



Archaeology:  
**Just Add Water**

volume II

2019



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# Archaeology: Just Add Water

Underwater Research at the University of Warsaw



Ministerstwo Nauki  
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POLISH CHAPTER  
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WARSZAWA 2019



## Preface

Dear Colleagues,

It is our great pleasure to present to you the second volume of the U Supplement Series of the “Światowit” periodical. To a large extent it is based on the papers presented during the 3<sup>rd</sup> *Warsaw Seminar on Underwater Archaeology*, which took place at the University of Warsaw on the 17<sup>th</sup> and 18<sup>th</sup> of January 2019.

An efficient and prompt process of editing we owe to the funding from the Ministry of Science and Higher Education, grant no. 959/P-DUN/2018.

Organization of the Seminar and publication of the hereby volume was possible thanks to the co-operation with the Polish Chapter of the Explorers Club, in particular its President, Professor Mariusz Ziółkowski, and the Vice-President, Marcin Jamkowski, to whom we are deeply grateful.

We would also like to acknowledge and appreciate the support of the University of Warsaw, namely the Vice-Rector Ph.D. habil. Maciej Duszczyk, the Dean of the Faculty of History, Ph.D. habil. Małgorzata Karpińska, Professor UW, as well as the Director’s Board of the Institute of Archaeology: Ph.D. habil. Krzysztof Jakubiak, Ph.D. Michał Starski, and Ph.D. Marta Żuchowska.

The special thank you we traditionally owe to the Diving Museum by the Warsaw Diving Club, especially the Museum’s Curator, Karina Kowalska, and the Club’s President, D.Sc. Grzegorz Kowalski, who have been supporting our activities for many years, and constantly guide and help us in numerous enterprises.

We would like to extend our gratitude to all the Authors and Reviewers, who have been extremely diligent and punctual to keep up with our strict deadlines.

During the editing of the volume we have received invaluable consultations in the matter of ancient languages by Tomasz Płóciennik and Ph.D. Joanna Wegner, who we would also like to thank with all our hearts. The post-editing process was successful due to the the kind assistance of Ph.D. Rafał Dmowski, who we owe enormous gratitude.

The whole book was once again skilfully supervised and managed by the one and only irreplaceable Ph.D. habil. Bartosz Kontny, Professor UW. Him we would like to thank for all the advice and help with difficult choices, as well as the dedication to the organizational matters, even though the really tight schedule.

Last but not least, we would like to thank all the Readers who have reached for the hereby volume. We sincerely hope you will enjoy the outcome of our efforts and wish you pleasant reading!

*Aleksandra Chołuj*

*Małgorzata Mileszczyk*

*Magdalena Nowakowska*

## 3<sup>rd</sup> Warsaw Seminar on Underwater Archaeology



3<sup>rd</sup> Warsaw Seminar on Underwater Archaeology held on 17<sup>th</sup>-18<sup>th</sup> of January 2019  
at the University of Warsaw  
(photos by: M. Sugalska)

## Foreword

The volume, which we hereby present to our esteemed Readers, is the vivid proof that underwater archaeology at the University of Warsaw is doing more than well. It is the second publication in the “*Światowit*” *Supplement Series U: Underwater Archaeology*, issued for now (and we hope this pace will be sustained!) with a frequency of a periodical. Within the book one might find i.a. the texts being an outcome of the international 3<sup>rd</sup> *Warsaw Seminar on Underwater Archaeology*, organized in the Institute of Archaeology, University of Warsaw. The Readers will discover here the articles presenting broad chronological and geographical range of issues: from the Prehistory until the Second World War, from Guatemala and Peru to Poland and Slovakia. We are trying to reflect this diversified character also by the choice of photographs on the cover.

The leitmotif of all this vast range of archaeological issues is **water**: realm bearing a magnificent symbolic character. Changing its colour (even during the day – from the blackness, through greyness, then blue, until the bloody-red at the sunset, turning again into black) and visibility, it has manifested also other features, which can be contemplated as signs of its animation, such as movement: horizontal (currents, waves, tides) and vertical (fluctuations of the surface). It was also the source of life quite literally, providing food and dihydrogen monoxide, essential for living.

Along with its whole mystery and dangerousness, water may also serve as a refuge (lake settlements from the early Iron Age) and a trade route, at the end of which there is a (hopefully) safe harbour. That is how underwater archaeology marches onto the land... Although, it is neither place nor time for the deliberation about the definitions of archaeology related to water environment; the discussion in this matter has lasted for many years, abound in more and more new terminological propositions, still being far from any resolutions. Whichever position we assume in the aforementioned debate, it is impossible not to notice that the symbolism, the rituals, and everyday casual activities essential for life and connected with water pass through each other, which is well-exemplified by the hereby volume. Objects lost during transportation and other kinds of exploitation of water basins, items put in the water as a matter of rituals, military aspects connected with watery environment, lake settlements, harbours, and trade – all of that and even more you can discover in *Just Add Water 2*. To all the Readers, who are going to immerse themselves into this topic, I wish a pleasant intellectual adventure and... good dives!

*Bartosz Kontny*





**Significant Crossroads at the Lower Reaches of the River Váh<sup>1</sup>**

Klaudia Daňová\*

Miroslava Daňová\*\*

**Abstract:**

*The Váh River is the longest Slovak river and at least from the Middle Ages it has been both an important traffic artery and a border, separating two banks that had to be connected with a bridge. For this purpose fords, ferries, and bridges have been used and the remains of these structures are still visible at some points when the water level is reduced. This paper will focus on the mapping of important traffic hubs at the lower reaches of the Váh River and look at their current conditions and their informative value. In particular, the area of the Váh near the town Hlohovec (Trnava Region, Slovakia), where numerous round structures are visible to the naked eye, attracts attention and in recent times has become a part of unwanted interest and the negative interference from the 'public'. In order to save as much information as possible, the attention of several scientific teams has, in recent years, begun to concentrate on the remains of the medieval (?) bridge.*

**Keywords:**

river, the Váh, Hlohovec, Sered', bridge, dendrochronology, ford

**Introduction**

Examination of monuments and sites under water is one of the priorities of the grant project of the Slovak team of underwater archaeologists. In spite of the effort to get the maximum data from the Slovak rivers and lakes, the research team is constantly facing several problems. Not only are the legislation and the methodological guidelines of the Monuments Board of the Slovak Republic insufficient, the methodology of the research itself is as well. The problem is also that there is a small number of experts able to perform work in the extremely adverse conditions of Slovak rivers. These factors greatly affect the possibilities of research. Because of these and other reasons, the research team has decided to focus on the lower reach of the Váh River (**Fig. 1**); they were interested in the region enclosed by the Hlohovec (Trnava Region, Slovakia) surroundings, along the estuary of the river, where it flows into

<sup>1</sup> The contribution is created with the support of the VEGA grant (2/0146/18) titled *Fords, Bridges, Long-Distance Roads. Ancient Communications and Settlements in Považie and Ponitrie*.

\* Ph.D.; Institute of Archaeology, Slovak Academy of Sciences, Nitra, Slovakia; e-mail: klaudia.danova@gmail.com.

\*\*Ph.D.; Department of Classical Archaeology, Trnava University, Trnava, Slovakia; e-mail: miroslava.danova@truni.sk.

the Danube. It is a territory rich in findings from the prehistoric period to the Modern Age. The Váh itself is the longest river in Slovakia (406 km) with a relatively large, but in many places shallow, riverbed. The river in the studied area flows approximately north to south, and its basin was in the west of the Slovakian part of the north-south Amber Road, which has been in use since the prehistoric times. Unique findings give evidence about the intensive life on the river since the last ice age. Fossilized remains of wood and bones of mammoths found in the Váh have been deposited at the Museum in Hlohovec. In the river a random finding has also been discovered, a part of a Neanderthal cranial bone found in the Šaľa area (Nitra Region, Slovakia), anywhere from 40 000 to 80 000 years old. The river has also been a source of water and livelihood in earlier periods. Numerous findings of fishing hooks provide evidence of fishing activities. Plenty of findings of various kinds in the shallowest places indicate the existence of fords across the river dating from the prehistoric times, and over time man has mastered the river so much that it has started to be used for transport more and more frequently. The oldest vessels on the Váh are boats from one piece of a tree trunk, so called monoxyla (also known as logboats or dugouts). They have been used for local fishing in the upper section of the Váh up until the last century. The last big functioning Váh monoxylon had been discovered in Chlmec (Žilina Region, Slovakia) and was added to the collections of the National Museum in Prague (Novotný 1951: 259). Rafts have also been largely used as a way of transportation on the river. The transfer of people and goods in this way has been documented since the 16<sup>th</sup> century. Even nowadays it is possible to see tourist rafts on the Danube River. For the river crossings, ferries have been used, that might have originated by merging separate smaller monoxyla. However, the difficulty and slowness of this way of crossing the river, not to mention the frequent floods, has later prompted the construction of bridges on the river as well as its regulation. The efforts to regulate the Váh appeared in the 16<sup>th</sup> century, when the landlords from the Nitra Region riverside area presented a request to parliament to reinforce the banks. Parliament started to deal with these requests with articles of law in the years 1659, 1687, and 1751 (Mezey 1899: 406). According to the research of the Slovak colleagues, the lower Váh River (within the section from Sered' to Komárno, Nitra Region) was intensively modified from the 17<sup>th</sup> century. The number of original meanders of the river, not having been listed during the *Second Military Survey of the Habsburg Empire (1806–1869)*, increased to 26 (Procházka and Pišút 2015: 45) and modifications continued for another 200 years. Floods were not the only reason for its modifications in lowland areas. The water in Slovakia is, as well

as in other countries, used to generate energy. In the past large and small dams had been built to regulate the water flow. The most important reservoir in the researched area is the Kráľová Water Reservoir (44.2 to 78.6 kilometres of the river). The vast majority of the territory that has been regulated has gone underwater without any research. Even today, occasional cleanings and modifications to the riverbed and the banks devastate these areas.

For the archaeological public, rivers are a very difficult source of information to access. Despite the theoretical and archival research, areas that still have potential and can greatly help to gain new knowledge about the road infrastructure as well as other ways of usage of the Váh River have been defined. During 2018 intensive research focused on three locations of archaeological potential. Those were Hlohovec, Sered'/Šintava (Trnava Region, Slovakia) and the Neded areas (Nitra Region, Slovakia). This study concentrates only on two of them, Hlohovec and Sered'.

#### *The Váh River near Hlohovec*

Hlohovec city was originally established as a residence near the elevated cliffed coast, on which today lies a monumental Renaissance-Baroque castle. The Váh River flow is inherently linked to its history because there have been places near Hlohovec which could be crossed; therefore, contributing to the fact that there are places located not only directly in the city, but also in its close surroundings (**Fig. 2**).

The fact that the territory was inhabited in the prehistoric period has been proven by several well-known findings, not only from the surroundings of the river (settlement from the Bronze Age in Posádka; Kuzma and Bartík 2011: 159), but also directly from its riverbed. If the places are named from north to south, Zelenice (Trnava Region, Slovakia) is between Hlohovec and Dvorníky (Trnava Region, Slovakia). According to Urminsky's report, in 1994 when rafting on the river between Hlohovec and Zelenice, the city's inhabitants discovered “*a shaman's antler stick decorated with a set of notches and an aperture for the placement of a stoc,*” which dated back to the Mesolithic (Urminský 2018). One extremely rare finding from the Bronze Age is called ‘Stabdolch’/Early Bronze Age (Halberd). It was found in 2017 in the St. Peter district (Hlohovec) of the Váh and after observing the condition, the Regional Monuments Board Trnava (according to Slovak legislation) awarded the finder with 100% of the finding's value. The place of the finding was further north of the current bridge across the Váh (Bača *et al.*, forthcoming; Daňová *et al.* 2018: 204, fig. 213) and could indicate

a larger settlement or a crossing of the river above Hlohovec in the area of Koplotovce village (Trnava Region, Slovakia) has been existing during this period. Down the river there is the Dvorníky-Posádka location, where another ford has probably been located. Several findings from the Roman Period have been found, among which the finding of a Germanic snaffle in 1989 is the most interesting (**Fig. 3**). It also points to the presence of the Germanic people in this area (Novosedlík 2013). Jozef Urminský specifies the chronology of the finding for the 2<sup>nd</sup> century A.D. (Urminský 2018). According to a study by Susane Wilbers-Rost, the different parts of the snaffle can be typologically assigned and complemented by analogies. The chain links correspond to the type Z 4b (Wilbers-Rost 1994: 46–47) and the analogies of this element are stated in a study from Sweden (Wilbers-Rost 1994: 194, Nr. 85; 197, Nr. 92) and Germany (Wilbers-Rost 1994: 184, Nr. 42). The chain rings correspond to the type R 1, which, according to the study, cannot be dated more precisely (Wilbers-Rost 1994: 56–57). The end of the snaffle chain cannot be typologically assigned more precisely, but its shape is similar to the type Rh 2a (Wilbers-Rost 1994: 59–60). They differ in the shape of the flat end (the snaffle from Hlohovec has it rectangularly shaped) and the specimen from Hlohovec is missing holes in the threads. The snaffle bit is similar to the Ks 4 type (Wilbers-Rost 1994: 56–57) which has analogies in the territory of Denmark (Wilbers-Rost 1994: 166, Nr. 14; 178–179, Nr. 28; 180, Nr. 33; 181–182, Nr. 35), Moravia (Wilbers-Rost 1994: 186, Nr. 52), Poland (Wilbers-Rost 1994: 189, Nr. 65; 193, Nr. 81), and Slovakia (Wilbers-Rost 1994: 212, Nr. 138). Basing on datable chain link analogies (Z 4b) and the bit (Ks 4), the Hlohovec snaffle can be assigned to the period C<sub>1b</sub>–C<sub>2</sub>. A La Tène quern-stone (Urminský 1997: 178), Celtic bronze jewellery, a clasp from the Roman Period, as well as bronze and iron fishing hooks, which are now part of the exhibition in the Homeland Museum Hlohovec<sup>2</sup>, probably have their origin in this area (Urminský 2018). Unfortunately, some authors date the preserved remains of the bridges in Hlohovec to this period, which cannot be the case basing on reality (Patrov *et al.* 2016: 112). The presence of Roman troops in the territory of present-day Slovakia is undisputed at least during the Marcomannic Wars, but the preservation of bridges of any kind on Slovak rivers with the exception of the Danube would be rather unique. Other well-known objects from the Váh River are dated back to the High Middle Ages, despite the fact that the historians presume the presence of the Great Moravian settlement on Hlohovec castle hill. After the fall of Great Moravia, the territory of Hlohovec and the nearby Červeník

<sup>2</sup> Slovak: *Vlastivedné múzeum v Hlohovci*.

(further south) was apparently occupied by the first wave of the Old Hungarians as a significant support point (Gálik 2013: 263) and the character of the settlement and material monuments suggest that the area had to be defended against the enemies from the northwest, who could have crossed the Váh River near Hlohovec, Červeník or Šintava (Gálik 2013: 265). In the 11<sup>th</sup> century the fortified castle above the river ford had become the residence of the border committee and gradually developed into a flourishing town with market privileges (14<sup>th</sup> century) helped with the further development of the city. The undeniable cause of the city's economic prosperity was the construction of the passage across the Váh River, which was firstly a ford and later a bridge at the latest in 1270 (Gálik 2013: 283). Besides the dry toll for the bridge, a so-called wet toll for goods travelling on the Váh was collected, mostly timber, and 10% of the income belonged to the Bishop of Nitra (Gálik 2013: 283-284). There is also a large number of different melee weapons dated to the Middle Ages from the Váh riverbed between Madunice (Trnava Region, Slovakia) and Hlohovec (Urminský 2018 – iron swords from the 13<sup>th</sup> century), near Hlohovec (Labuda 2016: 62, 6.11 [fourteenth/fifteenth-century sword]) or the nearby Dvorníky, Posádka location (Labuda 2016: 115, 7.9 [fifteenth-century hunting sword]; Labuda 2016: 119, 8.1 [fourteenth-century sword]). The first known image of the Hlohovec Bridge is on the Lazio's map from the middle of the 16<sup>th</sup> century, where the city is shown as an important crossing; it documents its importance on the Czech Road (*Via Bohemica*), which at that time had been a centuries-old trade route. According to Urminský, the size and width of the built bridge should have been sufficient for two carriages going alongside each other (Bojničan 2016; **Fig. 4**). It stood in place (**Fig. 2.1**) at least until the 18<sup>th</sup> century, when (in 1727) its main role was taken by a bridge a little lower along the river flow (**Fig. 2.2**), closer to the Erdödy Castle in Hlohovec (Bojničan 2016) and remained so until 1905. In the 18<sup>th</sup> century, there were also some great changes in the riverbed above Hlohovec, when Emperor Charles VI attempted an unsuccessful modification in the flow of the Váh around Leopoldov (Pišút *et al.* 2016: 136–137). These could have affected and influenced the coastal life as well. The appearance of a wooden bridge from the 18<sup>th</sup> century is captured on the paintings (*Painting of Hlohovec I*, *Painting of Hlohovec II*, both after: Pišút *et al.* 2016: 226 fig. 184–185) as well as in the first photographs (*Hlohovec Bridge in 1899*). The bridge was replaced at the beginning of the 20<sup>th</sup> century by the reinforced concrete structure, which in April 1945

was destroyed by retreating German troops (Urminský 2018). Today's bridge was built in the 1960s a few hundred metres upstream from the medieval ones (**Fig. 2.3**).

A separate chapter of the findings from the Váh riverbed includes copper ingots, which are now stored in the collections of the Homeland Museum in Hlohovec. There are ten flat round objects, weighing from 2.5 to 6 kg. Urminský offers the theory that due to their quantity, somewhere near Hlohovec a vessel (raft) that was carrying the cargo of ingots, has capsized (Urminský 2018). Slovak researchers have been recording these findings for a long time; one of the oldest is an unpublished master thesis by Mária Novotná, who dates the first round of copper ingots from this area back to the Bronze Age (Novotná 1958: 96–97, 123–124). Some scholars still accept this information (Podolan 2003: 24). The new specimens of copper cakes from Hlohovec have not been subjected to any metallographic analysis yet; nevertheless, considering the findings from other locations, it can be assumed that the raw material found in Hlohovec originates from the territory of Central Slovakia. However, on the basis of analogies, dating may be earlier. The similar ingots can be traced beyond the northern borders of the Kingdom of Hungary. A Polish study reviewed copper ingot cargo from a medieval shipwreck in the Gulf of Gdańsk (Pomerania, Poland). Their features (Ossowski 2014: 244, fig. 2) are the same as those of the ingots from the Váh near Hlohovec. Waldemar Ossowski reports other cases of similar copper ingots in Europe (Ossowski 2014: 246, fig. 4). It seems that in case of the Slovak provenance of copper and its distribution to northern Europe, the Váh also significantly contributed, especially in the time of the Turkish threat – after the Battle of Mohács in 1526.

An integral part of life in Hlohovec was the system of water mills. Their most important centres were located at the Váh near Hlohovec, Sered', and Šoporňa (Danterová 2007: 3). Urminský has referred to a significant discovery of the residues of an old mill during a dredging of a meander in the old Váh in Hlohovec (on Industrial Street); a millstone has also been found there, and thanks to the humid environment also the remains of blades (Urminský 2018). The number and distribution of water mills in Hlohovec has probably changed according with the alterations of the riverbed after the periods of high water level in spring and after floods. This is evidenced by comparing information from maps with vedute (see the information further in the text). For example, a relatively detailed study by Daniela Gräf, who focuses on documenting the number and types of mills, draws directly from the *Second Military Survey...* about Hlohovec and counted 28 water mills on both banks of the Váh (*Second military survey...*). According to the archives, representation

of the Monuments Board is on vedute and sketches of Hlohovec town (*Painting of Hlohovec I; Painting of Hlohovec II; Painting of Hlohovec III*; all after: Urminský 2013: 16), and the number of water mills in the 19<sup>th</sup> century was diverse.

The interest of amateurs and the professional public has recently focused mainly on the poles that protrude from the Váh River below the current bridge. The historical value of these structures is repeatedly emphasised by archaeologist Jozef Urminský in his papers addressed to the public, while focusing on information about the medieval bridge (Urminský 2018; Bojničan 2016). According to the previously unpublished research by Urminský and Bárta, the piles are at the place of the medieval bridge, dated to the 17<sup>th</sup> century.<sup>3</sup> A local fisherman, who earned himself undesired attention, decided that he would sell two of them and advertised them on the Internet as ‘piles from a medieval bridge’ for 20–30 euro.<sup>4</sup> Thanks to the quick response of the Regional Monument Board Trnava (Trnava Region, Slovakia), in cooperation with the police of the Slovak Republic, both poles with iron forged reinforcement at sharpened ends have been secured and offered to archaeologists for documentation and to dendrochronologists for taking samples. Thanks to collaboration with Mojmir Choma (ADendro/ dendrolab.sk), on-going since November 2018, the research team knows that the poles are made of oak trees cut in the 19<sup>th</sup> century (the last measurable annual ring in both of them was in 1832).

The fisherman’s activity encouraged the authors of the report to the field survey. The first one took place in June 2018, and during the low level of the river not only the remains of several bridge structures have been discovered, but also wooden piles along the banks that could have belonged to water mills or structures controlling river flow (**Fig. 5**). At the same time the authors recorded and documented several poles (**Fig. 6**) of similar construction as the ones found by the unreflective seller. The structure or precise location around Hlohovec to which they belong has not been identified so far. Subsequent drone documentation in the same month was inadequate to create a photogrammetric model with respect to the scope of the area (longer than 1200 m). The systematic documentation of preserved structures will be the biggest challenge for the authors of the hereby paper. The interdisciplinary cooperation with experts in history, dendrochronology, hydrology, landscaping, IT, etc. will be necessary for their subsequent understanding and presentation.

<sup>3</sup> Oral information from Jozef Urminský.

<sup>4</sup> The advertiment on bazos.sk has been deleted during the police investigation.



### *The Váh River at Sered' and Šintava*

Area of Sered' and Šintava (**Fig. 7**) is an important location, especially due to the existence of several fords across the Váh River, which have apparently already existed in the prehistoric period. In the 8<sup>th</sup> and 9<sup>th</sup> century they were protected by fortifications having been a part of an important route linking the West and the East. In the area of interest there is a well accessible link between the highlands of Nitra and Trnava (neither have been flooded) passing through the river flat made of several river bends, among which the higher-lying fluvial-eolic dunes are situated (Ištók 2002: 14). On the banks of the Váh River between Šintava and Sered' a castle has been built, dated back to the 12<sup>th</sup> century. The castle was the centre of the so-called 'border committee' (Slovak: *pohraničný komitat*), which formed the second line of kingdom defence against attacks from the western area of the Czech principality. In the same time, it also provided protection for the river crossings (the ford, and also the bridge) and has also served in the system of country's economic governance to collect tolls. The importance of the castle is also evidenced by its reconstruction from wood to stone, the first phase of which took place in the first third of the 13<sup>th</sup> century, during the reign of Andrew II (Chromeková 1998: 31). In the written sources, the long way (the Czech Road/*Via Bohemica*) from Sered' to the West is mentioned in the Nekýj restriction from 1324 (*Magyar Nemzeti Léveltár 2253*, after: Sedlák 2002: 42). In 1412 tolling while crossing Sered' is mentioned (*Magyar Nemzeti Léveltár 9869*, after: Sedlák 2002: 43).

The subject of our interest was to gain as much information as possible about the existence of a ford, bridge, or findings pointing to these places. The first mention of toll bridge in Šintava is dated back to 1508 – *The Register of Receives of the Šintava Castle from the Crossing the Bridge and Toll*<sup>5</sup> (*Magyar Nemzeti Léveltár 32 632*, after: Kerestés 2016: 12, 14).

Another source of information is the maps. The oldest known map is the Lazio map of Hungary from 1556 (*Lazius map 1556*), which depicts Šintava Castle. The research team did not identify any marked passages on this map, although one can notice a clearly marked Hlohovec Bridge. Even on the next map from 1663 (*Extract, Wass A 1663*, after: Melníková 2002: 60), which captures the Turkish military campaign from 1663 in the Šintava surroundings, no passage across the river is depicted. The passage across the Váh River was marked for the first time in 1667 in the plans of the fortification reconstruction of Šintava Castle (*Landesarchiv Karlsruhe HfK XIII*, after: Petrovič 2006: 9). In addition to the bridge

<sup>5</sup> "Regestrum... Matheii Porkolab de Zered provisorem castris Sempthe super proventi pontis et telloni" (trad. the authors).

itself, a building (toll house) in near of it is also marked. It was identified by Engineer František Böhme<sup>6</sup> that on maps and plans from the earlier period, in addition to the bridges, a river modification has been made. In connection with the search for information, the research team member also interviewed museum workers in Sereď and Galanta (regional museums<sup>7</sup> where archaeological findings from the closest surroundings are deposited). The valuable information was provided by former museum workers Jozef Ižof and Pavol Ištók, who in the 1980s documented part of the bridge construction (pillars) at the time of the low water levels (**Fig. 8**). This information became the basis for field research in the area. A unique copper ingot with embossed signs was found in 1985 near the older bridge between Šintava and Sereď (Ragač 2008: 8). On the surface of the ingot the letter “M” is embossed, a circular seal with the symbols of the Fugger family and the inscription “FEP”. Even this finding has not been metallographically analysed so far and published in detail.

In 2018 the first research was done in the area of bridge construction 1 (**Fig. 9**), which is the same as the bridges depicted on newer maps from the 18<sup>th</sup>–19<sup>th</sup> centuries (*Second Military Survey...*). The water level allowed photographic documentation of five pillars. This was well-worked wood in square shaped cross-sectional dimensions. The pillars were perpendicular and only a few centimetres were visible; the rest was under a thick layer of river gravel. Obliquely laid piles with a circular cross-sectional dimension were captured south of the bridge construction. It was a dense construction. After consultation with Pavol Ištók, it was found that this could be a technical work regulating the direction of the river flow, a so-called spur (diagonally from the bank to the flow protruding spikes of logs [tree trunks], reflecting the water flow, serving as protection against damage and erosion of the bank). Due to the unfavourable conditions – the strong current as well as the higher water level in the river channel and very poor visibility – it was not possible to examine the bridge structure 1 to a larger extent. The aim of the next season is to take samples from bridge 1 as well as to attempt to look for the rest of the structure 2 (south of bridge 1) that was identified in the 1990s. Today the structure 2 is located under approximately 50 cm of gravel silt.<sup>8</sup> During the period of the existence of the bridges, they were on many occasions subject to intentional and accidental destruction or damage – military conflicts, natural disasters (glaciers), high water level impact, tree trunks ripped out by floods (Kerestes 2016: 14).

<sup>6</sup> František Böhme was an Engineer and Geometer of Nitra County, serving also to Esterhazy family.

<sup>7</sup> Municipal museum in Sereď (Slovak: *Mestské múzeum Sereď*); Municipal museum in Galanta (Slovak: *Vlastivedné múzeum v Galante*).

<sup>8</sup> Oral information by Pavol Ištók.

A large amount of information about the bridges has brought forth many questions. How is the dating to be dealt with? From the previously mentioned written sources it is known that several shifts, re-buildings, and modifications have happened over the centuries. Parts of the bridges have been dismantled and then used in the construction of new ones. Archival research was important for the identification of structural elements in individual periods and for the recording of conversions and the construction of new bridges in the surrounding area. Historical mapping (*Second military survey...*) points to locations and also approximate dates. But what phase is captured by the pillars? At the moment we are facing the challenge of designing the research methods as efficient as possible in order to achieve the desired effect. It should result in the clarification of the dating of the bridges, identification of their re-building and modifications that occurred.

### Conclusion

In the past, rivers had strategic importance. They formed boundaries but also connected remote areas. The Váh River also played this role. In 2018 the attention of the research team focused on exploring two positions: Sered'/Šintava and Hlohovec, which are located on the Váh River. Thanks to the fact that both cities are rich in history, archivists gave them due attention in the past. Archival research has uncovered much information in both cases, particularly in relation to toll collection when crossing the Váh River (Kerestěš 2016: 10–12). Both locations had about the same strategic position. They connected a significant European trade route (the so-called 'Czech Road') in the direction from the East to the West through the fords and bridges. The Váh River formed a separate river route in the north-south direction, and, in particular, it was convenient for the transportation of bulk cargo carried on rafts. Near the intersections there were water mills which could convert some of the raw materials into ready-made goods (such as driftwood for boards), and the settlement of the banks used the presence of the island in the middle of the Váh (in both cases). Thanks to the conducted archaeological survey it was possible to capture the position of several bridges. At the connectors of these two road types, unique intersections have been created, which served for the relocation of goods, the collection of tolls and information and technology transfer.

Archaeological findings are the evidence that both locations could have been crossroads in prehistoric and ancient times. The frequency of medieval trade and road building allowed for the formation of full-fledged intersections that required organisation and rules.

The protection of commercial interests, rules, and toll collection started to be relatively fast in both localities (Hlohovec, Sereď) by the fortified settlements of the elite to which the bridges belonged in the earlier period (18<sup>th</sup>/19<sup>th</sup> century). Thanks to written documents, much more has been learnt about them, but only broad interdisciplinary research can provide a comprehensive view of these important crossroads on the lower Váh River in the future.

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### **Written and Archive Sources:**

*Landesarchiv Karlsruhe HfK XIII*, fol. 22: Landesarchiv Baden-Württemberg, Generallandesarchiv Karlsruhe HfK XIII, fol. 22, after:

2006 *Šintava Kastle – Sereď Manor House under Construction from the 17–19<sup>th</sup> Centuries*, R. Petrovič, “Revue Pamiatky a múzeá” 1/2006, 9

*Magyar Nemzeti Léveltár 32 632*, Magyar Nemzeti Léveltár 32 632 – Országos Léveltár Budapest, Diplomatikai Levéltár 32 632, after:

2016 *Most a mýto cez rieku Váh v Sereďi*, P. Kerestész, “Revue Pamiatky a múzeá” 1/2016, 12, 14

*Magyar Nemzeti Léveltár 2253*, Magyar Nemzeti Léveltár – Országos Léveltár Budapest, Diplomatikai Levéltár 2253, after:

2002 *Sereď v stredoveku*, V. Sedlák (in:) E. Vrabcová, R. Petrovič (eds), *Sereď – dejiny mesta*. Sereď, 42

*Magyar Nemzeti Léveltár 9869*, Magyar Nemzeti Léveltár – Országos Léveltár Budapest, Diplomatikai Levéltár 9869, after:

2002 *Sereď v stredoveku*, V. Sedlák, (in:) E. Vrabcová, R. Petrovič (eds), *Sereď – dejiny mesta*. Sereď, 43.

### **Literature:**

Bača M., Bátora J., Sládok M.

forthcoming, *The Early Bronze Age Halbert from the Váh River*, poster presented at the 25<sup>th</sup> International Conference “Starší doba bronzová ve střední Evropě 2017”, Mistelbach 10–13.10.2017

Bojničan E.

2016 *Významná pamiatka v Hlohovci je väčšinu času pod vodou: Uhádnete o ktorej je reč?*, Hlohovec Dnes 24 z 21.marca 2016 (online, accessed: 28/12/2018) <https://hlohovec.dnes24.sk/vyznamna-pamiatka-v-hlohovci-je-vacsinu-casu-pod-vodou-uhadnete-o-ktorej-je-rec-232699>

Chromeková V.

1998 *Historický vývoj. Hrad v stredoveku*, (in:) V. Chromeková, I. Danterová, P. Ištok (eds), *Šintava: pohľad do histórie obce a na jej súčasnosť pri príležitosti 425. výročia prvej tlačiarne v obci*, Banská Bystrica, 28–41

Danterová I.

2007 *Mlynárstvo v oblasti Malého Dunaja a dolného toku Váhu*, (in:) *Sprievodca expozíciou Vlastivedného múzea v Galante*, 1–4

Daňová K., Daňová M., Stehlíková J.

2018 *Potential and Perspectives of Underwater Archaeology in Slovakia*, (in:) B. Kontny, A. Chołuj, M. Mileszczyk, K. Trusz (eds), *Archaeology: Just Add Water. Underwater Research at the University of Warsaw*, “Światowit” Supp. Series U vol. I, Warsaw, 203–216

Gálik Z.

2013 *Dejiny Hlohovca po páde Veľkej Moravy do roku 1275 s osobitným zreteľom na polohu hradu Szolgagyőr*, “Historický časopis. Vedecký časopis o dejinách Slovenska a strednej Európy” 61(2), 263–287

Gräf D.

2006 *Boat Mills in Europe from Early Medieval to Modern Times*, Dresden

Ištok P.

2002 *Lokalizácia a prírodné pomery*, (in:) E. Vrabcová, R. Petrovič (eds), *Sered' – dejiny mesta*, Sered', 11–22

Kerestěš P.

2016 *Most a mýto cez rieku Váh v Seredi*, “Revue Pamiatky a múzea” 1/2016, 10–18

Kuzma I., Bartík M.

2011 *Letecká prospekcia na Slovensku v roku 2008*, “Archeologické výskumy a nálezy na Slovensku v roku 2008”, 147–160

Labuda M.

2016 *Chladné zbrane 10.–16. storočia pochádzajúce z rieky Váh*, Masaryk University in Brno, unpublished M.A. thesis

Melníková M.

Mestečko Sereď od Moháča do rokov meruôsmych (1526–1848), (in:) E. Vrabcová, R. Petrovič (eds), *Sereď – dejiny mesta*, Sereď, 51–76

Mezey Gy.

1899 *Vizszabályozás és árvédelem*, (in:) J. Sziklay, S. Borovszky (eds), *Magyarország vármegyéi és városai (Magyarország monografiája). A magyar korona országai történetének, földrajzi, képzőművészeti, néprajzi, hadügyi és természeti viszonyainak, közművelődési és közgazdasági állapotának enciklopédiája. A "Magyarország Vármegyéi és Városai" állandó munkatársainak bizottsága közreműködésével szerkeszti I*, Budapest, 406–412

Novosedlík P.

2013 *Umelecké dedičstvo kraja: germánske zubadlo*, "Rodný môj kraj. Župný magazín" 8, 9

Novotná M.

1958 *Copper Tools in Slovakia and the Problem of the Oldest Copper Mining in Czechoslovakia*, Faculty of Philosophy Comenius University, Bratislava, unpublished M.A. thesis

Novotný B.

1951 *Nejstarší plavidla na českých vodách*, "Národopisný věstník československý" 32, 253–292

Pišút P, Procházka J., Matečný I., Bandura P. (eds)

2016 *Vývoj koryta Váhu pri Leopoldove v 17.-20. storočí a odozva rieky na zásahy človeka*, Bratislava

Patrov D., Mašlak M., Ivanov R., Petkov M., Sergeev D., Dimitrova A.

2016 *The Development of Wooden Bridges through the Ages – a Review of Selected Examples of Heritage Objects. Part 2 – the Iconic Structures from the Western Slavdom Area and those that Inspired them*, "Czasopismo Techniczne – Budownictwo" 113(2-B), 107–120

Petrovič R.

2006 *Šintava Kastle – Sereď Manor House under Construction from the 17 – 19<sup>th</sup> Centuries*, "Revue Pamiatky a múzea" 1/2006, 9–13

Podolan P.

2003 *Komunikácie v oblasti stredného a dolného toku Váhu v mladšej a neskorej dobe bronzovej a dobe halštatskej*, "MEDEA – Studia mediaevalia et antiqua" 7, 21–44

Procházka J., Pišút P.

2015 *Regulácie koryta nížinného meandrujúceho vodného toku v období r. 1782–1900 (na príklade rieky Váh v úseku Sereď-Komárno)*, "Geographia Cassoviensis" 9 (1), 44–55

Sedlák V.

2002 *Sered' v stredoveku*, (in:) E. Vrabcová, R. Petrovič (eds), *Sered' – dejiny mesta*, Sered', 39–50

Urminský J.

1997 *Ďalšie nálezy z koryta rieky Váh v Dvorníkoch-Posádke*, “Archeologické výskumy a nálezy na Slovensku v roku 1995”, 178–179

2013 *Hlohovec naše mesto*, Hlohovec

2018 *Ked' Váh otvorí trinástu komnatu*, “Fraštatské noviny” January 31<sup>th</sup> 2018 (online, accessed: 27/12/2018) <http://www.frastackenoviny.sk/relax/1966-muzeum>

Wilbers-Rost S.

1994 *Pferdegeschirr der römischen Kaiserzeit in der Germania libera. Zur Entstehung, Entwicklung und Ausbreitung des “Zaumzeuges mit Zügelketten”*, Oldenburg.

#### Other Sources:

*Extract, Wass A 1663*, Merian C.: Engraving, Map of Wars between Turks and Habsburgs in 1663, Bratislava City Gallery, Inv. Nr. C 6024

*Hlohovec Bridge in 1899*, Kronich L., [S.l.]: Képek Nyitravármegyéből, (in:) “Vasárnapi Ujság” July 16<sup>th</sup>, 1899/fig. A./p. 484 (online, access: 04.06.2018) <https://epa.oszk.hu/00000/00030/02371/pdf/>

*Lazius map 1556*, Lazius W. [S.l.]: Regni Hungariae descriptio vera, Universitätsbibliothek Basel, UBH Kartenslg AA 86–89 (online, access: 10.06.2019) <http://dx.doi.org/10.3931/e-rara-12901>

*Painting of Hlohovec I*, unknown Author: Oil Painting of Hlohovec 1756, (chronosticon: SANCTA DEI GENETRIX EX GALGO CZ SAEVA POPULSES ICONE QUOD –OVET HAC SE.), Museum in Hlohovec (online, access: 10.06.2019) [https://www.pamiatky.sk/Content/PZ\\_ZASADY/Hlohovec/0209-Hlo-veduty.pdf](https://www.pamiatky.sk/Content/PZ_ZASADY/Hlohovec/0209-Hlo-veduty.pdf)

*Painting of Hlohovec II*, J. Lippert: Painting of Hlohovec 1799, Museum in Hlohovec. (online, access: 10.06.2019) [https://www.pamiatky.sk/Content/PZ\\_ZASADY/Hlohovec/0209-Hlo-veduty.pdf](https://www.pamiatky.sk/Content/PZ_ZASADY/Hlohovec/0209-Hlo-veduty.pdf)

*Painting of Hlohovec III*, Unknown Author: Sketch of Hlohovec 1756, Museum in Hlohovec. (online, access: 10.06.2019) [https://www.pamiatky.sk/Content/PZ\\_ZASADY/Hlohovec/0209-Hlo-veduty.pdf](https://www.pamiatky.sk/Content/PZ_ZASADY/Hlohovec/0209-Hlo-veduty.pdf)

*Planum Fluvij Vagi ad Galgocz*, Jaczig, G. [S.l.]: Planum Fluvij Vagi ad Galgocz, 1775, National Archives of Hungary, Budapest, S 12 Div. XVI. – No. 13, (online, access: 10.06.2019) <https://maps.hungaricana.hu/en/MOLTerkeptar/5878/>

*Second Military Survey of the Habsburg Empire (1819–1869)*, unknown author [S.l.]: Institute and Museum of Military History, Vienna, B IX a 1124; (online, access: 10.06.2018) <https://mapire.eu/en/map/secondsurvey-hungary>.

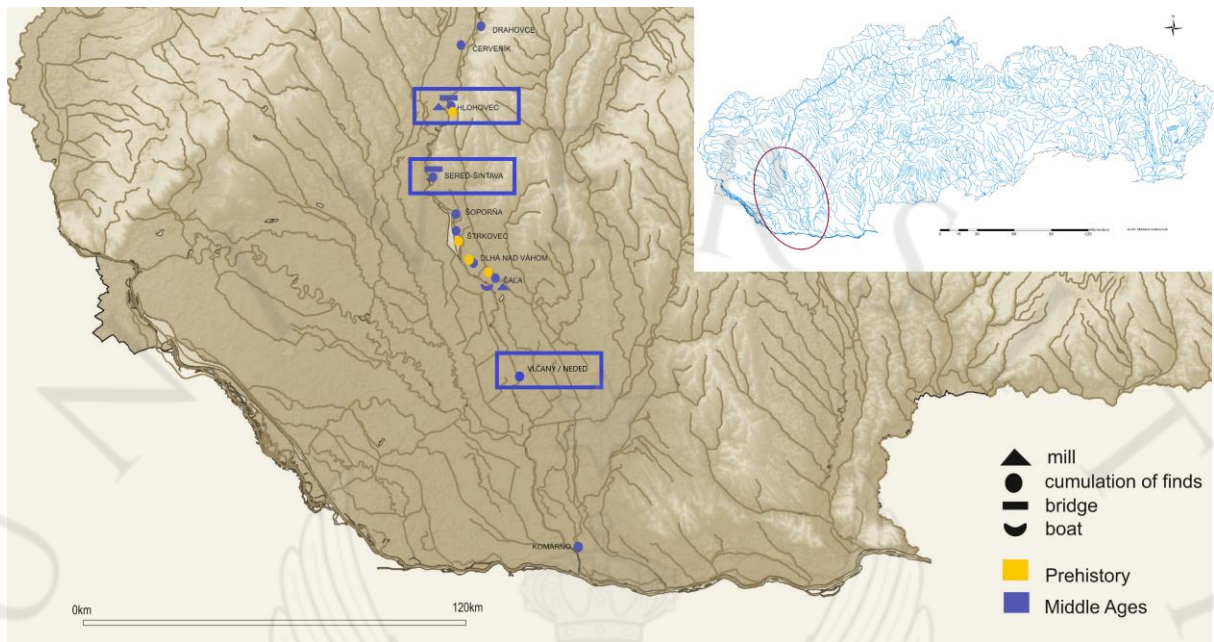


Fig. 1 – Map of important archaeological sites on the lower reach of the Váh River (elaborated by: M. Kaštierová, K. Daňová, M. Daňová, J. Stehlíková)

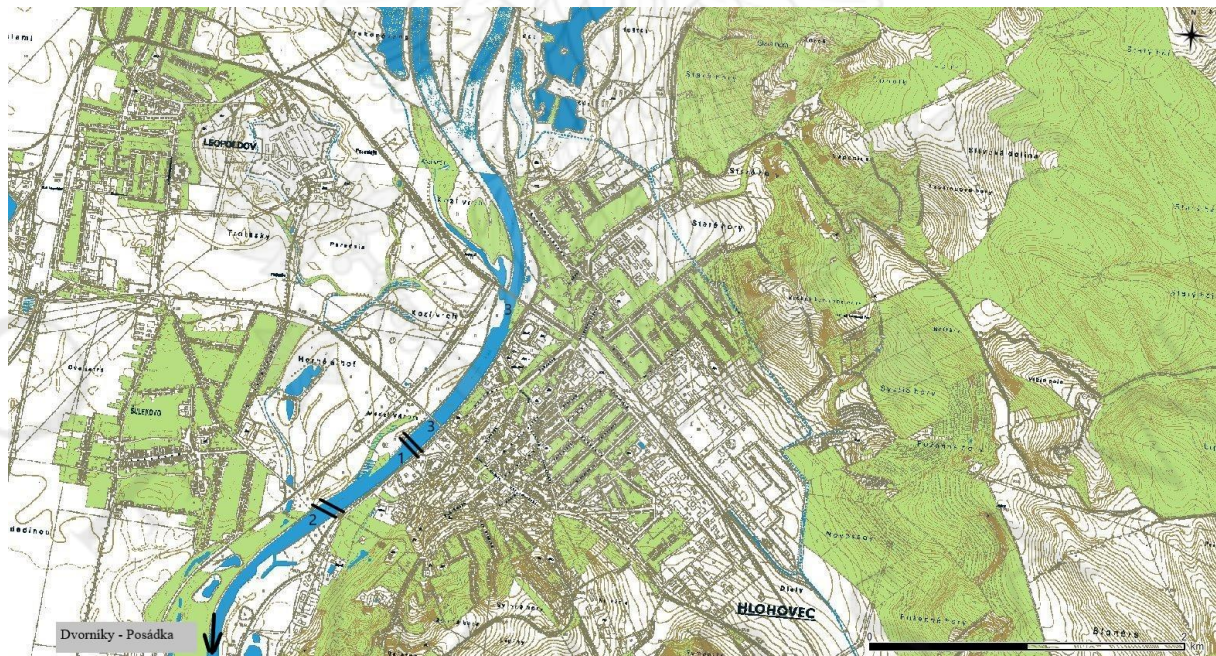


Fig. 2 – Bridges in Hlohovec (1 – medieval (?) bridge remains, 2 – bridge from the 18<sup>th</sup> century, 3 – present-day bridges); scale 1:10 000 (elaborated by: K. Daňová, M. Daňová)



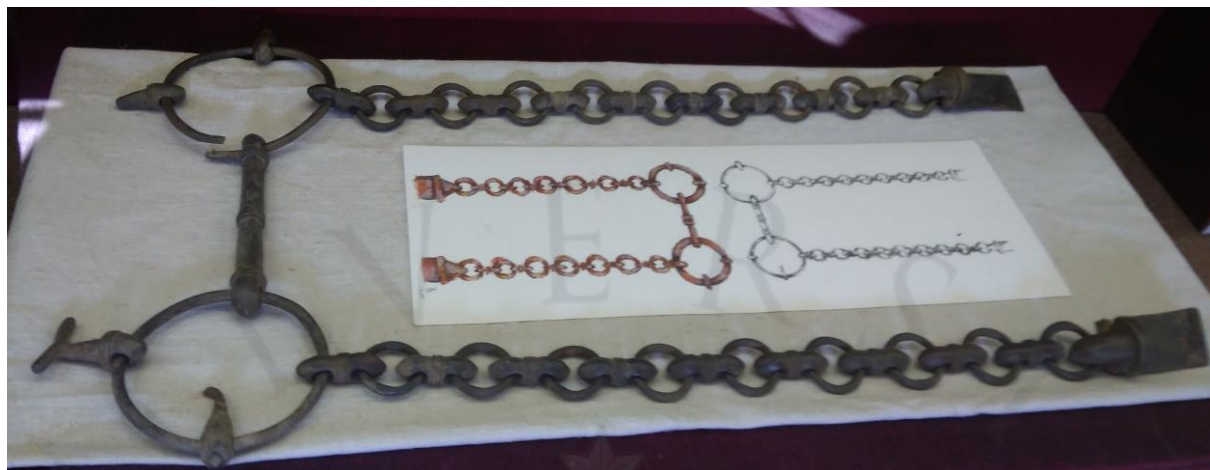


Fig. 3 – Snaffle from the Roman Period, found at Hlohovec, in the location Dvorníky–Posádka, directly from the Váh riverbed (photo by: K. Daňová)



Fig. 4 – Remains of the medieval (?) bridge, in service until the 18<sup>th</sup> century A.D. (photo by: K. Daňová)



Fig. 5 – Wooden piles and structures along the banks of the Váh River, area of the eighteenth-century bridge (photo by: K. Daňová, M. Cheben [Institute of Archaeology, Slovak Academy of Sciences])



Fig. 6 – Piles with iron forged reinforcement on the bank of the Váh River (photo by: K. Daňová)



Fig. 7 – Bridges in Sered' (1 – bridge from the 19<sup>th</sup> century, 2 – medieval bridge remains (?), 3 – present-day bridge, in red– area studied in 2018); scale 1:10 000 (elaborated by: K. Daňová)

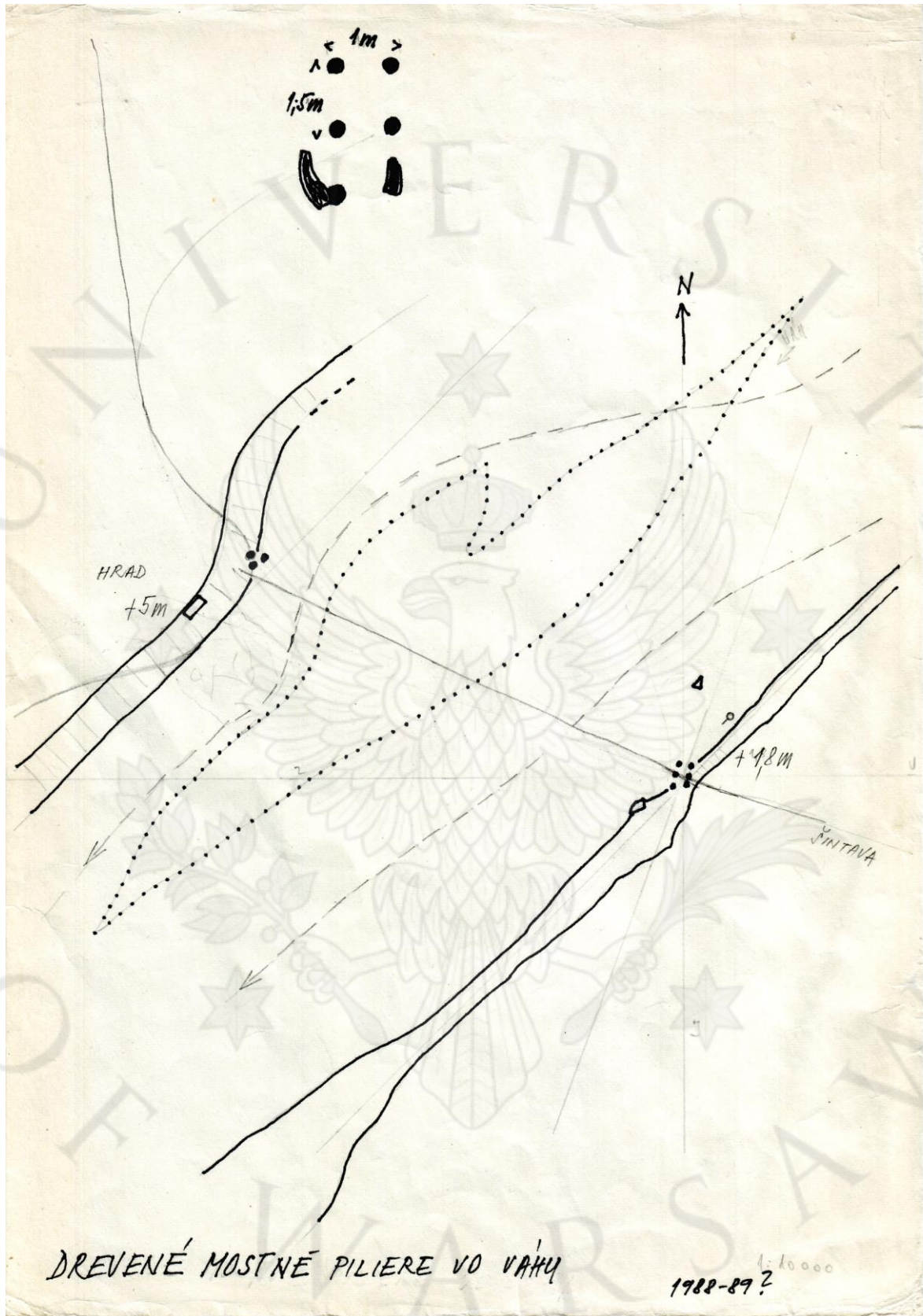


Fig. 8 – Documentation of the bridge construction (no. 2) by former museum workers; not visible today (elaborated by: P. Ištók)

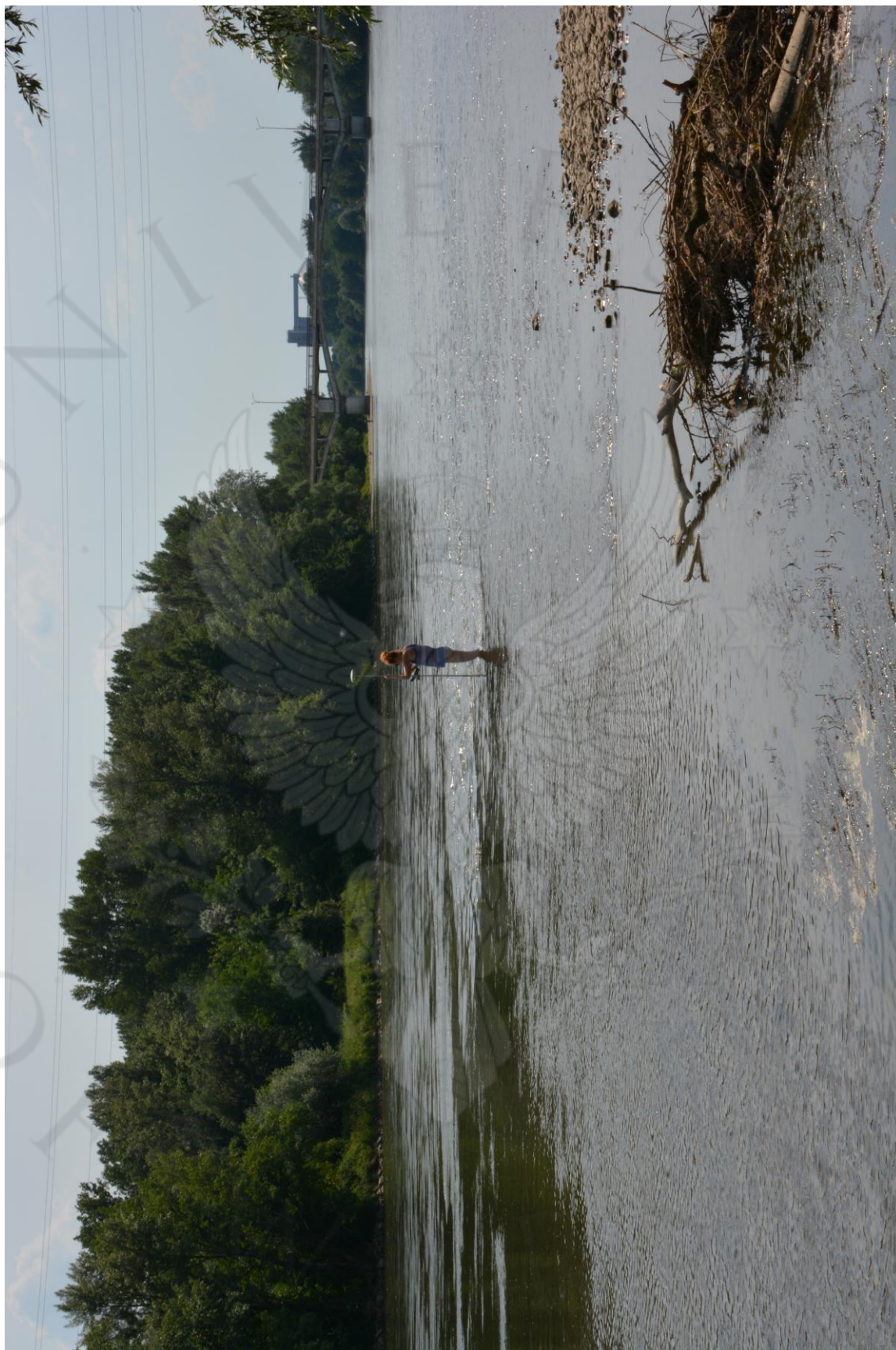


Fig. 9 – Documentation of the wooden remains of the bridge (no. 1) and water regulation system; summer 2018 (photo by: K. Daňova)





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