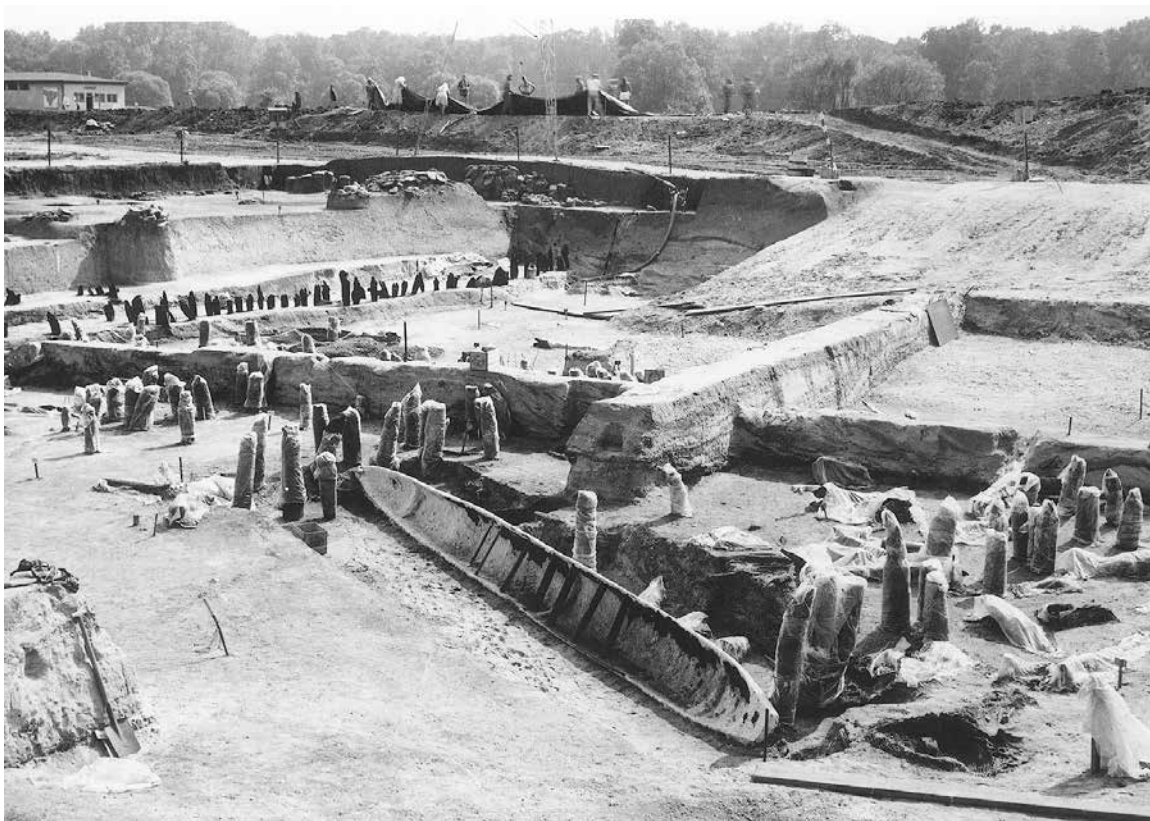


Fig. 1.10 The Mikulčice-Valy stronghold, “channel 1”. First bridge’s piles with boat No. 3. A palisade at the foot of a hill in front of the outer bailey wall is also visible. View from N. Photo Archive IARB.

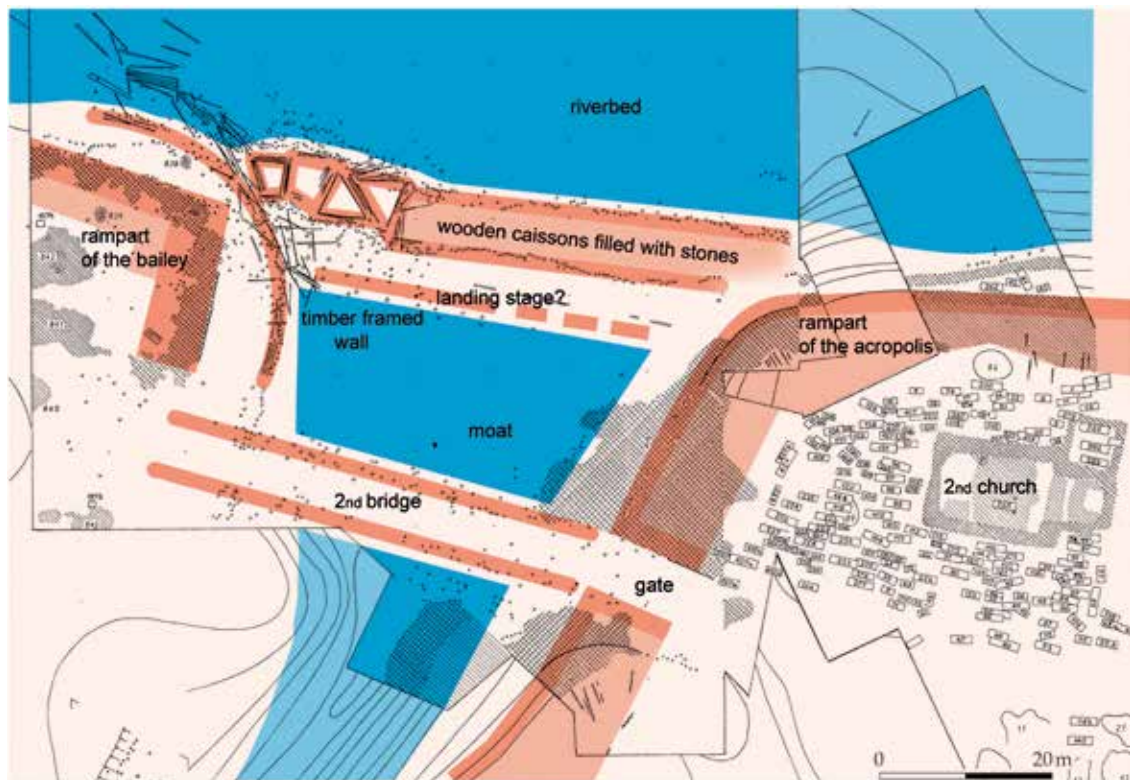


Fig. 1.11 The Mikulčice-Valy stronghold, “channel 2” and adjoining moat between the outer bailey and the acropolis (the K 1972-75 and R 1979-80 areas). The situation around bridge No. 2 and parallel barriers that close off the moat. After POLÁČEK 2008.



Fig. 1.12 The Mikulčice-Valy stronghold, “channel 2” (the K 1972-75 area). A barrier made of wooden capsules filled with stones and adjoining stake construction of unknown purpose (a landing stage?). View from W. Photo archive IARB.

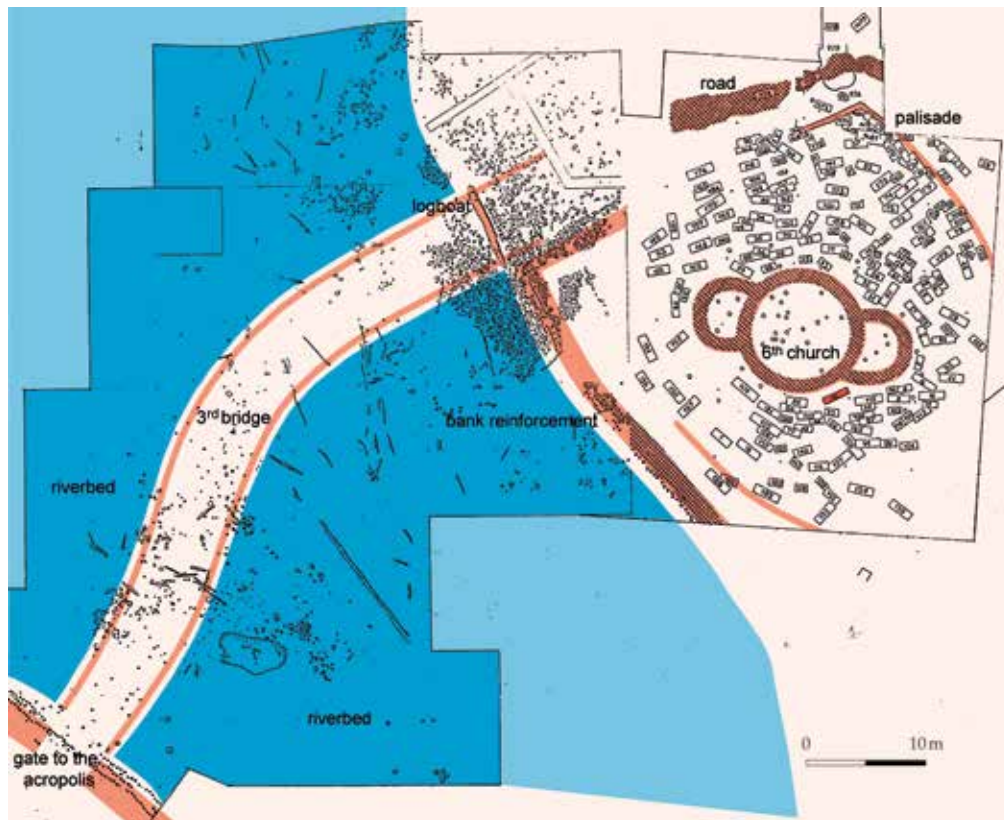


Fig. 1.13 The Mikulčice-Valy stronghold, “channel 3” (the K 1977-84 area). The situation around bridge No. 3 in front of the north-eastern gate of the acropolis. After POLÁČEK 2008.



Fig. 1.14 The Mikulčice-Valy stronghold, bridge no. 3 and its piles within the K 1977-84 area. View from S. Photo Archive IARB.

Large-scale excavations of filled-up river branches in Mikulčice

Thanks to the large-scale archaeological excavations of river branches, Mikulčice has earned a special place in Czech river archaeology (Fig. 1.4). These excavations, which comprise 2 acres, are a valuable insight into the everyday life and environment of a castle within Great Moravia. They provide crucial information about the original river network which protected the 9th century castle, and also about communications, defensive buildings and water constructions (bridges, walls, palisades, anti-erosion barriers and so on), and about the natural environment in the vicinity of the castle and its inhabitants' material culture (POLÁČEK 1996, 225–226; POLÁČEK 2007; 2012). The wooden remnants found in Mikulčice's river branches (a situation that is otherwise quite rare in our country) offer a way to learn much more about this period than other excavations ever could. For instance, we found four boats (dugouts) and a number of fishing pots, weapons, pails, domestic furnishings, toys and parts of buildings (Fig. 1.5, 1.6; POLÁČEK/MAREK/SKOPAL 2000). The dendrochronological data that we collected from Mikulčice's bridges is unique as well (DVORSKÁ et al 1999). The riverbed excavations uncovered wood, plant macro-remains, mollusc shells and other organic material, and were a rare insight into the floodplain palaeoecology of the older part of the younger Holocene period (see OPRAVIL 1972; OPRAVIL 1983, 23–33; OPRAVIL 2000). In view of these findings, the riverbeds around Mikulčice's castle can be considered a unique and valuable natural archive of wood and other organic material (POLÁČEK 2012).

Terrain research that took place within the area of the filled-up river branches was technically exhausting, as it required the groundwater level to be lowered artificially. The local water extraction that had been used during the first study within the P 1963–64 area proved rather ineffective, so it was not possible to examine the bottom properly, and wooden artefacts were “extracted” from the water. For internal purposes, this space was labelled “channel 0” (“koryto 0”; Fig. 1.7; see POLÁČEK 2012, 28).

The river branch excavations of 1966 received better technological support: the groundwater level of the whole area was lowered through a system of

wells that were drilled all around the actual excavation space (Fig. 1.8). These wells were usually about 10 meters deep. This allowed for systematic water extraction and the whole area was completely deprived of water, which made these large-scale excavations possible. Three large separate excavation sites were created; officially, they were called excavated areas K 1966–68, K 1972–75, R 1979–80 and K 1977–84, but for internal purposes, their names were “channel 1” (“koryto 1”; K 1966–68, B 2012; Fig. 1.9, 1.10), “channel 2” (“koryto 2”; K 1972–75, R 1979–80; Fig. 1.11, 1.12) and “channel 3” (“koryto 3”; K 1977–84; Fig. 1.13, 1.14) (POLÁČEK 2012, 28; for a brief description see POLÁČEK/MAREK 2005). This order is reflected in the names of the bridges: “first”, “second” and “third” bridge. These bridges can also be labelled according to the nearest gate, e.g. “the bridge in front of the outer bailey's north-western gate” (POLÁČEK/MAREK 1995, 19; for a brief description of the bridges see POLÁČEK 2011; 2012).

The evolution of paradigms and methods

The filled-up river branch excavation in Mikulčice has taken place over the last 60 years, but the period from the mid-1950s to the beginning of the 1980s was the most intensive. Methodologically, this research was based somewhere between chronological-typological and processual archaeology (further information in HLADÍK/POLÁČEK 2013). The influence of processualism can be seen mainly in the effort to study environmental and economic problems, and the situation was ideal for it – in this particular area, filled-up river branches with findings of plant macro-remains and wooden artefacts presented a new source of knowledge. However, the initial reason for attempting the terrain works was more down-to-earth: researchers wanted to obtain interesting new artefacts, and to raise the prestige of this archaeological site (and research into it) in consequence. Unlike settlement excavations, where wood was always found only in the form of ashes or the burnt parts of buildings, the filled-up river branch excavations brought to light many rare artefacts consisting of organic materials, including wet

wood. Therefore, we have many rare finds that are still unique within this geographical region and that have not been found in any other power centre of Great Moravia. The Mikulčice region was already famous for its excavations of ancient churches, lavishly furnished graves and whole burial grounds, and these further finds in the form of bridges, boats, weapons and other items only confirmed that it is the “first” among Great Moravian dig sites. Even the technological backing was unique and without competition – no other archaeological field office in Czechoslovakia could afford such a costly method of water extraction from filled-up riverbeds.

Over time, of course, initial pragmatic considerations were modified with a more professional approach. One area that stands out is the question of the agglomeration's communications: Z. KLANICA (1985) focused on large-scale filled-up river branch excavations, but he observed the locations of roads, gates and bridges as well (and on a long-term basis). Klanica was aware that if we wanted to study the fall of the power centre and the settlement of the Mikulčice agglomeration, river sediments were invaluable (i.e. KLANICA 1972, 38). Unfortunately, he did not attempt to verify or further specify his hypothesis about a quick filling of the riverbed with a massive sand layer and its separation from an active current (this hypothesis was a result of his excavation in the K 1966–68 area). He focused on cultural problems, but as interdisciplinary research was inadequate at the time, he struggled with dead ends and problematic interpretations. One of these vicious circles was a supposed cult monument that was reconstructed at the southern tip of the northern extra-mural settlement. This place on the point-bar side of the meander had been subjected to a specific kind of sedimentation, and so the find looked like an artificial round building, which was mistakenly interpreted as a pagan cult monument (MAZUCH 2010 with lit.).

Palaeobotanist E. Opravil built his whole life's work around analysis of the plant macro-remains found in the riverbeds: he was able to reconstruct the vegetation and economic conditions of Mikulčice as they had been in the Early Middle Ages, and he also provided a general overview of the Holocene floodplain evolution. Unfortunately, Opravil was not invited to the actual excavations, and so he remained

an armchair scientist. However, this does not detract from the quality of his work; in his field of study, he was undoubtedly a pioneer (OPRAVIL 1983).

The Mikulčice archaeological excavations, and in fact any floodplain excavations, would have been impossible without wide interdisciplinary research. This pertains primarily to geoarchaeology, archaeobotany, and dendrochronology. These fields were part of these excavations right from the beginning. At first, it was a haphazard collaboration initiated by biologists who were interested in data obtained from Mikulčice's terrain works. The Institute of Archaeology in Brno was consequently enriched by new branches – botany (E. Opravil), zoology (Z. Kratochvíl) and anthropology (M. Stoukal) – which then became committed to long-term analysis of Mikulčice's data. However, these branches were limited by insufficient communication with the field of archaeology itself, as it was too “self-centred” and enchanted by its own fascinating finds. A project called “Sídlní aglomerace velkomoravských mocenských center v proměnách údolní nivy” (Great Moravian power centre settlements and the changes of the floodplain) carried out between 1996 and 2001 attempted to breach these barriers. The main partners of this interdisciplinary study of the archaeological and environmental aspects of Great Moravian island castles were professionals from the fields of geoarchaeology, archaeobotany, palynology and dendrochronology (POLÁČEK 2002 with lit.). As a part of the project, a brand new palaeoecological and dendrochronological laboratory was built in Mikulčice. The works focused mainly on analysing the data from previous research (archaeobotany: OPRAVIL 1998, 2000, 2003; dendrochronology: DVORSKÁ/POLÁČEK 1998, DVORSKÁ et al 1999, malacology: HORSÁK/MAREK/POLÁČEK 2003), but it also attempted new non-destructive terrain research (geoarchaeology, palynology and dendrochronology: HAVLÍČEK/POLÁČEK/VACHEK 2003; JANKOVSKÁ/KAPLAN/POLÁČEK 2003; VRBOVÁ-DVORSKÁ et al 2005). Even though it was a success, the absence of new archaeological excavations was a limiting factor. Systematic fieldwork in Mikulčice was resumed after 2004, but a tragic fire destroyed the archaeological base in 2007 and the works were interrupted. The new base, which was built in Mikulčice-Trapíkov in 2014, is well equipped for new fieldwork, and

filled-up river branch excavations should be resumed in the future. In addition, theoretical interest in the environmental problems of this region has proved permanent and persistent.

Outlook and conclusion

There are limitations that complicate further study of river networks within the area of this former Great Moravian power centre, but there are also many opportunities in Mikulčice. We would certainly benefit from a complex critical analysis of previous excavations into the riverbeds around the castle; this analysis is being carried out at the moment and we should have the first results soon. The B 2012 research also provided valuable insights into this problem, as well as important notes for the field of river archaeology. It also threw up new questions, both for the analysis of previous research and for future excavations.

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