

Doctoral Dissertation

WHO STOLE THE WATER?
THE CONTROL AND APPROPRIATION OF WATER RESOURCES IN
MEDIEVAL HUNGARY

by

András Vadas

Supervisors:
Alice M. Choyke
and
Katalin Szende

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List of Abbreviations

| | |
|-----------------------------|--|
| ÁMTF | Györffy, György. <i>Az Árpád-kori Magyarország történeti földrajza</i> , 4 vols [A historical geography of Hungary in the Árpadian period] Budapest: Akadémiai Kiadó, 1963–1998. |
| AO | <i>Anjoukori okmánytár / Codex diplomaticus Hungaricus Andegavensis</i> , 7 vols. Eds. Imre Nagy and Gyula Tasnádi Nagy. Budapest: Magyar Tudományos Akadémia, 1878–1920. |
| AOKlt | <i>Anjou-kori oklevéltár</i> , 43 vols [Angevin cartulary]. Ed. in chief, Gyula Kristó, and Tibor Almási. Szeged and Budapest: JATE – MNL OL, 1990–2019. |
| ÁÚO | <i>Árpádkori új okmánytár</i> , 12 vols [New Árpadian-age cartulary]. Ed. Gusztáv Wenzel. Pest–Budapest: Eggenberger Ferdinánd, 1860–1874. |
| BTOE, vol. 1 | <i>Budapest történetének okleveles emlékei/Monumenta diplomatica civitatis Budapest</i> , vol. 1. Ed. Albert Gárdonyi. Budapest: Budapest Székesfőváros, 1936. |
| CD | <i>Codex diplomaticus Hungariae ecclesiasticus ac civilis</i> , 11 vols. Ed. Georgius Fejér. Buda: Typis Regiae Universitatis Hungaricae, 1829–1844. |
| CDB, vol. 1 | <i>Codex diplomaticus et epistolaris regni Bohemiae</i> , vol. 1. Ed. Gustavus Friedrich. Prague: Sumptibus Comitiorum Regni Bohemiae, 1904/1907. |
| CDES | <i>Codex diplomaticus et epistolaris Slovaciae</i> , 2 vols. Ed. Richard Marsina. Bratislava: Academia Scientiarum Slovaca, 1971–1987. |
| DHA, vol. 1 | <i>Diplomata Hungariae Antiquissima</i> , vol. 1. 1000–1131. Ed. György Györffy. Budapest: Akadémiai, 1992. |
| EFHU, vol. 3/2 | <i>Elenchus fontium historiae urbanae</i> , vol. 3/2. Ed in chief András Kubinyi. Budapest: Balassi, 1997. |
| Engel, <i>Archontológia</i> | Engel, Pál. <i>Magyarország világi archontológiája: 1301–1457</i> , 2 vols [Lay archontology of Hungary, 1301–1457]. Budapest: História, 1996. |
| Házi, <i>Sopron</i> | Házi, Jenő. <i>Sopron szabad királyi város története</i> , 13 vols [The history of the free royal town of Sopron]. Sopron: Székely, Szabó és Társa Könyvnyomdája, 1921–1943. |

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| HO | <i>Hazai okmánytár / Codex diplomaticus patrius</i> , 8 vols. Ed. Imre Nagy. Győr and Budapest: Sauervein Géza – Franklin, 1865–1891. |
| MCZ | Tkalčić, Ivan Krstitelj. <i>Povjestni spomenici slob.kralj. grad. Zagreba. Monumenta historica liberae regiae civitatis Zagrabiae</i> , 11 vols. Zagreb: Brzotisk Albrechta, 1889–1905. |
| MES | <i>Monumenta Ecclesiae Strigoniensis</i> , 4 vols. Eds. Nándor Knauz et al. Esztergom and Budapest: Horák – Argumentum, 1874–1999. |
| MGH | <i>Monumenta Germaniae Historica</i> |
| MNL OL | Magyar Nemzeti Levéltár Országos Levéltára (National Archives of Hungary, State Archive), Budapest |
| MNL OL DF | Diplomatikai Fényképgyűjtemény [Photographic Collection of Diplomats], U szekció [Section “U”] |
| MNL OL DL | Diplomatikai Levéltár [Archives of Diplomats], Q szekció: Mohács előtti gyűjtemény [Section “Q”: Pre-1526 Collection] |
| MNL OL E | Magyar Kincstári Levéltárak [Archives of the Hungarian Chambers] |
| MNL OL P | Családok, testületek és intézmények levéltárai [Archives of Families, Corporations, and Institutions] |
| MNL OL S | Térképár [Collection of Maps] |
| OSZK | Országos Széchényi Könyvtár (Széchényi National Library), Budapest |
| PMTOE | <i>Pest megye történetének okleveles emlékei 1002–1599-ig</i> [Diplomatic sources on the history of Pest County, 1002–1599]. Ed. László Bártfai Szabó. Budapest: [N. p.], 1938. |
| RA | <i>Az Árpád-házi királyok okleveleinek kritikai jegyzéke / Regesta regum stirpis Arpadianae critico-diplomatica</i> , 2 vols. Eds. Imre Szentpétery, and Iván Borsa. Budapest: Akadémiai, 1923–1987. |
| <i>Tripartitum</i> | <i>The Customary Law of the Renowned Kingdom of Hungary: A Work in Three Parts Rendered by Stephen Werbőczy (The “Tripartitum”)</i> . Ed. and transl. by János M. Bak, Péter Banyó, and Martyn Rady. Idyllwild, CA: Charles Schlacks, 2005. |
| UB | <i>Urkundenbuch des Burgenlandes und der angrenzenden Gebiete der Komitate Wieselburg, Ödenburg und Eisenburg</i> , 5 vols. Hans Wagner, and Irmtraut Lindeck-Pozza. Graz and Cologne: Böhlau, 1955–1999. |

- VMMS, vol. 1 *Výsady miest a mestečiek na Slovensku. I. 1238–1350* [Privileges of towns and cities in Slovakia, 1238–1350]. Ed. Ľubomír Juck. Bratislava: Veda – Vydavateľstvo Slovenskej akadémie vied, 1984.
- Zichy *A zichi és vászonkeői gróf Zichy-család idősb ágának okmánytára / Codex diplomaticus domus senioris comitum Zichy de Zich et Vasonkeő*, 12 vols. Eds. Imre Nagy et al. Pest – Budapest: Magyar Történelmi Társulat, 1871–1931.
- ZsO *Zsigmondkori oklevéltár*, 13 vols [Sigismundian cartulary] (Magyar Országos Levéltár kiadványai, II. Forráskiadványok 1, 3–4, 22, 25, 27, 37, 39, 41, 43, 49, 52, 55). Eds. Elemér Mályusz et al. Budapest: Akadémiai, 1951–2017.
- Zsoldos, *Archontológia* Zsoldos, Attila. *Magyarország világi archontológiája, 1000–1301* [Lay archontology of Hungary, 1000–1301] (História könyvtár. Kronológiák, adattárak, 11). Budapest: História – MTA Történettudományi Intézete 2011.

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A Note on Names

Where the location of a settlement falls outside of the present-day territory of Hungary, I always use its current, official place name. If a settlement no longer exists, I use the medieval or early modern name. Since rivers have sections that flow through present-day Hungary, I will use the Hungarian names unless they have an English version. With rivers running outside of present-day Hungary, I use the form of the name used in the relevant countries. I will use the Hungarian forms of historical county names.

1. Introduction

“Hungary shall cede to Czechoslovakia the villages of Horvathjarmalu [Jarovce], Oroszvar [Rusovce] and Dunacsun [Čunovo, part of present-day Bratislava], together with their cadastral territory as indicated on Map No. IA annexed to the present Treaty. Accordingly, the Czechoslovak frontier on this sector shall be fixed as follows: from the point common to the frontiers of Austria, Hungary and Czechoslovakia, as they existed on January 1, 1938, the present Hungarian-Austrian frontier shall become the frontier between Austria and Czechoslovakia as far as a point roughly 500 meters south of hill 134 (3.5 kilometers northwest of the church of Rajka), this point now becoming common to the frontiers of the three named States; thence the new frontier between Czechoslovakia and Hungary shall go eastwards along the northern cadastral boundary of the village of Rajka to the right bank of the Danube at a point approximately 2 kilometers north of hill 128 (3.5 kilometers east of the church of Rajka), where the new frontier will, in the principal channel of navigation of the Danube, join the Czechoslovak-Hungarian frontier as it existed on January 1, 1938; the dam and spillway within the village limits of Rajka will remain on Hungarian territory.”¹

The infamous peace treaty of Paris in 1947 reordered the borders of Hungary and Czechoslovakia as described above. Along a good part of their lengths, as before the Second World War, the Danube and the Ipoly Rivers marked the border between the two polities. The rivers, especially the Danube with its significant flow, seemed to be the most obvious border. However, in order to provide energy to fuel plans for Socialist industrialization and no less importantly to bring the political life of the countries closer soon after the Second World War, the old idea of a major hydropower complex again moved to the forefront. Similar projects were initiated by the Soviet Union in a number of countries where communists took over power and joined the Warsaw Pact. The Iron Gate hydropower plant between Yugoslavia and Romania served similar purposes. While the latter project was completed, the Hungarian-Czechoslovakian project was never fully finished. This, so-called Gabčíkovo–Nagymaros Dams, planned and partially built in the 1970s–1990s on the Danube, became one of the most debated industrial projects in the history of both countries. The plan was to dam the river at two points to create a hydropower complex, one close to Bratislava – at Gabčíkovo – and one further downstream, close one of the most picturesque points along the River Danube in

¹ *Treaties of Peace with Italy, Bulgaria, Hungary, Roumania, and Finland* (Washington, D.C.: U.S. G.P.O., 1947), 1–2. (part I.4.c)

Hungary, by the so-called Danube Bend, between towns on opposite banks of the river, Nagymaros and Visegrád. The case proved of crucial importance in the formation of the Hungarian political opposition, which along with the unfolding financial crisis in the country, lead to the gradual halting and then suspension of the project on the Hungarian side. At that point, as the hydrological works on the Czechoslovak side were almost complete, the Slovak government, then just forming after the disunion of the Czech Republic and Slovakia, strongly opposed aborting the project. The controversy peaked with diversion of more than 80 per cent of the waters of the Danube by a sluice that began operation on the Slovak side in October 1992. The project was to mostly misfire, ending in a long-lasting lawsuit between newly formed Slovakia and Hungary and a major transformation of landscapes in the upper section of the River Danube in Hungary. The dispute caused major political tension between the two countries in which Slovakia – not without good reason – was accused of stealing the Danube, and Hungary – again rightfully – was accused of breaking a signed international agreement.² The history of the project, which oddly enough lacks a comprehensive study, demonstrates how crucial water ownership and the different interests at play in water use remain, up to the present day.³ The damming described above as well as the water project itself is no exception. Dozens of similar lawsuits took place over the past decades addressing the rights of individuals and collectives to water resources including fresh water access, water for hydropower, industrial water, etc. Based on recent reports, this competition for water resources will pose a growing challenge for all humanity in the coming decades. Yet, there is nothing new under the sun; similar lawsuits can be traced back at least a millennium in the region. The different interests of people drinking the water of a river, farming by it, using a water body to produce energy, support certain craft industries, in fishing, navigating, or organizing the defense of a settlement or a country, all resulted in different priorities that often led to conflict and compromise.

In this dissertation I will address the problems surrounding water management, a space where different economic and other socio-political interests met and sometimes clashed. Modern politics focuses on who has legitimate rights to claims in such disputes, but for historians, it is certainly more relevant to understand how such conflicts were approached and

² For the case, see: Judit Galambos, “An International Environmental Conflict on the Danube: the Gabčicovo – Nagymaros Dams,” in *Environment and Democratic Transition in Central and Eastern Europe. Policy and Politics in Central and Eastern Europe* (Technology, Risk and Society, 7), eds. Anna Vári, and Pál Tamás (Dordrecht–Boston–London: Springer, 1993), 146–156, and John Fitzmaurice, *Damming the Danube: Gabčikovo and post-communist politics in Europe* (Boulder, CO and Oxford: Westview, 1996).

³ For a recent summary of the problem: Niklas Mortimer Franz Wittmann, “From red to green? The relationship between democratic opposition and environmentalism in the Hungarian people’s republic and the GDR.” (MA thesis, Central European University, 2018).

resolved in the past by posing questions about how pre-modern societies dealt with these same problems. These questions include what kind of disputes unfolded with regard to the use of water and the degree to which water conceived as private or as ‘common’? How were different interests aligned with each other? In this dissertation I raise these questions in the context of Central Europe, and more particularly, in the Kingdom of Hungary in the Middle Ages (from the ca. tenth century to the mid-sixteenth century), i.e. the period of the re-appearance of literacy in the area after the Roman period. Throughout the different chapters of the dissertation I shall argue that use of water by the societies of the Kingdom of Hungary in the Middle Ages gave rise to fairly complex sets of customs and norms that, until the Modern times, were the most important principles in settling water use related disputes. Before addressing the scope and the hypotheses of the present work, I discuss how scholarship addressed these questions in the past century.

1.1. Riverine Landscapes as Conflict Environments in Pre-Modern Europe – Some Historiographic Reflections

Historical scholarship in the last few decades has demonstrated the complexity of water-related disputes in modern contexts.⁴ There is strong evidence from many parts of Europe and beyond however, that those modern water-related disputes – centered on uneven access to water –, can actually be shown to have begun well before the modern period.⁵ Due to the growing water scarcity problem in many regions of the world, especially in urban environments, researchers have increasingly started to address water-related issues in historical contexts as well.⁶ The topic has been approached in scholarship from numerous

⁴ See e.g. *A History of Water*, 9 vols, ed. Terje Tvedt (New York: I. B. Tauris, 2009–2011). For theoretical consideration, mostly focusing on water scarcity: David K. Kreamer, “The Past, Present, and Future of Water Conflict and International Security,” *Journal of Contemporary Water Research & Education* 149 (2012): 87–95, and Scott Moore, “Rethinking Conflict over Water,” in *Oxford Research Encyclopedia of Environmental Science* (Oxford: Oxford University Press, 2016); doi: 10.1093/acrefore/9780199389414.013.104.

⁵ For the ancient period, see: Jonas Berking et al., “Problems Concerning Ancient Water Management in the Mediterranean,” *Journal for Ancient Studies* 6 (2016): 74–101. See also two special issues of the journal *Water History* 2, no. 2 (2010): Ancient Near East and Americas and 4, no. 1 (2012): Roman and Byzantine Empires, both including papers read at a conference held at the University of Durham in 2009 (Water and Power: Hydraulic Management and Conflicts in the Ancient World). For non-European contexts, see e.g. Michele Campopiano, “Cooperation and Private Enterprise in Water Management in Iraq: Continuity and Change between the Sasanian and Early Islamic Periods (Sixth to Tenth Centuries),” *Environment and History* 23 (2017): 385–407, or Ingrid Hehmeyer, *A History of Water Engineering and Management in Yemen* (Handbook of Oriental Studies, Section 1. The Near and Middle East, 129) (Leiden and Boston: Brill, 2019), esp. 113–129.

⁶ On the development of water history scholarship and modern water resource problems, see: Lawrence B. Lee, “Water Resource History: A New Field of Historiography?,” *Pacific Historical Review* 57 (1988): 457–467. Lee

research directions and has been studied by technological and architectural historians, political and legal historians, economic and social historians, and last but not least, environmental and landscape historians and archaeologists. All these historians have all made important contributions to the field. Of late, an entirely different approach dealing with an intellectual history of water has also become a topic of interest among historians and literary historians. A comprehensive survey of the scholarship on the history of water use and management in general would be worthwhile as there is a considerable lacuna in this regard. However, delving into this field would by far exceed the limitations of this dissertation and given the large extent of the scholarship, could hardly claim to be complete. In the following pages therefore, I chose to provide an overview of the main research directions as well as the questions that have been raised concerning pre-modern European contexts with regard to water-related conflicts. I will try to be more comprehensive however, concerning recent scholarship on Central Europe compared to other regions, as works produced in various countries in recent years have only partially reached English- or German-speaking readerships despite considerable growth in the English and German publications from the region. Major research directions will be outlined in the following pages. Further specific works will be referred to and discussed in individual chapters.

The survey, although it refers to works on water use in general, will primarily focus on mills and milling, because milling environments seem to have played the most important role in disputes. However, because research tradition into water mills is very extensive, the part they played in conflict may be somewhat over-emphasized.

The study of historical water management and related conflicts is not entirely new; historians began to enquire into related questions well over a century ago. The monumental four-volume study by Richard Bennett and John Elton – *History of Corn Milling* – is, despite focusing primarily on milling in England, still the most useful basic handbook on numerous aspects of milling and water use in the British Isles and continental Europe in the last millennium. This ground-breaking work set the stage for the research directions of the twentieth century.⁷ Further, this monumental work was probably produced in one of the last moments when it was still feasible as many of the technological aspects were much easier to study at that time compared to a century later, as numerous mills were still standing, if not functioning. At the same time the two English historians wrote their work, two research

argues for the importance of the world's water resource problems in the 1950s and 1960s in the formation of what he calls water resource history scholarship.

⁷ Richard Bennett, and John Elton, *History of Corn Milling*, 4 vols (London: Simpkin, 1898–1904).

directions unfolded and still form an important part of water history scholarship: historical topography and geography, and more significant from the point of view of this dissertation, legal history. Historical topographies and regional historical geographies published in France, Germany, as well as Central Europe all contributed to the study of historical water management. The datasets gathered within them contain numerous references to toponyms and topographic features related to human interventions into water systems such as artificial channels, dykes, dams, sluices, fish ponds, etc.⁸ Nonetheless, studies into historical water rights have more relevance for this analysis since by nature these works focused on conflicts that unfolded in water management and water-use, their resolutions, and resulting regulations in historical times. In this tradition, German historiography has proven to be most important and numerous German scholarly works have been dedicated to different legal aspects of water management. Apart from general works,⁹ the problems surrounding dykes,¹⁰ mills,¹¹ fishing and fishponds¹² as well as regional variations in the regulation of water use have been discussed in detail in many of the German-speaking areas.

⁸ For France, see the regional monographs written based on the principles laid down by Paul Vidal de la Blache (idem, *Tableau géographique de la France* [Paris: Hachette, 1908]). For a critical analysis of these monographs: André Thibault, “L’analyse des espaces régionaux en France depuis le début du siècle,” *Annales de Géographie* 81, no. 444 (1972): 129–170. For Hungary, see: Tivadar Ortway, *Magyarország régi vízrajza a XIII. század végéig*, 2 vols [Hydrography of ancient Hungary until the end of the 13th century] (Budapest: MTA, 1892).

⁹ Heinrich Geffcken, “Zur Geschichte des deutschen Wasserrechts,” *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte. Germanistische Abteilung* 21, no. 1 (1900): 173–217, Reinhard Härtel, “Von Wasser- und Mühlenrecht im Hochmittelalter,” in *Recht und Geschichte. Festschrift Hermann Baltl zum 70. Geburtstag*, ed. Helfried Valentinitz (Graz: Leykam, 1988), 219–236, J. Getzler, *A History of Water Rights at Common Law* (Oxford: Oxford University Press, 2004). For a critical survey of the German legal history research into water use and milling see: Niels Petersen, and Arnd Reitemeier, “Die Mühle und der Fluss. Juristische Wechselwirkungen,” in *Wasser in der mittelalterlichen Kultur : Gebrauch – Wahrnehmung – Symbolik = Water in Medieval Culture : Uses, Perceptions, and Symbolism* (Das Mittelalter. Beihefte, 4), eds. Gerlinde Huber-Rebenich, Christian Rohr, and Michael Stolz (Berlin: De Gruyter, 2017), 276–290.

¹⁰ Julius von Gierke, *Geschichte des deutschen Deichrechts*, 2 vols (Deutschen Staats- und Rechtsgeschichte, 63 and 128) (Breslau: M. & H. Marcus, 1901–1917), esp. vol. 1. 16–183.

¹¹ Carl Koehne, *Das Recht der Mühlen bis Zum Ende der Karolingerzeit. Ein Beitrag zur Geschichte des Deutschen Gewerberechts* (Deutschen Staats- und Rechtsgeschichte, 71) (Breslau: M. & H. Marcus, 1904), idem, “Die Mühle im Rechte der Völker,” *Beiträge zur Geschichte der Technik* 5 (1913): 27–53, Harm Wiemann, “Beiträge zur Geschichte des Mühlenrechts. Dargestellt an Mühlen der Herrschaft Crimmitschau vom 14.–17. Jahrhundert,” *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, Germanistische Abteilung* 66 (1948): 477–500, Rüdiger Moldenhauer, “Mühlen und Mühlenrecht in Mecklenburg,” *Zeitschrift der Savigny-Stiftung zur Rechtsgeschichte, Germanistische Abteilung* 79 (1962): 195–236, Werner Kohl, *Recht und Geschichte der alten Münchner Mühlen* (Miscellanea Bavarica Monacensia, 15 = Neue Schriftenreihe des Stadtarchivs München, 32) (Munich: Stadtarchiv, 1969), Ingo Herbert Kropač, *Mühlen und Mühlenrecht in der Steiermark während des Mittelalters* (Dissertationen der Karl-Franzens-Universität Graz, 61) (Graz: Verlag für d. Techn. Univ. Graz, 1982), esp. 40–65, Christoph Bachmann, “Altbayerns erste bisher bekannte Mühlordnung. Die Ordnung der Ingolstädter Müller aus dem Jahr 1437,” *Sammelblatt des Historischen Vereins Ingolstadt* 102/103 (1993): 309–316.

¹² Alajos Degré, *Magyar halászati jog a középkorban* [Fishing law in medieval Hungary] (Budapest: Sárkány Nyomda, 1939), Hermann Heimpel, “Die Federschnur. Wasserrecht und Fischrecht in der ‘Reformation Kaiser Siegmunds’,” *Deutsches Archiv für Erforschung des Mittelalters* 19 (1963): 451–488 and Guido Kisch, *Das Fischereirecht im Deutschordensgebiet* (Forschungen und Quellen zur Rechts- und Sozialgeschichte des Deutschordenslandes, 3) (2nd ed. Sigmaringen: Thorbecke, 1978).

Following in the footsteps of the early legal histories that primarily focused on normative sources – law codes and other legal regulations instead of actual attempts at conflict resolution found in documented court cases – came new historical approaches to waterscapes during the interwar period. These scholars focused on technological as well as economic and social history. Of course, these three aspects are intertwined. Most of the important studies from the period are just as much technological and economic histories as they are economic and social histories. It is not so much the number of studies that is important from this interwar period as much as the influence of a few works that laid down the basic questions historians would keep returning to in the following decades.

The most important of these new interwar studies was written by the famous French historian, Marc Bloch. His study on the spread of water mills, published in 1935, probably became one of the most frequently referred to works in water history scholarship even today.¹³ There is virtually no comprehensive work on water history that does not mention this critical study which is valuable from technological, economic and social historical points of view. The main argument in Bloch's study was that the spread of the watermills was not primarily due to growing demands by the population, but rather to the landlords' power to enforce a *ban* on milling anywhere but in the lord's own mill, provided the landlord with significant income. Although he discussed the technological aspects of the spread of water mills as well, he was mainly interested in the social organization behind the spread of mills. He also considered economic demands, but came to the conclusion that in itself, the growing number of mills in Europe from the tenth century onwards could not be explained by market demands. Later, increases in mill numbers was partly explained by the growing demand for industrial mills – especially for the textile¹⁴ and metal¹⁵ industries – but this trend may have

¹³ Marc Bloch, "Avènement et conquêtes du moulin à eau," *Annales d'histoire économique et sociale* 7 (1935): 538–563, also published in English: idem, "The Advent and Triumph of the Watermill," in *Land and Work in Mediaeval Europe: Selected Papers by Marc Bloch* (London: Routledge, 1967), 136–168. I used the former when writing the thesis.

¹⁴ E[leonora] M[ay] Carus-Wilson, "An Industrial Revolution of the Thirteenth Century," *The Economic History Review* 11, no. 1 (1941): 39–60 (published again in: *Internal Colonization in Medieval Europe* [The expansion of Latin Europe, 1000–1500, 2], eds. Felipe Fernández-Armesto, and James Muldoon [Farnham: Ashgate, 2008], 301–322) and R[eginald] A[rthur] Pelham, *Fulling Mills: A Study in the Application of Water Power to the Woollen Industry* (London: Society for the Protection of Ancient Buildings, 1958). For fulling mills, see recently: Adam Lucas, "Fulling mills in medieval Europe. Comparing the manuscript and archaeological evidence," in *Archéologie des moulins hydrauliques, à traction animale et à vent, des origines à l'époque médiévale et moderne en Europe et dans le monde Méditerranéen: Actes du colloque international, Lons-le-Saunier du 2 au 5 novembre 2011* (Annales littéraires de l'Université de Franche-Comté, 959), eds. Luc Jaccottey, and Gilles Rollier (Besançon: Presses Universitaires de Franche-Comté, 2016), 581–594.

¹⁵ For a pioneering work, see: B. Gille, "Le moulin à eau, une révolution médiévale," *Techniques et civilisations* 3 (1954): 1–15. More recently, see the works of Matheux Arnoux in the topic, most importantly: "Moulins à fer et procédé indirect. Innovation technique et conditions géographiques dans la sidérurgie européenne (XIIIe-XVIe siècles)," in *I Mulini nell'Europa medievale: Atti del Convegno di San Quirico d'Orcia, 21-23 settembre 2000*,

had a rather limited geographical impact on a European scale, especially before the Late Middle Ages. This research led to another research problem, only discussed from the 1950s onwards, namely, the degree to which mills should be considered urban phenomena in the High Middle Ages. Some scholars argued that, unlike most industries, mills were, more or less, evenly distributed over the countryside and as such contributed to the industrial development of rural areas. Conversely, many other works pointed to the high concentration of industrial and flour mills in urban environments.¹⁶ Historians keep returning to the problem of the role water power played in the intensification of medieval industry and the energy regime of the pre-modern (pre-coal) period.¹⁷

It was primarily social and technological historians in the postwar period who discussed issues of water management.¹⁸ Georges Duby, from the Annales School after Bloch, addressed the issue of water management and argued for the crucial importance of water mills in the development of the countryside in Western Europe.¹⁹ Historians of technology, following in Duby's footsteps published a number of influential – and partly popularizing – books on the role of water mills in the intensification of industry in the Middle Ages.²⁰ Richard Holt's monograph on English mills, in many ways, represents the most important summary on the subject until the advent of new approaches that became widespread from the

eds. Paola Galetti, and Pierre Racine (Biblioteca di storia agraria medievale, 21) (Bologna: Clueb, 2003), 317–328.

¹⁶ Bloch, "Avènement et conquêtes," André Guillerme, *Les temps de l'eau : la cité, l'eau et les techniques : nord de la France, fin III^e-début XIX^e siècle* (Seyssel: Champ Vallon, 1983) and more importantly Germain Sicard, *Aux origines des sociétés anonymes : les moulins de Toulouse au Moyen âge* (Paris: Édition de l'EHESS, 1953). Both books have been translated into English: André Guillerme, *The Age of Water: The Urban Environment in the North of France, A. D. 300–1800* (Environmental History Series, 9) (College Station, TX: A & M University Press, 1988) and Germain Sicard, *The Origins of Corporations : the Mills of Toulouse in the Middle Ages* (New Haven, CT and London: Yale University Press, 2015). The latter has oddly been published in English more than 60 years after its original publication.

¹⁷ John Langdon, "The Economics of Horses and Oxen in Medieval England, *Agricultural History Review* 30 (1982): 31–40; idem, "Water-mills and Windmills in the West Midlands, 1086–1500," *Economic History Review* 2nd series 44 (1991) 424–444 and more recently: John H. Munro, "Industrial energy from water-mills in the European economy, 5th to 18th Centuries: the limitations of power," in *Economia e energia, secc. XIII–XVIII : atti della trentaquattresima Settimana di studi, 15–19 aprile 2002* (Istituto Internazionale di Storia Economica F. Datini, Prato. Serie 2. Atti delle settimane di studio e altri convegni, 34), ed. Simonetta Cavaciocchi ([Florence]: Le Monnier, 2003), 223–269.

¹⁸ E.g. Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace and Co., 1934)

¹⁹ Georges Duby, *L'économie rurale et la vie des campagnes dans l'Occident médiéval*, 2 vols (Paris: Aubier, 1962). Published in English as *Rural Economy and Country Life in the Medieval West* (London: E. Arnold, 1962). (I used the former when writing this thesis.)

²⁰ Lynn White Jr., *Medieval Technology and Social Change* (London: Oxford University Press, 1962), Jean Gimpel, *La Révolution industrielle du Moyen âge* (Paris: Seuil, 1975). Published in English as: *The Medieval Machine: The Industrial Revolution of the Middle Ages* (New York: Holt, Rinehart & Winston, 1976). For its impact, see: Shana Worthen, "The Influence of Lynn White, Jr's Medieval Technology and Social Change," *History Compass* 7, no. 4 (2009): 1201–1217.

1990s in Europe and somewhat earlier in the U.S. Because of its concise and clear argumentation, this basic handbook remains influential.²¹

Apart from mills, historians of technology and social historians also became interested in large water regulation and canalization projects – most importantly the Karlsgraben of Charlemagne, which was first conceived, to some extent, as a prime example of an expression of imperial power, and later as a forerunner of the Rhine–Main–Danube Canal.²² The social background of major water regulation works in the Middle Ages, however, has only been partially discussed in the literature, despite their potential in the study of the relationship of state power and water construction on the one hand, and the social organization lying behind these works on the other.²³ Lack of research is probably not independent of the problem of social historians sometimes distancing themselves from ideas easily identified as Marxist. One other social historical aspect that has attracted the attention of some scholars is the importance of mills as local centers. In the countryside where most of the mills stood, simply because of the distribution of the water resources, and thus often the population as well, despite the above-mentioned attempts to demonstrate the contrary, these buildings were the most important objects connected to particular communities. Partly because of the *ban*, people from the surrounding areas appeared at mills regularly. Mills became meeting places of the local communities in villages for its utility but also because the miller would have been one of the best informed and often most educated of the villagers.²⁴ This has made mills and millers important objects for social historians of research.

²¹ Richard Holt, *The Mills of Medieval England* (Oxford and New York: Basil Blackwell, 1988).

²² Ernst Eichhorn, “Ein Kaiser an der Altmühl. Zwischen Solagrab und Fossa Carolina,” in *Karolingisches Franken*, ed. Wolfgang Buhl (Würzburg: Echter, 1973), 107–143, Klaus Grewe, “Der Karlsgraben bei Weißenburg i.B. und der Fulbert-Stollen von Maria Laach: zwei große Wasserbauprojekte des Mittelalters in Deutschland,” in *Europäische Technik im Mittelalter, 800 bis 1400: Tradition und Innovation*, ed. Uta Lindgren (Berlin: Gebr. Mann, 1996), 111–115, Theodor Fischer, and Markus Strobel, “Von der Fossa Carolina zur Main-Donau-Überleitung,” in *Historische Wassernutzung an Donau und Hochrhein sowie zwischen Schwarzwald und Vogesen* (Schriften der Deutschen Wasserhistorischen Gesellschaft, 10), ed. Christoph Ohlig (Norderstedt: Books on demand, 2008), 61–71. Cf. Paolo Squatriti, “Digging Ditches in Early Medieval Europe,” *Past and Present* 176, no. 1 (2002) 11–65. Most recently, see: *Großbaustelle 793 : das Kanalprojekt Karls des Großen zwischen Rhein und Donau ; Begleitbuch zur Ausstellung im Museum für Antike Schifffahrt des Römisch-Germanischen Zentralmuseums in Mainz, 30. April 2014 bis 10. August 2014* (Mosaiksteine, 11), eds. Stefanie Berg-Hobohm, and Peter Ettel (Mainz : Verl. des Röm.-German. Zentralmuseums, 2014).

²³ Karl A. Wittfogel, *Oriental Despotism: a Comparative Study of Total Power* (New Haven, CT: Yale University Press, 1957), passim. Cf. Terje Tvedt, and Eva Jakobsson, “Introduction,” in *Water History is World History*, vol. 1/1. xvii and Squatriti, “Digging Ditches.”

²⁴ See in details on millers Chapter 4 with the relevant literature. Also: Carlo Ginzburg, *The Cheese and the Worms. The Cosmos of a Sixteenth-Century Miller* (Baltimore, MD: Johns Hopkins University Press, 1992), Jean Chapelot, and Robert Fossier, *Le village et la maison au moyen âge* (Paris: Hachette, 1985). Published in English: *The Village and House in the Middle Ages* (Berkeley, CT: University of California Press, 1986), 150ff. (I consulted the latter when writing the thesis.) More recently, in a Hungarian context, see: Gyöngy Kovács-Kiss, “Mozaikkockák a fejedelemség kori Kolozsvár mindennapjaiból,” [Mosaics in the everyday life of Cluj in the period of the Principality of Transylvania] *Korunk* 24, no. 10 (2013): 100.

To sum up, the first steps in studying historical water management developed from a number of different directions. First, legal history had a major impact on the first period of research, and remains one of the most important approaches, especially in German scholarship. Next, historical geography and local and regional histories contributed to the study of water management, by collecting data on waterways, fish ponds, fords, etc. Studies from the 1930s, then began to focus on pre-modern water management; social and economic historians, along with historians of technology, discussed quite different aspects of historical water management compared to their predecessors. These aspects continued to be important in research in the following decades and relatively little new developments can be seen from the postwar period to the 1990s. Notably, there was very little consideration of the impact of hydraulic works on their immediate and broader environment, on the one hand, and the conflicts that went with the exploitation of these water bodies in various economic spheres, by different actors in towns and country, on the other.

1.1.1. New Directions in Research – Where Environmental, Social, and Technological History Meet

The last three decades have brought major changes to the research field of historical water management. General interest in water history has grown continuously, an unsurprising development given the above mentioned present political and social concerns, but more importantly, the methods surrounding the way water history could be approached have also changed significantly. Up to the 1980s, scholarly works, with very few exceptions, treated water as a passive substance that was to be exploited by past societies or which could be modified as the technological possibilities permitted.²⁵ From the 1980s, however, a number of theories by philosophers, sociologists, ecologists, and not least historians, proposed new ways of dealing with historical – and present day – waterscapes and landscapes in general.²⁶ Historians – especially historical ecologists and environmental historians – increasingly looked at rivers, not only as objects or as passive elements but also as dynamic actors, which produced major impacts on surrounding material and social arrangements. In this respect, the research group that dealt with the waters of Vienna lead by Verena Winiwarter is probably the

²⁵ Cf. Tvedt, and Jakobsson, “Introduction.”

²⁶ Verena Winiwarter, Martin Schmid, and Gert Dressel, “Looking at half a millennium of co-existence: the Danube in Vienna as a socio-natural site,” *Water History* 5 (2013): 108.

best example.²⁷ Just as today, the riverscapes evidently were amongst the most dynamic landscapes in historical times and as such must be understood as complex arrangements, “socio-natural sites”, as they are frequently described in the literature.

The last three decades witnessed the expansion of environmental history, along with the growth of environmental archaeology which introduced new sources, methods and, research questions in connection with rivers. While the question traditionally was how rivers were modified in order to exploit them, environmental historians turned the question upside down and in many cases looked at rivers that acted as agents that influenced, worked in concert with or against the societies surrounding them. As part of this recent research agenda, river histories have been written where waterways were attributed agency as never before. Apart from the methodological studies,²⁸ particularly important from this dissertations’s point of view, is Leona Skelton’s ‘biography’ of the Tyne which looks at four centuries of changes in the social and economic organization of the river.²⁹ Even if virtually none of the river environmental histories provide total histories of rivers, the snapshots, or the longer periods they discuss, show how different social, economic, and political environments affect the ways societies conceive of and utilize the rivers. As Paula Schönach has recently put it:

“While rivers create opportunities, and impose limits, they don’t determine the eventual paths that are taken. Competing claims are made, and the various actors aspire to different kinds of rivers at specific times and places. Water is political, the riverine waters are political, and the human–river interactions are political, which brings explorations in river history down to questions of power.”³⁰

²⁷ See as historiographical introductions to the topic: Christof Mauch and Thomas Zeller, “Rivers in History and Historiography: An Introduction,” in *Rivers in History: Perspectives on Waterways in Europe and North America*, eds. iidem (Pittsburgh: University of Pittsburgh Press, 2008), 1–10, Winiwarter, Schmid, and Dressel, „Looking at half a millennium of co-existence,” Paula Schönach, “River histories: a thematic review,” *Water History* 9 (2017): 233–257, Giacomo Bonan, “Riflessi sull’acqua. Ricerca storica e biografie fluviali,” *Contemporanea: Rivista di storia dell’800 e del ‘900* 22, no. 2 (2019): 317–328, Matthew Evenden, “Beyond the Organic Machine? New Approaches in River Historiography,” *Environmental History* 23 (2018): 698–720. Very recently, with focus on smaller waters and water-related infrastructure: Raphael Longoni, and Oliver Wetter, “Urban stream works in Central Europe 1200–1700: municipal administration, hydraulic engineering and flood reconstruction,” *Water History*. Online first. <https://doi.org/10.1007/s12685-019-00231-6> (last accessed: 4 September, 2019).

²⁸ Although not focusing on the medieval period, Mark Cioc’s book on the Rhine is pioneering in this respect: idem, *Rhine : An Eco-Biography, 1815–2000* (Seattle, WA: Seattle: University of Washington Press, 2002).

²⁹ Leona J. Skelton. *Tyne after Tyne: An Environmental History of a River’s Battle for Protection, 1529-2015* (Winwick: White Horse Press, 2017). For the problem of river biographies as labels, see the excellent review of: Paula Schönach, “River histories: a thematic review,” 248–252.

³⁰ Schönach, “River histories,” 244.

In many of the new studies, the focus has been on the contest between water as a resource and the impact of water on power relations in seeking to harness these waterscapes. However, as is quite clear if one looks at the recent historiographic overviews of the topic, this problem has largely been confined to the modern period.³¹ Nonetheless, as has been shown by Skelton and other scholars, this approach could very well be applied to the pre-modern period as well. Skelton's book and the example of the River Tyne, in many ways condenses the main problems. The author looks at the "Tyne as an industrial river, a port, a liquid highway, a salmon river, an open sewer, a source of energy for mills, a regional icon, a recreational facility, a tourist attraction and a source of regional pride and artistic inspiration."³² Although not all the aspects are relevant in pre-modern Central European contexts, the main sources of conflicts, the different interests of the actors living along the river, is nicely summarized within these lines. The Tyne, as with other rivers in England and of course in Central Europe, were exploited for fishing, certainly well before the Early Modern period that Skelton primarily focused on. Although the catchment of the Tyne is not represented in the Domesday Book, mills were built along the river by the High Middle Ages.³³ The growing industrial activity required different installations and arrangements along the river, as well as the construction of harbors. This took place all throughout Central Europe in the medieval period. The Tyne was rich in salmon, just like the Danube and other major rivers in Central Europe in sturgeon, but the many obstacles – weirs most importantly – introduced in the river for milling as well as industrial activities, hindered their migration, an event that happened along a number of rivers in the British Isles and on the continent.³⁴ In England, research has put particular emphasis on the problem of the impact of mills and fishing (weirs) on the inland's transportation.³⁵ Changes in the ecology of riverine

³¹ Schönach, "River histories," and Patrick Fournier, and Sandrine Lavaud, "Rapport historiographique," in *Eaux et conflits dans l'Europe médiévale et moderne* (Flaran conférences), eds. Sandrine Lavaud, and Roland Viader (Toulouse-Le Mirail: Université de Toulouse-Le Mirail, 2012), 7–31.

³² Skelton, *Tyne after Tyne*, 25.

³³ For the areas covered, see: <https://opendomesday.org/> (last accessed: July 26, 2019).

³⁴ Richard C. Hoffmann, "A Brief History of Aquatic Resource Use in Medieval Europe," *Helgoland Marine Research* 59 (2005): 25–26 and H. J. R. Lenders et al. "Historical Rise of Waterpower Initiated the Collapse of Salmon Stocks," *Nature. Scientific Reports* 6, art. no. 29269 (2016): 9–18.

³⁵ See for the example of the Thames: R. H. C. Davis, "The Ford, the River and the City," *Oxoniensis* 38 (1973) 258–267, R. B. Peberdy, "Navigation on the River Thames between London and Oxford in the Late Middle Ages: a Reconsideration," *Oxoniensis* 61 (1996): 311–340, esp. the highly informative Fig. 2. on 318, and Derek Keene, "Issues of Water in Medieval London to c. 1300," *Urban History* 28 (2001): 161–179. See also the following polemic articles for the problem in a broader context: J. Edwards and B. Hindle, "The Transportation System in Medieval England and Wales," *Journal of Historical Geography* 17 (1991) 123–134, J. Langdon, "Inland water transport in medieval England," *Journal of Historical Geography* 19 (1993): 1–11, J. Edwards, and B. Hindle, "Comment: Inland Water Transportation in Medieval England," *Journal of Historical Geography* 19 (1993): 12–14, E. T. Jones, "River Navigation in Medieval England," *Journal of Historical Geography* 26 (2000): 60–75, and J. Langdon, "Inland Water Transport in Medieval England: The View from the Mills: A

environments, due mostly to navigation and the disposal of industrial and domestic waste, as well as physical interventions in the flow of the rivers also caused controversies.³⁶ This already lead to changes in fishing conditions in the Middle Ages, as is clear from a number of sources.³⁷ Most of the relevant studies however, have addressed major water flows, just as in Modern contexts, tending to ignore smaller tributaries. While struggles for the use of major waterways were certainly sources of conflicts, especially along urban riverscapes,³⁸ I shall argue that small catchments may have been just as frequently sources of conflicts between competing users. That said, a few studies have sought to address the problem in the recent years, most importantly many of the papers from a conference held at the Abbey of Flaran in France.³⁹ As the studies in this conference proceedings as well the coming chapters of this dissertation show, in the case of small catchments, the players were in many cases involved in the same sort of economic activities, but because of the limited water resources available, the

Response to Jones,” *Journal of Historical Geography* 26 (2000): 75–82. See more recently in a German context: Sascha Bütow, *Straßen im Fluss. Schifffahrt, Flussnutzung und der lange Wandel der Verkehrsinfrastruktur in der Mark Brandenburg und der Niederlausitz vom 13. bis zum 16. Jahrhundert* (Studien zur brandenburgischen und vergleichenden Landesgeschichte, 18) (Berlin: Lukas, 2015), Gerrit Jasper Schenk, “»der straßen halb uff der Yll«. Wasserwege im Elsass als »kritische Infrastruktur« für Wirtschaft und Gesellschaft (1350-1550),” in *Weg und Steg. Aspekte des Verkehrswesens von der Spätantike bis zum Ende des Alten Reiches* (Kraichtaler Koll, 11), eds. Kurt Andermann, and Nina Gallion (Ostfildern: Thorbecke, 2018), 121–152 and Gerrit Jasper Schenk, “»Knoten« im »Netz«? Überlegungen zur Hafenstadt als »kritischer Infrastruktur«,” in *Flusstäler, Flussschifffahrt, Flusshäfen: Befunde aus Antike und Mittelalter Der Tagungsband fasst 15 Beiträgen die Ergebnisse der gleichnamigen, internationalen Tagung zusammen* (RGZM – Tagungen, 39 = Interdisziplinäre Forschungen zu den Häfen von der Römischen Kaiserzeit bis zum Mittelalter in Europa, 7), eds. Peter Ettel, and Achim Thomas Hack (Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 2019), 207–236.

³⁶ E.g. Dolly Jørgensen, “Local government responses to urban river pollution in late medieval England,” *Water History* 2, no. 1 (2010): 35–52 (with reference to earlier literature), Roberta J. Magnusson, “Water and Wastes in Medieval London,” in *A History of Water*, vol. 1/1, 299–313, and Ronald Edward Zupko, and Robert Anthony Laures. *Straws in the Wind: Medieval Urban Environmental Law; the Case of Northern Italy* (Boulder, CO: Westview Press, 1996).

³⁷ See most importantly: Richard C. Hoffmann and Christoph Sonnlechner, “Vom Archivobjekt zum Umweltschutz: Maximilians Patent von 1506,” *Studien zur Wiener Geschichte. Jahrbuch des Vereins für Geschichte der Stadt Wien* 62–63 (2006–2007) [2011]: 79–133.

³⁸ Jean-Pierre Leguay, *L'eau dans la ville au moyen âge* (Rennes: Presses universitaires de Rennes, 2002) and *La città e il fiume (secoli XIII–XIX)*, ed. Carlo M. Travaglini (Rome: École Française de Rome, 2008). For the modern period in general, see: *Rivers Lost, Rivers Regained: Rethinking City-River Relations* (History of the Urban Environment), eds. Martin Knoll, Uwe Lübken, and Dieter Schott (Pittsburgh, PA: University of Pittsburgh Press, 2017). For individual rivers, see for instance: Pierre-Henri Guittonneau, “Petites villes et espace fluvial: pratiques sociales et conflits d’usage autour de Paris au XV^e siècle,” in *The Power of Space in Late Medieval and Early Modern Europe: The Cities of Italy, Northern France and the Low Countries* (Studies in European urban history, 30), eds. Marc Boone, and Martha C. Howell (Turnhout: Brepols, 2013), 57–76 (for the Loire), the special issue of *Water History* 5, no. 2 (2013) (for the Danube), Maria Grazia Nico Ottaviani, *Statuti, territorio e acque nel Medioevo: Perugia e Marsciano, Tevere e Nestore* (Spoleto: Fondazione Centro italiano di studi sull’alto Medioevo, 2008) (for the Tiber). For the problem of water use in major towns, see the example of medieval Pest and Buda in Chapter 3.2.1.

³⁹ See esp. Mark F. Gardiner, “Bateliers, pêcheurs et habitants des ports: les conflits sur les droits des rivières dans l’Angleterre médiévale,” Marc Suttor, “Les conflits pour l’usage et le contrôle de l’eau sur les rivières entre Seine et Meuse à la fin du Moyen Âge et au début de l’Époque moderne,” Emmanuel Grégoire, “Les usages concurrents de la rivière: l’Allier en Basse-Auvergne (XIII^e-XVIII^e siècle),” Denis Reynard, “Conflits et procès autour de l’utilisation de l’eau de la Sionne (Valais, Suisse), du XV^e au début du XX^e siècle,” in *Eaux et conflits*, 59–70, 71–86, 107–118, and 189–208, respectively. See also: *Fleuves et marais*, esp. 285–340.

amount of water used by each party became critical. Even smaller interventions to these waterways could have major impacts both up- and downstream, impacts that frequently lead to lawsuits.

Researchers have also shown interest in the role and construction of artificial water systems such as canals, irrigation lines and mill races but until the last few decades, most of these works emphasized the despotic nature of the ruling authorities who oversaw their creation. The concept of hydraulic societies – as in many cases, the studies referred to them – was used to express the ways the interests of the individuals were overwritten by ‘empire building’.⁴⁰ In the past decades, emphasis shifted from revealing despotism to looking at the role of co-operation, on different historical scales in the construction and maintenance of water management – irrigation, flood-mitigation – systems. A number of recent studies argued that rulers or ruling groups often entrusted local societies with power and authority in matters of water regulation.⁴¹ In one example, Alan Mikhail recently demonstrated how different peasant communities in Ottoman Egypt were given full authority to govern irrigation networks and had the power to force members of the local elites to defer to their will.⁴²

While these new research trends have flourished, existing fields of scholarship have not, of course, disappeared in the last decades. Apart from the social history aspects of water management discussed in the previous paragraphs, technological and economic history, as well as to some extent legal history, are still represented in the scholarship. In technological history, several important volumes have been published, many of which used methods and results from another relatively recently emerging research field mentioned above, that is, environmental archaeology. This combination has significantly contributed to the study of medieval fishing, milling, irrigation networks and, navigation to mention just a few important aspects and general works as well as case studies have been published in high numbers in the

⁴⁰ See e.g. Wittfogel, *Oriental Despotism*. See its criticism: Robert L. Carneiro, “A Theory of the Origin of the State,” *Science* 169, no. 3947 (1970): 733–738.

⁴¹ E.g. Paolo Squatriti, *Water and Society in Early Medieval Italy, 400–1000* (Cambridge: Cambridge University Press, 1998), Alan Mikhail, “Oriental Democracy,” *Global Environment* 7, no. 2 (2014): 381–404, Michele Campopiano, “Rural communities, land clearance and water management in the Po Valley in the Central and Late Middle Ages,” *Journal of Medieval History* 39 (2013): 377–393, Daniel R. Curtis, and Michele Campopiano, “Medieval land reclamation and the creation of new societies: comparing Holland and the Po Valley, c.800–c.1500,” *Journal of Historical Geography* 44 (2014): 93–108, Greg Bankoff, “The ‘English Lowlands’ and the North Sea Basin System: A History of Shared Risk,” *Environment and History* 19, no. 1 (2013): 3–37, John Emrys Morgan, “The Micro-Politics of Water Management in Early Modern England: Regulation and Representation in Commissions of Sewers,” *Environment and History* 23 (2017): 409–430, and *Fleuves et marais, une histoire au croisement de la nature et de la culture : sociétés préindustrielles et milieux fluviaux, lacustres et palustres : pratiques sociales et hydrosystèmes* (Archéologie et histoire de l’art, 19), eds. Joëlle Burnouf, and Philippe Leveau (Paris: Ministère de l’éducation nationale, de l’enseignement supérieur et de la recherche, 2004), esp. the part: Gestion des espaces hydrauliques at 341–393. See also a number of works dedicated to the topic by Petra van Dam.

⁴² Alan Mikhail, “Oriental Democracy.”

recent decades in Central Europe. Of these works, a volume edited by Paolo Squatriti should be mentioned as it is one of the most frequently referred to works because of its comprehensiveness, integrating in many cases technological, social, as well as landscape history.⁴³ Apart from this edited volume, historians of technology dedicated increasing attention to the survival of ancient water technologies, including water wheels, in Late Antiquity and the Early Middle Ages. They also studied their subsequent spread thanks to the movement of monastic orders in ‘New Europe’ and other vehicals of knowledge transfer.⁴⁴ Archaeology, not independent of the spread of environmental archaeology and new prospection techniques, has further contributed to the question of the survival of ancient technologies, by uncovering a number of early medieval mill complexes.⁴⁵

Water-related economies have also continued to be an important research topic marked by numerous conferences and proceedings volumes over the past decades.⁴⁶ In these studies, water mills continued to be important foci of research. As was the case before the 1990s, the

⁴³ *Working with Water in Medieval Europe* (Technology and Change in History, 3), ed. Paolo Squatriti (Leiden, Boston, and Cologne: Brill, 2000).

⁴⁴ Örjan Wikander “The water-mill,” in *Handbook of Ancient Water Technology* (Technology and Change in History, 2), ed. idem (Leiden: Brill, 2002), 371–400, Roberta J. Magnusson, *Water Technology in the Middle Ages. Cities, Monasteries, and Waterworks after the Roman Empire* (Baltimore, MD: The Johns Hopkins University Press, 2001), and Adam Lucas, *Wind, Water, Work Ancient and Medieval Milling Technology* (Technology and Change in History, 8), ed. idem (Leiden: Brill, 2005). See also: *Wind and Water in the Middle Ages: Fluid Technologies from Antiquity to the Renaissance* (Penn State Medieval Studies, 2 = Medieval and Renaissance Texts and Studies, 322), ed. Steven A. Walton (Tempe, AZ: Arizona Center for Medieval and Renaissance Studies, 2006). See Chapter 2 for details.

⁴⁵ See most recently: *Römische und frühmittelalterliche Wassermühlen im Paartal bei Dasing Studien zur Landwirtschaft des 1. Jahrtausends* (Materialhefte zur bayerischen Vorgeschichte, 103), ed. Wolfgang Cyszcz (Kallmünz: Verlag Michael Laßleben, 2016). For archaeological research into milling and water management, see also: *Water Management in Medieval Rural Economy* (Ruralia, 5 = Památky archeologické, Supplementum, 17) (Prague: Institute of Archaeology, Academy of Sciences of the Czech Republic, 2005), *Archéologie des moulins hydrauliques, à traction animale et à vent, des origines à l’époque médiévale et moderne en Europe et dans le monde Méditerranéen: Actes du colloque international, Lons-le-Saunier du 2 au 5 novembre 2011*, 2 vols, eds. Luc Jaccottey, and Gilles Rollier (Besançon: Presses Universitaires de Franche-Comté, 2016) and Jens Berthold, “Mühlen im Befund – Eine Übersicht zu archäologischen Erscheinungsformen von Wassermühlen,” in *Wassermühlen und Wassernutzung im mittelalterlichen Ostmitteleuropa* (Forschungen zur Geschichte und Kultur des östlichen Mitteleuropa, 50), eds. Martina Maříková, and Christian Zschieschang (Stuttgart: Steiner, 2015), 235–268.

⁴⁶ See for the most important volumes: *Die Wasserversorgung im Mittelalter* (Mainz am Rhein: von Zabern, 1991), *I mulini nell’Europa medievale : atti del convegno di San Quirico d’Orcia, 21-23 settembre 2000* (Biblioteca di storia agraria medievale, 21), ed. Paola Galetti (Bologna: CLUEB, 2003), *L’acqua nei secoli altomedievali : Spoleto, 12–17 aprile 2007*, 2 vols (Settimane di Studio del Centro Italiano di Studi sull’Alto Medioevo, 55) (Spoleto: Presso La sede della Fondazione, 2008), *La città e il fiume, Historische Perspektiven auf Wasserhaushalt und Wassernutzung in Mitteleuropa* (Cottbuser Studien zur Geschichte von Technik, Arbeit und Umwelt, 38), eds. Knut Kaiser et al. (Münster: Waxmann, 2012), *L’eaux et conflits, Wassermühlen und Wassernutzung, Wasserinfrastrukturen und Macht von der Antike bis zur Gegenwart* (Historische Zeitschrift. Beiheft, N. F., 63), eds. Birte Förster, and Martin Bauch (Berlin: De Gruyter – Oldenbourg, 2015), *Gestione dell’acqua in Europa (XII–XVIII secc.) : selezione di ricerche = Water management in Europe (12th–18th centuries) : selection of essays* (Serie II, Atti delle ‘settimane di studio’ e altri convegni, 49) (Florence: Firenze University Press, 2018), *Usus aquarum : interdisziplinäre Studien zur Nutzung und Bedeutung von Gewässern im Mittelalter* (Forschungen zur Geschichte und Kultur des östlichen Mitteleuropa, 54), eds. Christoph Mielzarek, and Christian Zschieschang (Vienna: Böhlau, 2019).

most important studies dealt with milling industry in England, although a number of works have also been dedicated to mills on the Iberian Peninsula⁴⁷ and their role in the Italian⁴⁸, German⁴⁹, Austrian⁵⁰, French⁵¹ economies as well. Amongst the numerous studies on the milling industry in England, two works stand out. The first, authored by John Langdon, whose work, despite its title, *Mills in the Medieval Economy*, is just as much a technological history as an economic history of the medieval milling industry. His main point centers, nonetheless,

⁴⁷ For present-day Spain: M. M. Martínez, “Desarrollo historiográfico de la molinería hidráulica en la España medieval: perspectivas y resultados,” in *I mulini nell'Europa medievale*, 103–142, *Wasser – Wege – Wissen auf der iberischen Halbinsel: Vom Römischen Imperium bis zur islamischen Herrschaft* (Berliner Schriften Zur Rechtsgeschichte, 6), eds. Ignacio Czeguhn et al. (Baden-Baden: Nomos Verlagsgesellschaft mbH & Co. KG, 2016), *Usos sociales del agua en las ciudades hispánicas a fines de la Edad Media* (Estudios de historia medieval, 6), ed. María Isabel del Val Valdivieso (Valladolid: Universidad de Valladolid, 2002), and María Isabel del Val, “Water: Object of Desire and Source of Conflict in Castile in the Late Middle Ages,” *Imago Temporis. Medium Aevum* 8 (2014): 239–262. For Portugal, see: Robert Durand, “Les moulins hydrauliques dans le Portugal medieval,” in *I mulini nell'Europa medievale*, 87–102.

⁴⁸ Milan is overrepresented in the studies, because of the lack of navigable rivers within the town, and the efforts made by the government of the town to provide canals to allow navigation in the water system of the River Po: Luisa Chiappa Mauri, *I mulini ad acqua nel milanese (secoli X–XV)* ([Milan]: Società Editrice Dante Alighieri, 1984), Giuliana Fantoni, *L'acqua a Milano. Uso e gestione del basso medioevo (1385–1535)* (Bologna: Cappelli, 1990), Patrock Boucheron, “Water and power in Milan, c. 1200–1500,” *Urban History* 28, no. 2 (2001): 180–193, Maria Paola Zanoboni, “L'acqua come spazio economico: attività commerciali e manifatturiere lungo i navigli milanesi (sec. XV),” *Storia economica* 16 (2013): 143–193. For the Italian Peninsula in general, see a number of studies in the above mentioned three conference proceedings: *I mulini nell'Europa medievale*, *L'acqua nei secoli altomedievali*, and *Gestione dell'acqua in Europa*. From a landscape historical point of view, see also: *Este, l'Adige e i Colli Euganei : storie di paesaggi*, ed. Gian Pietro Brogiolo (Sesto Fiorentino: All'Insegna del Giglio, 2017). See also: *L'acqua nemica : fiumi, inondazioni e città storiche dall'antichità al contemporaneo : atti del Convegno di studio a cinquant'anni dall'alluvione di Firenze (1966–2016) : Firenze, 29–30 gennaio 2015* (Biblioteca del Centro per il collegamento degli studi medievali e umanistici in Umbria, 37), eds. Concetta Bianca, and Francesco Salvestrini (Spoleto: Fondazione Centro italiano di studi sull'alto Medioevo, 2017), esp. the contribution of: Francesco Salvestrini, “Le inondazioni a Firenze e nella valle dell'Arno dal XII al XVI secolo,” at 31–60.

⁴⁹ See the studies in the following volumes: *Wasserversorgung im Mittelalter, Historische Perspektiven auf Wasserhaushalt, and Wassermühlen und Wassernutzung*, and *Usus aquarum*. Apart from these, mostly comprehensive studies, about a dozens of local histories and regional histories of milling were published in the past decades. To name but a few, more important ones: Ilka Göbel, *Die Mühle in der Stadt : Müllerhandwerk in Göttingen, Hameln und Hildesheim vom Mittelalter bis ins 18. Jahrhundert* (Veröffentlichungen des Instituts für historische Landesforschung der Universität Göttingen, 31) (Bielefeld: Verl. für Regionalgeschichte, 1993), Peter Theissen, *Mühlen im Münsterland : der Einsatz von Wasser- und Windmühlen im Oberstift Münster vom Ausgang des Mittelalters bis zur Säkularisation (1803)* (Veröffentlichungen der Historischen Kommission für Westfalen., 22 A = Geschichtliche Arbeiten zur westfälischen Landesforschung, wirtschafts- und sozialgeschichtliche Gruppe, 13 = Beiträge zur Volkskultur in Nordwestdeutschland, 101) (Münster and New York: Waxmann, 2001), Willi Klein, *Zur Geschichte des Mühlenwesens im Main-Kinzig-Kreis* (Hanauer Geschichtsblätter, 40) (Hanau: Selbstverl. d. Hanauer Geschichtsvereins u. d. Wetterauischen Gesellschaft für die Gesamte Naturkunde zu Hanau, 2003), and Peter Johannes Droste, *Wasserbau und Wassermühlen an der Mittleren Rur: Die Kernlande des Herzogtums Jülich, 8. – 18. Jahrhundert* (Aachener Studien zur älteren Energiegeschichte, 9) (Aachen: Shaker Verlag, 2003).

⁵⁰ *Wasser – Fluch und Segen : Schwarzer Silber*, ed. Wolfgang Ingenhaeff ([Innsbruck]: Berenkamp, 2004), and especially *Verwaltetes Wasser im Österreich des Spätmittelalters und der Frühen Neuzeit* (Forschungen zur Landeskunde von Niederösterreich, 37), eds. Martin Scheutz, and Herwig Weigl (St. Pölten: Verein für Landeskunde von Niederösterreich, 2016).

⁵¹ Leguay, *L'eau dans la ville, L'eaux et conflits*, the special issue of the journal, *Médiévales* no. 36 (1999): Le fleuve, eds. Odile Kammerer, and Odile Redon, and numerous works of Mathieu Arnoux in the topic. Most importantly: idem, “Les moulins à eau en Europe occidentale (IXe–XIIIe siècle). Aux origines d'une économie institutionnelle de l'énergie hydraulique,” in *L'acqua nei secoli altomedievali*, vol. 2. 693–746.

on an economic question. He argues that although the late medieval period is traditionally associated with major economic restructuring and the birth of capitalism, this is not true for the late medieval English milling industry. From the point of view of the present dissertation, however, his summary of the problems surrounding maintenance and rebuilding of mills in the late medieval period is at least as important as his overall conclusion.⁵² The other work is the recent monograph by Adam Lucas, who studied the ecclesiastical involvement in milling in medieval England, a topic that is highly relevant to this dissertation because, as we shall see in the coming chapters, church institutions were especially actively involved in water-related economies medieval Central Europe including Hungary. Lucas shows that in England, mostly with the Benedictines and partly with episcopal lords, great emphasis was placed on their incomes from milling (which in the case of the Benedictines amounted to ca. 10 per cent of their manorial incomes, a number similar for some church institutions in Central Europe⁵³), and thus, took great care to maintain their privileges.⁵⁴

Of the different spheres of water usage in pre-modern societies, very little attention has so far been paid to fishing in this rather short survey. This is to a large extent due to the fact that although some works were dedicated to the topic in the nineteenth and early twentieth century, greater interest was generated only from the postwar period onwards, experiencing a real upsurge only from the 1980s.⁵⁵ Since then the number of works, not least thanks to the emergence of ichthyoarchaeology and historical ecology mark the unfolding of this field as a distinct research area.⁵⁶ In these works, similarly to recent works on milling and

⁵² John Langdon, *Mills in the Medieval Economy: England 1300–1540* (Oxford: Oxford University Press, 2004).

⁵³ Cf. Erik Fügedi, “Az esztergomi érsekség gazdálkodása a XV. század végén,” [The farming of the archbishopric of Esztergom at the end of the 15th century] *Századok* 107 (1972): 536 and Hajnalka Kuffart, “Az esztergomi érsek *pisetum*-jövedelme Battyányi István udvarbíró idején,” [The *pisetum*-income of the archbishop of Eszterom in the period of the provisorship of István Batthyányi] in *Veretek, utak, katonák. Gazdaságtörténeti tanulmányok a magyar középkorról* [Mints, routes, soldiers. Studies in the economic history of medieval Hungary], eds. István Kádas, Renáta Skorka, and Boglárka Weisz (Budapest: MTA BTK Történettudományi Intézet, 2018), 93–109.

⁵⁴ Adam Lucas, *Ecclesiastical Lordship, Seigneurial. Power and the Commercialization of Milling in Medieval England* (Farnham and Burlington, VT: Ashgate, 2014).

⁵⁵ Probably the earliest of these works is: Simon Barthélemy Joseph Noel de la Morinière, *Histoire generale des peches anciennes et modernes, dans les mers et les fleuves des deux continens*, vol. 1 (Paris: Impr. royale, 1815). See from the early works for Italy: Giuseppe Mira, *La pesca nel medioevo : nelle acque interne italiane* (Milan: A. Giuffrè, 1937). For a more comprehensive survey of the research tradition into freshwater fisheries with a focus on Germany, see: Angelika Lampen, *Fischerei und Fischhandel im Mittelalter : wirtschafts- und sozialgeschichtliche Untersuchungen nach urkundlichen und archäologischen Quellen des 6. bis 14. Jahrhunderts im Gebiet des Deutschen Reiches* (Historische Studien, 461) (Husum: Matthiesen, 2000), 14–18. See for comprehensive surveys on a European scale: Richard C. Hoffmann’s seminal work in the topic idem, “Development of Aquatic Ecosystems in Medieval Europe” *The American Historical Review* 101 (1996): 631–669 and idem, “Medieval Fishing,” in *Working with Water*, 331–393.

⁵⁶ *Fish Exploitation in the Past: Proceedings of the 7th Meeting of the ICAZ Fish Remains Working Group* (Tervuren: Koninklijk Museum voor Midden-Afrika, 1994), *Archéologie du Poisson. 30 ans d’archéologie ichtyologie au CNRS*, eds. Philippe Béarez, Sandrine Grouard, and Benoit Clavel (Antibes: Éditions APDCA,

historical navigation, the problem of the different interests of the people accessing water bodies has been addressed repeatedly.

Apart from specific works mentioned in the previous pages, the growing general interest in water and society in the past is indicated by new publication forums. Several journals founded from the 1990s and the 2000s onwards, have published extensively on water histories. As environmental history developed both in the U.S. and Western Europe, two important forums came to existence, *Environment and History* (founded in 1995) focusing more on Europe (but more and more opening up to a global scale), and *Environmental History* (founded in 1996), which right from its beginnings focused heavily on the Americas, Africa, and Asia, and mostly the period after 1800.⁵⁷ A more recent, but very promising endeavor is the journal of the International Water History Association, *Water History*, founded in 2009. The main theme of the journal is centered on the problem of water management and water as an energy resource in different contexts in historical times. Articles from these journals as well as the conferences held on the topic in recent decades show clearly the diversity of the problems that can be addressed within this broad framework as well as the sources that can be used to answer relevant questions.

In the previous paragraphs I have shown that after being first studied from the perspective of technological and legal history, other approaches to the history of water management gained ground, most importantly environmental history, becoming dominant in studying historical water management from the 1990s onwards. Of course, large lacunae remain in numerous countries of the region, including Slovakia, Romania or Ukraine. The new sources, research questions, methods as well as the interdisciplinary approach to various research problems has brought significant new results in the past decades in the social history of water as well as a growing interest towards historical water management amongst scholars in a number of fields.

1.1.2. Hungary and Central Europe – Research traditions and recent results

Scholarship on historical water management in the countries of Central Europe has had a very different development. Polish, Czech, and Hungarian historians were and are

2008), and for the role of historical ecology in the study of medieval fishing and fisheries, see: Gertrud Haidvogel et al., “Historical Ecology of Riverine Fish in Europe,” *Aquatic Sciences* 77 (2015): 315–324.

⁵⁷ Pretty much the same is true for the most ambitious multi-series volume on water history: *A History of Water*. Europe is badly underrepresented, especially the period between antique Rome and the nineteenth century.

interested in somewhat different questions, and despite similar political environments, scholars researched different aspects of historical water management. This is somewhat surprising, as the questions raised by social historians in the interwar period and after the Second World War on the social constructs behind water management works would have been a topic welcomed in Marxist historiography. Nonetheless, in all three countries, important results have come from the study of historical waterscapes and management techniques. The varying scholarly interests, naturally, lies in part in the different geographical characteristics of these countries. The Czech lands and Hungary are somewhat similar as they are centered in a basin area. However, dominantly lowland characteristics of Poland, with the river Vistula flowing along its long axis from the Silesian Beskids in the south to the Baltic Sea in the north is a different story altogether.⁵⁸ While in Poland, the northern areas, similarly to the central lowlands of the Carpathian Basin, possessed extensive wetlands, this was not typical of the Czech and Moravian landscapes.

In Hungary, after the first steps were taken in the first third of the twentieth century in studying historical water management from the perspective of legal history, and to some extent, from a technological historical perspective, little research attention was dedicated to the question between the 1940s and the 1990s.⁵⁹ With the exception of mostly ethnographic studies on pre-modern water management, virtually no research based on primary sources was carried out during these five decades. If the problem was considered, it was mostly part of a more general economic history of either individual settlements or institutions.⁶⁰ Despite the lack of innovative research on the role of water in the Middle Ages and the Early Modern period, some scholars dedicated works on the topic. When writing these works however, scholars did not appear to have worked with primary sources predating the eighteenth century at all.⁶¹

⁵⁸ András Vadas, "Geography, Natural Resources and Environment," in *The Oxford Handbook of Medieval Central Europe*, eds. Nada Zečević, and Daniel Ziemann (in preparation)

⁵⁹ See for the early discussion of these constructions: Sándor Takáts, "Műveltségtörténeti közlemények: a magyar molnár," [Studies in intellectual history: the Hungarian miller] *Századok* 41 (1907), 52–56, idem, "Műveltségtörténeti közlemények: a magyar malom I–II," [Studies in intellectual history: the Hungarian mill] *Századok* 41 (1907), 143–160 and 236–249, and idem, "A magyar faragómolnárok I–II," [The Hungarian millers] in *Rajzok a török világból*, 4 vols [Images from the Ottoman Times], ed. Sándor Takáts (Budapest: Magyar Tudományos Akadémia, 1915–1917), vol. 2. 422–463. See also: Kálmán Lambrecht, *A magyar malmok könyve* [The book of Hungarian mills] (Budapest: [N.p.], 1926).

⁶⁰ See for instance the works of József Papp, Bertalan Andrásfalvy and Tibor Bellon.

⁶¹ For the basically only overview of the question: Zsigmond Károlyi, *A vízhasznosítás, vízépités és vízgazdálkodás története Magyarországon* [The history of water use, water construction and water management in Hungary] (Műszaki tudománytörténeti kiadványok, 13) (Budapest: Tankönyvkiadó, 1960). See also the chapters written by Károlyi in *A magyar vízszabályozás története* [The history of water regulation in Hungary], ed. Dénes Ihrig (Budapest: [Országos Vízügyi Hivatal], 1973).

In more recent decades, as in Western Europe, Hungarian social historians and archaeologists have addressed the problem of water supply and waste water disposal, although owing to the problematic source situation, only to a limited extent. The technological aspects of water supply have been studied for certain urban sites such as Buda, Fehérvár, Sopron or Esztergom. In the last few years, a growing number of works have dealt with wells and cisterns in rural areas and market towns.⁶² Not only human population needed drinking water. Livestock also required reliable sources of drinking water. The problem has been identified, though the sources do not allow us to give a definite answer, as to how livestock was watered during major gatherings of the nobility – such as diets – or during cattle drives to western markets.⁶³ The disposal of waste water and feces has also been considered and identified in archaeological research on medieval Buda.⁶⁴

Fishing has been studied in Hungary from a number of different aspects. An archivist at the turn of the nineteenth century, Sándor Takáts – whose works, in the absence of more modern research, are still frequently referred to – wrote a number of studies on fishing along the Danube with special regard to sturgeon.⁶⁵ Somewhat later, Alajos Degré wrote a fundamental study on fishing rights in Hungary using legal sources.⁶⁶ He saw the roots of

⁶² András Kubinyi, “Städtische Wasserversorgungsprobleme im mittelalterlichen Ungarn,” in *Städtische Versorgung und Entsorgung im Wandel der Geschichte* (Stadt in der Geschichte. Veröffentlichungen des südwestdeutschen Arbeitskreises für Stadtgeschichtsforschung, 8), ed. Jürgen Sydow (Sigmaringen: Jan Thorbecke, 1981), 180–190, Sándor Garády, “Buda középkori és újkori vízművei, különös tekintettel a Svábhegy-Városkút kutatására,” [The medieval and modern water works of Buda with special regard to Svábhegy-Városkút] *Budapest Régiségei* 32 (1998): 245–265, Imre Holl, “Sopron (Ödenburg) im Mittelalter,” *Acta Archaeologica Academiae Scientiarum Hungaricae* 31 (1979): 105–145, Gabriella Fényes, “Középkori vízmű maradványai Budapest Lánchíd utca 19–21. alól: 1/A lelőhely,” [Remains of a medieval water construction under 19–21 Lánchíd Street, Budapest] *Budapest Régiségei* 41 (2008): 193–227, Gyula Siklósi, “Die Wasserversorgung und das Kanalsystem im mittelalterlichen Székesfehérvár (Stuhlweissenburg),” *Antaeus* 26 (2003): 217–244, and Ágnes Nagy, “Brunnen und Zisternen im mittelalterlichen Ungarn,” *Antaeus* 26 (2003): 343–411 (this volume of the *Antaeus* includes other articles on the topic

⁶³ Cf. László Bartosiewicz, *Animals in the Urban Landscape in the Wake of the Middle Ages* (BAR International Series, 609) (Oxford: British Archaeological Reports, 1995) and András Vadas, “A kecskeméti marhahajtók megpróbáltatásai és egy végvár jóllakott őrsége,” [The hardships of the cattle drivers of Kecskemét and the well-fed guards of a borderline fortification] in *Genius loci – Laszlovsky 60*, eds. Dóra Mérai et al. (Budapest: Archaeolingua Alapítvány, 2018), 38–40. Online document: http://files.archaeolingua.hu/Laszlovsky60/Vadas_Laszlovsky60.pdf (last accessed: April 24, 2019)

⁶⁴ Sándor Garády, “Jelentés az 1936–1942. évben végzett ásításokról,” [Report of the excavations carried out between 1936 and 1942] *Budapest Régiségei* 13 (1943): 418–427.

⁶⁵ Sándor Takáts, “A komáromi vizahalászat a XVI. században I–II.,” [Sturgeon fishing at Komárno in the 16th century] *Magyar gazdaságtörténelmi szemle* 4 (1897): 425–445 and 485–509.

⁶⁶ Degré, *Magyar halászati jog*. On disputes related to fishing rights: István Ecsedi, “Rekesztő halászat a Tiszán és az alföldi kisvizeken,” [Kiddle fishing in the Tisza and the smaller waters in the Middle Ages] *Néprajzi Értesítő* 18 (1926): 61–75, József Papp, “Halászlási jog a Hortobágy vizein,” [Fishing rights on the waters of the Hortobágy] in *Tanulmányok a Hortobágy néprajzához* [Studies in the ethnography of the Hortobágy], eds. Béla Gunda (Debrecen: Kossuth Lajos Tudományegyetem, 1972–1974), 189–205; Bertalan Andrásfalvy, “A paraszti halászati jog a Duna mentén Tolna és Baranya megyében,” [Peasant fishing rights on the Danube in Tolna and Baranya counties] *Ethnographia* 81 (1970): 316–326, idem, *A Sárköz és a környező Duna menti települések ősi ártéri gazdálkodása és vízhasználata a szabályozás előtt* [The Sárköz and the ancient flood plain and water

fishing rights in Hungary in the German legal tradition, the actual presence of which, he failed to show in most cases. Nonetheless, he uncovered numerous unedited documents that discussed all sorts of – not solely fishing related – legal disputes that arose around the usage of both navigable rivers and minor ones. Since then, scholars have pointed to the importance of fishing in feeding the population, especially during fasting periods when red meat consumption was prohibited. Fishing along major rivers – similarly to most parts of Europe – ,⁶⁷ was an important privilege in Hungary which kings gradually gave away to particular groups such as settlers, church institutions, etc. leading to local controversies.⁶⁸ The economic role of medieval fishing is clearly reflected in the construction of numerous and sometimes extensive fish pond complexes, both on the estates of lay people and the church. Studies have been dedicated to fish ponds at particular locations, but never on the scale of the Hungarian Kingdom as whole. To these works, similarly to Western European trends, both archaeozoology⁶⁹ and landscape archaeology⁷⁰ have brought major developments.

Just like in Western Europe, technological historians have also paid attention to the history of water management. After some studies on the technological aspects of mills, and most importantly dam construction by the above-mentioned archivist, Sándor Takáts in the

management of the settlements along the Danube] (Vízügyi történeti füzetek, 6) (Budapest: Vízdok, 1973), and most importantly, idem, *Duna mente népének ártéri gazdálkodása Tolna és Baranya megyében az ármentesítés befejezéséig* (Tanulmányok Tolna megye történetéből, 7) (Szekszárd: Tolna Megyei Tanács, 1975). See also: István Tringli, “Adalék a magyar vadászati jog középkori történetéhez,” [To the medieval history of hunting rights] *Herman Ottó Múzeum Évkönyve* 52 (2013): 213–219.

⁶⁷ Cf. Kisch, *Das Fischereirecht*, 23–99.

⁶⁸ Degré, *Magyar halászati jog* and István Sugár, “Az egri püspökség és káptalan középkori vízfogó szegyei a Tiszán,” [Sturgeon fishing traps of the bishopric and chapter of Eger on the River Tisza in the Middle Ages] *Archívum. A Heves Megyei Levéltár közleményei* 9 (1979): 5–33, Erik Fügedi, “Középkori magyar városprivilegiumok,” [Urban privileges in medieval Hungary] *Tanulmányok Budapest Múltjából* 14 (1961): passim. On the fishing rights of the mining town settlers, see Chapter 3.3.

⁶⁹ László Bartosiewicz et al. “Animal Exploitation in Medieval Hungary,” in *Economy of Medieval Hungary* (East Central and Eastern Europe in the Middle Ages, 450–1450, 49), eds. József Laszlovszky et al. (Leiden and Boston: Brill, 2018), 113–165 (with reference to numerous articles published in recent decades mostly by the first author of the article).

⁷⁰ For examples, see: István Viczián, and Csilla Zatykó, “Geomorphology and environmental history in the Drava valley, near Berzence,” *Hungarian Geographical Bulletin* 60 (2011): 357–377, and Csilla Zatykó, “Aspects of fishing in medieval Hungary,” in *Processing, storage, distribution of food. Food in the medieval rural environment. Ruralia VIII, 7th–12th September 2009*, Lorca, Spain, ed. Jan Klápště (Turnhout: Brepols, 2011), 399–408. More recently, see András K. Németh, “Vizek és vízgazdálkodás a középkori Tolna megyében, I–III.,” [Waters and water management in medieval Tolna County] *Wosinsky Mór Múzeum Évkönyve* 35 (2013): 121–151, 36 (2014): 223–251, and 37 (2015): 7–39, idem, “Barátok tava: Tájregészeti és történeti adatok egy helynév eredetéhez,” [The lake of the brothers. Landscape archaeological and historical data on the origin of a placename] *Archaeológiai Értesítő* 138 (2013): 367–374, Zsuzsa Eszter Pető, *Hermits in the heart of the Hungarian kingdom : medieval monastic landscape of the Pauline order in the Pilis* (Archaeolingua. Series minor, 41) (Budapest: Archaeolingua, 2018), 67–71, and László Ferenczi, “Molendinum ad aquas calidas. A pilisi ciszterciek az állítólagos Fehéregyházán. Történeti, topográfiai és tájregészeti kutatás a pilisi apátság birtokán,” [The Cistercians of Pilis at the alleged ‘Fehéregyháza’ – Historical-topographical and landscape archaeological study on the estate of the Pilis Abbey] *Studia Comitatus* N. S. 1 (2014): 145–160.

early twentieth century,⁷¹ interest in the question slowly increased after the Second World War. Although it focused predominantly on the modern transformations of the waterscapes (not independent from the visible impact of people on their environment in post-war industrialization). Zsigmond Károlyi, a historian of technology, wrote the first work that included important aspects of water management and the role of water in the lowland areas of the Carpathian Basin in Early Modern period.⁷² As one of the founding fathers of the Hydrology – later Danube – Museum, he was one of the few scholars in the region to discuss the water history in a monograph. Because of his own research field, he understandably focused on the modern period, especially the period of the great river control projects. Nevertheless, he was one of the first to draw attention to the extensive farming of the lower floodplains in the Middle Ages and the Early Modern period, as well as the growing exploitation of water power in these periods. He discussed the problem of fish farming as well as the spread of different types of industrial mills.⁷³ The various uses of mills has been discussed by other historians as well, contributing to the problem of industrial mills and their importance in economic intensification as well as the question of their spread in the countryside.⁷⁴

Partly technological and partly social historical aspects of water management have been brought up by ethnographers, and later, archaeologists. Based on research results from very different source materials and methods, the existence of diverse hydraulic systems was hypothesized. An ethnographer, Bertalan Andrásfalvy argued for the existence of a complex flood-mitigation system in the Great Hungarian Plain in the pre-modern period, called the ‘*fok*’ system.⁷⁵ The dating and the complexity of this system has been at the center of research by several scholars from different fields of study. Even if it is highly problematic to assume the existence of this floodplain economy in the medieval period, the debates around the birth of this system highlight how little we know about pre-modern water management systems.

⁷¹ Takáts, “Műveltségtörténeti közlemények: a magyar malom.”

⁷² Zsigmond Károlyi, *A vízhasznosítás, vízépítés és vízgazdálkodás története Magyarországon*. (Vázlat) [History of water-use, water-construction and water management in Hungary (A sketch)] (Budapest: Tankönyvkiadó, 1960). See also: *A magyar vízszabályozás története* (the relevant part is the work of Zoltán Károlyi)

⁷³ Károlyi, *A vízhasznosítás*, 59–64.

⁷⁴ László Makkai, “Östliches Erbe und westliche Leihe in der ungarischen Landwirtschaft der frühfeudalen Zeit,” *Agrártörténeti szemle* 45 [Supplementum] (1974): 45. See also: Walter Endrei, “A magyar malomipar, 1550–1800,” [Hungarian milling industry, 1550–1800] in *Műszaki innovációk sorsa Magyarországon: malomipar, vaskohászat, textilipar* [The fate of technological innovations in Hungary: milling industry, metallurgy, textile industry], ed. idem (Budapest: Akadémiai, 1995), 48–54. See Chapter 2 for a comprehensive survey of the problem.

⁷⁵ Andrásfalvy, *A Sárköz és a környező Duna menti települések*, and idem, *Duna mente népének ártéri gazdálkodása Tolna és Baranya megyében*.

The beginning of research into water management systems in the dense network of waterways covering in the lowland areas of the Carpathian Basin had to await the 1990s. It was an archaeologist who led this research. Károly Takács assumed the existence of a complex system of artificial channels in the plain areas of the Carpathian Basin, most extensively studied in the context of Rábaköz (a micro region in northwest Hungary).⁷⁶ Maintaining this channel system must have required major labor expenditure. Takács argued that these channels – that functioned according to him in the early centuries of the Kingdom of Hungary – were maintained by a service population, operating in the castles of the *ispáns*.⁷⁷ According to Takács, maintenance of the system must have come to an end in the thirteenth century when Hungarian society underwent major social transformations, including the castle system, which had according to his theory been the basis for the maintenance works. It is not the place to discuss the questions surrounding the validity of Takács's otherwise fascinating idea, but it is important that he was among the first to ask who was in charge of maintaining these water systems and who was interested or involved in managing waters generally in the Carpathian Basin. Although the hydrography in this region was very dense, most rivers were slow flowing so that only limited number of river sections could be exploited for water power. These river sections were thus, just as valuable as rivers in areas where less dense river networks served local societies. In order to keep this system up, dams, sluices and races were built in hilly areas in order to provide a more even distribution of water, necessary in milling, fish cultivation, as well as irrigation (which probably played a rather limited role in the medieval period in the Kingdom of Hungary). This hill system was possible on streams rather than major rivers, but partial dams were sometimes built on significant waterways as well. In consequence, some landed properties would have acquired water while other lands would have lost their water supply. This led to numerous legal controversies all throughout Western Europe as well, although as research focus, has been primarily on major rivers, less attention has been drawn to this problem.⁷⁸ Such constructions in the Middle Ages – as today –

⁷⁶ Károly Takács, “Árpád-kori csatornarendszerek kutatása a Rábaközben és a Kárpát-medence egyéb területein,” [Investigation into Árpadian period canals in the Rábaköz and other areas of the Carpathian Basin] *Korall* no. 1 (2000), 27–61 and idem, “Árpád-kori csatornarendszerek II,” *Korall* no. 3–4 (2001): 297–314. For a summary in English, see: Károly Takács, “Medieval Hydraulic Systems in Hungary: Written Sources, Archaeology and Interpretation,” in *People and Nature in Historical Perspective* (CEU Medievalia 5), eds. József Laszlovszky, and Péter Szabó (Budapest: Archaeolingua – CEU Press, 2003), 289–312.

⁷⁷ *Ispáns* (*comites*) are appointees of the kings who governed medieval counties in the kingdom of Hungary. Takács suggested that this service population, under the leadership of the *ispán*, was the social basis for the maintenance of the system.

⁷⁸ E.g. Rüdiger Moldenhauer, “Mühlen und Mühlenrecht in Mecklenburg,” *Zeitschrift der Savigny-Stiftung zur Rechtsgeschichte, Germanistische Abteilung* 79 (1962): 195–236, and numerous studies in *Fleuves et marais, L’eaux et conflits*, and *Wasser in der mittelalterlichen Kultur*.

provided fertile grounds for dispute. The long-lasting debate mentioned in the introduction and will be followed up in the epilogue over the Gabčíkovo–Nagymaros-Dam in the 1980s and 1990s connected to the diversion of the River Danube is a modern example of a very old trend. While the proposed Gabčíkovo–Nagymaros-Dam was of course, a larger scale project, it closely parallels the jurisdictional problems that arose when medieval waterways were dammed and part of their water diverted from the original riverbeds to new channels or mill races. It also highlights the problems of adjudicating different economic interests of the varied actors. Even if the rivers were smaller, the problem of diverting rivers on country borders, as recently demonstrated from a political history perspective, was a clear problem in medieval Hungary, both along its borders with the Austrian duchies and the Kingdom of Bohemia.⁷⁹

In the past three decades, growing interest can again be attested amongst historians in pre-modern water management systems in Hungary. Apart from the unquestionable impact of the expanding research in Western Europe, the most important factor in this revival has been a number of new source publications, especially charter summary collections, the DVD and not much later online publication of the overwhelming majority of medieval Hungarian documentary evidence.⁸⁰ The *regesta* collections have allowed quantitative analyses and also drew the attention of scholars to numerous relevant cases worthy of more nuanced analyses. The online databases have facilitated research by easing access to tens of thousands of unedited legal sources. This ready access has produced a number of collections of sources on water management from medieval documentary evidence.⁸¹

The problem of the impact of water mills⁸² on riverine environments has been addressed as well, including their impact on the water regimes of rivers and the artificial floods they caused from time to time.⁸³ A short but important study by István Tringli should be mentioned here. He was the first to address the problem of the customary law of mills

⁷⁹ For the problem, see: Chapter 3.4. Important recent contributions to the question has been made by Bence Péterfi, “Debates Concerning the Regulation of Border Rivers in the Late Middle Ages: The Case of the Mura River.” *Hungarian Historical Review* 8 (2019): 313–335, and Renáta Skorka, “On two sides of the border. The Hungarian–Austrian border treaty of 1372,” *Hungarian Historical Review* 8 (2019): 290–312.

⁸⁰ In details, see Chapter 1.2.2 on the sources.

⁸¹ Vajda, “Okleveles adatok,” Tamás Vajda, “Hazai vízimalmaink 1301–1325 közötti okleveles adatai,” [Charter evidence on Hungarian water mills in the 1301–1325 period] in *Középkortörténeti tanulmányok III.* [Studies in medieval history, III] ed. Boglárka Weisz (Szeged: Szegedi Középkorász Műhely, 2003), 193–213 and Tamás Vajda, “Újabb adatok Árpád-kori vízimalmainkról,” [New Charter evidence on Árpadian Period mills of Hungary] in *Medievalisztikai tanulmányok V.* [Studies in medieval history, V], eds. Éva Révész, and Miklós Halmágyi (Szeged: Szegedi Középkorász Műhely, 2007), 211–245.

⁸² See the numerous publications of Tamás Vajda referred in the different chapters of the dissertation.

⁸³ Andrea Kiss, *Floods and Long-Term Water-Level Changes in Medieval Hungary* (Springer Water) (Cham: Springer, 2019), and Tamás Vajda, “Vízimalmok építésével előidézett, mesterséges áradások a középkori Magyarországon,” in *Középkortörténeti tanulmányok 8. A VIII. Medievalisztikai PhD-konferencia (Szeged, 2013. június 17–19.) előadásai* [Studies in medieval history, 8. The 8th PhD conference in medieval studies (Szeged, 17–19 June 2013)], eds. Márta Tóber, Ágnes Maléth (Szeged: Szegedi Középkorász Műhely, 2015), 347–362.

construction after Degré's work from the 1930s.⁸⁴ He had a much broader dataset at his disposal than Degré, partly thanks to his editorial work on the cartulary of an influential Hungarian noble family.⁸⁵ An urban historian, Katalin Szende, recently revisited the question of the disparate interests of mill owners operating along the same waterway in the context of some Hungarian towns using a topographical approach, which had been almost completely neglected in previous research.⁸⁶

In the past few years, two research directions can be attested that are to some extent similar to that which has dominated Western European research, environmental and landscape history as well as the social history of water management. Archaeologists, as well as historians, combined written evidence, cartographic data, and field surveys to show how water management systems worked on a local scale in pre-modern times. László Ferenczi looked at mills in the immediate surroundings of present-day Budapest,⁸⁷ Zsuzsa Pető discussed monastic fish ponds in the Pilis Mountains,⁸⁸ Ünige Bencze as well as Gusztáv Jakab and his colleagues studied water management systems in Eastern Transylvania,⁸⁹ while István Viczián and Csilla Zatykó reconstructed the water management system along a smaller river and one of its tributary streams in southern Transdanubia (in Hungarian *Dunántúl*, meaning the areas west of the River Danube in Hungary) based on legal evidence and field walks, with its numerous mills and mill dams.⁹⁰ The other problem that has been addressed in numerous

⁸⁴ István Tringli, "A magyar szokásjog a malomépítésről," [Customary law on construction of mills] in *Tanulmányok a középkorról* [Studies in medieval history] (Analecta Medievalia, 1), ed. Tibor Neumann ([Budapest–Piliscsaba]: Pázmány Péter Katolikus Egyetem, 2001), 251–268.

⁸⁵ *A Perényi család levéltára 1222–1526* [Cartulary of the Perényi family, 1222 to 1526] (Magyar Országos Levéltár kiadványai, II. Forráskiadványok, 44), ed. István Tringli (Budapest: Magyar Országos Levéltár, 2008).

⁸⁶ Katalin Szende, "Mills and Towns: Textual Evidence and Cartographic Conjectures from Hungarian Towns in the Pre-Industrial Period," in *Extra muros. Vorstädtische Räume in Spätmittelalter und Früher Neuzeit. Espaces suburbains au bas Moyen Âge et à l'époque moderne* (Städteforschung, A 91), eds. Guy Thewes, and Martin Uhrmacher (Cologne and Vienna: Böhlau, 2019), 485–516. A slightly different earlier version of the article: Katalin Szende, "Malmok a városban. Az energiatermelés topográfiája négy magyar városban az iparosodás előtt," [Mills and towns. The topography of energy production in four Hungarian towns in the pre-industrial period] in *Mesterségek és műhelyek a középkori és kora újkori Magyarországon. Tanulmányok Holl Imre emlékére / Crafts and Workshops in Hungary during the Middle Ages and the Early Modern Period. Studies in Memory of Imre Holl*, eds. Elek Benkő, Gyöngyi Kovács, and Krisztina Orosz (Budapest: MTA BTK Régészeti Intézet, 2017 [2018]), 485–506.

⁸⁷ Ferenczi, "Molendinum ad aquas calidas."

⁸⁸ Pető, *Hermits*, 67–70.

⁸⁹ Ünige Bencze, "Reconstructing a monastic landscape: the example of the Cistercian abbey Cârța (Kerz, Kerc)," in *Monastic Life, Art, and Technology in 11th–16th Centuries* [Special issue of: *Annales Universitatis Apulensis. Series Historica*], ed. Ileana Burnichioiu (Alba Iulia: Universitatea „1 Decembrie 1918” din Alba Iulia, 2015), 29–44, Ünige Bencze, "A medieval Pauline landscape in the Szekler Land," *Transsylvania Nostra* 9, no. 34 (2015): 10–17, Gusztáv Jakab et al., "The Environmental History of a Former Salt Town in Transylvania (Sic, Northern Romania)," *Acta Archaeologica Academiae Scientiarum Hungaricae* 69 (2018): 185–206, and Gusztáv Jakab et al., "Relict Anthropogenic Ecosystem from the Middle Ages: History of a Salt Marsh from Transylvania (Sic, N Romania)," *Environmental Archaeology* 2019, 1–18.

⁹⁰ Viczián, and Zatykó, "Geomorphology and environmental history," and Csilla Zatykó, "Eltűnt berzencei malmok nyomában," [In pursuit of the lost mills of Berzence] in *Genius loci*, 108–112.

studies is the social organization of various water management systems. A recent volume was dedicated to the topic in which pre-modern and modern case studies were presented in a, more or less, balanced way.⁹¹ In the volume, a study by Tamás Vajda addressed the seigniorial rights around mills and the milling business possibilities open to different social groups, while László Gálffy focused on how societies along the Danube depended on the water. The ways wars influenced water management systems in frontier zones and its impact on riverine societies has also been discussed.⁹²

Even if there has been a slow but steadily growing interest in past years in Hungary, the methods and results from Anglo-Saxon, German, French and Italian research have only slowly influence Hungarian scholarship. Political history still dominates the research agenda at major research institutions, lacking in a number of basic works and handbooks, even in the context of water management.⁹³

Moving to look at the state of scholarship in Hungary's Central European neighbors, research in Poland has probably been even less active in the study of historical water management.⁹⁴ Apart from some individual studies, mostly focusing on the technological and economic aspects of water power exploitation, little research had been carried out on these issues until the last few decades.⁹⁵ In recent years, there has been an upswing in research and innovative methods have been used to understand pre-modern water management systems. Scholars have explored the possibilities of reconstructing water management systems using GIS'and environmental archaeology in addition to more traditional source materials such as urban statutes and tax registers.⁹⁶ Looking at water supply systems in medieval Polish towns

⁹¹ *Víz és társadalom Magyarországon a középkortól a XX. század végéig* [Water and society in Hungary from the Middle Ages to the end of the 20th century], ed. Gergely Krisztián Horváth (Budapest: Balassi Kiadó, 2014).

⁹² Tamás Vajda, "Földesúri jogok és kötelezettségek a középkori vízimalmok körül," [Seigniorial rights and dues around medieval water mills] László Gálffy, "Dunai társadalmak: Változások a városi folyamtérben Bécs és Buda között (XIII. század vége–XV. század közepe)," [Danube societies: changes in the urban riverspace between Vienna and Buda (from end of the 12th to the mid-15th century)] and András Vadas, "Vízgazdálkodás és háborús védekezés: Csákány és a Vas megyei Rába-mente a kora újkorban," [Water management and war defense: Csákány and the course of the Rába in Vas County in the Early Modern period] in *Víz és társadalom*, 79–110, 111–155, and 207–245 respectively. See also, *A Landscape of Water. An Environmental History of the Ottoman–Hungarian Wars* (Environmental Humanities in Pre-modern Cultures) (Amsterdam: Amsterdam University Press [in preparation]).

⁹³ See e.g. a number of studies in *Víz és társadalom*.

⁹⁴ Grzegorz Mysliwski, "Utilisation of water in Central Europe (12th–16th cents.)," in *Economia e energia*, 321–333.

⁹⁵ Maria Dembińska, *Przetwórstwo zbożowe w Polsce średniowiecznej (X–XIV wiek)* [Grain processing in medieval Poland (10th–14th centuries)] (Wrocław: Zakład Narodowy im. Ossolińskich Wydawnictwo PAN, 1973).

⁹⁶ Rafał Kubicki, *Młynarstwo w państwie zakonu krzyżackiego w Prusach w XIII–XV w. (do 1454 r.)* [Milling Industry in the State of the Teutonic Order in Prussia in the 13th–15th century (to Year 1454)] (Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego 2012), idem, "Water mills and rural settlements in the Dominion of the Teutonic Order in Prussia," in *Usus aquarum*, 29–50, Tomasz Związek, "Kształtowanie sieci młynów wodnych

as well as in the towns of the Teutonic Order has been particularly important.⁹⁷ The most important fruit of these recent endeavors is Urszula Sowina's monograph. She used a wide variety of written evidence showed how towns such as Kraków and Wrocław managed to provide water for their industries and population.⁹⁸ Apart from studying written sources, water supply systems in Poland have also been studied from an archaeological point of view.⁹⁹ While economic history still is important in research, the social history of water management remains marginal in Polish research.¹⁰⁰

Scholars in Bohemia were also not very active in water history research until recent times. Even in past years only limited research interest can be evidenced. Milling, however, has generated some interest¹⁰¹ as so fishponds and fishing cultures, but there is a lacuna in

na przykładzie powiatu konińskiego (ok. 1300–1550),” [The formation of a network of water mills on the example of the Konin district (approx. 1300–1550)],” *Studia Geohistorica* no. 2 (2014): 118–142.

⁹⁷ Urszula Sowina, and Waław Kulczykowski, “The first urban water supply systems in the State of the Teutonic Knights: the transfer of hydrotechnical knowledge,” in *Origines et mutationes. Transfer – Exchange – Power*, eds. Aleksandra Girsztowt, Piotr Kitowski, and Andrzej Gierszewski (Kraków: Libron, 2017), 51–62.

⁹⁸ Urszula Sowina, *Water, Towns and People. Polish Lands against a European Background until the Mid-16th Century* (Polish Studies – Transdisciplinary Perspectives, 17) (Frankfurt am Main: Peter Lang, 2016).

⁹⁹ Jerzy Piekalski, “Elementy infrastruktury średniowiecznego Wrocławia,” [Elements of the infrastructure of medieval Wrocław] in *Wrocław na przełomie średniowiecza i czasów nowożytnych. Materialne przejawy życia codziennego* [Wrocław at the turn of the Middle Ages and Modern times. Everyday life in light of the material culture] (Wratislavia Antiqua, 6), eds. idem, and Krzysztof Wachowski (Wrocław: Uniwersytet Wrocławski, 2004), 9–24, Jerzy Piekalski, “The Environment and Living Conditions in Wrocław (Breslau) in the 16th–18th Centuries,” in *Historical Archaeology in Central Europe*, ed. Natascha Mehler (Rockville, MD: Society for Historical Archaeology, 2013), 379–394, and Paweł Cembrzyński, *Zaopatrzenie w wodę i usuwanie nieczystości w miastach stref bałtyckiej i sudecko-karpackiej w XIII–XVI wieku* [Water supply and waste disposal in cities of the Baltic and Sudeten-Carpatians zones in the 13th–16th centuries] (Wratislavia Antiqua, 14) (Wrocław: Uniwersytet Wrocławski, 2011).

¹⁰⁰ Apart from Sowina's works, see the early social topographies: Mateusz Goliński, *Wokół socjotopografii późnośredniowiecznej Świdnicy*, 2 vols [The sociotopography of late medieval Swidnica] (Wrocław: Wydawn. Uniw. Wrocławskiego, 2000), vol. 1 and Jacek Wiesiołowski, *Socjotopografia późnośredniowiecznego Poznania* [The social topography of late medieval Poznań] (Warsaw: Państw. Wydawn. Nauk, 1982). See more recently: *O rzecze i wodzie w życiu codziennym człowieka średniowiecza* [Rivers and waters in everyday life] (Spotkania Bytomskie, 8), eds. Sławomir Moździoch, and Krystian Chrzan (Wrocław: Wydawnictwo Instytutu Archeologii i Etnologii Polskiej Akademii Nauk – Ośrodek Badań Nad Kulturą Późnego Antyku i Wczesnego Średniowiecza, 2015). Cf. Marcin Danielewski, “Korabniki, Niewody i Rybitwy z terenu Kujaw jako osady służebne związane z książęcym regale wodnym,” [Korabniki, Niewody and Rybitwy in the Kujawy region as service settlements connected with the ius ducale water system] *Roczniki Dziejów Społecznych i Gospodarczych* 71 (2011): 33–53, and most recently: Tomasz Związek, “The Will, the Mill and the Town. Prolegomena to the Functioning of the Miller Family in the Late Medieval Town,” in *Usus aquarum*, 71–86. On waste water management, see: Leslie Carr-Riegel, “Waste Management in Medieval Krakow: 1257–1500,” (MA thesis, Central European University, 2016) and *Ekobiografia Krakowa* [Kraków. An Ecobiography], eds. Rafał Szmytka, and Adam Izdebski (Kraków: Znak, 2018).

¹⁰¹ Martina Maříková, “Středověké mlýny v českých zemích (Archeologické a písemné prameny),” [Medieval mills in Czech lands (archaeological data and written sources)] *Mediaevalia Historica Bohemica* 10 (2005): 89–148, Tomáš Petráček, “K otázce datace počátků vodních mlýnů v českých zemích v kontextu změny vnímání dynamiky vývoje českých zemích 10.–12. století,” [On the issue of dating the beginning of water mills in the Czech lands in the context of changes in the perception of the dynamics of the Czech lands in the 10th–12th centuries] In *Sborník k počtě Jiřího Kalfersta* [Studies in honor of George Kalferst] (Hradec Králové: Muzeum východních Čechů Hradec Králové, 2014), 249–252, Oldřich Kotyza, “K počátkům vodních mlýnů v českých zemích aneb o existenci vltavských jezů a hydraulických mlýnů v Praze 10. století. Poznámky k břevnovskému aktu ze 14. ledna 993,” [On the origin of water mills in the Czech lands or on the existence of the weirs on the

basic handbooks and overviews of the subject.¹⁰² Both mills and fishponds were mostly studied by archaeologists and environmental archaeologists¹⁰³ and historians paid less attention to them despite the importance of fishing culture in the medieval economy of the Czech lands and the field's potential using written sources.¹⁰⁴ Nonetheless, a recently published volume shows that medieval waterscape research also is becoming more active in Bohemia.¹⁰⁵ In the volume, apart from a summary of the technological aspects of water mills in Bohemia,¹⁰⁶ the problem of urban water supply was addressed.¹⁰⁷

Even if promising research has been initiated in recent years in Central Europe, including Hungary, communication of the research results to international audiences is only slowly gaining ground while the adoption of research results from the region rarely appears in western scholarly work. There are conferences where growing number of attendance from these countries can be attested while the increasing number of English-language publications in Hungary and Poland and German publications in Bohemia is likely to gradually change this situation.

Not every important study dedicated to the topic has been referred to in the previous pages. A number of monographs of collected volumes on different aspects of water management will be discussed in the following relevant subchapters. Nonetheless, I have presented the most important research directions on historical water management in this overview and pointed out the wide variety of scholarly approaches. In past decades there has been a clear tendency either to look at the ways societies organized themselves, either top-down or increasingly from bottom-up, in managing water bodies and water systems of

Vltava and hydraulic mills in Prague in the 10th century. Notes on the Břevnov act of 14 January 993] in *Středověká Evropa v pohybu k počtě Jana Klápště / Medieval Europe in Motion in Honour of Jan Klápště*, eds. Ivana Boháčová and Petr Sommer (Prague: Archeologický ústav AV ČR, Praha, v. v. i., 2014), 461–499.

¹⁰² Jiří Andreska, "Development of Fish-Pond Culture in Bohemia," in *The fishing culture of the world*, 2 vols, ed. Béla Gunda (Budapest: Akadémiai Kiadó, 1984), vol. 1. 77–83, Frantisek Graus, *Dějiny venkovského lidu v Čechách v době předhusitské*, 2 vols [History of the rural population in Bohemia in the pre-Hussite period] (Prague: Státní nakladatelství politické literatury, 1953–1957), vol. 2. 32–35 and 483–486, and Hoffmann, "Economic development," 660–662.

¹⁰³ Vlasta Jankovská, and Jan Pokorný, "Palaeoecology of a medieval fishpond system (Vajgar, Czech Republic)," *Folia Geobotanica* 37, no. 3 (2002): 253–273, Ivo Přikryl, "Historický vývoj našeho rybníkářství a rybníčních ekosystémů: Produkce rybníkářství," [Historical fishponds and fishpond ecosystems] *Veronica* 1 (2004): 7–10, Adéla Pokorná et al., "The oldest Czech fishpond discovered? An interdisciplinary approach to reconstruction of local vegetation in mediaeval Prague suburbs," *Hydrobiologia* 730, no. 1 (2014): 19–213, and most recently, see the overview by Lucie Galusová, "Vodní mlýn jako objekt archeologického výzkumu," [Water mills as objects of archaeological research] *Archaeologia historica* 40 (2015): 267–293

¹⁰⁴ Andreska, "Development," and Hoffmann, "Economic development."

¹⁰⁵ *Wassermühlen und Wassernutzung*.

¹⁰⁶ Lucie Galusová, and Martina Maríková, "Die Baugestalt der Wassermühlen im mittelalterlichen Böhmen und Mähren," in *Wassermühlen und Wassernutzung*, 309–324.

¹⁰⁷ Jaroslav Jásek, "An Attempt at an Outline of the Historical Development of Water Supply and Sewerage of Medieval Settlements in the Czech Lands," in *Wassermühlen und Wassernutzung*, 57–76.

different sizes. Numerous studies addressed how various conflicts were resolved; what legal regulations, customs, and social norms lay behind the organization of the network of waterways in certain regions, and not least, how these social arrangements impacted the environment and how environmental processes changed the surrounding social organization. These problems will be revisited later in the dissertation.

1.2. The Goals of this Work

Looking at the map of the medieval Kingdom of Hungary (*Fig. 1*) it immediately becomes apparent why water has always been a crucial resource in the Carpathian Basin. The geographic conditions of the area are characterized by a basin formed by an ancient sea surrounded by the high mountains of the Carpathians. The major flat areas in the central part of the Basin – both the so-called Little and the Great Hungarian Plain (*Kisalföld* and *Alföld*) – comprise a major part of the inhabited area in the Middle Ages (*see: Fig. 2*). In these territories, it was necessary to deal with water from the very beginning of Hungarian state formation (ca. 900-) as vast areas lay in the flood plains of the rivers flowing through the Basin. Of course, water was also a valuable resource in the hilly and more mountainous areas. These waters, as elsewhere in Europe, were harnessed to provide water power, to feed fish ponds, to irrigate lands, to provide drinking water for people as well as water and winter pasturage for their livestock, to support all sorts of industrial activities, as well as for transporting goods.

The hypothesis of this dissertation is that precisely because of the dense network of waterways and their rather uneven water regimes,¹⁰⁸ from the tenth century onwards, a system based on norms of water use formed. By the late medieval period, these unwritten norms had become customary. If this hypothesis is right, it is fundamental to the understanding of the development and functioning of water management system to study how water bodies were organized. In these complex water systems, despite the disparate interests, social status and political power of the parties involved it was possible to find long-term solutions to the management of water bodies, a task of the utmost priority for the different actors. In the long-run, access to water by different landlords depended on other landowners both up and downstream along the same water way.

¹⁰⁸ See: Kiss, *Floods and Long-Term Water-Level Changes*.

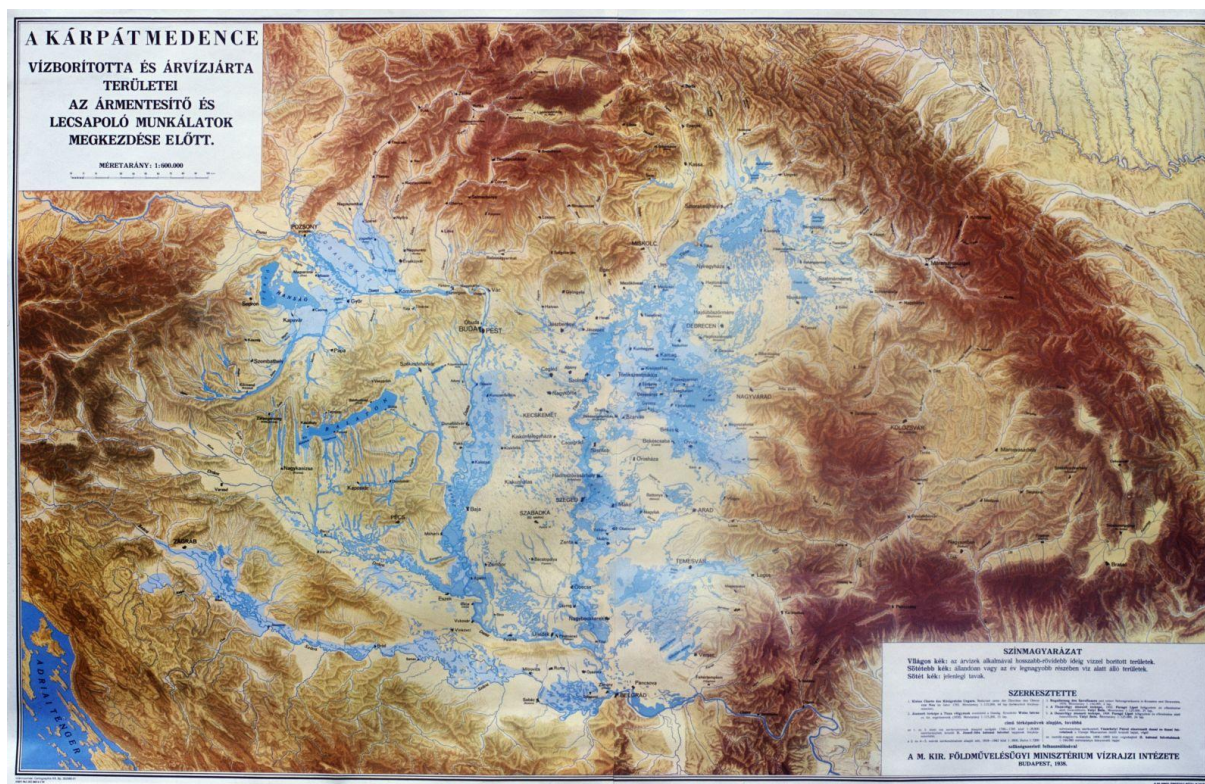


Fig. 1. Areas covered by water and wetlands before river regulation in the Carpathian Basin (after Woldemár Lászlóffy)¹⁰⁹

The way waters were manipulated in order to exploit them in all these varied ways is far from evident. In the Kingdom of Hungary – at least based on the large amount of legal textual evidence that has come down to us – disputes connected to the water were dominated by the problem of rights to the use of bodies of water by individuals and institutions from the earliest existence of the Hungarian state. The main problems that arose were:

- What rights did landowners have to a river that ran through their estate?
- Did someone have the right to restrict the flow of water of a river when its source lay on one's own property?
- How did different players in society conceive of water as a resource: was it treated like any other kind of property or natural resource on an estate, or was it treated differently from mineral resources, for example, or forest lands?

¹⁰⁹ Although the map has lately been criticized, the basic characteristics of the territory could clearly be seen on it. See: Zsolt Pinke, and Beatrix Szabó, "Analysis of the map of the Ministry of Agriculture: Water Covered Areas and Wetlands in the Carpathian Basin Before the Commencement of Flood Protection and Draining," in *8. országos interdiszciplináris Grastyán konferencia előadásai* [Papers presented at the 8th Grastyán interdisciplinary conference], eds. Virág Rab, and Melinda Szappanyos (Pécs: PTE Grastyán Endre Szakkollégium, 2010), 207–217.

- What landscape changes did the manipulation of water bodies result in?
- How were these multi-functional waterways managed and who were the main drivers of the system?

The questions derived from the legal evidence leads to the problem of the environments in which the debated actions took place. Without understanding the local environments, the problem of legal patterns of water use cannot be studied. As legal evidence is the most important group of sources, it is also true that the environmental processes behind the water constructions can only be studied via the analysis of the surviving legal records – combined with other evidence discussed below. By the very nature of the surviving legal evidence (to be discussed in Chapter 1.2.2) the interests of different actors were put down in writing in one form or another. The production of such texts requires two things: on the one hand, the existence of complex water systems where the different actors – landowners – located by a body of water had different economic interests and on the other hand, a juridical system that allowed the players to negotiate their way through the various issues that inevitably arose. The evolution of these water systems in the different parts of the Carpathian Basin and the legal evidence that record these disputes delineate the space and the time-frame addressed in the coming chapters.

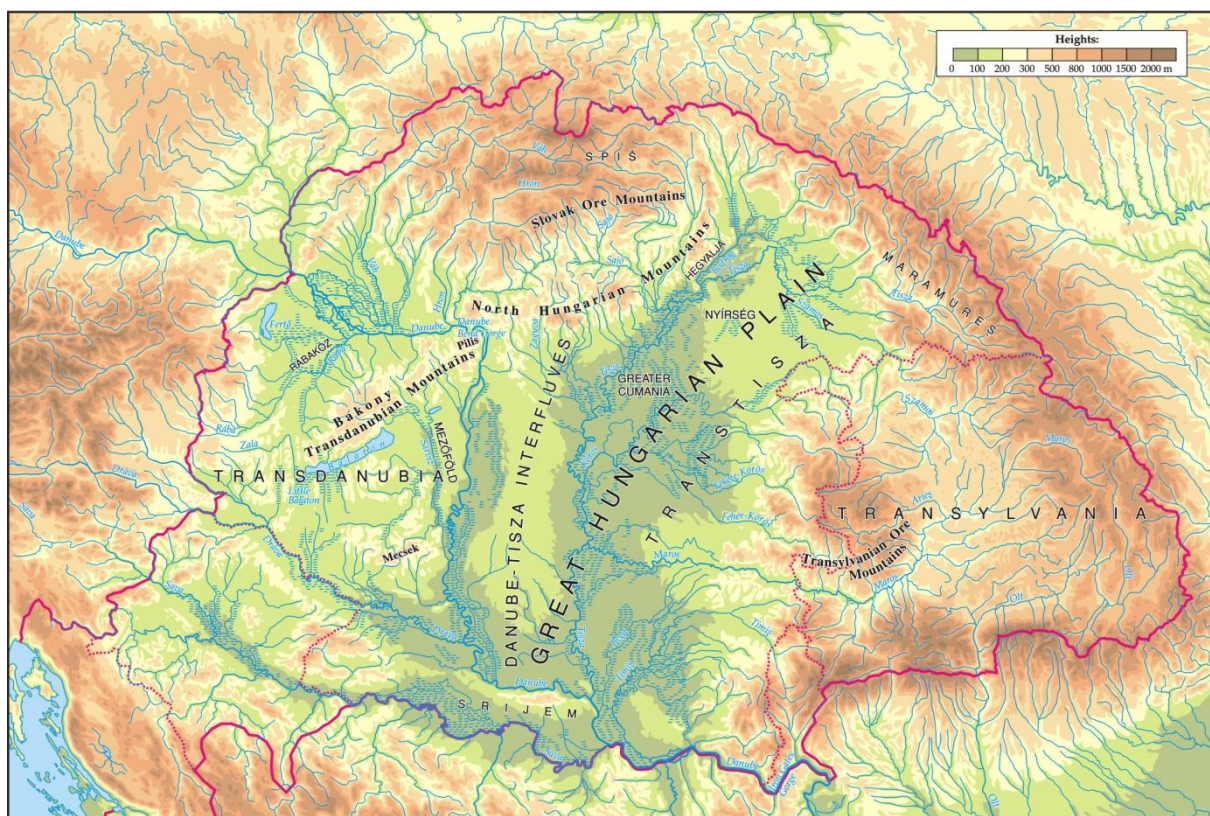


Fig. 2. Major geographical units in the Carpathian Basin (drawn by Béla Nagy)

1.2.1. The Time and the Space

Although as mentioned above, there are some signs that rather complex hydraulic systems already functioned in the Carpathian Basin from the Early Árpadian period onwards, it is quite difficult to draw conclusions about the conflicts that surrounded the use of various kinds of waters in that period because of the scarcity of the available written evidence. In previous decades, research has made tremendous strides in reconstructing settlement patterns in the Hungarian Kingdom in the Árpadian period. The monumental, and yet to be completed work of György Györffy (1917–2000) on the historical geography of Hungary up the early fourteenth century clearly shows that it is quite difficult to gather data on individual settlements not to mention data on water systems.¹¹⁰ Written sources up to the second half of the thirteenth century, apart from registering the existence of different elements of water-related infrastructure, seldom refer to any of their features. One can presume that these constructions frequently caused controversies in this early period, too, but these disputes left little trace in the surviving legal evidence. Thus, it would be premature to draw any conclusions based on this evidence group. Chapter 2 addresses this early period of literacy in order to understand how the most important element in waterscapes of medieval Hungary, water mills, started to spread. Because of the nature of the sources and the probably growing number of disputes, the later chapters of the dissertation focus on the period that is usually referred to as late medieval in the context of the Kingdom of Hungary, i.e. the period ranging from the beginning of Angevin rule (early fourteenth century) to the fall of the medieval state to the Ottomans in 1526. Of course, neither the death of the last Árpadian ruler, King Andrew III in 1301 nor the loss at the battlefield of Mohács to the Ottomans and the death of King Louis II in 1526 can be considered as turning points from the perspective of water management. Nonetheless, the almost three hundred-year period permits me to pursue processes, to see how different customs and norms remained stable or changed, how the privileges of various social groups connected to water use were negotiated and practiced, and last but not least, how complex water systems were managed over the long term. From the fourteenth century onwards, there is a clear increase in the surviving written evidence produced in the Kingdom of Hungary, not so much in the narrative sources but in the legal

¹¹⁰ ÁMTF, vols 1–4.

documents issued each year. From this period on, in at least some regions and social milieus, there was a clear intention to leave some kind of written record concerning the way a dispute was settled. There is no point in limiting the scope of the dissertation to the year 1301 although there will be a clear focus on this period thanks to the presence of a more sophisticated legal system from this later time. Not only can the existence of water-related infrastructures be ascertained, but some of the legal and non-legal evidence permits me to analyze the social and environmental background to the recorded disputes. Most of the problems fall into a time period between 1301 and 1526 although in many cases, examples are taken from either earlier or later times. Because of the logic of the archival sources, and partly the edited ones I use, as well as the aims of this dissertation, arbitrary as it is, I will primarily focus on the later medieval period.

It is somewhat easier to limit the geographic space which will form the basis of the dissertation. The focus will be on the medieval Kingdom of Hungary. Even though the borders of this political entity changed significantly during the period studied here, the area which fell under the authority of the kings of Hungary clearly defines the boundaries of the area to be considered. I will not discuss Dalmatia although for some periods it belonged to the authority of the kings of Hungary. However, the legal system of Dalmatia never was aligned to that of Hungary, and only a limited number of case studies concern Croatia and Slavonia.

The overwhelming majority of the cases to be discussed, both urban and rural, fell under the aegis of the Kingdom of Hungary. Where relevant, I will make continuous reference, however, to similarities with other parts of Central Europe, especially for urban water use because Hungarian urban practice has strong parallels with Polish and Bohemian towns.

1.2.2. About the Sources

As shown above, different kinds of written evidence have been used to study historical water management in Western Europe although even to understand water-related disputes sources other than written ones will also be considered. Archaeology contributes to scholarly understanding of the impacts of the various kinds of water constructions on other objects connected to the water, both up- and downstream, while environmental archaeology has been fundamental in analyzing the problems surrounding the impacts of urbanization and industrialization on water systems and water qualities. Nonetheless, at the present stage of

research, the primary emphasis will be on written evidence, although, where available, visual sources, as well as archaeological data and environmental and geographic data will also be brought in to enhance our understanding of the hydrological processes and legal disputes that unfolded around water use.

For the medieval period, the written sources that provide good insight on the above problems are mostly referred to in Hungarian scholarship as *oklevelek* (similar to *charters* in English or *litterae* in Latin) as well as laws and statutes. Both types of sources represent legal evidence – as do most sources from medieval Hungary that have come down to us. This legal focus has certain consequences. First and foremost, water use related issues appear as written evidence where disputes arose or at least when the customs and rights around the use of water were not clear. It also means that as long as water was not used intensively or systematically, there is little chance of finding written evidence reflecting contemporary understanding of water as a resource or property.

Several *charters* mention the problem of the water control when creating dams, mills, sluices, fishponds, etc. This group of evidence – consisting of different kinds of legal documents that were mostly meant to endow someone or a certain group with rights including, but not restricted to, property rights as well as settle disputes amongst the parties named in the texts – provide the most important corpus for research. The disputes themselves clearly reflect the inclusion of water in farming and the ways certain groups of people understood their rights to water. Hundreds of cases arose connected to the creation of mills and other water constructions, in most cases, between members of the local nobility and townspeople respectively. Often, the nobility and townsmen can be found in dispute with a variety of church institutions. One usually finds only snapshots of sometimes decade-long disputes. There are only a few negotiations about which more than a few charters still exist, though in many cases these documents do contain the texts of earlier ones issued on the same matter.

The charters I was interested in were gathered from the existing secondary literature and three different sources: *regesta* (document summary) collections (most importantly the Angevin and Sigismundian Cartularies – *Anjou-kori* and *Zsigmondkori oklevéltár*¹¹¹ – and the online database of the *regestas* of the Hungarian National Archives¹¹²), published charters in

¹¹¹ AOklt and ZsO.

¹¹² For the period until August 29, 1526, see note 114, and for the period between August 27, 1526 and 1570, see the new database of the Hungarian National Archives: <https://adatbazisokonline.hu/imgview/reformacio-koraml-ol-1526-1570/> (last accessed: December 12, 2019).

the major cartularies¹¹³ (part of which was included in the Digital Library of medieval Hungary¹¹⁴) and finally, in the most important cases, unpublished charters in the collection of the Hungarian National Archives. The index system of the Angevin and Sigismundian Cartularies, despite the sometimes too brief charter summaries and the lack of consideration of numerous archives in the earlier edited volumes of both series, permitted the collection of charters where reference is made to dams, dykes, water mills, channels and, fish ponds. In addition, the *Lexicon latinitatis medii aevi Hungariae* (and its recent supplement by Kornél Szovák)¹¹⁵ also clarifies some of the notions used in medieval charters related to water constructions. The fifteenth–sixteenth-century sources are less systematically published or summarized as the sources up to 1426.¹¹⁶ In most cases, fifteenth- to sixteenth-century charters are published in cartularies of noble families (Zichy, Perényi, Károlyi, Frangepán, Héderváry, Teleki, Szapolyai, etc.). In addition to these charters, a significant number of late medieval document summaries – greatly varying in quality – is available in the online Database of Archival Documents of Medieval Hungary. These have also proven fundamental to the study of late medieval water use related disputes.

The other type of written evidence comprises laws and regulations. There are a few late medieval regulations preserved in the *Corpus Juris Hungarici* that refer to the use of water.¹¹⁷ The early sixteenth-century summary of customary law, the *Tripartitum* of Stephen Werbőczy, refers extensively to the legal questions connected to the construction of mills and dams. In addition, sixteenth-century statutes and town council registers also preserved water-related decisions. The comparison of the legislative documents and the disputes reflected in charters will provide insight into the way water was understood as property both in theory and practice.¹¹⁸

¹¹³ The most important ones: ÁÚO, DHA, vol. 1, HO, *Erdélyi okmánytár: oklevelek, levelek és más írásos emlékek Erdély történetéhez* [Transylvanian Cartulary. Charter, missals and other written sources to the history of Transylvania], ed. Zsigmond Jakó et al. (Budapest: Akadémiai, 1997–2004), CD, and the cartularies of noble families (not listed here, but in the relevant notes throughout the dissertation).

¹¹⁴ *A középkori Magyarország digitális könyvtára /The Digital library of medieval Hungary*, ed. György Rác. Online document: <http://mol.arcanum.hu/medieval/> (last accessed: June 20, 2014). Later integrated to <http://www.hungaricana.hu> (last accessed: September 20, 2019).

¹¹⁵ János Harmatta, ed., *Lexicon Latinitatis medii aevi Hungariae*, 6 vols (Budapest: Akadémiai and Argumentum, 1987–2017) and Kornél Szovák, *Supplementum ad Lexicon Latinitatis Medii Aevi Hungariae, A–I* (Budapest: [Argumentum], 2013).

¹¹⁶ This is how far the Sigismundian Cartulary (ZsO) has gotten until now.

¹¹⁷ Béla Némethy, “Vízjogi előzmények a magyar Corpus Jurisban,” [Water law antecedents in the Corpus Iuris] *Vízügyi Közlemények* 13 (1931): 126–148 and János Ede Szilágyi, “Vízjog: a vizek tulajdonának és használatának főbb magyar előírásai a nemzetközi tendenciák tükrében,” [Water law: the major regulations on the ownership and use of water in Hungary in light of international trends] *Sectio Juridica et Politica Miskolc* 29 (2011): 595–622.

¹¹⁸ On the customary law on mill construction, see: Tringli, “A magyar szokásjog a malomépítésről” and Chapter 3.1.

From the last decades of the Middle Ages with the spread of literacy, new kinds of evidence appear including terriers (*urbaria*), account books, minutes of noble gatherings of the counties, and from the sixteenth century, maps. These sources are also relevant and will be used in different chapters and subchapters. They, nevertheless, form only a relatively small part of the source base of this dissertation. Let me refer very briefly to maps. In many cases in Western Europe, from the medieval period onwards, the resolutions that followed border disputes – including borders along water bodies – were recorded by representing the space on a sketch or a map. This recording can be achieved in different ways. In England, in many cases, maps were used similarly to our modern understanding and represented those landscape elements that were important in understanding the situation.¹¹⁹ In other areas, such as the Kingdom of Hungary, it was very rare to create a map prior to the modern era. Rather, borders were described in prose, similarly to what has been shown for Ottoman Egypt with the canal systems discussed in Alan Mikhail's study.¹²⁰ Nevertheless, as there is strong continuity in the location of mills, dams, fords, etc. between the medieval period and the seventeenth or eighteenth centuries, even modern maps may prove useful in some cases.¹²¹ The detailed maps of the so-called First Military Survey (*Josephinische Landesaufnahme*) of the Kingdom of Hungary, carried out in the 1780s, mark all water constructions in the landscape including mills and fish ponds, etc.¹²²

The source basis of the dissertation is diverse, despite the fact that it primarily focuses on the most extant written evidence that has survived from the medieval Kingdom of Hungary – charters. I hope to show in the coming chapters that these sources allow a detailed image to be formed of the ways water could be modified by local societies for their benefit and how

¹¹⁹ E.g. Laura Lehua Yim, "A Watercourse 'in Variance': Re-situating a Sixteenth-Century Legal Map from Ashbourne, Derbyshire," *Imago Mundi* 68, no. 2 (2016): 147–163, William D. Shannon, "Dispute maps in Tudor Lancashire," *The Local Historian* 42, no. 1 (2012): 2–15, Peter Barber, "Mapmaking in England, ca. 1470–1650," in *The History of Cartography, Vol. 3. Cartography in the European Renaissance*, ed. David Woodward (Chicago: Chicago University Press, 2007), 1594–1595, Roger. J. P. Kain, "Maps and Rural Land Management in Early Modern Europe," in *The History of Cartography, Vol. 3*, 706–708. For a collection of similar maps: *Local Maps and Plans from Medieval England*, eds. R. A. Skelton, and P. D. A. Harvey (Oxford and New York: Clarendon and Oxford University Press, 1986).

¹²⁰ For surviving perambulation sketches, see: Andrea Kiss, "Study on the historical geography of the first extent perambulation sketch from the Carpathian Basin," *Zbornik Odsjeka za povijesne znanosti ZPDZ HAZU* 19 (2002): 127–141, Csilla Zatykó, "Medieval Villages and their Landscape: Methods of Reconstruction," in *People and Nature*, 343–375. Cf. Mikhail, "Oriental Democracy."

¹²¹ András K. Németh, and Gábor Máté, "Szempontok és példák a középkori eredetű malmok és malomhelyek folytonosságának vizsgálatához," [Notes and examples to the study of the continuity of medieval mills and mill-places] in *Középkori elemek a mai magyar anyagi kultúrában* [Medieval elements in the present-day Hungarian material culture] (Tanulmányok a Kárpát-medence anyagi kultúrája köréből, 1), eds. Anikó Báti, and Zsigmond Csoma (Budapest: Agroinform Kiadó és Nyomda Kft., 2014), 47–68.

¹²² For the edition of the first military survey, see: *Az Első Katonai Felmérés 1763–1785* [DVD-Rom] [First military survey, 1763–1785, DVD-Rom] (Budapest: Arcanum Adatbázis Kft., 2006). Made available online at: <http://mapire.eu> (last accessed: August 1, 2019).

past societies resolved conflicts if these benefits were not mutually satisfactory for every party involved in the life of a water way.

1.3. The Structure of the Dissertation

In this dissertation I wish to understand how the manipulation of the different rivers, the creation of “socio-natural sites” proceeded, how it impacted various people who lived by and away from the water bodies. To do so, I will first address the formation of the various means of exploitation of different water bodies by local economies. Chapter 2 discusses the spread of the most important infrastructural elements to modify riverscapes in the Kingdom of Hungary, water mills. This development has traditionally been associated with the foundation of the Christian state around the year 1000, and the settling of monastic orders, most importantly the Benedictines, within the kingdom. I will argue that their role in introducing water mills may have been taken as too self-evident in research. Nonetheless from around the eleventh and early twelfth century onwards, there seems to have been a small increase in the number of water mills. By the thirteenth century, this increase led to a variety of legal cases that are discussed in the following chapters.

Chapter 3 represents the longest part of the dissertation. It focuses on the fourteenth- to sixteenth-century rural and urban waterscapes of the Kingdom of Hungary, and looks at the different ways dams, weirs, and all kinds of stream construction works lead to legal controversies as well as what sorts of arrangements were made in order to avoid or resolve these disputes. The first subchapter (Chapter 3.1) examines primarily rural environments. By studying the term, *locus molendini*, an argument will be made that from the early fourteenth century onwards, the rights around using water for milling had already acquired a rather well-defined legal norm. I then continue the analysis by studying places where the problem of water rights and access probably comes to light most frequently, that is, in urban space. Here, a relatively large number of people living in a small area aimed to use water resources for more diverse activities than in rural spaces. Urban space therefore provides one of the best “laboratories” for looking at water-related legal disputes. The different subchapters here are dedicated to a variety of urban environments from two aspects; first the water bodies that served (or sometimes impeded) the well-being of these settlements, and second, the function, and legal standing of these settlements. The different water bodies discussed include major waterways, small rivers and streams, including rivers fed by hot springs, and urban moats

(Chapter 3.2). This part is followed by a study of the problem of water access in a special town type found in the Kingdom of Hungary, that is, mining towns (Chapter 3.3). These settlements enjoyed special privileges provided by the kings in order to settle these settlements with miners and to facilitate their development, and last but not least increase royal incomes from gold and silver extraction. Water power is a crucial resource for mining settlements. Therefore, the privileges accorded to these settlements in some cases indicate the forms in which water rights could have been appropriated by different groups. A special kind of water-related conflict that is poorly studied, not only in Hungarian but in foreign scholarship as well, is the problem of rivers as borders is addressed in the following subchapter (3.4). This, as will be shown, was a source of numerous conflicts where environmental changes – whether natural changes in the riverbed or artificial alterations of rivers – leading to lasting fights for riverbeds and the connected floodplains as well as other lands. Chapter 4 will be dedicated to the social groups behind the different water control and regulation works. Based on late medieval and sometimes later sixteenth-century sources, I argue that millers as well as pond masters had a complex task to manage water bodies. Their duties extended well beyond the mere task of grinding grain and supervising water-levels. In Chapter 5, apart from drawing some basic conclusions, I point to the modern parallels of water-related disputes discussed in Chapter 3 and the potential relevance of pre-modern case studies in understanding present contests for waterscapes.

2. The Spread of Water Mills in Medieval Hungary with a Central European Overview*

It is generally clear from the scholarly literature that by the late medieval period in majority of the waterways in Western and Central Europe, water mills and the connected infrastructural elements were one of the most widespread elements of water management. Water mills were not solely water wheels standing by a river or on it, but in many cases, they provided even distribution of the water supply, including a number of built elements – mill races, dams, sluices and mill buildings, all features impacting the amount and the flow of the waters they exploited. These buildings, as will be discussed in the coming chapters, often posed obstacles to each other. As soon as water mills became recurrent objects by waterways, they gave rise to the problem who owned and controlled the water they used. Here in Chapter 2, I discuss the spread of water mills in the Kingdom of Hungary. However, as I have argued, the written sources are limited for the early period of their first appearance, it is worth studying the problem in a Central European context. It is generally thought that the spread of this water technology took place at roughly the same period in Bohemia, Poland, and Hungary. The spread of water mills is associated with the integration of these countries into Western Christianity.¹²³

It is an almost century-long commonplace in historiography, that Christianization played a significant role in spreading technological innovations during the Middle Ages. More effective use of power must rank among the most important of these innovations. On the one hand, the spread of the breast harness was fundamental in making more use of animal power and on the other hand, water mills proved a more effective way of grinding grain than the usual hand mills of the time. Research dating back to the basic handbook by Richard Bennett and John Elton mentioned above, attributes the spread of mills in the high medieval period to the activity of religious orders in various regions of Europe, primarily the Benedictines.¹²⁴

* This chapter is the significantly modified version of a paper, published as: “Technologies on the Road between West and East The Spread of Water Mills and the Christianization of East Central Europe,” in *The Medieval Networks in East Central Europe: Commerce, Contacts, Communication*, eds. Balázs Nagy, Felicitas Schmieder, and András Vadas (New York: Routledge, 2018), 123–138.

¹²³ For the Christianization of the countries, see: *Christianization and the Rise of Christian Monarchy. Scandinavia, Central Europe and Rus’ c. 900–1200*, ed. Nora Berend (Cambridge: Cambridge University Press, 2007), and Nora Berend, Przemysław Urbańczyk, and Przemysław Wiszewski, *Central Europe in the High Middle Ages : Bohemia, Hungary and Poland c.900 – c.1300* (Cambridge: Cambridge University Press, 2013), 110–137, and rather recently. Florin Curta, *Eastern Europe in the Middle Ages (500–1300)*, 2 vols (Brill’s Companions to European History, 19) (Leiden and Boston: Brill, 2019), vol. 1. 470–499.

¹²⁴ Bennett and Elton, *History of Corn Milling*. For the role of Cistercians, with primary focus on their role in spreading industrial mills: Christie Peters, “Industrial milling and the prolific growth of the Cistercian order in the twelfth and thirteenth centuries,” in *Fifty Years of Medieval Technology and Social Change*, ed. Steven A. Walton (London: Routledge, 2020), 150–164.

This thesis was partly supported by the results of two essential studies published in the mid-1930s by Lewis Mumford and Marc Bloch.¹²⁵ They both believed that after the Roman period in most parts of Europe, the re-introduction of water mills was primarily connected to religious orders. However, Adam Lucas recently drew attention to the different narratives of the two historians: while Mumford believed that the spread of new technologies was intended to create better time management for the peasantry, Bloch thought that it rather served to increase incomes from peasantry connected to ecclesiastical domains.¹²⁶

Bloch, in his above discussed seminal study, attempted an overview of the spread of mills in different regions of Europe. His limited access to the secondary literature only permitted him to sketch out a very approximate chronological sequence. In spite of the fact that his chronology ultimately proved inaccurate, for example for Ireland or Iberia, his main conclusion, that the areas that had been subject to longer Roman authority used water mills earlier compared to other places, is still accepted by historians.¹²⁷ Since Bloch, however, archaeological research demonstrated that the use of water mills was much more widespread in the Roman Empire than had been assumed.¹²⁸ Despite Bloch's effort to be comprehensive, there are areas that lacked secondary literature at the time and were almost completely omitted by him, especially Central Europe. He, as well as other scholars trying to provide an overview of the spread of mills in Europe, with a few exceptions, did not engage with the scholarship of the region even though a number of questions arose with regard to the time when water mills spread as well as the role of the Benedictines in this process.

This chapter does not aim at providing a comprehensive survey of the entire technological advancement in Central Europe but seeks to focus attention on some of the problems noted in recent scholarship with regard to the rather over-simplified notion that water mills spread through Central Europe with the Benedictine order's support, very soon after the arrival of Western religious orders in the region. Here, sources and scholarship for the Hungarian Kingdom lie at the center of the analysis with reference to the sometimes strikingly similar questions in Polish, Czech and to some extent in Croatian, Serbian and

¹²⁵ Mumford, *Technics and Civilization*, and Bloch, "Avènement et conquêtes du moulin à eau."

¹²⁶ Adam Lucas, "The Role of the Monasteries in the Development of Medieval Milling," in *Wind & Water in the Middle Ages*, 89–91.

¹²⁷ E.g. Finbar McCormick et al., *The Archaeology of Livestock and Cereal Production in Early Medieval Ireland, AD 400–1100* (Reconstructing the Early Medieval Irish Economy EMAP Report 5.1) (Belfast: [N. p.], 2011), 39–42.

¹²⁸ Örjan Wikander, *Exploitation of Water-Power or Technological Stagnation? A Reappraisal of the Productive Forces in the Roman Empire* (Scripta Minora 1983–84, 3) (Lund: Gleerup, 1984) and *Handbook of Ancient Water Technology*, esp. his contribution in the volume. See also: Adam Robert Lucas, "Narratives of Technological Revolution in the Middle Ages," in *Handbook of Medieval Studies: Terms – Methods – Trends*, ed. Albrecht Classen (Berlin: De Gruyter, 2010), 979–980.

Romanian scholarship.¹²⁹ I offer here a rough chronology of the spread of this technological device in Hungary in order to better understand how the norms developed for the exploitation of waterways in local economies.

2.1. Mills and Benedictines – Some Preliminary Considerations

Before turning to Central Europe and the spread of mills in that region, some remarks are required about why early monastic communities are usually associated with the spread of the water wheel. Anywhere where grain production was present, grain had to be ground. Most of this work was carried out using small hand mills found all over Europe on excavated sites from the Neolithic well up into Modern times – of course in significantly varying qualities. Hand mills, however, were less effective than water wheels. The quantities that could be ground with a hand mill, even a rotary hand mill, barely covered family needs and the quality of the flour it provided was no way comparable to the product of a water mill. A water mill's efficiency also differed considerably from rotary hand mills. Water mills, however, could not be built everywhere. The location of the early Benedictine and other religious houses on hilltops did not always allow for water to be used sources of energy. Nevertheless, when Saint Benedict of Nursia wrote his *Rule* for the abbey he founded at Monte Cassino, he listed mills as essential elements of the monastery. According to the Rule, mills had to be located within the inner side of the walls of the monastery, although it is not evident whether he referred to human muscle driven hand mills or water mills.¹³⁰ The scarcity of fresh running water may have been true for many of the early medieval foundations of the order but water used for producing energy as well as other purposes was usually considered an essential element in location of monasteries in the High and Late Middle Ages. This policy is reflected in the famous St Gall monastery plan prepared at Reichenau. Although the rather stereotypic representation of the mills makes it difficult to decide which kinds were represented, based on a fairly detailed study it is, more or less, certain that by the early ninth century, water mills

¹²⁹ For a partial survey of the question, with reference to Poland, Bohemia and Hungary, see: Myśliwski, "Utilisation of Water."

¹³⁰ *Monasterium autem, si possit fieri, ita debet constitui ut omnia necessaria, id est aqua, molendinum, hortum, vel artes diversas intra monasterium exerceantur, ut non sit necessitas monachis vagandi foris, quia omnino non expedit animabus eorum.* Sant Benet de Núrsia [Saint Benedict of Nursia], *Regula monachorum* (Subsidia Monastica, 21), ed. Ignasi M. Fossas (Barcelona: Publicacions de l'Abadia de Montserrat, 1997), cap. 66.

were regarded as a defining element of Benedictine abbeys.¹³¹ However, at the abbey of Reichenau – situated on an island in the Bodensee – the water lying so close to the abbey may have been perceived differently compared to many other monastic sites. Still, in this one case, the arguments presented primarily by Horn and Born stand, that is, during the Carolingian period, monastic complexes were imagined as having their own water mills. It has recently been demonstrated that water mills were spread throughout the broader hinterland of Reichenau in the Carolingian period. For example, archaeological research revealed a water mill complex in Bavaria that operated from as early as the late seventh century. This very early example suggests that mills were used in what is today southern Germany from the early medieval period onwards.¹³²

Christianity came to Central Europe, the area in the primary focus of this chapter, from two directions. Following the Roman influence in parts of Central Europe, Christian ideas spread from the Byzantine Empire and later from western Christian areas through missionary activity. Western missionaries in Hungary, Poland and Bohemia were key to this spread. However, in Wallachia and Moldavia as well as other parts of the Balkan Peninsula, Byzantine missionary activity was certainly more influential.¹³³ Although in recent years, the use of water mills has been demonstrated in the later Byzantine areas of the Roman Empire, there is no evidence to suggest that this technology appeared in the Balkans or even the Carpathian Basin from this direction after the Romans retreated from the region.¹³⁴ The question is rather difficult to discuss as hardly any written evidence survived before the thirteenth century. In addition, it has recently been pointed out that there have been no archaeological excavations carried out in Bulgaria, Serbia or Macedonia to test the validity of

¹³¹ Stiftsbibliothek St. Gallen, Codex Sangallensis 1092. For a comprehensive analysis of the plan, see the project: Carolingian Culture at Reichenau and St. Gall. Online: <http://www.stgallplan.org/> (last accessed: March 16, 2016). For the problem of the mill on the plan, see: Walter Horn and Ernest Born, “Water Power and the Plan of St. Gall,” *Journal of Medieval History* 1 (1975): 219–258. The main conclusions of Horn and Born, although with some caution, are accepted by Lucas, *Wind, Water, Work*, 208–209.

¹³² Carl I. Hammer, “‘A Suitable Place for Putting up a Mill.’ Water Power Landscapes and Structures in Carolingian Bavaria,” *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 95 (2008): 319–334. For the earliest excavated mill in the region north of the Danube: Wolfgang Cyszcz, *Die ältesten Wassermühlen. Archäologische Entdeckungen im Paartal bei Dasing* (Thierhaupten: Klostermühlenmuseum, 1998) and idem, *Römische und frühmittelalterliche Wassermühlen*.

¹³³ See the number of studies by László Koszta on the topic.

¹³⁴ For mills in the Byzantine Empire, see: K. Th. Raptis, “Water as Power: Early Christian and Byzantine Watermills in Greece: Typology and Distribution,” in *1st IWA International Symposium on Water and Wastewater Technologies in Ancient Civilizations: Symposium Preprint Book*, eds. A. N. Angelakis, and D. Koutsoyiannis (Iraklio: National Agricultural Research Foundation, 2006), 109–117, Sophia Germanidou, “Watermills in Byzantine Greece (5th–12th cents.). A Preliminary Approach to the Archaeology of Byzantine Hydraulic Milling Technology,” *Byzantion* 84 (2014): 185–201 (I am thankful for the author for kindly providing me with her article before it was printed), and Curta, *Eastern Europe*, vol. 1. 323. For the possible impact on the north of the Balkans, see: e.g. Dumitru Țicu, *Watermill in the Banat* (Brăila: Museum of Brăila – “Istros” Publishing House, 2012), 384.

this suggestion.¹³⁵ The roughly one hundred water mills known to have functioned in early medieval Bavaria, however, leave no doubt that water mills were used by local groups in the region where most of the monasteries in Central Europe recruited their members, around the year 1000. The earliest monastic foundations in Bohemia – Břevnov and Ostrov – were both connected to Regensburg and Niederaltaich, although the first monks arrived in Regensburg from Rome – another place where water mills were clearly present.¹³⁶ The first monasteries in Poland may also have been built around 1000, but until the mid-eleventh century, their history is quite unclear while a permanent presence of monks in them may not predate the 1040s. Still, in Bohemia and Silesia, the Bavarian influence was clearly the most important.¹³⁷ The situation is similar in the Kingdom of Hungary. The first missionaries are known to have come to the Carpathian Basin in the second half of the tenth century. Saint Wolfgang and Bruno (Prunward) were both from southern German areas, the former having been raised at the above-mentioned abbey of Reichenau. The first monasteries, Pannonhalma (founded in 996), Pécsvárad (1015), Bakonybél (1018), and Zalavár (ca. 1019) all arose during the rule of Grand Prince Géza and during the reign of St Stephen, his son. The Bohemian influence as well as the Bavarian, can certainly be detected in Hungary, just as in Silesia.¹³⁸ Thus, the monks of the first Western monastic foundations in Central Europe were recruited from areas where water mills were, if not widespread, then at least well known.

2.2. The First Water Mills in the Region – Historical Evidence, Linguistics and (the lack of) Archaeological Data

As concluded in the last subchapter, the appearance of the Benedictine order reveals marked variation within the region. In light of these temporal disparities, it becomes even

¹³⁵ Biljana Arandjelović, and Ana Momčilović-Petronijević, “The Water Mills Architecture in the South of Serbia,” *AR-Architecture, Research* no. 2 (2010): 59–62. See online: http://www.fa.uni-lj.si/filelib/9_ar/2010/ar2010_2_07.pdf (last accessed: March 10, 2016)

¹³⁶ Petr Sommer, “The Monastery of Břevnov,” and “The Monastery of Ostrov u Davle,” in *Europe’s Centre around AD 1000*, eds. Alfried Wieczorek, and Hans-Martin Hinz (Stuttgart: Theiss, 2000), 266, and 267 respectively. See also: David Kalhous, *Anatomy of a Duchy. The Political and Ecclesiastical Structures of Early Přemyslid Bohemia* (East Central and Eastern Europe in the Middle Ages, 450–1450, 19) (Leiden and Boston: Brill, 2012), esp. 143–169. For the mills in Italy at the time, see: Roberta Magnusson, and Paolo Squatriti, “The Technologies of Water in Medieval Italy,” in *Working with Water*, 258–266.

¹³⁷ Marek Derwich, “The Earliest Monasteries in Poland,” in *Europe’s Centre*, 334.

¹³⁸ See Kornél Szovák, “A bencés szerzetesség korai századai Magyarországon,” [The early centuries of the Benedictines in Hungary] and Szilveszter Sólmos, “Az első bencés szerzetesek hazánkban,” [The first Benedictine monks in Hungary] in *Paradisum plantavit. Bencés monostorok a középkori Magyarországon / Benedictine Monasteries in Medieval Hungary*, ed. Imre Takács (Pannonhalma: Pannonhalmi Bencés Főapátság, 2001), 35–47 and 48–60 respectively.

more interesting to demonstrate the presence of similar time gaps in the appearance of water mills in the region. First, data from Hungary is considered, followed by comparison with the available data for Bohemia, Poland and the Balkan states.

In Hungary, a number of scholars have expressed quite varying opinions on the spread of water mills in the Carpathian Basin. Analysis of the early written evidence – both from pragmatic and narrative sources – based on the first references to mills, has resulted in arguments over whether these mills were driven by water power or by human muscle. Many prominent Hungarian historians have expressed their opinions on these questions including Péter Váczy, László Makkai, György Györffy, and Gyula Kristó. Besides historians of the Árpáadian period, another group of scholars, historians of technology, have also presented their arguments supporting one date or another.¹³⁹ Apart from the written evidence, the question was and can be studied by the integration of other sources as well. At least two possible research directions need to be addressed: linguistic and archaeological.

The integration of linguistics into the study of the spread of mills s first appeared in scholarly literature almost a century ago. Between the 1950s and the 1970s, a debate unfolded amongst linguists concerning the origin of some words related to milling, including the term *malom* (or *molna*, the Hungarian term for mill).¹⁴⁰ Elemér Moór argued that the Slavic origin of the word shows the early use of water mills amongst the Slavic population living in the

¹³⁹ Péter Váczy, “A korai magyar történet néhány kérdéséről,” [On some questions of the early Hungarian history] *Századok* 92 (1958): 278, Makkai, “Östliches Erbe und westliche Leihe,” 46, idem, “A malom mint a középkori Európa erő- és munkagépe,” [Mill as the power machine of medieval Europe] in *Műszaki innovációk sorsa Magyarországon*, 33, Gyula Kristó, “A korai feudalizmus (1116–1231),” [Age of early feudalism (1116–1231)] in *Magyarország története I/1. Előzmények és magyar történet 1242-ig* [History of Hungary, vol. 1/1. Prehistory and Hungarian history until 1242] (Magyarország története: tíz kötetben), ed. György Székely (Budapest: Akadémiai, 1978), 1025. For an overview of the historiography of the earliest mention of water mill in a Hungarian context, see: Tamás Vajda, “Okleveles adatok Árpád-kori vízimalmainkról,” [Documentary data on Árpáadian-age water mills] in *Medievalisztikai tanulmányok: a IV. Medievalisztikai PhD-konferencia (Szeged, 2005. június 9–10.) előadásai* [Studies in medieval history. Papers read at the 4th conference of medievalists, Szeged, 9–10 June 2005], eds. Szabolcs Marton, and Éva Teiszler (Szeged: Szegedi Középkorász Műhely, 2005), 193–197 and more recently, see also Tamás Vajda, “Korai bencés apátságaink vízimalmaink: a szerzetesek szerepe a technikai fejlődésben,” [Water mills of the early Benedictine abbey of Hungary and their role in technological development] in *Episcopus, Archiabbas Benedictinus, Historicus Ecclesiae. Tanulmányok Várszegi Asztrik 70. születésnapjára* [Studies in honor of Asztrik Várszegi on the occasion of his 70th birthday] (METEM Könyvek, 85), eds. Adám Somorjai OSB, and István Zombori (Budapest: Magyar Egyháztörténeti Enciklopédia Munkaközösség – Historia Ecclesiastica Hungarica Alapítvány, 2016), 25–45.

¹⁴⁰ János Melich, “Malom,” [Mill] *Magyar Nyelv* 16 (1920): 61–66 and on his footsteps in the 1950s and 1960s: István Kniezsa, *A magyar nyelv szláv jövevényszavai*, 2 vols [Slavic loanwords in Hungarian] (Budapest: Akadémiai, 1955), vol. 1. 325–327 and 342; Elemér Moór, “Malom és molnár,” [Mill and miller] *Nyelvtudományi Közlemények* 67 (1965): 130–138, Dezső Pais, “Pamlény: malom? — és az mn > ml hangváltozás,” [Pamlény – mill? – and the mn > ml sonant changes] *Magyar Nyelv* 61 (1965): 455–458, Antal Bartha, “Gazdaságtörténet és szavak,” [Economic history and the words] *Magyar Nyelv* 65 (1969): 14–25 and Elemér Moór, “A szóegyüttesek és a csoportos szóhiányok: művelődéstörténeti tények,” [Joint words and joint word omissions: intellectual historical facts] *Magyar Nyelv* 70 (1974): 173–181. See also the reflections of Egon Maróti on the debate: idem, “A vízimalom európai elterjedésének történetéhez,” [On the history of the spread of water mills in Europe] *Antik Tanulmányok* 22 (1975): 55–74.

Carpathian Basin when the Hungarians arrived. Moór concluded that the term was adopted by the Hungarians from a Slavonic dialect that became the basis of the Slovak language, and based on that, believed that the adoption of the term may have taken place in the western area of the Slovak–Hungarian language contact zone, the area of the Little Hungarian Plain. For present purposes, it is even more important the acoustic changes in the form of the Slovak word for mill (*mlýn*) and the adoption of other water management related terms, Moór, following in the footsteps of István Kniezsa, dated this adoption to the tenth century – although the issue of whether water mills were used in West-Slavic areas at that time was neglected. The other problem that was never explained was why, according to them, *mlýn* (and *molna*) referred only to water mills and not hand driven ones.

In historical scholarship, it was probably László Makkai who first referred to this linguistic debate in an important German language article – although he never mentions what works he was referring to – also accepting the ninth-century adoption of the term (and of course of mills).¹⁴¹ Walter Endrei, a historian of technology, accepted Makkai’s view without explaining why he dated the appearance of mills in the region to eighth [sic!]–ninth-century Carolingian-rule in the Transdanubian area.¹⁴² The dating of the adoption of water mills among West Slavic peoples and Hungarians well before the year 1000 is unique in the historiography of the whole region. Symptomatic of the uncertainty in the dating is that Endrei in his later works does not mention the eighth–ninth-century spread of water mills in the Carpathian Basin again.¹⁴³ Since Endrei, Tamás Vajda challenged the validity of the tenth-century (or even the Carolingian-period) spread of mills in light of archaeological evidence in a recent article.¹⁴⁴

Archaeological data also needs to be taken into account in the Central European context, partly as with more precise methods, it often contributed information about the spread of water wheels in many parts of Europe¹⁴⁵ and partly because of the limited literacy in the period this chapter focuses on. Although no archaeological excavation in the Carpathian

¹⁴¹ Makkai, “Östliches Erbe,” 44–45.

¹⁴² Walter Endrei, “Malom,” [Mill] in *Korai magyar történeti lexikon (9–14. század)* [Early Hungarian historical dictionary, 9th to 14th centuries], ed. Gyula Kristó (Budapest: Akadémiai, 1994), 441. For the Carolingian rule in the region, see: Curta, *Eastern Europe*, vol. 1. 101–112 with reference to the basic works on the topic.

¹⁴³ See for instance his entry “Malom,” [Mill] in *Magyar művelődéstörténeti lexikon*, 14 vols [Lexicon of cultural history in Hungary], ed. Péter Kőszeghy (Budapest: Balassi, 2003–2014), vol. 7. 257–258 or idem and György Balázs, “Vízimalom,” [Water mill] in *Magyar művelődéstörténeti lexikon*, vol. 12. 485–488. Also available online in an updated form at: <http://mamul.btk.mta.hu/> (last accessed: April 1, 2016).

¹⁴⁴ Tamás Vajda, “Régészeti adatok középkori malmainkról,” [Archaeological data on medieval mills in Hungary] in *Középkortörténeti tanulmányok VI.* [Studies in medieval history, 6], eds. Péter G. Tóth, and Pál Szabó (Szeged: Szegedi Középkorász Műhely, 2010), 307–318.

¹⁴⁵ See most importantly: Czysz, *Römische und frühmittelalterliche Wassermühlen*.

Basin has yet uncovered any trace of water mills predating written evidence mentioning these constructions, it is worth considering the research potential of this area as well. In recent years, archaeological dating methods – most importantly dendrochronology – has significantly broadened the possibilities of studying the history of various constructions. A number of medieval mills have been excavated or observed in Hungary during archaeological research in the last 50–60 years although their dating usually proved to be very problematic. This is important with regard to this study as some of the mills were even dated to post-Carolingian times in earlier scholarship.¹⁴⁶ Hand mill fragments may also be useful indicators of the spread of mills in addition to actual archaeological finds of water mills themselves. For many years, most hand mills (at least the actual grinding stones) were unearthed at sites on the Great Hungarian Plain. This distribution resulted in the idea that the western parts of the Carpathian Basin – i.e. those that were under Carolingian authority – were more technologically advanced than the plains areas within the Basin where hand mills – i.e. household flour production – dominated for a long time. This view was strongly challenged in recent years as more and more small grinding stones came to light in Transdanubia as well.¹⁴⁷ One very important site should be mentioned in this context: the village of Kána (on the edge of present-day Budapest) where numerous hand mill fragments were discovered. It is rather unclear when exactly these hand mills were used there, but most probably the village existed at roughly the same period as the Benedictine abbey of Kána to which the village belonged. The abbey was founded in the mid-twelfth century and functioned until the mid-thirteenth (up to the Mongol invasion). The existence of the large number of hand mills in a village owned by Benedictines in the mid-twelfth to mid-thirteenth century clearly shows that water mills were not the only tools available for grinding grains in the mid-Árpáadian period, not even within monastic environments in the so-called *medium regni*, the power center of the Kingdom of Hungary, usually believed to be the most developed region at the time.¹⁴⁸

¹⁴⁶ For the critics of some of these archaeological finds: Vajda, “Régészeti adatok,” and idem, “Árpád- és Anjou-kori vízimalmaink tájalakító hatása,” [Water mills as driving forces of landscape change in the Árpáadian and Angevin Periods] in *Micae mediaevales II. Fiatal történészek dolgozatai a középkori Magyarországról és Európáról* [Studies of young historians on medieval Hungary and Europe], eds. Péter Jakab et al. (Budapest: ELTE BTK Történelemtudományok Doktori Iskola, 2012), 60–63.

¹⁴⁷ Tamás Vajda, “Régészeti adatok.”

¹⁴⁸ For the hand mills, see: Szilvia Földesi, “Remarks on the Medieval Millstones at Kána,” in *Archaeological Investigations in Hungary in 2004*, ed. Júlia Kisfaludi (Budapest: Kulturális Örökségvédelmi Hivatal – Magyar Nemzeti Múzeum, 2005), 54–55. For an overview of the results of the research on the village of Kána, see: György Terei, “Az Árpád-kori Kána falu,” [The Árpáadian-age village of Kána] in *A középkor és a kora újkor régészete Magyarországon*, 2 vols [Archaeology of the Middle Ages and the Early Modern Period in Hungary], eds. Elek Benkő, and Gyöngyi Kovács (Budapest: MTA Régészeti Intézet, 2010), vol. 1. 81–111.

As mentioned above, despite the significance of linguistics and archaeological evidence, written evidence is, of course, of primary importance when determining dates for the introduction of mills to the area of the Kingdom of Hungary. Some problems do occur, however, when using early foundation charters and donation documents where the first references to water mills may be found. Most recently, it has been postulated that the earliest undoubtedly authentic document which mentions water mills in the Hungarian Kingdom dates to 1009. The document is a donation charter endowing the newly founded bishopric of Veszprém. Although the document did not survive in the original, research accepts the document as an authentic piece of early-eleventh-century writing. Thus, most scholars accept the document as the first solid proof for the existence of water mills in Hungary.¹⁴⁹ In the charter, King Stephen, apart from listing counties under the authority of the diocese of Veszprém, bestowed the bishops with lands in three counties: Fejér, Veszprém and Visegrád, and in the district of the castle of Kolon (all in Western Hungary). The lands, according to the charter, were donated with: *omnibus utensibus iugiterque pertinentiis, scilicet famulis familiabusque, pratis, vineis, areis, edificiis, campis, terris, agris cultis et incultis, piscacionibus, aquis aquarumque decursibus, molendinis, viis, inviis tam exitibus quam inexitibus*.¹⁵⁰ Looking at the list of utilities, there is little doubt that mills are referred to, coming as they do immediately after other water related utilities in the text that were water powered not hand driven.

I argue, however, that in itself this reference does not directly mean that water mills were really in operation in those parts of the Transdanubian estates transferred to the bishopric by Stephen at the time of the donation. Four possibilities need to be considered. First, that indeed there were water mills functioning at that time in the mentioned areas. In this case, the Benedictines might not have had much impact as previously thought on the spread of water mills in the counties of the Hungarian Kingdom mentioned in the document. The impact of Benedictine technical know-how in the first decade of the eleventh century may not yet have been all that strong.¹⁵¹ The lands in question were obviously held in royal hands at the time of donation and had no connection with monastic domains, though

¹⁴⁹ György Györffy, *István király és műve* [King Stephen and his legacy] (Budapest: Akadémiai Kiadó, 1977), 419. (For a shorter German version of the book, see: idem, *König Stephan der Heilige* [Budapest: Corvina, 1988]) Vajda, “Korai bencés apátságaink vízimalmaink,” *passim*.

¹⁵⁰ DHA, vol. 1. 52 (emphasis mine – AV).

¹⁵¹ For their role in early farming practices, see: László Erdélyi, “Szent István-kori bencések hatása a föld- és kertművelésre meg az iparra,” [The role of the Benedictines in the age of St Stephen on gardening and industry] in *Emlékkönyv Szent István király halálának kilencszázadik évfordulóján*, 3 vols [Memorial volume on the 900th anniversary of Saint Stephen’s death], ed. Jusztián Serédi (Budapest: Szent István Társulat, 1938), vol. 1. 479–491.

presumably the Church had a great impact on the early organization of royal estates. György Györffy, following in the footsteps of German diplomatic research as well as of Imre Szentpétery, drew attention to the fact that this charter displays obvious parallels with charters issued by the Holy Roman emperors, most importantly of course with those of Henry II. Philological analysis usually points to the endowment charter issued in favor of St Michael monastery at Bamberg (Michelsberg) as the closest parallel to the donation charter of Veszprém. Although this charter did not list the utilities comprising the donation, another charter dating to the same year and connected to the same notary did list the donated utilities in exactly the same order as the one mentioned above.¹⁵² Without going into the vexed question of the person of the notary in the case of the Veszprém-charter, there is no doubt that he came from the lands of the Empire, either from Northern Italy or from the Southern German region. In this period, both in Northern Italy as well as in areas north of the Alps, water mills were frequent constituents of estates.¹⁵³ The notary, who is likely to have written a number of similar donations in the Empire issued under the name of Henry II to different institutions, may not have been very much aware of the physical realities of the estates affected by the donation. In donations of this kind, one finds lists of all the various utilities found on estates, although in reality they may not ever have existed. Even mountains, in the sense of forest related utilities, and their incomes could be donated to landlords living in lowlands areas. Nevertheless, the inclusion of such elements in these utilities lists aimed at providing the new owners with the entirety of all possible future incomes related to the piece of land they had acquired, including income from water mills.¹⁵⁴ Thus, the second possibility is that this element was included because of the presence of this utility in the Empire at the time the Veszprém bishopric was endowed and because mentioning mills was a formulaic element of donation charters. Partly connected to this, a third option should be considered. It has been shown in the context of Carolingian Empire that endowment charters in many cases included pertinence lists, fairly similar to the one above. They may also express royal will and

¹⁵² *MGH Diplomata regum et imperatorum Germaniae*, vol. 3 [Henrici II et Arduini diplomata] (Hannover: Hahn, 1900–1903), 488–489 (no. 384).

¹⁵³ For German speaking areas, see above the works on Bavarian mills, for Italian mills, see: Squatriti, *Water and Society*.

¹⁵⁴ Berent Schweineköper, “‘Cum aquis aquarumve decursibus’ Zu den Pertinenzformeln der Herrscherurkunden bis zur Zeit Ottos I.,” in *Festschrift für Helmut Beumann zum 65. Geburtstag* ed. Kurt-Ulrich Jäschke (Sigmaringen: Thorbecke, 1977), 22–56, Walter Schlesinger, “Die Hufe im Frankenreich,” in *Untersuchungen zur eisenzeitlichen und frühmittelalterlichen Flur in Mitteleuropa und ihrer Nutzung*, 2 vols (Abhandlungen der Akademie der Wissenschaften in Göttingen, Phil.-hist. Klasse 3, 115), eds. Heinrich Beck, Dietrich Denecke, and Herbert Jankuhn, (Göttingen: Vandenhoeck & Ruprecht, 1979), vol. 1. 40–70, and Anikó Kiss, “A gyulai várbirtok malmainak története,” [History of the mills in the castle domain of Gyula] *A Békés Megyei Múzeumok Közleményei* 5 (1978): 270.

a desire to create a more unified settlement network as well as other economic units. In the case of the Carolingians, a network of small agricultural units was organized under *villas*. The lists of pertinences in such documents rather illustrate the arrangements the rulers intended to establish as models of production.¹⁵⁵ The royal endowments to the newly founded bishoprics in Hungary, such as Veszprém, may also fit a similar pattern. Due to a lack of sufficient control sources, however, it is hard to confirm this supposition. Nevertheless, it is clear that in the early endowment charters, as opposed to some of the Carolingian capitularies and instructive documents, nothing points clearly to systematic differences or significant variances that would suggest intentional arrangement in early pertinence lists.

The fourth, and less likely, scenario is that this element represents an interpolation in the charter. This latter is highly unlikely based on the close parallels of the utilities list to the above mentioned imperial charters and other donations of Henry II, not to mention a number of other philological reasons that have been noted in earlier research. The second and, in my opinion, most likely option, i.e. that mills were mentioned in the utilities list as a possible future source of income, certainly focuses attention on scholarly opinion that puts the *terminus ante quem* of the appearance of water mills in the Carpathian Basin at 1009. The above-mentioned arguments, however, in no way represent absolute proof that water mills did not already operated in the Hungarian Kingdom by 1009. Still, this latter aspect should certainly be taken into account with regard to the Veszprém-charter.

As noted above, research usually attributes the spread of mills to the Benedictines even though the first reference can really not be connected to their activities. Nevertheless, a number of references make it quite clear that water mills were introduced at a certain point in the eleventh century on monastic estates. The foundation charter of the Benedictine abbey of Tihany from 1055 – the earliest charter from the Hungarian Kingdom preserved in its original – mentions mills as well as millers. King Andrew I endowed the monastery with a number of estates from his own. Thus, again nothing actually suggests that these mills were built by

¹⁵⁵ See for instance the infamous *Capitulaire de villis*. Published in: *MGH Capitularia regum Francorum* (MGH Legum 2.1), ed. Alfred Boretius (Hanover: Hahn, 1883), 82–91 (no. 32). For the problem, see: Christoph Sonnlechner, “The Establishment of New Units of Production in Carolingian Times: Making Early Medieval Sources Relevant for Environmental History,” *Viator. Medieval and Renaissance Studies* 35 (2004): 21–48, idem, “Raumstrategische, agrarökologische und ökonomische Funktionen von Salzburger Stützpunkten im Frühmittelalter,” in *Die Kirche im mittelalterlichen Siedlungsraum. Archäologische Aspekte zu Standort, Architektur und Kirchenorganisation* (Beiträge zur Mittelalterarchäologie in Österreich, 21), ed. Sabine Felgenhauer-Schmiedt (Vienna: Österreichische Gesellschaft für Mittelalterarchäologie, 2005), 119–130, and Christoph Sonnlechner, “Die Etablierung Salzburgs als Netzknoten: karolingische Kirchenstruktur, Raumstrategien und Organisation der Landnutzung um 800,” in *Deutsche Königspfalzen* (Beiträge zu ihrer historischen und archäologischen Erforschung, 8: Places of Power – Orte der Herrschaft – Lieux de Pouvoir = Veröffentlichungen des Max-Planck-Instituts für Geschichte, 11/8), ed. Caspar Ehlers (Göttingen: Vandenhoeck & Ruprecht, 2007), 199–226.

Benedictines.¹⁵⁶ However, this charter leaves little doubt that water mills were present in Hungary by the middle of the eleventh century at the latest. When, however, they first began to be used as well as the extent of their distribution remains an open question.

Based on sometimes controversial data, the appearance of mills in the Hungarian Kingdom can be dated to before 1055 with a number of uncertainties and discrepancies between the different kinds of source materials. Written evidence from the Czech lands also has been discussed in contexts similar to the early charters referring to mills in Hungary. Apart from the unreliable sixteenth-century vernacular, *The Czech Chronicle* by Wenceslaus Hájek refers to water mills in the eighth century.¹⁵⁷ The earliest data on mills is preserved in a charter, no less controversial than most of the early written documents from Hungary. The document in question is the endowment charter of the Benedictine monastery of Břevnov.¹⁵⁸ The reference to mills in the charter is much more descriptive than the endowment charter of Veszprém. It mentions mills as well as weirs, not only as general pertinences of estates, but in a concrete context and at, more or less, well defined locations: *cum omni familia et terra sufficienti ac montem ad meridiem, tendentem a bivio quodam, in quo precipiuntur molares, Schirnornice dicto ... Duo molendina sub ipso castro Praga et de ipso flumine Wltawe ad tria obstacula molendinorum in eodem loco. ... Decimam quoque de omni agricultura in Porecze ... et mansum in litore fluminis Wltawe ad horreum construendum et obstaculum in eodem loco ad molendina edificanda*. The document was long considered a highly interpolated charter however Jiří Pražák not long ago argued that most of the charter indeed dates to the tenth century.¹⁵⁹ Following Pražák's work, some scholars accepted that mills and places for

¹⁵⁶ DHA, vol. 1. 145–152 or the latest edition of the charter: István Hoffmann, *A Tihanyi alapítólevél mint helynévtörténeti forrás* [The foundation charter of Tihany as a source of onomastics] (A Magyar Névtárhivatal Kiadványai, 16) (Debrecen: Debreceni Egyetemi Kiadó, 2010), 23–29. For the relevant part, see 28: *Sunt igitur aratra XX cum LX mansionibus, vinitores cum vineis XX, equites XX, piscatores X, agasones V, bubulci III, pastores ovium III, subulci II, apinarii II, coquinarii II, sutores II, fabri II, aurifex I, dolatores II, molendinarii cum molendinis II, tornator I, vestimentorum ablutor I, cerdo I, ancille X, preter hec sunt emissarii XXXIII cum subditis equabus, vacce C, oves septingente, porci C, apium vasa L. Preter hec ad necessaria fratrum per singulos annos constituimus de armento regali L poletros. Inter omnes namque sunt servorum ecclesie mansiones CXL*. (emphasis mine – AV)

¹⁵⁷ When writing the paper I could only access an older edition of the chronicle: *Kronika česká: Podle originálu z r. 1541*, 4 vols [Czech Chronicle. From the beginnings to 1541], ed. Václav Flajšhans (Praha: Česká Akademie věd a umění, 1918), vol. 1. 97–98, 106 and 176. See also: Bennett and Elton, *History of Corn Milling*, vol. 2. 77–78.

¹⁵⁸ For the early history of the monastery, see: Dana Koutná-Karg, “Die Anfänge des Klosters Břevnov,” in *Tausend Jahre Benediktiner in den Klöstern Břevnov, Braunau und Rohr*, ed. P. Johannes Hofmann OSB (St. Ottilien: EOS Verlag, 1993), 219–230, and also Sommer, “The Monastery of Břevnov.”

¹⁵⁹ Jiří Pražák, “Privilegium pervetustum Boleslai,” in *Milénium břevnovského kláštera (993–1993)*. *Sborník statí o jeho významu a postavení v českých dějinách* [Millennium of the history of the Břevnov monastery (993–1993). Collection of studies on its significance and role in Czech history], eds. Ivan Hlaváček, and Marie Bláhová (Prague: Karolinum, 1993), 13–24, and Kalhous, *Anatomy of a Duchy*, 140–143. For the edition of the charter, see: CDB, vol. 1. 347–350 (no. 375).

mills mentioned in the charter show that by then, water was regularly being used to produce power.¹⁶⁰ Recently, however, a study by Oldřich Kotyza drew attention to some important points based on which he considered this part of the charter to be an interpolation dating at the earliest to the late twelfth century.¹⁶¹ One clearly problematic point is the location of these mills. Despite the Vltava River not being amongst the most significant rivers of Central Europe, its discharge was still too great to accommodate suitable places for mills to be built by it. The first medieval mills were usually constructed on minor streams since technologically, building mills along major rivers with their many obstacles, channels, etc. required more technological expertise.¹⁶² Despite the number of convincing arguments he presents, Kotyza does not totally dispute the possible existence of mills in the surroundings of Prague around the year 1000. According to him, however, if mills were present they must have been located by smaller streams surrounding the town and certainly not built on the Vltava.

Apart from this controversial charter from 993, the first document that clearly refers to water mills appears more than a century later, between 1125 and 1140. Jan Klápšte drew attention to this charter. He emphasized that the document, in which a not particularly rich canon was in the possession of a mill he inherited from a less significant estate according, suggests that by that time, a fair number of mills already existed in the Czech lands. Though Klápšte did not refer to it directly, Únětice – the village in which the water mill is mentioned – is located close to Prague which was by then had become a center of ecclesiastical and political governance leading to more rapid development.¹⁶³ Another source from 1130, again similar to the first Hungarian reference dating to 1009, mentions water mills in the utilities list connected to an estate.¹⁶⁴ Literary sources as well as legal evidence can be useful in discussing the spread of water mills in the Czech lands. The first book of the early-twelfth-century chronicle of Cosmas of Prague (completed in 1119) refers to millers (*molendinarius*) which is more likely to be associated with a specialized group of people working in water mills than to anyone grinding grain on household equipment such as hand mills.¹⁶⁵

¹⁶⁰ Maříková, “Středověké mlýny,” and Petráček, “Kotázce datace počátků vodních mlýnů.”

¹⁶¹ Kotyza, “K počátkům vodních mlýnů,” 461–499.

¹⁶² Hammer, “‘A Suitable Place for Putting’,” and See Chapter 3.2.2 of the present work.

¹⁶³ Jan Klápšte, *The Czech Lands in Medieval Transformation* (East Central and Eastern Europe in the Middle Ages, 450–1450, 17) (Leiden and Boston: Brill, 2012), 320–321. For the original donation, see: CDB, vol. 1. 129–131 (no. 124).

¹⁶⁴ CDB, vol. 1. 111 (no. 114).

¹⁶⁵ Cosmas Pragensis, *Chronicon Boemorum* in *MGH Scriptores rerum Germanicarum Nova Series*, vol. 2, ed. Bertold Bretholz (Berlin: Weidmann, 1923), 14 (cap. 1/5). For the English translation of the chronicle, see: Cosmas of Prague, *Chronicle of the Czechs* (Washington, D.C.: The Catholic University of America Press, 2009), here 44. On the problem of millers, see: Vajda, “Korai bencés,” 34.

In Poland, the scarcity of legal evidence from the period of early statehood and the lack of reference to water mills in the earliest pieces of Polish historiography – such as the chronicle of Gallus Anonymus – means there is not sufficient data to argue for or against the existence of mills in the eleventh or the early twelfth century.¹⁶⁶ The first written record dates to roughly the same period as in the Czech lands, to the middle of the twelfth century – to the year 1149. Compared to Bohemia and the Hungarian Kingdom, however, the systematic analysis of the written records has only been partially carried out.¹⁶⁷ Research concentrates more on the late medieval period. Promising results have been recently published concerning the spread and commercialization of the milling industry. Despite the scarcity of data on the eleventh–twelfth-century spread of water mills in the Polish areas, there is a well-regarded source that clearly reflects the way grain was usually ground around the end of the twelfth century in Poland. The so-called Book of Henryków has made the Cistercian abbey of the same name one of the best known ecclesiastical institutions in medieval Poland. The codex contains an extremely detailed summary of the early history of the monastery, including a number of references to mills and milling. One reference is certainly noteworthy. It was written by Peter, abbot of the abbey and the author of the first narrative part of the Book of Henryków. He recalled that: “Let it be known that in those days here in the circuit, water mills were extremely rare, so the wife of the said Boguchwał the Czech very often stood at the quern to grind.”¹⁶⁸ The short story described in this chapter of the narrative part written by Peter, comes from ca. 1200. The extreme scarcity of water mills mentioned shows clearly that even in the region of Henryków in Silesia, milling was predominantly carried out on hand mills around 1200. This may also have been the situation further north or east.¹⁶⁹ Archaeological excavation results to date have not shown the existence of water mills predating the written sources concerning their presence on rivers in either Bohemia or

¹⁶⁶ For this, see in the case of Poland: Anna Adamska, “‘From Memory to Written Record’ in the Periphery of Medieval Latinitas: The Case of Poland in the Eleventh and Twelfth Centuries,” and Ivan Hlaváček, “The Use of Charters and Other Documents in Přemyslide Bohemia,” in *Charters and the Use of the Written Word in Medieval Society* (Utrecht Studies in Medieval Literacy, 5), ed. Karl Heidecker (Turnhout: Brepols, 2000), 83–100 and 133–144 respectively.

¹⁶⁷ Myśliwski, “Utilisation of Water,” 324. The 1149 charter referred to by Myśliwski was not at my disposal when writing this chapter. Earlier, see: Dembińska, *Przetwórstwo zbożowe w Polsce*, esp. 63–72.

¹⁶⁸ *Sed sciendum, quia in diebus illis erant hic in circuitu aquatica molendina valde rarissima, unde dicti Bogwali Boemi uxor stabat sepiissime ad molam molendo.* Edited in: *Liber foundationis claustrum Sancte Marie Virginis in Heinrichau (Księga henrykowska)*, ed. Roman Grodecki (Wrocław: Muzeum Archidiecezjalne we Wrocławiu, 1991), 47 (cap. 113). An English edition of the text is to be found in Piotr Górecki, *A Local Society in Transition. The Henryków Book and Related Documents* (PIMS Studies and Texts, 155) (Toronto: Pontifical Institute of Mediaeval Studies, 2007), 139. See also on mills here: 40–43.

¹⁶⁹ On the spread of mills in the later medieval period, see: Dembińska, *Przetwórstwo zbożowe w Polsce*. For the Teutonic areas, see: Kubicki, *Młynarstwo w państwie zakonu krzyżackiego w Prusach*.

Poland.¹⁷⁰ Thus, no direct evidence exists for the use of water mills in these areas before the mid-twelfth century. However, just as with Hungary, a number of hand mill fragments came to light during excavations both in the Czech lands and different parts of Poland. These results are certainly worth considering in the context of the linguistic debate in Hungarian scholarship regarding the adoption of the Hungarian term for mills from a West Slavic language, sometime before the tenth century.

Although scholarship has dealt less systematically with the spread of water mills in Croatia, Serbia and Moldavia-Wallachia, what has been published is no less interesting with regard to the technological changes taking place over the broader region. In the territory of present-day Croatia, scholars suppose the widespread use of water mills in Roman times although most of the research comes from Dalmatia which in the eleventh century may have had weaker contacts with Central Europe than the inland areas. Archaeological data confirms the existence of ancient water mills by the River Jadro by the town of Salona in the Ancient period. In the early eleventh century, this river was again used for milling although there is no data concerning mill operation between the Roman period and the turn of the eleventh century. Although reference to mills was already made in a tenth-century document, this text was later shown to be a late medieval forgery. Royal donations to ecclesiastical institutions demonstrate that in the eleventh century, water mills did operate in the Dalmatian coastal areas both on the mainland and on the islands although no sources have survived in the Kingdom of Croatia before the late eleventh century personal union by the Hungarians.¹⁷¹ In the inland areas of the Balkans, sources only refer to water mills from the late thirteenth century onwards.¹⁷² The Roman influence on medieval milling has been suggested both in Croatian as well as Romanian scholarship. Some scholars argued for the continuous use of water mills in the former territory of the Roman province of Dacia. The arguments raised in the 1970s have been criticized in many ways since then and nowadays most scholars date the

¹⁷⁰ Galusová, “Vodní mlýn jako objekt archeologického výzkumu.”

¹⁷¹ *Codex diplomaticus Regni Croatiae, Dalmatiae et Slavoniae. Diplomatički sbornik Kraljevine Hrvatske s Dalmacijom i Slavonijom*, 2 vols (Monumenta historica Slavorum meridionalium, 2–3), ed. Ivan Kukuljević Sakcinski (Zagreb: Ex officina societatis typographicae, 1874–1875), vol. 1, 121–122 (no. 138), 154–155 (no. 189), 170–176 (no. 209) and 181–182 (no. 220). On the mills of Salona, see: Lovre Katić, “Solinski mlinovi u prošlosti,” [The ancient mills of Salona] *Starohrvatska prosvjeta* Serija III. 2 (1952): 201–219. On mills in Croatia in the medieval period: Marin Knezović, “Voda u hrvatskim ranosrednjovjekovnim ispravama,” [Water in the Croatian early medieval documents] *Ekonomika i ekohistorija* 3, no. 1 (2007): 42–46.

¹⁷² Ранко Финдрик [Ranko Findrik], “Увод у проучавање старих воденица [Uvod u proucavanje starih vodenica],” [Introduction to the study of ancient mills] *Саопштења [Saopštenje]* 15 (1983) 95–117 and Biljana Arandjelović and Ana Momčilović-Petronijević, “Arhitektura vodnih mlinov v južni Srbiji,” [The architecture of water mills in Southern Serbia] *AR Arhitektura, raziskave* 2 (2010): 59–62.

appearance of mills in this region to the twelfth–thirteenth century, the period when mills start to be mentioned in the written sources connected to the Banat and Transylvania.¹⁷³

2.3. Conclusions

Historical scholarship usually associates the spread of various medieval technological innovations such as water mills with the appearance of monasticism in particular regions, traditionally considered the “peripheries of Christianity”.¹⁷⁴ Central Europe is one of the regions where Christianization and the spread of monasticism took place within a relatively narrow time frame. Although Christianization started in the Czech lands as in Poland some decades earlier than in the Principality (later Kingdom) of Hungary, by the middle of the eleventh century, the monastic network was denser in Hungary than on the lands of its northern neighbors. In Dalmatia, a strong Christian ecclesiastical organization already existed in the Roman period. Some of the bishoprics as well as monasteries were again in operation by the tenth century.¹⁷⁵ The aim of this chapter was to assess the degree to which the spread of mills is associated with the chronological framework summarized here and to what extent the first written references or archaeological data on mills can be connected directly with monastic orders.

The association has proved to be far less evident than usually suggested by historians. The first references to water mills in the region do not mention that these buildings belonged to Benedictines, but rather consist of charters endowing church institutions with these essential and, no less importantly, expensive constructions. The fact that the sources that have usually come down to us are royal donations favoring different church bodies, should mostly be attributed to the character of the early products of literacy in Central Europe. Namely, most eleventh- or early-twelfth-century legal documents were issued in connection with royal resolutions – primarily donations. By the middle of the eleventh century in Hungary, it is not

¹⁷³ Ţeicu, *Watermill*, passim.

¹⁷⁴ On the concept, see: *Christianization and the Rise of Christian Monarchy* and more recently the studies in the volume: *Medieval East Central Europe in a Comparative Perspective: From Frontier Zones to Lands in Focus*, eds. Gerhard Jaritz, and Katalin Szende (New York: Routledge, 2016).

¹⁷⁵ See on this matter: Joan Dusa, *The Medieval Dalmatian Episcopal Cities. Development and Transformation* (American University Studies, Series IX., History, 94) (New York: Peter Lang, 1991).

only kings but also other laymen who donate to or found monasteries, institutions endowed with water mills.¹⁷⁶

No claim is made here that the spread of monasticism had no impact on the appearance of water mills in Central Europe since it certainly did. The relationship, however, between monasteries and mills is likely more complex than previously thought. There is very little written evidence available from the eleventh–twelfth centuries that would suggest widespread use of water mills even on ecclesiastical properties, and certainly there is insufficient evidence to suggest that cereal grains were processed in water mills soon after the spread of Benedictine monasteries into Central Europe. The economy of ecclesiastical properties was undoubtedly one of the best organized in that period and thus, supposedly, the spread of mills on these estates would have been more rapid than elsewhere. There is, however, no grounds to suggest that from the early eleventh century in the Kingdom of Hungary and from the twelfth century in Czech lands and in Poland, water mills dominated agrarian production.

Even if the connection between the appearance of monasticism and the spread of water wheels is probably less than self-evident, it is probably true that water mills only became widespread in these regions from the twelfth century onwards. Presumably, it is not before the thirteenth century that their numbers reached the point that they posed obstacles to each others' operations. The first lawsuits connected to water use come from this period reflecting not only the spread of literacy, but probably a shift in water construction traditions.

¹⁷⁶ See for instance from 1061: DHA, vol. 1. 170–174. On the criticism of the heavily interpolated charter: Bernát Kumorovitz L., “A zselicszentjakabi alapítólevél 1061-ből, ‘Pest’ legkorábbi említése,” [The foundation charter of Zelicsszentjakab from 1061 and the earliest mention of ‘Pest’] *Tanulmányok Budapest múltjából* 16 (1964): 43–83.

3. Waterscapes as Conflict Environments in Medieval Hungary – Are There Any Patterns?

This central chapter of the dissertation is dedicated to the discussion of the main research problems of the dissertation, i.e. the different kinds of conflicts that arose surrounding water use based on medieval legal evidence from the Kingdom of Hungary. The separate subchapters cover different landscapes and different kinds of waterways – from smaller streams to major water flows – to allow a comprehensive understanding what conflicts can be found in rural areas, urban landscapes, as well as in the surroundings of towns with particular characters such as mining towns. I argue that from the turn of the thirteenth century, probably every water way in the inhabited areas of the Carpathian Basin was intensively used in local economies, leading to a growing number of resource conflicts. These conflicts varied significantly depending on the kind of riverscapes. Major rivers, as discussed in the introduction, needed to satisfy needs that differed from the demands made on lesser water flows. While the former were exploited for transportation, they also provided industrial and drinking water, were a source of fish and, to a lesser extent, provided energy. Smaller rivers and streams played a minor role in transport for the most part but were of signal importance in providing an even distribution of water-driven grain mills.

The different needs required different interventions to the flow of the rivers. In the first subchapter (Chapter 3.1) I focus on the formation of norms regarding issues surrounding two competing mills situated along the same water way, as well as the conflicts between landlords owning holdings by the waterway where mills were erected. As argued in Chapter 2, it is probably not until the thirteenth century that lawsuits resulting for competing demands on water use for powering water mills became more common. Earlier, of course, there had also been a need for negotiations between landlords who used the same water way, but it is probably from the thirteenth century onwards that the different actors found it necessary to ensure their rights to the use of different bodies of water.¹⁷⁷ Building on legal evidence, the first subchapter addresses the formation of customary law on mill construction in the medieval countryside. It argues that from the fourteenth century onwards, the previously existing norms and practices probably transformed into widely accepted customary law.

Chapter 3.2 looks at the conflicts surrounding water use in urban environments. As major settlements developed in Central Europe, as elsewhere, water was and remains one of

¹⁷⁷ Cf. *The Development of Literate Mentalities in East Central Europe* (Utrecht Studies in Medieval Literacy, 9), eds. Anna Adamska and Marco Mostert (Turnhout: Brepols, 2004).

the most important factors in economies.¹⁷⁸ Because of major population concentrations and the resulting enhanced need for resources, more effective resource use became necessary, as well as closer cooperation between different actors living by a given water body. In many ways, towns act as showcases for demonstrating a variety of conflicts over resources. I chose to highlight different towns and different types of waterways from the Kingdom of Hungary to show what types of conflicts arose and how these were resolved locally. Chapter 3.3 discusses water use in a special town type, mining towns and their surroundings. These towns were settled from the thirteenth century onwards, mostly by German-speaking (with them Czech, Slovak, and perhaps, even Polish) people, many of whom in some form were involved in mining precious metal and other metal ores. Privileges, many of which concerned access to water for fishing and milling, were of crucial importance in the foundation of these settlements. In this chapter, I argue that water-related economic privileges played a fundamental role in the life of these towns as well as in the villages settled under the leadership of burghers from mining towns. I show how water use was organized in these towns, where apart from grinding grain for the rapidly growing population of these towns, water power was necessary in a number of other industrial spheres in the economy such as crushing ore, sawing timber for construction and stabilizing mine shafts. A dense network of waterways prevailed in more mountainous areas in Transylvania and Upper Hungary. It is here that most of the mining settlements in the medieval Kingdom of Hungary could be found and competition for water resources, based on the legal evidence, was strong as shown by the number of legal disputes.

Chapter 3.4 looks at another, almost completely ignored aspect, of water-related conflicts, that is, the role of waters as border markers. Medieval estate boundaries were mostly formed by natural borders such as hills, ditches, forests, meadows, etc. Of course, in many cases, trees could be marked in some way or small mounds were built to clarify estate borders. Almost none of these would seem, at a first sight, as conclusive as a boundary as a border following rivers and streams. However, a closer look at customary law collections, and legal disputes that arose in connection with estate borders makes it clear that, as borders of estates, bodies of water, could also be a basis for conflict. In this subchapter, I discuss thirteenth to the sixteenth century sources from the medieval Kingdom of Hungary that concern problems in rights to land arising from changes in the direction of riverbeds. I argue that similar legal disputes were recurrent in medieval Hungary, and despite the formation of a

¹⁷⁸ See: Katalin Szende, "Stadt und Naturlandschaft im ungarischen Donauraum des Mittelalters," in *Europäische Städte im Mittelalter* (Forschungen und Beiträge zur Wiener Stadtgeschichte, 52), eds. Ferdinand Oppl, and Christoph Sonnlechner (Vienna, Bozen, and Innsbruck: Studien Verlag, 2010), 365–397.

norm by the late medieval period, it proved of little help in resolving problems of shifting water borders.

All subchapters are dedicated to specific water related disputes that allow a rather general image of the problem in a variety of land- and waterscapes in medieval Hungary. Of course, many other questions also arose but the coming discussion shows that water management along a range of water bodies involved a complex system of control that in the long run could only function by applying certain legal principles and, no less importantly, through continuous negotiations between different actors along the same water way. I aim to show that because of the nature of water as a substrate and the immediate impact of intervening the flow of a water flow at other points in riverscapes, water generated conflicts far exceeded the simple property right disputes.

3.1. Legal Regulations and Practice surrounding Mill Construction in Medieval Hungary¹⁷⁹

As has been argued in Chapter 2, from the Árpáadian period, i.e. from the time of early Hungarian statehood onwards, hydraulic works were carried out on different scales, similarly to what happened in Poland and Bohemia. These constructions impacted both smaller rivers, and probably with time, increasingly significant water flows. By the thirteenth century, it is likely that in the densely populated areas of the Kingdom of Hungary, rights to streams and smaller rivers became increasingly important to the landlords, and norms on their exploitation became fully crystallized. As shown in the Introduction, scholars have dedicated some attention to the formation of these norms, although many questions have only partly been resolved. What rights did landowner have to rivers running through his land? How could a landowner restrict the flow of water from a river source located on his own property? How could one manipulate a water course in order derive income from it? As discussed in Chapters 1 and 2, one of the main motivations for manipulating waters in the Middle Ages in the study area was to provide energy for grinding grain and using water power for other industrial activities. These mills, however, seriously affected the current of waterways both up- and downstream because of mill dams or other constructions that created obstacle in the water flow. In this chapter, I will concentrate on the period in which well-defined norms in building

¹⁷⁹ The subchapter in a shorter and significantly different version has already been published: Vadas, “Some Remarks on the Legal Regulations and Practice of Mill Construction.” and idem “Terminológiai és tartalmi kérdések.”

such obstacles to rivers and streams were fixed and a customary law developed from these norms. I will primarily focus on analyzing one special term, *locus molendini*, which despite its frequent occurrence in the legal sources in Hungary, and to a smaller extent elsewhere in Europe, has yet to be treated in the scholarship.

Trying to find a definition for the term *locus molendini* (or rather rarely *fundus molendini*) in the scholarly literature surprisingly soon leads to a dead end.¹⁸⁰ The term, nonetheless, appears on hundreds of occasions in legal evidence from Hungary. In many cases, one finds the term in lists of utilities, similar to those discussed in Chapter 2. The main cartularies of medieval Hungarian legal literacy contain hundreds of other references where *loca molendinorum* appear as subjects in legal transactions. Of course, it may well be that the reason for the low scholarly interest in this term has no special significance and analyzing it will be of little help in understanding what was intended in these sources. István Tringli, uses a rather simple definition for the term, claiming: “mill-place (*locus molendini*) denoted a place where a water mill once stood, and by rebuilding or restoring this building, milling could once again take place there.”¹⁸¹ Research in Hungary over the past couple of years mostly accepted this definition.¹⁸² Studies, with a few notable exceptions, neglected to address the question. A slightly different understanding unfolds in a study written on the mills mentioned in the cartulary for the place of authentication (*locus credibilis*)¹⁸³ of the convent of Pécsvárad (in southern Hungary). The author of this essay, Tamás Kőfalvi, suggested that *locus molendini* referred to a land plot similar to a modern construction site. He came to this

¹⁸⁰ For the most important exceptions, see Ingo Herbert Kropač, “Mühlen und Mühlenrecht in der Steiermark während des Mittelalters,” (PhD-diss. Universität zu Graz, 1982), 40–41, Härtel, “Von Wasser- und Mühlenrecht im Hochmittelalter, 221, Mathieu Arnoux, “Les moulins à eau en Europe occidentale” 715–720. See also: Ryszard Kiersnowski, “Znaki graniczne w Polsce średniowiecznej,” [Border signs in medieval Poland]. *Archeologia Polski* 5 (1960): 267 and Alexandra Chira, “Documentary Evidence on the Uses of Water-Mills in Medieval Transylvania. A Case Study of the River Someș,” in *Usus aquarum*, 65–67.

¹⁸¹ Tringli, “A magyar szokásjog a malomépítésről.”

¹⁸² E.g. László Szabolcs Gulyás, “A mezővárosi önkormányzat funkciói és társadalmi háttere a középkori Hegyalján,” [Functions of the autonomy of market towns and its social background in the medieval Hegyalja region] (PhD-diss., Debreceni Egyetem, 2008), 144, Kristóf Keglevich, “A garamszentbenedeki bencések és Újbánya polgárai a 14. század közepén,” [The Benedictines of Hronský Beňadik and the burghers of Nová Baňa in the mid-14th century] in *Tiszteletkör: történeti tanulmányok Draskóczy István egyetemi tanár 60. születésnapjára* [Lap of honor. Studies in honor of the 60th birthday of Professor István Draskóczy], eds. Gábor Mikó, Bence Péterfi, and András Vadas (Budapest: ELTE Eötvös Kiadó, 2012), 144, and László Ferenczi, “‘Molendinum ad aquas calidas.’ A pilisi ciszterciek az állítólagos ‘Fehéregyházán’. Történeti topográfiai és tájregészeti kutatás a pilisi apátság birtokán,” [The Cistercian of Pilis at the alleged ‘Fehéregyháza’. Historical topographic and landscape archaeological research at the estates of the Pilis abbey] *Studia Comitatusiensia* [NS] 1 (2014): 146.

¹⁸³ Ecclesiastical bodies who were entrusted with issuing legally binding documents in medieval Hungary, with similar functions as public notaries in Western Europe, but which had less importance in medieval Hungary. See: László Solymosi, “Die glaubwürdigen Orte (loca credibilia) Ungarns im 14.–15. Jahrhundert,” *Archiv Für Diplomatik* 55 (2009): 175–190 and Katalin Szende, *Trust, Authority, and the Written Word in the Royal Towns of Medieval Hungary* (Utrecht Studies in Medieval Literacy, 41) (Turnhout: Brepols, 2018), 72–84.

conclusion by studying a charter issued by the convent in 1469. Based on the charter, according to Kőfalvi, *locus molendini* was not only well defined by law, but also in a physical – territorial sense. The document, however, does not actually – or certainly not self-evidently – support this argument.¹⁸⁴ The picture is even more confused if one considers the expression “abandoned mills” (*molendinum desertum*) that also occurred in a number of late medieval documents, although significantly rarely than *locus molendini*.¹⁸⁵

Apart from more recent works mentioned above, earlier legal and technological histories also addressed the terminological problem. Alajos Degré, in his above-mentioned work already referred to the need to analyze the term more deeply in order to understand whether *locus molendini* referred to an actual plot suitable for erecting a mill or rather to a legal privilege permitting a mill to be built in a certain place. Even if he failed to provide a definite answer, he proposed that this term was rather a legal claim or authorization rather than an actual physical space.¹⁸⁶ In a short monograph on the medieval hydrography of Zala County in the western part of Hungary, József Holub also suggested that the term may not be directly related to the existence of a mill that had operated earlier on a site but rather denoted a certain piece of land, the road leading to the land and the possible site of the building itself.¹⁸⁷ He also made an important point; where the actual place of a former mill was denoted *locus molendini*, the documents in many cases specifically refer to the existence of a lost building at the mill-place (for instance *locus molendini antiqui*).¹⁸⁸ Tamás Vajda, on the one hand, followed the crystallization of the term as a legal technical term by the thirteenth century, but on the other hand, showed that the medieval documentary evidence allows for different understandings of the term (which to some extent of course contradicts the actual

¹⁸⁴ Tamás Kőfalvi, “Malmok és malomhelyek a pécsváradi konvent hiteleshelyi gyakorlatában.” [Mills and mill-places in the practice of the credible place of the convent of Pécsvárad] in *Studia Professoris – Professor Studiorum. Tanulmányok Érszegi Géza hatvanadik születésnapjára* [Studies in honor of the 60th birthday of Géza Érszegi], eds. Tibor Almási, István Draskóczy, and Éva Jancsó (Budapest: Magyar Országos Levéltár, 2005), 158.

¹⁸⁵ József Holub, *Zala megye középkori vízrajza* [Medieval hydrography of Zala County] (A Göcseji Múzeum közleményei, 23) (Zalaegerszeg: Göcseji Múzeum, 1963), 48–49 and Pavol Maliniak, “Mlynárstvo na strednom Pohroní v stredoveku a na začiatku novoveku,” [Milling in central Pohronský region in the Middle Ages and in the beginning of the Modern Age] in *Z histórie technicko-hospodárskeho využitia vodných tokov na strednom Pohroní* [From the history of technical and economic use of watercourses in the central Pohronský region], eds. Ján Žilák, and Pavel Hronček (Banská Bystrica: Centrum vedy a výskumu UMB: Fakulta humanitných vied UMB, 2011), 38.

¹⁸⁶ Degré, *Magyar halászati jog*, 83 note 48.

¹⁸⁷ Holub, *Zala megye*, 48–49. On mill roads, see: Magdolna Szilágyi, *On the Road: The History and Archaeology of Medieval Communication Networks in East-Central Europe* (Series Minor, 35) (Budapest: Archaeolingua, 2014), 152–154.

¹⁸⁸ Holub, *Zala megye*, 48–49. See for a similar assumption: Dénes Jankovich B., “Adatok a Körösvidék középkori vízrajzához és a vizek hasznosításához,” [Data to the medieval hydrography and water use of the Körös region] *Békés Megyei Múzeumok Közleményei* 16 (1996): 340.

clarification of the legal term by the late Árpadian period). He argued that, in some cases, the term refers to the actual places of earlier mills (*genitivus possessivus*) – as suggested by Tringli – or a plot or place suitable for putting up a mill (*genitivus explicativus*).¹⁸⁹ Vajda proposes a third meaning, which refers to the actual territory where the mill building stood, having nothing to do with its state as a building, but is simply a matter of the right of possession. Earlier, he also proposed that mill-places are only referred to when the owner of the broader environment of a mill is different from the owner of the mill-place.¹⁹⁰ I will revisit this latter argument later in the present chapter. Finally, an archaeologist, András K. Németh, argued that “for some reason the plots suitable for erecting mills were kept in mind, even if at that point in time, there no building was present on the plot.” He leaves the question open, but I hope to argue that a rather precise answer can be given to that question which in many ways explains the formation of customary law on using waterways in medieval Hungary.¹⁹¹ Apart from Hungary, the problem has been raised in German and French historiography in past decades.¹⁹² Here, scholars argued that *locus molendini* appear in lists of utilities in a rather stereotypical way, as discussed in the previous chapter, without actually having a well-defined meaning. Finally, the question is also discussed in Romanian historiography, using written evidence from the eastern part of the medieval Kingdom of Hungary, Transylvania. It was argued in scholarship that mill-places were well defined sets of topographic arrangements, but do not necessarily include actual buildings.¹⁹³ While Western and Central European scholars

¹⁸⁹ Tamás Vajda, “Újabb adatok Árpád-kori vízimalmainkról,” [New data on Árpadian-age water mills] In *Középkortörténeti tanulmányok 5. Az V. Medieviztikai PhD-konferencia* [Studies in medieval history, 5. Papers read at the 5th conference of medievalists] eds. Éva Révész Éva, and Miklós Halmágyi (Szeged: Szegedi Középkorász Műhely, Szeged, 2007), 211–245, and Tamás Vajda, “Természeti adottságok szerepe és a környezet-átalakítás mértéke középkori vízimalmainknál,” [Role of natural constraints and interventions in the environment at water mills in medieval Hungary]. Paper presented at the Second conference of the Hungarian working group of the European Society for Environmental History, Szeged, 5 November 2011. I am indebted to Tamás Vajda for having shared his presentation with me.

¹⁹⁰ Tamás Vajda, “Hazai vízimalmaink 1301–1325 közötti okleveles adatai,” [Documentary evidence on water mills in Hungary from 1301 to 1325] in *Középkortörténeti tanulmányok. A III. Medieviztikai PhD-konferencia* (Szeged, 2003. május 8–9.) előadásai [Studies in medieval history. Paper presented at the 3rd PhD-conference in medieval studies, Szeged, 8–9 May 2003], ed. Boglárka Weisz (Szeged: Szegedi Középkorász Műhely, 2003), 212–213.

¹⁹¹ András K. Németh, “Vizek és vízgazdálkodás a középkori Tolna megyében I. Vízimalmok.” [Waters and water management in medieval Tolna County, I. Water mills] *A Wosinsky Mór Múzeum Évkönyve* 35 (2013) [2015]: 123.

¹⁹² Karl S. Bader stat., “Kollektaneen zu Geschichte und Streuung eines rechtstopographischen Begriffs,” *Blätter für deutsche Landesgeschichte* 101 (1965): 56–57; Härtel, “Von Wasser- und Mühlenrecht im Hochmittelalter,” 221 and Arnoux, “Les moulins à eau en Europe occidentale,” 715–720.

¹⁹³ Emil Cernea, “Dreptul asupra vadului de moară” [Legal rights on mill dams] *Analele Universității București* 40 (1991): 93–95; Livia Magina argued, that mill-places were simply plots suitable for putting up mills: eadem, “‘Molendinis, Piscinis et Piscaturis’: The Utilisation of Water Resources in the Banat in the Medieval and Early Modern Periods,” in *Government and Law in Medieval Moldavia, Transylvania and Wallachia* (Studies in Russia and Eastern Europe, 11), eds. Martyn Rady, and Alexandru Simon (London: UCL School of Slavonic and

have also noted that *locus molendini* as a term may have carried specific meaning, it is rather in Hungarian scholarship, probably owing to the frequent appearance of the term in medieval legal evidence here, that attempts have been made to understand what it actually meant. Here, different historians usually came to varied conclusions, and even the explanation for why this term was used so frequently has not been clearly articulated.

3.1.1. *Locus molendini* – A Place, a Right, a Claim?

It is impossible to establish the customs of water use based solely on the surviving royal decrees from medieval Hungary. In the most important compilations of the medieval laws of Hungary such as the sixteenth-century work of Zakariás Mossóczy known as the *Corpus Juris Hungarici* (first printed in 1584), one finds virtually nothing about water rights in constructing dams and mills next to a particular water body. The absence of such regulations does not mean however that they did not exist in medieval Hungary. By analyzing an early fifteenth-century lawsuit, Tringli demonstrated that by that time an established custom already existed regarding water-control in the Hungary. He argued that the principle was fairly simple: as expressed in a document dating to 1401, a new mill had to be constructed so that its placement did not harm another mill's interests: *molendina taliter debeant edificari, quod preiudicium uni per aliud non inferatur*.¹⁹⁴ By “another” in this context, the presence of another similar construction has to be understood, meaning that a new mill should not cause harm to an older, existing one. Tringli also demonstrated that over time, the concept of “loss” (*preiudicium*) was extended to any kind of economic loss caused to another landlord's estate, including a decrease in fish, harm to plough lands by floods, and so on. Indeed, in the late medieval period, there are at least as many cases when the claimed losses were connected to plough lands as to other mills.¹⁹⁵ When dams broke because of floods or poor construction, they could not only cause major destruction to downstream mills, but the water also could easily flood the lands downstream around the river. Therefore, a common source of debate and dispute in the Middle Ages revolved round the height of these

East European Studies, 2013), 65. See also: Alexandra Chira, “Documentary Evidence on the Uses of Water-Mills,” 65–67.

¹⁹⁴ See e.g. MNL OL DL 70 718. Discussed in: Tringli, “A magyar szokásjog a malomépítésről.”

¹⁹⁵ See e.g. MNL OL DL 14 969.

mill dams.¹⁹⁶ Of course, the problem was not unique to Hungary. Similar regulations were preserved for instance from the Holy Roman Empire as well as Lithuania.¹⁹⁷

Apart from charter evidence, the already mentioned summary of medieval customary law in Hungary written by Stephen Werbőczy, judge royal and palatine in the early sixteenth century, remains a key source for dealing with this question. His work, the so-called *Tripartitum*, is a major collection of all kinds of non-written, but by the early sixteenth century, more or less, established, common-law elements in Hungary. The fate of the work is certainly interesting. It never became a formally sanctioned legal source, but nevertheless, up to the nineteenth century, it remained the most important reference point when any sort of legal dispute arose.¹⁹⁸

The primacy of the utility established earlier – whether material present or not – is also emphasized as a general principle in this work: “First, in respect to time, as has just been discussed: since the other person’s privilege was given earlier, it cannot be abolished by a later one, not even through a derogatory clause.”¹⁹⁹ There are virtually no occasions when this principle was disregarded. The question is what happened when two landlords were about to build mills or other water-related constructions close to each other at the same time. An agreement from 1461 preserved such a case and the solution seems to have been logical: the contesting parties both agreed to build a mill or a fishery on the same section of the Sárosd River (on the border between Zala and Somogy Counties in western Hungary) and concurred that if either party caused damage to the other’s estate (by flooding the other’s mill or lands) with his construction, they would not sue each other.²⁰⁰ This example indicates that where there was no primacy in construction time, the risk was shared by the two landowners. It would be reassuring to identify a few other similar cases in order to collaborate this notion however it seems like the easiest solution in such cases.

¹⁹⁶ E.g. MNL OL DL 31 222, 70 170, 15 070, 15 098, 15 133, 15 344, 103 566, etc.

¹⁹⁷ Moldenhauer, “Mühlen und Mühlenrecht in Mecklenburg,” and *Zbior praw litewskich od roku 1389 do roku 1529 tudzież rozprawy sejmowe o tychże prawach od roku 1544 do roku 1563* [Collection of Lithuanian laws from 1389 to 1529 and parliamentary hearings on these rights from 1544 to 1563], ed. Adam Tytus Działyński (Poznań: W drukarni na Garbarach, 1841), 213 [*De inundacione prati, vel stagni ex stagno alterius*].

¹⁹⁸ Werbőczy, *Tripartitum*. On the work, see the volume: *A magyar jog fejlődésének fél évezrede. Werbőczy és a Hármaskönyv 500 év múltán* [Half a millennium of the development of the Hungarian legal system. Werbőczy and the Tripartitum after 500 years], ed. Gábor Máthé (Budapest: Nemzeti Közszerzői Egyetem, 2014) (esp. the contribution of István Tringli) and Martyn Rady, *Customary Law in Hungary: Courts, Texts and the Tripartitum* (Oxford: Oxford University Press, 2015).

¹⁹⁹ *Primo ratione temporis prout dictum est immediate. Quia prius emanavit privilegium alterius quod non potest tolli per posterius etiam cum clausula derogatoria.* Werbőczy, *Tripartitum*, Book 2. Ch. 11. 1.

²⁰⁰ MNL OL DL 15 540 (January 9, 1461). See the edition of the document in the appendix (no. 4). The charter is mentioned in Csilla Zatykó, “Adalékok egy 1460-as Zala megyei birtokmegosztó oklevelhez,” [Contributions to an estate division charter from Zala County from 1460] in “*Es tu scholaris.*” *Ünnepi tanulmányok Kubinyi András 75. születésnapjára* [Studies in honor of the 75th birthday of András Kubinyi] (Monumenta historica Budapestinensia, 13), eds. Beatrix F. Romhányi et al. (Budapest: Budapesti Történeti Múzeum, 2004), 128.

As far as can be determined, the first case when the role of *time* in such disputes was clearly expressed is the above-mentioned court resolution from 1401. In the next pages, I aim to show that this principle may have been applied much earlier in medieval Hungarian pragmatic literacy. In doing so, the above-mentioned *locus molendini*, will be discussed.

3.1.2. *Locus Molendini* in Early Literacy – First References and Terminological Unifications

It is worth considering when and in what form the notion of ‘mill-place’ came into being. This is important since the earliest references – probably not by chance as I shall point out – were preserved in highly interpolated or forged charters. These early references to mill-places, with a few exceptions, however, use terminologies other than *locus molendini*. The terminology usually clearly denotes plots on which a mill formerly stood or rather a plot of land that would be suitable for erecting a mill.²⁰¹ This is similar in the early – tenth–eleventh-century literacy of the Holy Roman Empire, and although it only appears in a single case, the term shows up as well in a document issued by the Eastern Frankish king, Arnulf.²⁰²

The first reference to the term in Hungarian legal evidence has been preserved in the interpolated foundation charter of the abbey Zselicszentjakab (part of present day Kaposvár) discussed above in Chapter 2 in the context of the spread of water mills in the medieval Kingdom of Hungary.²⁰³ There is no point in recapitulating the rather exhaustive historiography of the document here, but it is of key importance for the present discussion that the document was transcribed and extracted a number of times from the eleventh to the seventeenth century (1257, 1374, 1377, 1432, seventeenth century), in consequence of which a number of interpolated sections were added to the text.²⁰⁴ In the document, Otto, *ispán* of Somogy County – and later palatine of Hungary²⁰⁵ – amongst his other estates, gave the newly founded abbey “a mill with mill stone and the plot that belongs to the same mill in

²⁰¹ Cf. the first reference to water mills in from the Czech lands where mill-places are referred to as *loco ad molendina edificanda* discussed in Chapter 2.2.

²⁰² Kropač, “Mühlen und Mühlenrecht,” 40–41 and Härtel, “Von Wasser- und Mühlenrecht,” 221. For the period of Arnulf: Berent Schweineköper, “‘Cum aquis aquarumque decursibus’ – Zu den Pertinenzformeln der Herrscherurkunden bis zur Zeit Ottos I,” in *Festschrift für Helmut Beumann zum 65. Geburtstag*, ed. Kurt-Ulrich Jäschke (Thorbecke: Sigmaringen, 1977), 37 and 56.

²⁰³ DHA, vol. 1. 170–174 no. 50/II. For criticism of the document, see: Kumorovitz, “A zselicszentjakabi alapítólevél 1061-ből.”

²⁰⁴ Kumorovitz, “A zselicszentjakabi alapítólevél 1061-ből,” 52.

²⁰⁵ Kumorovitz, “A zselicszentjakabi alapítólevél 1061-ből,” 47–50. See also: Zsoldos, *Archontológia*, 15, 191, and 340.

Kesis village” (*in villa Kesis molam cum molario et terram ad eandem molam pertinentem*²⁰⁶). Vajda suggested that this *molam* term is an early, archaic form of the *locus molendini* used later. The earlier term ceased to be used by the thirteenth century.²⁰⁷ By the late thirteenth century, even if the terminology was not fully unified, by far the most frequently used term for similar arrangements was *locus molendini*. However, right in the middle of the thirteenth century, when research shows that the document was first transcribed (1257), a number of co-existing forms were still present in describing mill-places. For instance, in one of the most important sources produced by the Benedictines in Hungary at the time, the so-called Albeus-conscription, a complete register of the estates and peoples who lived within the territory of the Benedictine abbey of Pannonhalma, mill-places are sometimes denoted as *locum aptum ad molendinum*.²⁰⁸ A number of documents issued by the chapter of Győr used the terms *locus molendini* and *terra molendini* interchangeably.²⁰⁹ The part of the charter of Zselicszentjakab that included the above reference, however, probably belongs to the part which indeed dates to the eleventh century. Nonetheless, the earlier term’s relationship to the term(s) used later for mill-places is rather questionable as the transaction simply concerned a piece of land with a mill standing on it.

An estate conscription dated to not much later than the foundation charter of the abbey of Zselicszentjakab is also relevant for the present discussion. The document in question is a forged charter registering the estates that belonged to the bishopric of Veszprém (in western Hungary) issued by King Ladislas I on April 29, 1082.²¹⁰ It has been shown recently that the forging of the document can be dated to the decade between 1317 to 1327 when the bishopric of Veszprém probably produced the charter in order to insure its property rights.²¹¹ While the reference to *loca molendinorum* in the text is not, of course, amongst the earliest references to mill-places, it is important that in the early fourteenth century, the forgers of the text inserted

²⁰⁶ DHA, vol. 1. 173. The text that has been added to the charter also includes reference to a mill-place: *Idem bonae memoriae vir dedit Sancto Jacobo alium locum Jana nominatum cum saltu lignorum et cum terra ad unum aratrum pertinente, quatuor mansiones servorum, locum molarum cum piscina*. The part in question is at 173–174.

²⁰⁷ Vajda, “Okleveles adatok Árpád-kori vízimalmainkról,” 196.

²⁰⁸ [XL.] *In predio Karalka (...) habent terram ad tria aratra, preter prata et feneta et pascua peccorum communiter cum villa et congruum locum aptum ad molendinum*. *A pannonthalmi Szent-Benedek-Rend története*, 12 vols [History of the Benedictine order of Pannonhalma], eds. László Erdélyi, and Pongrácz Sörös (Budapest: Stephaneum, 1902–1916), vol. 1. 771–787 no. 185. The relevant part, here at 781.

²⁰⁹ MNL OL DL 40 059. Edited in: Ferencz Kubinyi, Jr., *Árpád-kori oklevelek 1095–1301 / Codex Diplomaticus Arpadianus* (Monumenta Hungariae historica, 1) (Pest: [Osterlamm], 1867), 46–50 no. 58–60.

²¹⁰ For its best edition, see: DHA, vol. 1. 228–240 no. 81.

²¹¹ Balázs Péter Karlinszky, “A veszprémi káptalan a középkorban. A veszprémi székeskáptalan középkori birtokai,” [The chapter of Veszprém in the Middle Ages. The medieval estates of the chapter] (PhD-diss., Pázmány Péter Katolikus Egyetem, 2013), 17–24.

references to mill-places. Once, they actually used a rather peculiar form, referring to *vacuum locum molendini*, a term which rarely appears in Hungarian legal texts.²¹²

The earliest authentic reference to mill-place as *locus* comes from 1138, and is preserved in the extremely detailed estate conscription of the collegiate chapter of Dömös (in central Hungary, not far from Budapest) ordered by King Béla II. According to the document, there were “two mills and two mill-places” in the yet to be localized village called Uten (*est enim ibi molendinum et duo loca molendini* [sic!]).²¹³ Though the original charter has not been preserved the document in which it was transcribed, dated to January 20, 1329, is unquestionably authentic.²¹⁴ Similarly authentic is the charter of Stephen, son of Adrian, dated to 1158, in which he donated his lands called Barátka (present day part of Levice) and Szántó,²¹⁵ including a *locus molendini* located by the River Kompa in the territory of Szántó, to the Benedictine abbey of Hronský Beňadik after his brother Euzidinus and his nephews died.²¹⁶ There are no grounds to suggest that the document is not authentic. The term appears here but did not reappear in the Dömös conscription in Hungarian textual sources for quite some time. The use of the term can be attested only from the thirteenth century onwards and it is likely that the term was not used in entirely identical ways in these early references to the later, more or less fixed, meaning of *locus molendini*.

In 1211, mill-place is used again in a different form in the conscription of the belongings of the Benedictine abbey of Tihany. The description of the borders of Lusta

²¹² *In predio Betereg, quod aliter Soyl nominatur, habet ecclesia terram ad IIII aratra, V servos, III aratores, IIII vinitores; IX iobagiones, III molendina et unum vacuum locum molendini, prata eciam atque silvam (...) In villa Vaschul habet ecclesia terram ad IX aratra, vineas X, servos VIII, yobag primos II, hospites iobag VII, aratores IIII^{or}, molendina III et I locum molendini.* MNL OL DF 200 611. For its critical edition and diplomatic analysis of the charter: DHA, vol. 1. 228–242 no. 81. For the text, see here: 237–238. There references for some reason were omitted by collection of Tamás Vajda: idem, “Okleveles adatok Árpád-kori vízimalmainkról,” 207.

²¹³ Dénes Szabó suggest that the village was close to the Danube or the River Žitava in the vicinity of present-day Moča. Idem, *A dömösi adománylevél hely- és vízrajza* [Topography and hydrography of the donation charter of Dömös.] (A Magyar Nyelvtudományi Társaság Kiadványai, 85) (Budapest: Akadémiai Kiadó, 1954), 44–45.

²¹⁴ MNL OL DF 238 281. For its best edition, see: Dénes Szabó, “A dömösi prépostság adománylevele (1138/1329). I–III.,” [Donation charter of the provostry of Dömös (1138/1329)] *Magyar Nyelv* 32 (1936): 54–57, 130–135, and 203–206. For the research history of the important document, see Gábor Thoroczkay, “A dömösi prépostság története az alapítástól I. Károly uralkodásának végéig,” [The history of the provostry of Dömös from its foundation to the end of the rule of King Charles I] *Fons* 19 (2012): 414–417.

²¹⁵ For their locations, see: ÁMTF, vol. 1. 420, 428–429, 474, and Kristóf Keglevich, *A garamszentbenedeki apátság története az Árpád- és az Anjou-korban, 1075–1403* [The history of the abbey of Hronský Beňadik in the Árpadian and Angevin period, 1075–1403] (Capitulum, 8) (Szeged: Szegedi Tudományegyetem Történeti Intézete, 2012), 65–66, 178–179, and 193. For the River Kompa (Compa), see: Melinda Szőke, *A garamszentbenedeki apátság alapítólevelének nyelvtörténeti vizsgálata* [Linguistic historical study of the foundation charter of the abbey of Hronský Beňadik] (A Magyar Névtárhívum Kiadványai, 33) (Debrecen: Debreceni Egyetemi Kiadó, 2015), 179.

²¹⁶ *Item aliam possessionem Zanto in vicinato adiacentem cum LXXII mansionibus hospitum, et terram ad XL aratra, cum fenetis et aliis pertinenciis suis, et locum molendini super fluvium Cumpa, qui transit ipsas possessiones.* For the better edition of the charters, see: MES, vol. 1. 116 no 89. and CDES, vol. 1. 79–80 no. 82, for its summary: RA, vol. 1/1. 31 no. 90. For the will: Keglevich, *A garamszentbenedeki apátság története*, 65–66, 178–179, and 193.

(*Lustah*, which later became part of the village of Fok, now called Siófok) estate starts accordingly: “The River called Foc [now called Sió] which flows out from the Bolotyn [Lake Balaton] from its effluence belongs to the church [the abbey of Tihany]. From this point, it [the river] flows towards the south and reaches the village of Lusta, then encircles the island – thus also fully belonging to the aforementioned church –, forming a place suitable for mills.”

²¹⁷ Accordingly, there the River Fok encircled an area in a manner that allowed easy construction of mills. The Benedictines probably registered this fact for their own use. Two things seem clear from the source. First, that at the time there were no mills standing at this place and there is nothing to indicate there ever had been a mill here before, and second, that the term does not seem to have any legal relevance. The document seems to have simply registered a clearly identifiable spot, which is rather normal for similar boundary descriptions.

In 1214, King Andrew II confirmed the donations of Boleslaus, bishop of Vác, to the convent of Leles. Amongst the numerous donations, there were estates and utilities, including two mill-places. Although the document uses the term *locus molendini*, similarly to the two twelfth-century instances discussed above, it is again a forgery, which as I shall later show is probably a fact of major importance.²¹⁸ However, references to two mill-places are preserved in the undoubtedly authentic estate conscription of the collegiate chapter of Vasvár (western Hungary) from 1217 where the same Latin term is used.²¹⁹ A mill, a forest called Rögös, and further mill-places were registered in the confirmation of the donations of the Cistercian abbey of Klostermarienbergr from 1225, on the Szomód (*Zumuld*) estate, next to the manor

²¹⁷ *Est Bolotyn, de quo egreditur fluvius, qui vocatur Foc; et ab egressu totus est ecclesie. Tendit autem ad meridiem et venit ad villam Lustah, circuitque insulam, que tota est prefate ecclesie, facitque loca molendinis apta.* Edited in: *A pannonhalmi Szent-Benedek-Rend*, vol. 10. 502–517 no. 8. The relevant part, here: 516. For the mills at Fok and its surrounding, see: Andrea Kiss, “‘Rivulus namque, qui dicitur Fuk, fluens de prefato lacu’ – Fok, Sár, Foksár,” in *Antropogén ökológiai változások a Kárpát-medencében* [Anthropogenic ecological changes in the Carpathian Basin], eds. Bertalan Andrásfalvy, and Gábor Vargyas ([Pécs] and Budapest: PTE Néprajz–Kulturális Antropológia Tanszék–L’Harmattan, 2009), 49–64. For Lusta estate, see here: 53 and 59, and Éva Kovács, *A Tihanyi összeírás mint helynévtörténeti forrás* [The conscription of Tihany as a source of historical toponymy] (Magyar Névtörténeti Kiadványai, 34) (Debrecen: Debreceni Egyetemi Kiadó, 2015), 190–191.

²¹⁸ *Iuxta villam [Mager etiam] Wodazow dedit duo territoria cum duobus locis molendinorum.* CD, vol. 3/1. 153–163. For the diplomatic analysis of the document, and its more recent edition: Géza Érszegi, “A leleszi monostor alapítóleveléről, 1214,” [On the foundation charter of the abbey of Leles] *Szabolcs-Szatmár-Beregi Levéltári Évkönyv* 16 (2003): 13–28, for the relevant part, see: 24. See also for the summary of the document: RA, vol. 1/1. 96–97 no. 295.

²¹⁹ *Predium Megehid nomine cum duobus locis molendinorum (...) Habet insuper duo loca molendinorum super aquam Raba et piscinam unam cum duabus vineis in exitu porte civitatis, iuxta viam, qua pergitur ad Sanctum Gothardum.* Edited in AÜO, vol. 6. 383–385 no. 234. For its more recent edition, see: UB, vol. 1. 72–74 no. 105. Its summary: RA, vol. 1/1. 105–106 no. 322. See also: Vajda, “Okleveles adatok Árpád-kori,” 197, and 209. (at the estate of Gely there were two mills not mill-places).

house of the abbot of Tata.²²⁰ In 1237, and then in 1239, King Béla IV confirmed the archbishopric of Esztergom as being in the ownership of the Šahy (*Ság*) estate. The estate comprised a mill-place by the River Ipoly.²²¹ These charters all use the term that was more common later, *locus molendini*. This, however, does not mean that *locus molendini* had become by then the exclusive term for referring to mill-places. As part of the much-studied lawsuit between the Holy Virgin chapter of Fehérvár (today Székesfehérvár) and the abbey of Pannonhalma, the estates of the former were conscribed. The document systematically uses the term “place for a mill” (*locus ad molendina*) not *locus molendini* when describing what were probably similar arrangements as mentioned in previous lines in the documents.²²² In 1231, Béla, the younger king (the future Béla IV), authorized *ispán* Isaac to build four mills on the River Rábca at Mihályi (in western Hungary) on the four designated places that were suited for building mills (*locorum factam ad opus molendinorum*). In return, Isaac had to promise to remedy the losses caused by foreign (meaning coming from the Holy Roman Empire. This area marked the frontier²²³) raids.²²⁴ In 1239, a testimonial, issued by the palatine of Hungary, Dionysius of the Tomaj clan, put an end to a conflict surrounding land

²²⁰ *Contulit eciam in Zumuld terram arabilem et tria aratra et pratum, quod situm est iuxta grangyam, quam predicti fratres construxerunt iuxta pomerium et molendinum quod positum est iuxta grangyam abbatis de Thata et alium locum molendini ibidem et silvam, que vocatur Rugus, et vineam in Stanch.* Edited in: UB, vol. 1. 102–109 no. 143, here: 106. See also: Lajos Kiss, “Középkori földrajzi nevek magyarázata,” [Explanations of medieval place names] *Magyar Nyelv* 86 (1990): 169. [Rögös]. For the estates of the abbey of Klostermarienberg, see: László Ferenczi, “Management of Monastic Landscapes. A Spatial Analysis of the Economy of Cistercian Monasteries in Medieval Hungary.” (PhD-diss., Central European University, 2018).

²²¹ *Terram Sag, ad Castrum Hunth pertinentem, que potest sufficere usui duorum aratorum et dimidii, et locum molendini super aquam Ipul et fenetum.* Edited in: ÁÚO, vol. 7. 32–33 no. 20, its summary: RA, vol. 1/2. 192 no. 627. See also: ÁMTF, vol. 3. 240–242, and Vajda, “Okleveles adatok Árpád-kori vízimalmainkról,” 210. For the confirmation of the donation of the estate from 1239: ÁÚO, vol. 7. 66–67 no. 45., its summary: RA, vol. 1/2. 199–200 no. 654.

²²² *Preterea Ecclesia habet quandam terram, que vocatur Inka, circumquaque metatam, fenetum sufficientem, loca apta ad stagna et ad molendina, silvas satis, de quantitate certificari non potitimus, quia incolis caret. In villa Kulked XX mansiones, terram ad XII aratra, fenetum cum arundineto quasi XL iugera, stagnum in I loco, et locum ad molendinum, silvam quasi L iugera.* MNL OL DF 206 903. Edited in: ÁÚO, vol. 6. 466–477 no. 295, and: *A pannonhalmi Szent-Benedek-Rend*, vol. 1. 694–696 no. 107, its summary: RA, vol. 1/1. 145 no. 451.

²²³ Cf. Károly Tagányi, “Gyepű és gyepűelve, I–IV.,” [Gyepű and gyepűelve] *Magyar Nyelv* 9 (1913): 97–104, 145–152, 201–206, and 254–266, and Attila Zsoldos, “A vasi várispánság felbomlása,” [Dissolution of the royal county district of Vas] *Vasi Szemle* 54, no. 1 (2000): 27–46, idem, “Confinium és marchia. Az Árpád-kori határvédelem néhány intézményéről,” [Confinium and marchia: on some institutions of Árpadian-age frontier protection] *Századok* 134 (2000): 99–116, and István Herényi, *A nyugati gyepű erődítményei: erődítmények, várak Nyugat-Magyarországon* [Constructions of the Western gyepű: fortifications and castles in Western-Hungary] (Budapest: Heraldika, 2007).

²²⁴ *De quibusdam molendinis in flumine, quod vulgo Rabucha nuncupatur, constitutis, in loco, qui dicitur Michal; nos considerantes dicti comitis Isac, et patris eiusdem merita, et fidelitatem, necnon servicia plurima, et digna etiam remuneratione maiori, dictorum ioubagionum querimoniam et contentionem nolumus exaudire; donacionem locorum factam ad opus molendinorum a felicis recordacionis Henrico Rege, patruo nostro ratam habuimus et firmam; ita, quod liceat dicto comiti et heredibus eius in perpetuum sine aliqua contradictione in quatuor locis molendina edificare; sed cum loca predicta in confinio regni Hungarie sint [sic!] sita; volumus ut omne dampnum quod propter hoc regno nostro contigerit; sive per hos[tes irruent]es regno Hungarie, sive per infideles de dicto regno fugientes, nobis resarcire teneatur dictus comes.* MNL OL DL 61 131. Its sometimes highly imprecise edition: CD, vol. 3/2. 254–255, its summary: RA, vol. 1/2. 183 no. 597.

transactions in Szatmár County on landownership. Amongst the lands in question there was “a mill-place with a house plot that was suitable to put a mill” (*locum molendini cum loco curie apto ad statum molendini*).²²⁵

Based on this analysis of the documents referring to mill-places up to the mid-thirteenth century, it can be concluded that even if the term *locus molendini* already appears in the sources, it neither seems to prevail in the surviving evidence, nor does it clearly have the same meaning as in the fourteenth century. The reference to a mill-place in the 1061 endowment charter of the abbey of Zselicszentjakab, as well as the reference in the estate conscription of the abbey of Tihany almost certainly means something other than a place where once a mill stood, but rather denotes plots suitable for a mill construction given the hydrography. The meaning is neither clear in the 1138 reference in the charter of Dömös nor in the donation of Stephen, son of Adrian, from 1156. The most relevant question to ask at this point is whether the thirteenth-century references to *locus molendini* might suggest the existence of earlier standing mills. The question can only be answered affirmatively if a reference to a mill that predated can be found in another document referring to a mill-place on the same estate. (Of course, even in that case, the two are not necessarily the same.) Second, it may also be indicative if the document mentioning a mill-place refers to a previously standing mill or elements of a mill’s infrastructure such as a mill race, a dam, or a mill road.

I was unable to find an earlier document telling of a functioning mill at the same spot either in the early references discussed above or in other sources that refer to mill-places in the Árpadian period. Of course, there are opposite examples when mill-places are later described as functioning mills. For instance, two mills operated in the village of Megyehíd, which had two mill-places (*duobus locis molendinorum*) in 1217, by 1237.²²⁶ One also finds instances when no mill was built on a mill-place for a long period of time, and different documents at considerable time intervals refer to a *locus molendini* in the same place. The village of Rum in Vas County for instance provides such example; a document in 1250

²²⁵ *Et si ipsam terram a Pousa et Laurencio recipere non possent, nichilominus darent Ponetho locum molendini cum loco curie apto ad statum molendini, de suo iure proprio (...) idem Mathias et N[icholaus] statuisset dixerunt et dedisse Poneto locum molendini cum loco curie apto ad molendinum in superiori parte insule Mathie et Nicholai in angulatione fluvii Zomus.* MNL OL DF 252 590. For its rather low quality edition: CD, vol. 4/1. 167–169, somewhat better is: ÁÜO, vol. 11. 309–310 no. 217, its summary: *Az Árpád-kori nádorok és helyetteseik okleveleinek kritikai jegyzéke* [Critical register of the charters of Árpadian-age palatines and their deputies] (A Magyar Országos Levéltár kiadványai, II. Forráskiadványok, 51), ed. Tibor Szócs (Budapest: Magyar Országos Levéltár, 2012), 75–76 no. 62.

²²⁶ ÁÜO, vol. 6. 383–386 no. 234. See also: Vajda, “Földesúri jogok,” 87; HO, vol. 4. 20–22 no. 7. For Megyehíd, see: Dezső Csánki, *Magyarország történelmi földrajza a Hunyadiak korában*. 5 vols [Historical geography of Hungary in the age of the Hunyadi family] (Budapest: MTA, 1890–1914), vol. 2. 775.

already notes a mill-place in Rum although the charter was proven to be a forgery.²²⁷ Nonetheless, an authentic document, introducing the new landlord of Rum to his property in 1263, also mentions a mill-place²²⁸ as does a document from 1274, when the then depopulated Rum was donated by King Ladislas IV to a certain Doroszló, son of Doroszló, with its mill-place by the River Rába.²²⁹ There are two further Árpadian-period charters that are worth mentioning as there are references in them to earlier mill infrastructure noted in documents mentioning mill-places. The first is one of the earliest surviving documents issued by the place of authentication of the abbey of Pécsvárad from 1256. During the perambulation of the *Janus* estate, one of the boundary markers is described as an “old mill-place” (*vetus locus molendini*).²³⁰ In light of the later practice, mentions of “old” or “ancient” (*vetus, antiquus*) mill-places, usually denote the place of a once standing mill. The second document with some possible significance is again a perambulation charter. In registering the borders of the Koksó (*Koxo*) in 1262, one of the fixed markers is a broken mill stone lying next to a mill-place.²³¹ It is probably not by chance that a used mill stone was lying in the direct vicinity of these mill-places. It was quite usual up to modern times to just discard the mill stone when it wore down and large stones were frequently used as boundary markers.²³² However, this document is not authentic either, but is probably a late medieval forgery.²³³

The early references to mill-places raise some points that are worth considering. It is clear that despite the varying forms of the term *locus molendini* in Árpadian-period sources, there are no grounds to suggest that up to the mid-thirteenth century references actually denoted previously existing, lost mill buildings. Up to the mid-twelfth century, as I hope I

²²⁷ ÁÚO, vol. 7. 308–309 no. 215, its summary: RA, vol. 1/2. 289 no. 934. For the forged nature of the document, see: János Karácsonyi, *A hamis, hibáskeltű és keltezetlen oklevelek jegyzéke 1400-ig: a Történelmi Tár 1908 évi számában megjelent „pótlások...”-kal kiegészítve* [Register of forged, wrongly dated and undated charters up to 1400, complemented by the additions published in the *Történelmi Tár* in 1908] (Aetas Könyvek, 1) (Szeged: Aetas, 1988), 22 no. 105. This forged charter is transcribed in the similarly forged charter of King Ladislas IV from 1272: RA, vol. 2/1. 147 no. 2189, then these are transcribed in the forged charter of Ladislas from 1278: RA, vol. 2/2–3. 214 no. 2881.

²²⁸ MNL OL DL 47 722., its editions: ÁÚO, vol. 8. 85–86 no. 58 and UB, vol. 1. 287–288 no. 424.

²²⁹ MNL OL DL 49 548., its editions: ÁÚO, vol. 9. 60–62 no. 36, UB, vol. 2. 57–58 no. 79.

²³⁰ *Inde reflectitur versus septemtrionem et descendit ad paludem super qua est vetus locus molendini...* MNL OL DL 78 961. (before September 10, 1256). Edited in: Zichy, vol. 1. 9–10 no. 12, its summary: Tamás Köfalvi, *A pécsváradai konvent hiteleshelyi oklevéltára, 1254–1526* [Cartulary of the credible place of the convent of Pécsvárad, 1254–1526] (Szeged: [SZTE], 2006), 55–56 no. 2.

²³¹ *Et a parte septemtrionali possessioni ecclesie antedictae et in eodem fluvio cu[r]rendo pervenit ad locum molendini Magistri Magii, et ibi exit de fluvio, et penes eundem fluvium a parte meridionali est una meta terrea, in qua meta pro signo est fracta pars lapidis molaris, qua separat a possessione Koxo Martini filii Magii, et a possessione Koxo Benedicti filii Corneli...* MNL OL DL 84 029, its edition: ÁÚO, vol. 8. 37–41 no. 26.

²³² For early modern borders marked by mill stones: Lajos Takács, *Határjelek, határjárás a feudális kor végén Magyarországon* [Boundary signs, perambulation at the end of feudal age in Hungary] (Budapest: Akadémiai, 1987), 102.

²³³ Karácsonyi, *A hamis*, 26 no. 122 and Vajda, “Okleveles adatok Árpád-kori vízimalmainkról,” 213 considers the document authentic, while György Györffy suggested it is a fourteenth-century forgery: ÁMTF, vol. 1. 113.

demonstrated in Chapter 2, there are very few references to water mills at all. Their numbers probably remained low up to the late Árpadian period, not only in Hungary, but elsewhere in Central Europe as well. When documents issued before the mid-thirteenth century mention mill-places, they probably do not actually refer to previously existing mills, but rather places suited for erecting a mill. Their appearance in documents may have served to identify these plots and marked the value of a certain estate or plot.

It is quite clear, even based on the partial survey provided above, that many of the references to mill-places where the term *locus molendini* was used almost exclusively, are found in forged charters. In the case of most of these charters, there are a number of different reasons to suggest they were forged; however, the use of this term may also be a sign of their later origin. Before the end of the first third of the thirteenth century, the term rarely appears in charters in the above form. The use of this term in early charters may indicate the documents they appear in are forgeries or at least of questionable authenticity.²³⁴ The most relevant question for the present investigation, however, is rather why numerous forged charters mention mill-places in different locations. In the second half of the subchapter, I will revisit the problem, studying references to mill-places in the period when the term *locus molendini* became prevalent and carried a rather specific meaning.

3.1.3. Terminological Uniformity – Uniformity in Meaning?

By the end of the Árpadian-period, the term used for denoting mill-places becomes almost exclusively *locus molendini*, something that does not change until modern times. The question is how much homogeneity in terminology means unity in the meaning. In the following lines, the different meanings that unfold in the legal evidence from the fourteenth to the sixteenth century sources from Hungary are discussed.

One of the meaning-groups revealed by the examination of the evidence from the Angevin period onwards consists of documents in which the term indeed refers to a place where a mill once stood or at least a place where some former construction work – either

²³⁴ For instance there is a royal charter by Andrew II in which he donates the estate of Tomaj (*Tumoy*) in 1216. According to Imre Szentpétery, the authenticity of the document, based on its structure and the landownership is dubious. The reference to the mill-place may be an other reason to suggest that the document was forged. *Sed compulsus Pete filius Leustah ob timorem suae possessionis quia Ochz similiter fuit adversarius, emit xl marcis argenti partem, quae in Tumoy Zaladiensi Tibam praenominatum contingebat et locum unius molendini et decem libertinos (...) necnon V vineas sitas in Wyta.* MNL OL DL 91 101, edited in HO, vol. 6. 11–12 no. 8, its summary: RA vol. 1/1. 102 no. 310. For the estate structure, see: MES, vol. 1. 214–215 no. 220.

channel-digging or mill-house construction – had been carried out earlier.²³⁵ As noted above, this is the way the term, *locus molendini* is usually identified in scholarly research. Some documents, such as land divisions (*litterae divisionales*), or donations (*litterae donationales*) refer to all the elements comprising the infrastructure of a mill located on an estate, but as the mill at the time of the issuing of the document was not in operation, the building complex was referred to as a mill with a mill-place.²³⁶ In a number of cases, however, only a few previous works testify that a landowner planned to build a future mill at the site, for example, an artificial channel meant to divert water towards the mill wheel(s).²³⁷ Sometimes whole rivers were diverted into a new bed in order to acquire water for milling, but the work stopped after the creation of the new riverbed. For instance, in 1476 when the Pauline monastery of Gombaszög (presently part of Slavec in Slovakia) exchanged some properties, the one they gave away possessed a number of mill-places by the new bed they had created for the River Hernád (for this bed with the later built mills, see *Fig. 3*). However, there was no mill working along this artificial riverbed before it was transferred to a new owner in 1476.²³⁸

²³⁵ E.g. *Deinde in meatu seu cursu ipsius putei venit ad fluvium Ipol, et descendit in ipsum fluvium ex inferiori parte molendini predicti comitis Michaelis et filiorum suorum, et deinde sursum in eodem fluvio Ipol eundo venit ad locum antiqui molendini, abhinc vadit ab locum molendini Mark filii Johannis prenotati*. MNL OL DL 1617 and 66 685, edited in: AO, vol. 1. 10–13 no. 8, *Et de illa transitur penes quoddam stagnum lateris a parte orientali adiacentis usque ad locum cuiusdam molendini antiqui, ab hinc transit in decursu aque ipsius molendinarii et attingit terram Pustawzud alio nomine Agagzug vocatam*. MNL OL DL 77 809, edited in: Zichy, vol. 4. 178–185 no. 153, *Ab occidente est una terra, que dicitur Kisvar et ibi est unus locus molendini desolatus et est molendinum idem Iohannis sartoris et Georgi et Egidi filii Pauli Ianka, sic quod idem molendinum vendiderat avus uxoris Georgi, qui vocabatur Iacobus, vinea tamen pertinebat ad ecclesiam de Beel*. MNL OL DF 207 754, edited at: http://monasterium.net/mom/HU-PBFL/PannHOSB/1433_V_18/charter (last accessed: June 16, 2015).

²³⁶ *Quandam possessionem suam Fonchol vocatam in comitatu Abawyuariensi existentem inter possessiones Bakta Popy Fay Deuecher Toka et inter eandem possessionem Forrow adiacentem et eisdem undique [...] vicinam simul cum uno loco molendini sui in quo edificium ad ipsum molendinum aptum et tres rothe lapides molares [...] situari possunt seu edificari, super fluvio Hornadyze a plaga occidentali scilicet a parte dicte ville Forow adiacente cum omnibus utilitatibus et pertinentiis suis ac sub eisdem metis antiquis et limitacionibus quibus ipsam sui predecessores et [...] [possi]disset, dedisset, donasset et contulisset*. MNL OL DL 2798, edited in: AO, vol. 3. 55–57 no. 43. For a similar case, see: MNL OL DL 43 182.

²³⁷ *Firmitatem vinculum quendam locum pro molendino aptum cum canali in superficie possessionis ipsorum Wgralregd vocate in fluvio Crisii ex opposito molendini eorum a parte possessionis eiusdem Ladislai Peterd predictae existentem pro fabrica molendini eidem Ladislao filio Jacovi dedissent donassent et contulissent immo dederunt donaverunt et contulerunt*. MNL OL DL 7521. See also: Jankovich, “Adatok a Körösvidék középkori vízrajzához,” 337. *Intra metas dicte possessionis eorum Eghazasgesen super fluvio Zerethwa aut predicto ryvulo Holknecheche locum molendini, ubi unus finis clausure ipsius molendini ad metas ipsorum Nicolai et Ladislai filii sui protendi posset et deberet et sine eo ipsum molendinum construi et edificari nequiret, ibi et in tali loco iidem Albertus et filii Ewdyn molendinum construi et edificari faciendi haberent facultatem contradictione ipsorum Nicolai et Ladislai filii sui in eo, quod finis clausure huiusmodi molendini ad metas eorum protenderetur, obviare eisdemque molendino in eodem portionem de regni consuetudine vindicare non valentibus*. MNL OL DF 275 823 and *Modo simili tradiderunt, contulerunt assignarunt antelato Nicolao filio Benedicti terram ipsorum cum loco molendini super possessionem Gargow in valle post quam vadit ductus aque seu fossatum ad molendinum cum cunctis utilitatibus et pertinentiis [...]*. MNL OL DL 63 858.

²³⁸ *Primo praefati frater Jacobus vicarius et conventus dicti claustrum Beatae Mariae Virginis quandam totalem sylvam antefati claustrum Morichzewge vocatam in comitatu Zempleminiensi circa metas possessionis Kak peaedictae adiacentem, quam ab orientali antiquus meatus fluvii Hernad, ab occidentali vero partibus modernus*

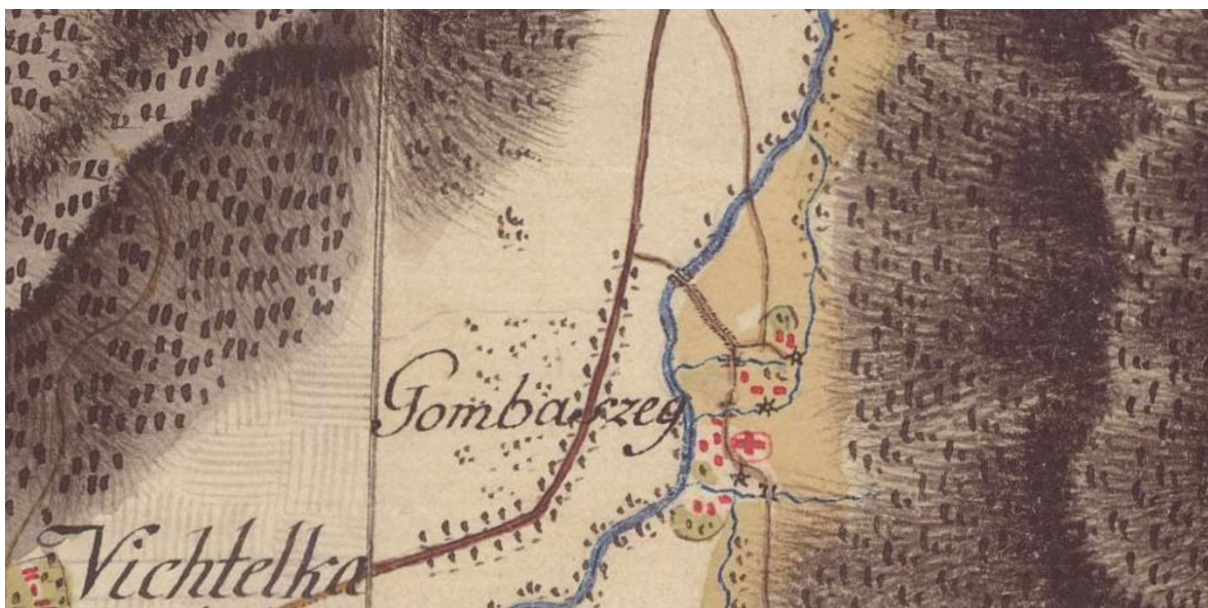


Fig. 3. Gombaszög with the location of the Pauline abbey (marked with the red cross and the water mills along the artificial riverbed of the Hernád (First Military Survey)

Probably, the documents in which reference is made to abandoned (*locus molendini deserti*)²³⁹ or old (*locus molendini antiqui*)²⁴⁰ mill-places should also be connected to this, most logical and widely accepted, meaning of the expression *locus molendini*. One case is particularly note-worthy, because it shows that for contemporaries a lost mill may have carried a different meaning than a mill-place. In 1358, King Louis I (the Great) gave lands away to the Pauline abbey of Kékes (today Pilisszentlászló in central Hungary). The monks received lands that surrounded their newly founded monastery, for instance by the stream bearing the same name as the site of the abbey – Kékes – a lost and ruined mill (*molendinum patiens ruinam et desolatum*) as well as another mill-place (*locum alterius molendini*). There may have been a reason that the two pieces of lands were described differently.²⁴¹

meatus dicti fluvii Hernad circumiacerem, simulcum locis molendinorum super eidem meatibus existentem aliisque universis utilitatibus eiusdem silvae. MNL OL DL 16 955.

²³⁹ E.g. see above note: 235 (MNL OL DL 1617 and MNL OL DF 207 754); *Ea propter quendam locum molendini nostri episcopatus Varadiensis desertum cuius sicut et nos ita et predecessores nostri utilitatis modici fructus perceperunt, qualicunque causa ad presens desertum et penitus desolatum in fluvio Kyskeres supra opidum nostrum Pyspeky vocatum in campestri videlicet loco et intra terminos eiusdem habitum cum omnibus suis utilitatibus et pertinentiis ac emolumentis rite et legitime ad idem ab olim pertinentibus et spectantibus.* MNL OL DL 16 570. See for the case also: Beatrix F. Romhányi, “A lelkiek a földiek nélkül nem tarthatók fenn...” *Pálos gazdálkodás a középkorban* [“without the earthly, the heavenly can not be sustained...” Pauline economy in the Middle Ages] (Budapest: Gondolat, 2010), 82.

²⁴⁰ E. g. MNL OL DL 77 809, 58 445, 86 774 or 27 788.

²⁴¹ *Ad supplicationem et instantiam fratrum heremitarum de eadem inclinati, quoddam molendinum nostrum quodammodo patiens ruinam et desolatum, in rivulo Kekyspataka vocato, in territorio ville nostre regalis Zenthendre vocate habitum, et locum alterius molendini in eodem rivulo supra predictum molendinum existentem, ab omni iurisdictione et potestate castri Wyssegradiensis et castellanorum eiusdem prorsus et per*

In other cases, the toponyms of mill-places suggest that functioning mill buildings had once stood there. As in many other cases, the locations were denoted as someone's *molna* (the old Hungarian term for mills), such as *Conthmolna* (i.e. "the mill of Conth") or *Myskeemolna* (i. e. "the mill of Myske").²⁴² To some extent, the references to mill-places with a specified number of wheels are similar. The first such reference comes from 1216, from a supposedly forged confirmation charter (*litterae confirmatoriae*). In this document, a mill-place with a single wheel is noted.²⁴³ A confirmation charter issued by the convent of Pécsvárad from 1469 refers to a mill-place with three or four wheels²⁴⁴ while another from 1511 lists an abandoned mill-place called *Zekemolna* ("the mill of Zeke") with two wheels.²⁴⁵ These precise wheel numbers very likely referred to the number of wheels employed by the former mill on the same spot.

The last group of documents that in some form refer to previous mills or earthworks are those which, despite not mentioning any presently standing infrastructural element, refer to rebuilding a mill on a mill-place.²⁴⁶ One further group of charters is worth considering. There are a number of documents that refer to *locus molendini* that were either suited to building certain types of mills, or where particular types of mills had formerly stood on the site. Without going into the details of the technological history of mills, the Hungarian legal material and the customary law collection of Werbőczy, discussed above, refer to two fundamentally different kinds of structures, under- and overshot (*molendinum subtus currens* and *molendinum desuper volvens*²⁴⁷) mills. The mill types are associated with waterways of different character. Some of these documents, without referring to pre-existing mills, tell of *locus molendini* for either an over- or an undershot mill. This reference might mean that either local geographic conditions only permit a certain type of mill –correlated with the value of the

omnia excepta et exempta, cum omnibus ipsorum utilitatibus et pertinentiis universis, auctoritate regalis excellentie eidem ecclesie sancti regis Ladislai et fratribus heremitis in ea deo famulantibus, elemosinalem et dotatitiam provisionem facientes, duximus concedenda, imo damus et conferimus pleno iure perpetuo et irrevocabiliter possidenda tenenda pariter et habenda. MNL OL DL 7121, edited in: AO, vol 7. 70–71 no. 40. Mentioned in: Romhányi, "A lelkiek a földiek," 75. See also for abandoned mills: Maliniak "Mlynárstvo na strednom Pohroní v stredoveku," 38.

²⁴² MNL OL DL 15 680, edited in: AO, vol. 6. 244–249 no. 160. For naming of mills, see: Christian Zschieschang, "Zur Benennung von Mühlen im Mittelalter," in *Wassermühlen und Wassernutzung*, 193–232 and idem, "Beobachtungen zur Entstehung von Mühlennamen westlich der Oder," in *Usus aquarum*, 87–162.

²⁴³ The charter from 1216: MNL OL DL 91 101. Other examples: MNL OL DL 98 120, 67 620.

²⁴⁴ MNL OL DF 265 871.

²⁴⁵ *In loco alterius deserti molendini similiter duarum rotharum Zekemolna nuncupato.* MNL OL DL 58 253.

²⁴⁶ MNL OL DL 2553 (*reparari facere*); 43 505 (*restaurandum*) or 17 428 (*reformare*).

²⁴⁷ Cf. Werbőczy, *Tripartitum*, Book 1. Ch. 133. 136–137.

piece of land²⁴⁸ – or that the previously existing building on that site was either an over or an undershot mill.²⁴⁹

Cases where no reference is made to the actual physical reality of any previous construction work will be briefly discussed below. The most evident examples are donations and other legal evidence that refer to empty mill-places. Such references are found forged estate-conscription of the bishopric of Veszprém from 1082 mentioned above, which is relevant for terminologies from the 1310s and 1320s. However, the document does not contain the only early reference to empty mill-places. For instance, a document from 1279 issued by the chapter of Esztergom, uses the same term.²⁵⁰

Another document group, where the term has a different meaning refer to plots suitable for putting up mills. As already discussed above, in the twelfth–thirteenth centuries, although different expressions are employed, phrases occur that possess this meaning. In these cases, the hydrographic and/or legal conditions provided a basis for building a mill. Such references can be found in lease agreements as it was in the interest of both the landlord and the tenant that the contracts described the detailed rights connected to the land.²⁵¹ A plot where a mill could be built for personal use was, of course, much more valuable than a piece of plough land of the same size. Thus, it was important for the tenant to have the right to use the water and, naturally, the landlord could ask for more rent if there was a place on that land suitable for a mill.

²⁴⁸ Werbőczy, *Tripartitum*, Book 1. Ch. 133. 136–137. Cf. György Bónis, *Középkori jogunk elemei. Római jog, kánonjog, szokásjog* [Elements of Hungarian medieval law. Roman law, canon law, customary law] (Budapest: Közgazdasági és Jogi Könyvkiadó, 1972), 167–168 and Vajda, “Árpád- és Anjou-kori vízimalmaink tájalakító hatása,” 72–74.

²⁴⁹ E.g. *In villa Woyanouch duas sessiones iobagionales populosas et insuper tres desertas, edificia domorum habentes, necnon unum locum molendini subtus pellentis, aqua eiusdem nonquam deficiente (...) in villa Mathewsouch decem sessiones iobagionales populosas et insuper quatuor desertas, necnon septem molendina subtus pellentia, aquis eorundem nonquam deficientibus et tria loca molendinorum deserta et edificia non habentia (...) in villa Zorouch tres sessiones iobagionales populosas et unam desertam ac unum molendinum (...) in Boysinch duas sessiones iobagionales populosas et unam desertam ac locum unius molendini desertum subtus pellentis, aqua eiusdem nonquam deficiente.* MNL OL DL 262 183. (February 6, 1418), for its summary, with the edition of the relevant part: ZsO, vol. 6. 397–400 no. 1416 or *Coram eodem conventu personaliter constitutus quendam locum molendini in fine et intra metas possessionis Bandayka in fluvio Thorna appellato aliis decurrens subtus pellente nunc edificiis destitutum apud manus suas pro centum florenis auri titulo pignoris habitum dudum dicto condam Petro filio condam Pauli patri suo a Johanni filii Johannis de dicta Ayka impignorum prefato Andree doctori et vicario dicti ecclesie Wespriminensi pro eisdem centum florenis auri puri plene ut dixisset ab eo accepisset simulcum uno loco sessionali in quo molendinator ipsius molendini moratus fuisset...* MNL OL DL 66 292 (September 1, 1467).

²⁵⁰ *Item in terra Kochou Magister Etthuruh habet eandem partem, quam prius habuit metis distinctam et Nicolaus habet similiter eandem porcionem, quam prius habebat metis separatam et molendinum, quod est in Kochou iuxta ecclesiam cessit Magistro Etthuruh; aliud vero molendinum quod est ibidem in fine ville inferiori cessit magistro Nicolao et in locis molendinorum adhuc vacuis equalem partes habebunt porcionem.* MNL OL DL 67 264, edited in: ÁÚO, vol. 12. 267–268 no. 225.

²⁵¹ As noted above Vajda suggested that the term *locus molendini* is used to describe pieces of lands that had different owners than the surrounding areas. He may have come to this conclusion based on such least contracts.

Some cases in this document group certainly deserve further attention. The first to be discussed is a lease agreement between a burgher from the medieval mining town of Pukanec and the Benedictine abbey of Hronský Beňadik. In this contract – and in a series of similar ones discussed in somewhat more details in Chapter 3.3.5 –, dating from 1345 (or 1346), a burgher from the town leased a mill-place by the Büksavnica Stream, a rather insignificant body of water flowing close to Pukanec. According to the agreement, the mill-place the burgher acquired was the nineteenth such location that could be found from the influx of the Büksavnica into the River Hron. Though there is no information in the contract concerning the location of this mill-place within what was an altogether less than 20-kilometer stretch of the river, it is highly unlikely that nineteen (or indeed more) mills could have functioned on this water way at the same time.²⁵² In yet another contract issued by the same institution, the abbey let a mill-place located by the even smaller Verence Stream which was the sixth such place from its influx point.²⁵³ The folios of the survey-maps of the First Military Survey discussed in Chapter 1.2.2, systematically represented mills and mill-places alike.²⁵⁴ Despite the fact that as it has recently been demonstrated mill-places usually remained visible for centuries, altogether only five mills (either abandoned or functioning) operated on these two streams in the late eighteenth century (see *Fig. 4*).²⁵⁵ In light of this and the general principles surrounding the density of mills in the region, it is more likely that the Benedictines simply designated places which in their opinion were suitable for building a mill, some of which they then managed to lease. The Benedictines were very active in these years in the way they made use of their properties; it was not only the monks at Hronský Beňadik who were active but there is a surviving and relatively similar lease contract that concerned the abbey of Pécsvárad.²⁵⁶ References to plots suitable for mills are also preserved in documents other than those from Hronský Beňadik and Pécsvárad. In one example from 1402, the nobles of the

²⁵² *Concessimus seu condonavimus Jacobo, famulo Kaboldi urbararii domini regis, civi de Bakabania, super fluvium Byksewniche, intra metas possessionis nostri monasterii habitum unum fundum, seu locum molendini nonum decimum ab inferiori parte ipsius rivuli sursum numerando.* For the latest edition of the charter, see: Kristóf Keglevich, *A garamszentbenedeki apátság 13. és 14. századi oklevelei (1225–1403)* [13th–14th-century charters of the abbey of Hronský Beňadik (1223–1403] (Capitulum, 9) (Szeged: Szegedi Tudományegyetem Történeti Intézete, 2014), 336–337 no. 8. For fairly similar lease contracts, see: see here 334–335 nos. 5 and 6. On the regulations of distances between mills, see: Moldenhauer, “Mühlen und Mühlenrecht in Mecklenburg,” 221 and Francesco Salvestrini, *Libera città su fiume regale. Firenze e l’Arno dall’Antichità al Quattrocento* (Florence: Nardini, 2005).

²⁵³ For the latest edition, see: Keglevich, *A garamszentbenedeki apátság*, 336 no. 7.

²⁵⁴ The sheets of the military surveys are available on: <http://mapire.eu> (last accessed: June 8, 2019).

²⁵⁵ See for instance: András K. Németh, and Gábor Máté. “Szempontok és példák a középkori eredetű malmok és malomhelyek folytonosságának vizsgálatához,” [Notes and examples to the study of the continuity of medieval mills and mill-places] in *Középkori elemek a mai magyar anyagi kultúrában* [Medieval elements in the present-day Hungarian material culture] (Tanulmányok a Kárpát-medence anyagi kultúrája köréből, 1), eds. Anikó Báti, and Zsigmond Csoma (Budapest: Agroinform, 2014), 47–68.

²⁵⁶ MNL OL DL 3683. With some omissions edited in: AO, vol. 5. 267–268 no. 138.

market town of Szakácsi (today Nagyszakácsi) gave a mill-place and one and a half acres of land to the local Pauline abbey to build a mill on. The one and a half acres of land was necessary because the waters of the small Horohalya Stream had to be diverted towards the mill-place and the channel from the stream ran through these lands. Most probably no work had previously been carried out to provide water for a mill at that particular site.²⁵⁷



Fig. 4. The surroundings of Pukanec with the Büksavnica (the one running west-east) and Verence Streams (running north-south) on the First Military Survey with the two mill-places on the latter

The most interesting meaning of *locus molendini* may comprise documents in which reference is being made to free choice mill-places. Perhaps the first such example is preserved in a land division charter from 1345. In the document, two brothers from the village of Berencs (today Rétközberencs in northeastern Hungary), the sons of Stephen, son of Keled, a certain Dominic and Ladislav, shared the estate that they had inherited. According to their agreement, in addition to a number of plots, Dominic had the right to choose a place

²⁵⁷ *Quoddam locum molendini ipsorum intra metas eiusdem possessionis Zakachy in fluvio Harahalya vocato habitum necnon duo iugera terrarum arabilium inter ipsum locum ipsius molendini in quibus alveum aque ipsius molendini edificandi preparari deberet necnon cursi antiquo meatu ipsius aque ac quoddam parvum pratum ibidem existens* MNL OL DL 8856.

anywhere on the river called Sebesér (*Sebuscher*, meaning “fast current”) to build a mill.²⁵⁸ In 1445, John, bishop of Oradea, gave one of his men, Nicolas, a piece of land called *Kochuba* (Cociuba Mare in Romania) to settle peasants. Apart from these lands, Nicolas received a mill-place by the River Crișul Negru. However, the location of this future mill was not identified and the beneficiary had the right to choose it.²⁵⁹ Finally, in 1478, a charter putting an end to a lawsuit over a number of estates in Heves County left a certain Ladislao of Szőlös (*Zewles*) in possession of a mill by the River Tarna. In exchange for that mill, however, the sons of Michael of Besnyő had the right to choose a mill-place anywhere along the same river to build another one for themselves.²⁶⁰

3.1.4. Mills and Mill-places – How Do They Relate to Each Other?

Why do charters refer to the mill-places at all? As discussed above, the most important point of the customary law regarding the water-mills and dam construction was that the earlier building was the one to be protected in the face of the new one. The key factor seems to be that legal customs in the fourteenth to sixteenth centuries did not differentiate between a mill and a place for a mill (mill-place). A new mill had to be adjusted to the other mills as well to all the *loca molendinorum* around it. An example from 1315 confirms this supposition. When discussing this case, István Tringli demonstrated that by the early fourteenth century there was already an established legal custom that a landowner had no right to endanger other landowners by building an indefinite number of mills on the same stretch of river.²⁶¹ From the perspective of this chapter, however, the case has another, at least as important, lesson. In the court case that took place before the bishop of Veszprém, the cathedral chapter of Veszprém

²⁵⁸ *Nos magistri Nicolaus et Stephanus vicecomites de Zaboch et quatuor iudices de eodem significamus quibus expedit universis praesentium per tenorem quod magistri Dominicus et Ladislaus filii Stephani filii Keleed nobiles de Berench accedentes ad nostram personalem praesentiam et nobis uno ore equalique voce et concorditer atque sana mente significare curaverunt quod in universis eorum possessionis [sic!] ubique existentibus talem celebrassent in consequens divisionem quod recta dimidietas dicte possessionis Berench vocate a parte orientali dicto magistro Dominico simul cum suo proprio loco sessionali cessisset praeter locum cuiusdam molendini a parte meridionali in rivulo Sebuscher habitam [sic!] quod locum magistro Ladislao antedicto successisset et similiter dimidietas eiusdem possessionis dicto magistro Ladislao scilicet a parte occidentali suo loco similiter proprio sessionali succedissent. Item idem dominus magister Dominicus unum locum pro molendino ubi voluerit liberam habebit occupandi facultatem, residuas vero tam villam loca molendina, quam alias utilitates quovismodo vocitatas communiter possidebunt. MNL OL DL 96 258.*

²⁵⁹ *Ex uberiori gracia nostra eidem Nicolao unum locum molendini prope dictam possessionem [Kochuba] in fluvio Fekethe Keres vocato gratiose concedimus ita ut ipse in dicto loco quem elegerit. MNL OL DL 44 405.*

²⁶⁰ *Idem Iohannes et Georgius pro ipso molendino per dictum Ladislaum de Zewles facto pro se modo simili unum locum molendini in dicto fluvio Tharna eligere et sibi ipsis aliud molendinum construi facere. MNL OL DL 18 035. For another similar case, see: MNL OL DL 64 552.*

²⁶¹ Tringli, “A magyar szokásjog a malomépítésről,” 255.

and the nobles of the village of Jutas, were about to divide the lands and a mill-place belonging to the sons of an certain Bagar. In the course of the division process, a third party, a certain Master Mikse (*Mykse*) protested that the construction of a new mill at this particular mill-place would hurt his interests as the land in question was situated between two of his mills.²⁶² It turned out, however, that a mill had indeed earlier stood at the *locus molendini* in question. The family of Mikse could not hinder the construction of that mill at that moment although in 1315 Mikse saw an opportunity to question the rightfulness of the mill-place. He chose not to do that by questioning the right to construct a mill at that mill-place, but by questioning the legitimacy of the original mill-construction decades before. The bishop accepted Mikse's objection and forbade the construction of a mill at that particular location. It seems that this prohibition was not implemented, as from the second half of the fourteenth century, a number of documents testify to the existence of a mill called *Bogarmolna* (meaning "mill of Bogar" – or "Bagar") on the same estate.²⁶³ With respect to the present investigation, however, it is the reasoning within the lawsuit that deserves attention. Mikse was trying to obstruct the reconstruction of the mill *not* by emphasizing that at the moment there was no mill there, but by arguing that it had originally been built unrightfully in that place. The reasoning of the charter makes it clear that by the early fourteenth century, the legal position of that piece of land did not change whether it concerned a physical mill or a place for a mill or not.

If this supposition is true, then it becomes clearly understandable, why from the early fourteenth century onwards, mill-places appear in legal evidence – especially in charters related to property disputes – in growing numbers, as well as in forged Árpáadian-period charters produced in the Angevin period and afterwards. Where proof was provided that there had been a mill-place on a particular plot of land in the Árpáadian period that proof would have forced the later built mills to align to that former building or land plot. Although both special and in a temporal sense somewhat distant, similar trends have been identified by Mathieu

²⁶² *Tandem magister Mykse, filius Reynoldi, de genere Ratholdi, ibidem in instanti coram nobis personaliter comparens dixit protestando quod predictum molendinum filiorum Bagar olim inter duo molendina sua super eundem fluvium ab utraque parte tum superiori tum inferiori decurencia, in preiudicium eorum, per facti potenciam, in indebito et inconvenienti loco fundatum ac hedificatum extitisset et ne per constructionem molendini in loco molendini filiorum Bagar supradicto, sibi in posterum preiudicium valeat generari, neque dicta loca molendinorum suorum propriorum, et terre ad eadem pertinentes, in divisionem huiusmodi immiscendo, occupentur et alienentur ab ipso, a rehedificacione ipsius molendini, et occupacione terrarum et locorum molendinorum suorum predietarum, fratres nostros capitulum et nobiles antedictos, perinodum protestacionis prohiberet et prohibuit coram nobis.* MNL OL DF 281 805, edited in: *Oklevelek Hontvármegyei magán-levéltárából I. 1256–1399* [Charters from private archives of Hont County, 1256–1399], ed. Ferenc Kubinyi, Jr. (Budapest: [N. p.], 1888), 61–62 no. 42.

²⁶³ MNL OL DF 201 008 and 201 009.

Arnoux with regard to the mills built within French territories (i.e. the Western part of the Carolingian Empire and its successor states) in the ninth–twelfth centuries, where mill-places similarly served as points of alignment for mills constructed later.²⁶⁴

With the gradually growing number of water-related infrastructural elements – mills, dams, ponds, etc. – in the Kingdom of Hungary, ensuring water rights probably became crucial. One of the possible ways to ensure such rights was to have a mill built by a landlord on a water way before someone else did along the same section of water, so that mills, ponds or dams up- and downstream to be built in the future would have to be aligned to it. This work however entailed certain expenses. It was certainly less costly to – after some ground work or even without any actual intervention – have a charter issued by a place of authentication or another entitled institution confirming the existence of a mill-place at the estate in question, as it could potentially ensure the landowner's future rights to the water body.

Through analysis of the meaning of the legal technical term, *locus molendini*, which in spite of its presence in Western and Central European legal texts, has not been previously investigated in detail, I reflected on the formation of norms connected to the use of waterways in medieval Hungary. The term, as I argued above, may be crucial in understanding the development of customary law connected to the construction of water mills, and probably in water use in general. The term is prevalent in medieval legal customs throughout Central Europe and shows that rights acquired earlier to a body of water had primacy over ones acquired later ones. How this term fully applies to medieval water-related construction has not yet been studied in depth. From the fourteenth century onwards, there was a clear expansion in the use of the written word in medieval Hungary, as well as elsewhere in Central Europe. Probably this was the same period when with the growth in water-related infrastructure, the finite nature of water-resources was becoming increasingly apparent. Thus, the importance of protecting one's property rights as they connected to water use, crystallized. The disputes connected to access to water resources, as well as the problem of endangering each others' water-related incomes were present everywhere in the landscape. The examples provided above mostly concern rural areas in the Kingdom of Hungary although, as I will argue in the next subchapters, urban environments are by no means exceptions with regard to legal disputes over water rights. In fact, as I shall argue, the situation was probably just the reverse.

²⁶⁴ Arnoux, “Les moulins à eau en Europe occidentale,” 715–720.

3.2. Rivers in Urban Landscapes – Rivers, Streams, Moats and Disputes

Not only did towns in medieval Europe represent major concentrations of population, but because they were high density nodes of craftsmanship, they were greater sources of energy consumption.²⁶⁵ Pre-industrial societies used numerous kinds of power sources, but mills – either water or wind – remained the most effective until the eighteenth century, when coal gradually took over as the most effective source of industrial energy. In medieval Central Europe, both water – as discussed in Chapters 2 and 3.1 – and to a lesser extent and from somewhat later, wind power was exploited. In the Kingdom of Hungary, wind mills never became important, mostly because Carpathian Basin is relatively well protected from winds. As far as can be ascertained from medieval sources, only one wind mill has been documented in Hungary and even in areas without rivers suited for water mills such as the Danube-Tisza Interfluvium area they only appeared relatively late compared to other parts of Central Europe.²⁶⁶ The one documented wind mill began operations no later than 1436 in Sopron.²⁶⁷ Apart from that, sources mention wind mills in greater numbers only from the post-Ottoman period (that is the turning of the seventeenth century) onwards.²⁶⁸ The most important and effective source of industrial power in towns was therefore certainly running water in the Middle Ages. Although in general the Carpathian Basin has a relatively dense network of waterways, the needs of towns had the potential to cause scarcity in water resources. In the next two subchapters of the dissertation I argue that access to water for different purposes

²⁶⁵ See: Richard C. Hoffmann, “Footprint Metaphor and Metabolic Realities Environmental Impacts of Medieval European Cities,” in *Natures Past: The Environment and Human History* (Comparative Studies in Society and History), ed. Paolo Squatriti (Ann Arbor, MI: University of Michigan Press, 2007), 288–325. See also: James A. Galloway, Derek Keene, and Margaret Murphy, “Fuelling the City: Production and Distribution of Firewood and Fuel in London’s Region, 1290–1400,” *The Economic History Review* NS 49, (1996): 447–472, and James A. Galloway, “Metropolitan food and fuel supply in medieval England: regional and international contexts,” in *Food supply, demand and trade: Aspects of the economic relationship between town and countryside (Middle Ages – 19th century)* (Comparative Rural History Network – Publications, 14), eds. E. Thoen, and P. Van Cruyningen (Turnhout: Brepols, 2012), 7–18.

²⁶⁶ Edit Sárosi, Magdolna Szilágyi, and Zsolt Szilágyi, *Kecskemét* (Magyar Várostartörténeti Atlasz, 7) (Budapest: MTA Történettudományi Intézete, 2018), 93 (mills). See for instance the wind mills in the Teutonic areas: Rafał Kubicki, “Windmills in the State of Teutonic Order in Prussia, 14th – first Half of the 15th Centuries,” in *Origines et mutationes*, 215–232.

²⁶⁷ Házi, *Sopron*, vol. 2/3. 57 and vol. 1/3. 122. See: Károly Mollay, “A Szélmalom utcai vám 1217–1564,” [The customs of the Windmühlgasse, 1217–1564] *Soproni Szemle* 45 (1991): 97–121 and Ferenc Jankó, József Kücsán, and Katalin Szende, *Sopron* (Magyar Várostartörténeti Atlasz, 1) (Sopron: Győr-Moson-Sopron Megyei Levéltár Soproni Levéltára, 2010), 66 and 82–83, György Balázs, “Vízimalmok, szárazmalmok, szélmalomok a 18–19. században,” [Water mills, tread mills, wind mills in the 18th–19th centuries] *A Magyar Mezőgazdasági Múzeum Közleményei 1995–1997*, 83–100 erroneously dates it to much later.

²⁶⁸ Kálmán Lambrecht, *A magyar szélmalom* [The Hungarian wind mill], eds. Ágnes Szilágyi, and György Balázs (Budapest: Magyar Élelmiszeripari Tudományos Egyesület, 1911–2004) and Balázs, “Vízimalmok, szárazmalmok, szélmalomok.”

caused numerous conflicts within urban landscapes and there was already a thorough competition for water resources from the Middle Ages onwards. In this first subchapter, I address what kinds of waters were used for milling in medieval urban environments in medieval Central Europe, and particularly in the Kingdom of Hungary. I then discuss a special type of town, mining settlements, where, as shall be argued, access to milling waters was a crucial problem.

Waters are one of the most important factors in deciding to settle in a certain area. Major waterways in Europe and elsewhere offered the most effective and cheapest forms of transport in pre-modern times and remained so until the appearance of railway networks.²⁶⁹ Accordingly, many of the major population concentrations in medieval Central Europe are located by major waterways, or to put it another way, few major population centers lack a navigable river in their proximities.²⁷⁰ Of course, where special ‘local energy’, such as mineral resources, was present, this could be different. The first short subchapter here is intended as a brief discussion of the ways major waterways were exploited as sources of power in medieval Hungary using the example of the towns of Buda, Óbuda and Pest.²⁷¹

3.2.1. Major Waterways and Mills – the example of Buda, Óbuda and Pest

Harnessing the energy of waterways was anything but a simple task. These difficulties are certainly true for major rivers, where the inherent, potential energy posed a constant threat to water mill operations. As previously noted in the context of the spread of water mills in Central Europe in Chapter 2, the earliest water mills in were built on minor rivers. However, the location of these mills does not mean that medieval societies abandoned use of the energy of major rivers. Although they probably appeared somewhat later than fixed mills in Western Europe, ship mills also began to appear on rivers.

In Western Europe the first reference to a ship mill dates to the sixth century, but it is very possible, that similarly to fixed place water mills, they were used by the Romans.

²⁶⁹ Judit Klement, *Hazai vállalkozók a hőskorban: A budapesti gőzmalomipar vállalkozói a 19. század második felében* [Hungarian entrepreneurs in the heroic age: the entrepreneurs of steam mill industry in the second half of the 19th century] (Budapest: Eötvös Kiadó, 2012), 56–69.

²⁷⁰ See the studies in the volume: *Montagnes, fleuves, forêts dans l’histoire. Barrières ou lignes de convergence? (Berge, Plusse, Walder in der Geschichte. Hindernisse oder Begegnungsräume?)*, ed. Jean-François Bergier (St. Katharinen: Scripta Mercaturae, 1989).

²⁷¹ The three settlements were entirely independent until the modern times (up to 1873), with different privileges and character. Cf. *Medieval Buda in Context* (Brill’s Companions for European History, 10), eds. Balázs Nagy et al. (Leiden and Boston: Brill, 2016).

Procopios in his account of the Gothic siege of Rome in 537 tells of how floating mills were invented:

“But after the aqueducts had been cut, as I have stated, the water no longer worked the mills and the Romans were quite unable to operate them with any animals owing to the scarcity of food in a time of siege; indeed, they were barely able to provide for the horses, which were indispensable to them. So Belisarios hit upon the following device. Before the bridge that I just mentioned as being connected with the circuit-wall, he fastened ropes from the two banks of the river and stretched them as tight as he could, and then attached to them two boats side-by-side and two feet apart, precisely where the flow of the water comes down with the greatest force because of the arch of the bridge, and placing two mills on either boat, he hung between them the mechanism by which the mills are turned. Beyond these he fastened other boats, each attached to the one next in order, and he set the waterwheels between them in the same way for a great distance. So by the force of the flowing water all the wheels in turn were made to revolve independently, and thus activated mills with which they were connected and ground sufficient flour for the city.”²⁷²

Although the chronicler probably used the invention of ship mills to highlight the skillfulness of Belisarios and his people, it nonetheless shows that the technology was already known in the sixth century. This unique evidence, however, does not mean that similar constructions were widespread in Western Europe. They were probably seldom to be found in the region up to the High Middle Ages, similarly to fixed place water mills. Later, they can be attested in the Rhine valley, where references to ship mills appear in Carolingian sources. Apart from the Rhine ship mills were perhaps found partly in Italy where they were in recurrent use from relatively early on, although not long before the year 1000.²⁷³ However,

²⁷² For a recent translation of the work, see: Prokopios, *The Wars of Justinian*, trans. by H. B. Dewing, revised by Anthony Kaldellis (Indianapolis, IN: Hackett, 2014), Book V/20. 298. See. Robert J. Forbes, *Studies in Ancient Technology, Volume 2. Irrigation and Drainage, Power [Water- and Windmills], Land Transport and Road Building, The Coming of the Camel* (Leiden: Brill, 1993), 105–106, and Örjan Wikander, “The Water-Mill,” in *Handbook of Ancient Water Technology* (Technology and Change in History, 2), ed. idem (Leiden: Brill, 2000), 383.

²⁷³ On ship mills in general, see: Daniela Gräf, *Boat Mills in Europe from Early Medieval to Modern Times* (Veröffentlichungen des Landesamtes für Archäologie mit Landesmuseum für Vorgeschichte, 51 = Bibliotheca molinologica, 19) (Dresden: Landesamt für Archäologie mit Landesmuseum für Vorgeschichte, 2006). For early medieval ship mills, see: Martin Schoebel, “Die Mainzer Rheinmühlen im Mittelalter: Ein Beitrag zur Geschichte der rheinischen Schiffsmühle,” *Blätter für deutsche Landesgeschichte* 129 (1993): 79–115, and Dietrich Lohrmann, “Schiffsmühlen auf dem Tiber in Rom nach Papsturkunden des 10.–11. Jahrhunderts,” in *Ex ipsis rerum documentis: Beiträge zur Mediävistik. Festschrift für Harald Zimmermann zum 65. Geburtstag*, eds. Klaus Herbers, Hans-Henning Kortüm, and Carlo Servatius (Sigmaringen: Jan Thorbecke, 1991), 277–286.

there were areas where they may have been more widespread than fixed mills.²⁷⁴ Their appearance in Central Europe and in Hungary, similarly to the appearance of water mills in general, has been dated to fairly different dates by the various scholars.²⁷⁵ The Polish as well as the Hungarian sources speak to their existence in the late thirteenth century at the earliest.²⁷⁶ The first reference in Hungary dates to 1292 and the second to 1305. Both references concern ship mills running from the section of the Danube by Óbuda, Buda and Pest.²⁷⁷ By the late thirteenth century, this area had the biggest population concentration in the Kingdom thus required the highest number of water wheels within this relatively restricted limited area. The use of ship mills makes sense for these three settlements because the area was not particularly rich in the smaller rivers and streams that were more suited for building fixed location mills (see *Fig. 5*).

²⁷⁴ Germain Sicard, *The Origins of Corporations. The Mills of Toulouse in the Middle Ages* (New Haven, CT: Yale University Press, 2015).

²⁷⁵ Walter Endrei, "A magyar hajómalom," [Ship mills in Hungary] *Technikatörténeti Szemle* 21 (1995): 10, Tamás Vajda, "Árpád- és Anjou-kori vízimalmaink tájalakító hatása," [Water mills as driving forces of landscape change in the Árpadian and Angevin Periods] in *Micae mediaevales II. Fiatal történészek dolgozatai a középkori Magyarországról és Európáról* [Studies of young historians on medieval Hungary and Europe, II], eds. Péter Jakab et al. (Budapest: ELTE BTK Történelemtudományok Doktori Iskola, 2012), 70, Balázs, "Vízimalmok, szárazmalmok, szélimalmok," Zsófia Vajkai, "Malomtípusok és a molnár mesterség a XIX. századi Magyarországon II.," [Mill types and millers in 19th-century Hungary] *A Magyar Mezőgazdasági Múzeum Közleményei 1981–1983*, 355–363, and Anon. "Hajóimalmok," [Ship mills] in *Magyar néprajz*, vol. 3. <http://mek.oszk.hu/02100/02152/html/03/23.html> (last accessed: March 16, 2018).

²⁷⁶ For Poland, see: Sowina, *Towns and People*, 84–85.

²⁷⁷ BTOE, vol. 1. 279–281 no. 259 (1292) and AO, vol. 1. 102–103 no. 96 (its summary: AOkl, vol. 2. 371–372 no. 775).

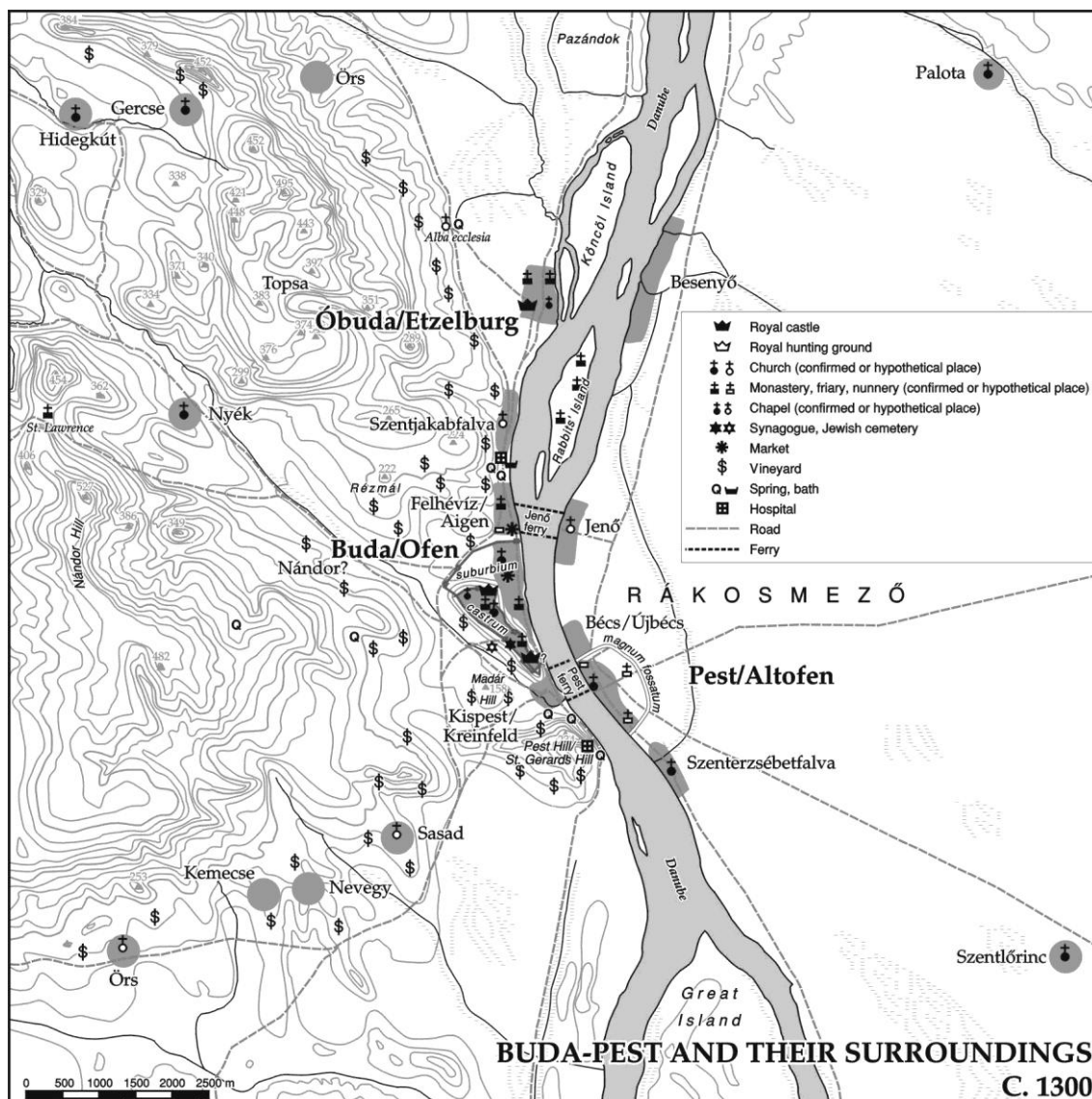


Fig. 5. Pest, Buda, and Óbuda and their surroundings in ca. 1300 (drawn by Béla Nagy)²⁷⁸

In the fourteenth and fifteenth centuries, the number of ship mills by the rivers in the Kingdom of Hungary probably increased significantly, as sources increasingly refer to their presence by a number of rivers, and at smaller settlements than Pest or Buda. However, remaining with Buda, Óbuda and Pest, the growing number of ship mills, as mentioned in sources, posed a potential threat to two other important forms of water exploitation, first navigation, and second, fishing. Ship mills were not limited to the short section of the Danube by Buda, Óbuda and Pest, but rather occupied more extended stretches close to the shorelines, thus, harming the interests of both fishermen and ferrymen. The owners of these mills did not select the sites to harm others, but these were the best spots on the river to mill. First, while

²⁷⁸ András Végh, "Buda-Pest 1300 – Buda-Pest 1400. Two Topographical Snapshots," in *Medieval Buda in Context*, 178.

ship mills could function in all seasons, the proximity of hot springs along the shores of Óbuda and Buda meant the icing up of the river started later than on the Pest side. Most of the ship mills floated close to the Buda and Óbuda shore of the Danube for this reason. The ship mills seldom stood next to each other simply because they would have easily damaged each other. They were usually fixed to a large stake driven into the riverbed. These stakes were called by their Hungarian name, *szelep*. Originally, probably each ship mill had one *szelep* (a stake), but at a certain point, probably in answer to the growing need for milling, more and more ships were adjoined to each other, with only the first, most upstream vessel being attached to the stake itself. This crowding led to a chain of floating mills which hindered river crossings as well as fishing along long stretches of the river.²⁷⁹

Already the second reference to ship mills mentions conflicts in their locations. The document from 1305, the Dominican nuns of Margaret Island (*Insula leporum* or “Island of the Hares” by its medieval name, today Margit-sziget) contains a complaint presented to the Knights Hospitallers of Budafelhévíz about the chapter’s placement of their ship mills above the ferry at Jenő. The nuns, apart from their dissatisfaction with the location of the mills, also claimed that millers kept insulting people crossing the river with the Jenő ferry.²⁸⁰ Because of the growing number of ship mills, the owners of the ferries and the harbors laid complaints against having more new stakes (*szeleps*) fixed along the Danube by the millers of the Buda suburb. In 1462, the Buda chapter and the Dominican nuns of Margaret Island laid a complaint against a number of burghers of Buda – including an certain John Ács (*Alch*, meaning carpenter²⁸¹) – because of the presence of numerous ship mills operating between Felhévíz and Jenő – the latter being one of the two most important crossing points on the river in the territory of present-day Budapest – a major source of income for the nuns. The mills and the stakes that held them in place along the river banks made crossing and use of the harbors impossible.²⁸² Not only was crossing the Danube increasingly difficult because of the growing

²⁷⁹ Judit Benda, “A kereskedelem épületei a középkori Budán, 3. Malmok, pékek és kenyérszékek a későközépkori Budán,” [Trade buildings in medieval Buda, 3. Mills, bakeries, bread shops at late medieval Buda] *Tanulmányok Budapest Múltjából* 38 (2013): 11–12 with reference to the Early Modern situation. See for the post-Ottoman period: Katalin Simon, “A Duna és a hajómalmok Pest-Budán a 18. században és a 19. század első felében,” [The Danube and ship mills at Pest-Buda in the 18th and the first half of the 19th century] *Urbs: Magyar Városhistória Évkönyv* 10–11 (2017): 301–321.

²⁸⁰ MNL OL DL 1691, edited in: AO, vol. 1. 102–103 no. 96 (for its summary: AOKlt, vol. 2. 371–372 no. 775).

²⁸¹ For the problem of carpenters and millers, see Chapter 4.

²⁸² *Idem index et iurati cives fluvium Danobii inter calidas aquas superiores Budenses et porcionem scilicet possessionariam dictarum dominarum priorisse et sanctimonialium in margine eiusdem Danobii adiacens et inter possessionem Jenew similiter earundem dominarum sanctimonialium, ubi scilicet semper et ab antiquo dicti possessus et capitulum ecclesie Budensis ad dicte domine sanctimoniales portum seu wadium navalem habuissent, haberentque de presenti, tam ex parte calidarum aquarum quam ex parte dicte possessionis Jenew vocate, quo scilicet naves hincinde ad portum ipsius Danobii remigio duci solite fuissent, nonnulla molendina*

number of ship mills but fishing was also impacted. The noisy machinery kept fish away from the surroundings of these constructions and therefore from longer and longer stretches of the Danube. Fishing in the territory of present-day Budapest – that is, from the southern end of the Szentendrei (or by its medieval name Rosd) Island to the Csepel (or by its medieval name Great) Island along the Danube was the privilege of the chapter of Buda.²⁸³ However, according to a complaint laid by the chapter, three men, a George *Révész* (meaning ferryman), a Paul *Aurifaber* (meaning goldsmith), and the master of the Saint Nicholas hospital of Pest²⁸⁴ installed ship mills next to the wall of Újbécs (*Beechwara*), where there never had been mills before. The new mills caused losses to the fishermen as their catch was halved. The document even specifies the species of fish that were usually caught in this part of the river, namely, pike and sturgeon.²⁸⁵

Despite the complaints by the institutions with interests in ferries and fishing along the Danube around Buda, Óbuda, and Pest, ship mills steadily rose in number. Most of them, because of the presence of hot springs, were located on the Buda side, but there was at least one ship mill established close to Pest, and one somewhat further to the south next to a southern suburb of Pest called Szentfalva (or Szentersébetfalva).²⁸⁶ The donation charter which documents the ship mill by Szentfalva is important from the point of view of present discussion. In the donation, dating to 1490, Stephen Szapolyai (the father of the later King John Szapolyai, then eternal chief *ispán* of Szepes), in recognition of his services, donated a

ligari et locari, ac multos palos et ligna wlgo zelep vocata ad transitum dictarum navium in ipsum fluvium Danobii incuti et locari fecissent, per hocque dictum wadum adeo impedivissent et in cessanter impedirent, ut naves in ipso wado hincinde transire nequirent. PMTOE 231 no. 882 (MNL OL DL 15 787).

²⁸³ ÁMTF, vol. 4. 502 and 584.

²⁸⁴ On the hospital, see: Katalin Irásné Melis, “Pest kialakulása és a középkori város építési periódusai,” *Budapest Régiségei* 47 (2014): 135 and 155. (with erroneously identifying George Révész as the master of the hospital, dating the document once to 1460 and then some pages later to 1476).

²⁸⁵ *Tamen nunc quidam Georgius Rewez, Paulus Aurifaber et magister hospitalis S. Nicolai confessoris de Pesth in medio meatus ipsius piscature prope murum Beechwara, vbi numquam alias molendina fuissent, senticulis suis firmiter in profundo Danobii fixis, molendina sua locassent perque recia et piscatores ipsos ita turbarent, vt vix medietatem piscium, quam antea prenidissent, prendere possent.* Nándor Knauz, “A budai káptalan regestái 1148–1649,” [Summary of the documents of the chapter of Buda] *Magyar Történelmi Tár* 12 (1863): 23–24 and 41. See also: PMTOE 248 no. 949 and László Bártfai Szabó, *Óbuda egyházi intézményei a középkorban* [Church institutions of Óbuda in the Middle Ages] (Budapest: [Author’s edition], 1935), 107 no. 142. For sturgeon fishing, see: Takáts, “A komáromi vizahalászat,” and Bartosiewicz et al. “Animal Exploitation,” 138–142. For the problem of fish, ferries and mills, see: Hoffmann, and Sonnlechner, “Vom Archivobjekt zum Umweltschutz.”

²⁸⁶ Bártfai Szabó, *Óbuda egyházi intézményei*, 105 no. 135. *Historia critica regum Hungariae. Vols. 8–19. Stirpis mixtae: 1301–1526*, 12 vols (Buda: Weingand & Koepf, 1788–1794), vol. 13. 718. On Szentfalva (or Szentersébetfalva), see: András Kubinyi, “Budapest története a későbbi középkorban Buda elestéig,” [History of Budapest in the later Middle Ages, to the fall of Buda] in *Budapest története*, 5 vols [History of Budapest], ed. László Gerevich (Budapest: Budapest Főváros Tanácsa, 1975–1980), vol. 2. 15 and 41 note 27; István Tringli, “Pest megye a késő középkorban,” [Pest County in the late medieval period] in *Pest megye monográfiája*, vol. 1/2 [Monography of Pest County], eds. Domokos Kosáry, Attila Zsoldos, and István Torma (Budapest: Pest Megye Monográfia Közalapítvány, 2001), passim (both as Szentersébetfalva and Szentfalva), and ÁMTF, vol. 4. 557 (Szentersébet).

place for a mill on the Danube to Michael Temesvári Bodó for building a mill.²⁸⁷ The place for the mill was, this case, no more than a stake, that is, a *szelep*. The charter of Szapolyai, probably not accidentally, ordered that no tax could be assessed on the building, and most importantly no one – probably the people of Szentfalva – may disturb the functioning of the mill. The people of Szentfalva had a significant share of Danube fishing so it is likely that the latter note refers to potential conflicts of interest between fishermen and the ship mill owner.

The last in the context ship mills in the Danube by Buda, Óbuda and Pest is probably the clearest indication of the difficulties posed by these constructions for crossing the Danube. By the Jagiello period, the Hungarian diets, with very few exceptions, took place in the ‘capital’ of the Kingdom, Buda (and Pest).²⁸⁸ While the lesser nobility gathered in the fields of Rákos, outside of the walls of Pest, the aristocracy met on the Castle Hill of Buda although the representatives of the ‘chambers’ met. At these times they had to cross the Danube. On one of these occasions, a group of noblemen, heading to Pest from Buda over the Danube somehow crashed into a ship mill and the noblemen fell into the water and drowned.²⁸⁹ The

²⁸⁷ *Quod in fluvio Danubii in territoriis possessionis nostre Zenthffalwa vocate in comitatu Pestiensi existentis habite, ubi habilis et utilis videbitur, unum locum molendini integri, quod vulgariter ‘zelep’ appellatur, eligere et illud molendinum iuxta cursum temporis, estivalis scilicet et hiemalis in loco, ubi voluerit, construi facere et locare fructusque et utilitates eiusdem ipse Michael Bodo ac sui heredes et successores universi absque solutione census soliti, qui vulgariter ‘ferthon’ vocatur, et etiam aliarum taxarum nostrarum ordinariorum et extraordinariorum perpetue, pacifice, quiete et sine contradictione quorumcumque percipere possint et valeant. Quocirca vobis, iudicibus, iuratis ceterisque populis et iobagionibus nostris in dicta possessione nostra Zenthffalwa constitutis et existentibus, item cunctis operariis et factoribus nostris in officiolatu eiusdem possessionis Zenthffalwa qualitercumque existentibus, presentibus atque futuris harum serie firmiter committimus et mandamus, quatenus dictum locum molendini annotato Michaeli Bodo in dicto fluvio Danubii, in territoriis eiusdem possessionis Zenthffalwa eligere et illud sibi pacifice construi facere et eidem suisque heredibus et posteritatibus universis uti, tenere fructusque eiusdem percipere et percipi facere permittatis et permitti facere debeatis, et aliud nullo modo facere presumpmatis.* MNL OL DL 46 153. edited in *A Szapolyai család oklevéltára / Documenta Szapolyaiana I. Levelek és oklevelek / Epistulae et litterae (1458–1526)* (Magyar történelmi emlékek. Okmánytárak = Monumenta Hungariae historica. Diplomataria), ed. Tibor Neumann (Budapest: MTA Bölcsészettudományi Kutatóközpont Történettudományi Intézet, 2012), 188–189 no. 198. See also: András Kubinyi, “Budai és pesti polgárok családi összeköttetései a Jagelló-korban,” [Family contacts of the burghers of Buda and Pest in the Jagiello period] *Levéltári közlemények* 37 (1966): 266. (later published under the same title, in *Tanulmányok Budapest középkori történetéről*, 2 vols [Várostartörténeti tanulmányok, 10], eds. István Kenyeres, Péter Kis, and Csaba Sasfi [Budapest: Budapest Főváros Levéltára, 2009], vol. 2. 513–570), and Benda, “A kereskedelem épületei a középkori Budán, 3.,” 11–12.

²⁸⁸ See: András Vadas, and János M. Bak, “Diets and Synods in Buda and Its Environs,” and András Kubinyi, “Buda, Medieval Capital of Hungary,” in *Medieval Buda in Context*, 322–344 and 366–385 respectively.

²⁸⁹ *In dieta pro festo beati Georgii martyris campo Rákos iuxta contenta decreti celebrata per dominum Joannem Bornemyzza, regium thesaurarium, in medium regnicolarum regestum istud missum est. Post cuius quidem diete finem, tertia videlicet die, feria utputa sexta post Stanislai, egregii et memoria perpetua digni viri Ambrosius Vydfy de Mohorra, Georgius de Kalonda ac magister Nicolaus Vydfy de Woykoch, regni Sclavonie prothonotarius unacum Ladislao Keletfy de Stwinack, Ambrosio [sic!] Erdewgh de Wragowcz, et ceteris notabilibus viris, navi in Danubio ad Pesth de Bwda navigantes tactu cuiusdam molendini submersa pariter occubuerunt suffocatique aquis decesserunt. Eadem in dieta dominus Emerichus de Peren in palatinum ante castrum Budense est creatus per magistrum Stephanum de Verbewcz tunc prothonotarium presente manu sua. Lajos Thallóczy, *Jajce (bánság, vár és város) története* [History of (the banate, castle and town of) Jajce (Magyarország melléktartományainak oklevéltára. Codex diplomaticus partium regno Hungariae adnexarum, 4) (Budapest: MTA, 1915), 182–183 no. 114.*

event was remembered even in later decades, as the humanist chronicler Antun Vrančić referred to the unfortunate event, although he dated it to the aftermath of the Dózsa peasant uprising in 1514.²⁹⁰

Most of the documentary evidence on ship mills refers to their presence on the stretch of the Danube by medieval Buda, Óbuda and Pest. This is not because this was the only area where numerous ship mills stood in the medieval period, but rather because it is here that their presence caused conflicts of interest that lead to court cases. If not from the late medieval period, then certainly by the sixteenth century, ship mills – sometimes many ship mills – operated by every major settlement along the Danube.²⁹¹ Even if ship mills were not rare, most of the milling in the Kingdom of Hungary, even in urban environments, took place in fixed location mills built along lesser streams.

3.2.2. Streams and Water – Use of Mills in Urban Environments – the Cases of Zagreb and Budafelhévíz

As discussed above, even if many of the major population concentrations in Central Europe and the Kingdom of Hungary, such as Buda, Óbuda and Pest, as well as Zagreb, one of the most significant medieval towns in the region and later capital of the Kingdom of Croatia (from 1102 part of the countries of the Hungarian crown) lay close to or directly by major rivers – the Danube and the Sava respectively – , controlled smaller rivers more easily therefore used them more systematically in water power exploitation. These smaller bodies of water represented important resources for local populations in milling as well as for building different industrial complexes, bathing houses, tanneries, etc. Because of their limited runoffs and the relatively larger number of people intending to use them, these streams and minor rivers in urban contexts were frequently sources of conflict. Two examples will be discussed. First, the case of Zagreb and the small stream that ran by the boundary between the two parts of the town that in the medieval period were individual legal entities, and second, the case of the small settlement of Budafelhévíz somewhat to the north of Buda and south of Óbuda (see *Fig. 5*), and the exploitation of the hot springs there for building mills and bath houses.

²⁹⁰ 1504–1566, *memoria rerum. A Magyarországon legutóbbi László király fiának legutóbbi Lajos királynak születése óta esett dolgok emlékezete. Verancsics-évkönyv* (Magyar Helikon), ed. József Bessenyei (Budapest: Magyar Helikon, 1981), 17–18. Referred to in Benda, “A kereskedelem épületei a középkori Budán, 3.,” 11.

²⁹¹ K. Németh, “Vizek és vízgazdálkodás, I.,” *passim*, Béla Czigány, “Adatok a Győr megyei hajósmolnárak életéhez, I–V.,” *Arrabona* 2 (1960): 133–139, 4 (1962): 97–116, 5 (1963): 207–228, 7 (1965): 413–428, 9 (1967): 149–178, 10 (1968): 123–140, and 12 (1970): 187–211. See also Simon, “A Duna és a hajómalmok.”

Zagreb provides a special example. It was the smaller water bodies running through the core of the settlement, not the Sava, the major river near the town²⁹² that was the most important for the local economy. Zagreb also provides an example of waterways as settlement borders to be further elaborated in Chapter 3.4. The town in the Middle Ages consisted of two separate parts, Kaptol and Gradec, founded with a significant time difference. The two settlements lay very close to each other and were basically divided by a small stream called Medveščak. Each settlement had somewhat different privileges, legal status, and autonomy but also shared some functions.²⁹³ This situation would have posed difficulties for the functioning of the town(s) anyway, but the unclear rights of the institutions and inhabitants of Kaptol and Gradec with respect to the stream that divided them sometimes lead to bloody conflicts.

The Medveščak – or by its medieval name Cirkvenik (*Cyrkvenich*) Stream,²⁹⁴ collected the waters of the Medvednica hills, directly north of Zagreb, and entered the territory of Zagreb from the north. The small stream valley formed the border between the two settlement parts, which developed on two small but well defined elevations, and continued towards the River Sava. Kaptol, founded at the turn of the eleventh century and owned by its bishops and the cathedral chapter, occupied the hill to the east of the Medveščak, while Gradec, founded by settlers after the Mongol invasion in the 1240s, lay on a plateau on the top of the Greč elevation west of the stream.²⁹⁵ The inhabitants of both settlements both tried to exploit the stream. The limited waters flowing along its bed, however, allowed for only a small number of mills and bathing houses. At least two obstacles made conflicts inevitable. First, the cathedral chapter seems to have also owned lands on the right bank of the Medveščak; amongst other things they owned at least three mills on the side that otherwise lay in the hands of the Gradec citizens. This situation is made clear from a donation charter

²⁹² Marija Karbić, and Bruno Škreblin, “Grad na rijeci ili pored nje: srednjovjekovni Zagreb i rijeka Sava,” [The Town On or Close to the River: Medieval Zagreb and the Sava River] in *Rijeka Sava u povijesti* [River Sava in history] (Bibliotheca Croatica: Slavonica, Sirmiensa et Baranyansia Posebna izdanja, 15), ed. Branko Ostajmer (Slavonski Brod: Hrvatski Institut za Povijest, 2015), 163–180.

²⁹³ *Potok u srcu Zagreba : uz potok Medveščak-od izvora do ušća / A brook in the heart of Zagreb : along the Medveščak Brook from source to mouth : Muzej grada Zagreba, spanj-studeni 2005*, ed. Nada Premerl (Zagreb: Muzej grada Zagreba, 2005), and Ivka Kljajić, and San Mikulec, “Cartographic-Historical Analyses of the Medveščak Stream Regulation and Quantum GIS,” *Kartografija i geoinformacije – Journal Cartography and Geoinformation* 12, no. 19 (2013): 30–43.

²⁹⁴ Andrija-Ljubomir Lisac, “Mlinarstvo Zagreba od najstarijih vremena do početka XX stoljeća,” [Mills of Zagreb from the earliest times to the beginning of the 20th century] *Zbornik Historijskog zavoda Jugoslavenske akademije* 8 (1977): 220 note 2.

²⁹⁵ See: Nada Klaić, *Zagreb u srednjem vijeku* [Zagreb in the Middle Ages] (Zagreb: Liber, 1982), Neven Budak, “Budući da smo htjeli u Zagrebu na brdu Gradecu sagraditi slobodni grad...” [As we Wanted to Build a Free City in Zagreb on the Hill Gradec...] in *Zlatna bula 1242–1992* [Golden bull], ed. Zlatko Stubić (Zagreb: Muzej grada Zagreba, 1992), 21. For the mills of Zagreb, see: Lisac, “Mlinarstvo Zagreba,” 217–290.

from 1257 in which a canon of the chapter, a certain Peter, gave three mills to the nearby Cistercian abbey. The recently settled citizens of Gradec were however highly dissatisfied with the donation and laid a complaint at the court of the ban of Slavonia, Stephen Gutkeled, against what was for them an unlawful donation. Stephen decided that two mills – the best and the worst of the three – would be left in the hands of the Cistercian abbey, while the third would be given to the townspeople of Gradec.²⁹⁶ This last mill remained in the hands of Gradec's citizens until it was confiscated by the ban of Slavonia, Nicolas Hahót because of the treason²⁹⁷ of its owner in the 1340s. The mill was then given to Stephen and Ákos, sons of the previous ban of Slavonia, Mikcs (*Mykch*, or Mikac – as he is referred to in Croatian historiography).²⁹⁸

The other problem that made it difficult for the two communities to share the water resource was the mill race dug out on the initiative of the community of Gradec. This construction diverted much of the water from the original riverbed of the Medveščak and created a second, artificial stream branch. This latter was referred to as *Pretoka* or *Prekopa*, while the main bed of the Medveščak was referred to as *Matična*. In 1346, the chapter of Zagreb laid a complaint against the citizens of Gradec in which they claimed that the channel destroyed the lands of the chapter.²⁹⁹ The representatives of the citizens of Gradec, however, claimed that the race was dug within the limits of their land. The decision was aggravated by a fire that burned every document concerning the privileges and the lands of the chapter of

²⁹⁶ *Petrus habuisset tria molendina a patre castri Grech, in aqua que dividit terram castri Grech a terra fratrum Zagrabiensium, que quidem archidiaconus sepe dictus ab antiquo possederat titulo empcionis. Verum pro bono pacis, mediante bano Stephano, exstitit ordinatum ut duo molendina de tribus, scilicet unum melius et aliud deterius, deberet habere archidiaconus antedictus, tercium vero molendinum, melius deteriori, deberent habere cives de Grech, suis usibus aplicatum.* MCZ, vol. 1. 26–27 no. 32. For the royal confirmation of the ban's decision, see MCZ, vol. 1, 29–30 no. 37. For Stephen: Zsoldos, *Archontológia*, 45.

²⁹⁷ Cf. Engel, *Archontológia*, vol. 1. 16.

²⁹⁸ *Preterea idem Nicolaus banus possessiones quorundam hominum, ut dicebant, infidelium domini regis, videlicet quoddam balneum in inferiori parte civitatis Zagrabiensis existens, cum omnibus domibus, utilitatibus et edificiis suis ac fundo curie in quo idem balneum existit et molendinum eorundem infidelium in eadem civitate in fluvio de suburbio castri Medue currenti situm.* MCZ, vol. 1. 169–171 no. 194. For Mikcs of Ákos: Engel, *Archontológia*, vol. 1. 16, and Antun Nekić, "Oligarchs, King and Local Society : Medieval Slavonia 1301–1343," (MA-thesis, Central European University, 2015), passim. For the bathing houses by the stream, see: Ivona Vargek, "Pleasure or Necessity? Zagreb Baths in the Middle Ages," (MA-thesis, Central European University, 2019).

²⁹⁹ *Accione eiusdem capituli ecclesie Zagrabiensis in facto possessionario contestata ad octavas festi Penthecostes tunc affuturas, prorogata, in quibus una accione ipsius capituli Zagrabiensis super facto cuiusdam fossati taliter proposita, quod ipsi hospites sub monte et in metis dicte civitatis de Grech quoddam fossatum propria eorum auctoritate et potencia fodere incipiendo et finem eius ad terram dicti capituli deducendo, quaedam aqua per ipsum fossatum deducta terram ipsius capituli destruxisset. In quorum contrarium, preallegatum fossatum et terram ad quam finis eius fossati perveniret, intra metas dicte civitatis procuratores eorundem hospitem adiacere allegarant.* MCZ, vol. 1. 445–452 [Addenda] no. 4.

Zagreb.³⁰⁰ There is however an important point, that the chapter never rose during the court case against the citizens of Gradec. Even if the channel that Gradec had dug lay within the border of the settlement, the citizens did not have the right to endanger farming on chapter lands.³⁰¹ This mill race existed up to modern times and can be clearly identified on maps, such as the one drawn by Nicholas Angielini, a well-known architect and map maker from the sixteenth century (see: Fig. 6).³⁰²

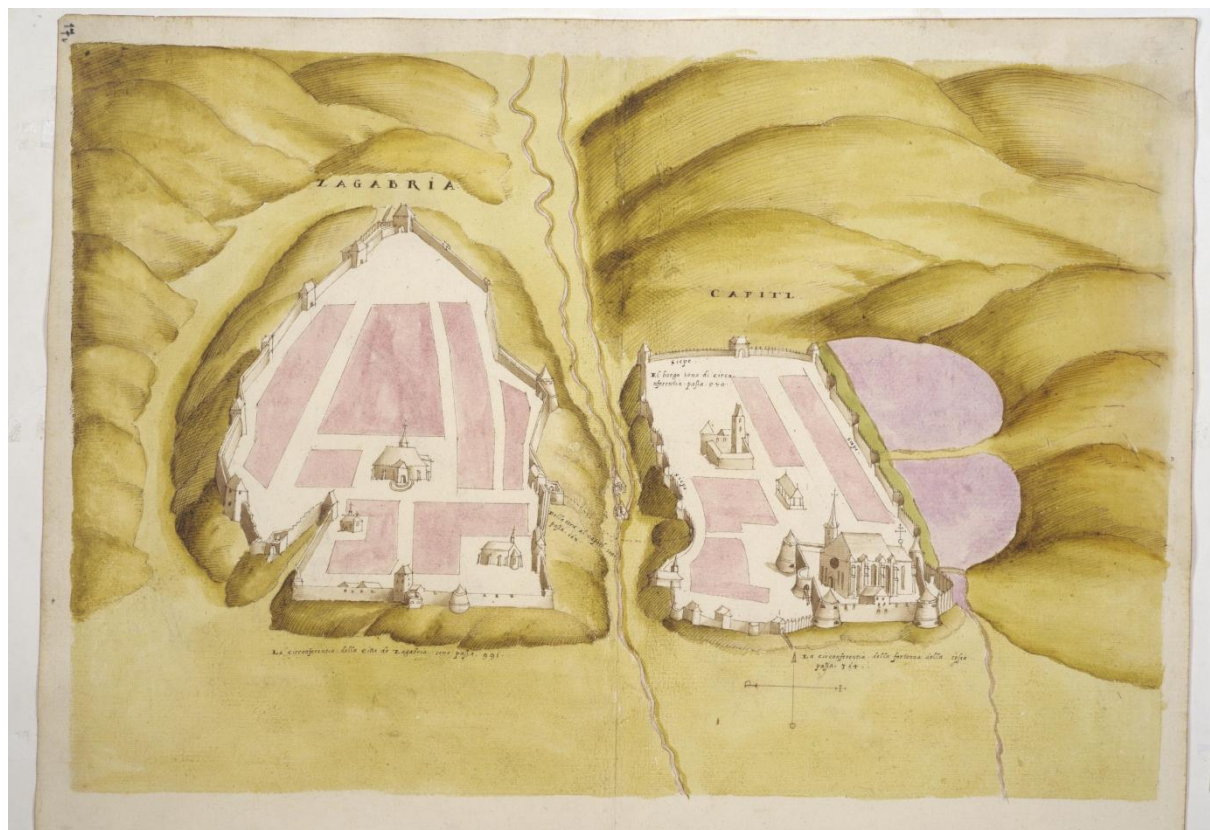


Fig. 6. Gradec, Kaptol, and the Medveščak Stream with the mill race on the manuscript map by Nicholas Angielini

³⁰⁰ *Ecce dominus Jacobus, dicte zagrabiensis ecclesie prepositus. tam pro se personaliter, quam cum procuratoriis litteris dicti capituli pro eodem capitulo comparando, se et ipsum capitulum cum preallegatis hospitibus super facto possessionario in causa fuisse et iam diu ventilatam et ad presentes octavas Epiphaniarum domini esse deductam, in qua eciam ipsum capitulum deberet instrumenta exhibere, astruendo universas litteras tam causales quam privilegiales tempore combustionis civitatis de Wysegrad (in con)servatoro domini Tbatamerii, Albensis ecclesie prepositi, in quo per magistrum Demetrium archydiaconum Zzagrabiensem, tunc procuratorem ipsius capituli repositae fuerant ad servandum, omnino fuissent concremate et amisse.* MCZ, vol. 1. 447 [Addenda] no. 4.

³⁰¹ Cf. Chapter 3.1.

³⁰² Österreichische Nationalbibliothek, Vienna, Handschriftensammlung, Cod. 8609. For Nicholas Angielini – Géza Pálffy, *Die Anfänge der Militärkartographie in der Habsburgermonarchie. Die regelmäßige kartographische Tätigkeit der Burgbaumeisterfamilie Angielini an den kroatisch-slavonischen und den ungarischen Grenzen in den Jahren 1560–1570 / A haditerképészeti tevékenysége a horvát-szlavón és a magyarországi határvidéken az 1560–1570-es években* (Budapest: Ungarisches Nationalarchiv / Magyar Országos Levéltár, 2011).

The frequent disputes between the two institutions may be easily understood considering the intensive exploitation of the small stream flowing between the two settlements. A perambulation from 1328 gives a detailed account of the mills that stood on the two branches (one natural and one artificial) of the stream. While checking the border, the surveyors headed from the south to the north along the Medveščak (*see* Figs. 6 and 7).³⁰³ The first relevant point mentioned from this chapter's perspective is the mill-place of the parish priest of the Saint Emeric Church. Moving along the stream against the current, the next two points of relevance here were the two mills of the "abbot of Zagreb". These mills are certainly the same as the mills of the Cistercians that were given to them in 1257 and left in their hands after the lawsuit against the citizens of Gradec. Above these two mills, the next point in the perambulation was the mill of the bishop by the same stream, followed by three more mills owned by the chapter and then again a mill of the bishop, followed by a further three chapter mills. Above this the two branches mentioned above – the artificially dug out channel and the old river stream bed – joined again. On the artificial riverbed flowing to the west and excavated by the citizens of Gradec, that the document tellingly calls the "real bed of the river" (*verum meatum ipsius rivuli*), had two further mills on it in the hands of the citizens, while in the natural and probably sometimes dry bed of the stream, was the "mill of the hermits" (*molendinum Heremitarum*). The hermits can be identified as Paulines, whose hermitage lay next to the town of Zagreb.³⁰⁴ Finally, mills – or a mill with multiple wheels – owned by the citizens of Gradec, stood on lands (*predium*) that Nicolas, son of Syrgarinus received from the chapter, also operated by the natural riverbed. Thus, there were at least fourteen mills and a mill-place established along a few-kilometer stretch of the not particularly bountiful waters of the divided Medveščak stream. These waters must have been among the most intensively used water flows in the territories studied for this dissertation

³⁰³ *Ad locum molendini super eodem rivulo sancti Emerici prope puteum, deinde per eundem rivulum sursum ad duo molendina abbatis de Zagrabia super eodem rivulo, que molendina ad metas capituli includuntur, deinde super ipsum rivulum ad tria molendina capituli, et dehinc ad molendinum damini episcopi, adhinc iterum ad tria molendina capituli, semper cum dicto rivulo in totum cum molendinis ad capitulum scilicet [?] Zagrabiensem ecclesiam pertinente, dehinc per verum meatum ipsius rivuli versus septentrionem pervenit ad duo molendina Grecensia, que aqua de dicto rivulo recepta ducuntur. Abhinc tendit per antiquum meatum sepe dicti rivuli ad molendinum Heremitarum, deinde per antiquum meatum ipsius rivuli transit quedam molendina Gracensia in vicinitate predii Nicolai*" MCZ, vol. 1. 129–130 no. 14. Cf. Igor Karaman. *Tisučljtni Zagreb* [Zagreb through a thousand years] (Zagreb: Školska knjiga, 1994) (map 20).

³⁰⁴ *Documenta Artis Paulinorum*, 3 vols, eds. Béla Gyéressy, and Ferenc Hervay (Budapest: MTA Művészettörténeti Kutató Csoportja, 1975–1978), vol. 3. 320–321, and 325. See also: Romhányi, *Kolostorok és társaskáptalanok*, 55.

research. The use of these waters remained a hotbed of hostilities between the citizens of Gradec and the chapter of Zagreb.

The disputes between the cathedral chapter and Gradec continued all throughout the fourteenth century. In 1392, however, they tried to come to an agreement that would have put an end to the disputes, which as we shall see was not a successful endeavor. In 1392, they nonetheless agreed, neither the chapter, nor the citizens of Gradec could erect mills in the lower section of the Medveščak stream – from the Dominican friary, to the Pisani or Krvavi (meaning “bloody”) Bridge.³⁰⁵ This was the southern (lower) section of the stream. The bridge was directly downstream from the place where the artificial mill race and the former natural stream of the Medveščak met. Upstream from this point, as the chapter had had its mills in this area since the thirteenth century, only they had the right to erect mills up to the mill of the Chupor family. Their mill stood in the southern part of the New Town (Nova Villa or Nova Ves). Above this point to the village of Gračani, a tenant peasant village founded by the citizens of Gradec, the latter town had the right to operate mills. Two institutions, the Cistercians and the parish priest of Nova Villa, had the right to keep their mills, as they had been there from the “old times”.³⁰⁶ The latter settlement’s mill is the same as the above-mentioned mill of the Paulines that the parish priests of Nova Villa came into possession of in 1376 in exchange for other properties.³⁰⁷

³⁰⁵ Cf. Nada Klaić, *Povijest Zagreba. 1. Zagreb u srednjem vijeku* [History of Zagreb, vol. 1. Zagreb in the Middle Ages] (Zagreb: SNL, 1982), 477.

³⁰⁶ *Molendina vero domini abbatis claustris beate Marie virginis de dicta Zagrabia inter predictas metas et signa metalia existencia, nos et ipsi cives in suo statu pacifico relinquimus et commisimus; (...) Hoc non pretermisso, quod incipiendo a predictis duabus metis prope dictum molendinum filiorum Chupor erectis usque predictarn villam Gracchan prenominati cives a parte occidentali in ipsorum territorio absque jmpedimento et destruccione molendini sancti Johannis Nove ville in porcione seu territorio ipsius civitatis existentis et habiti, molendina et alia edificia quotquot volunt, edificandi et construendi et aquam seu decursum aque ipsius rivuli de vero cursu in locis necessariis ad fossata excipiendi liberam habebunt facultatem.* MCZ, vol. 1. 341–345 no. 362.

³⁰⁷ MCZ, vol. 1. 250–254 no. 262.

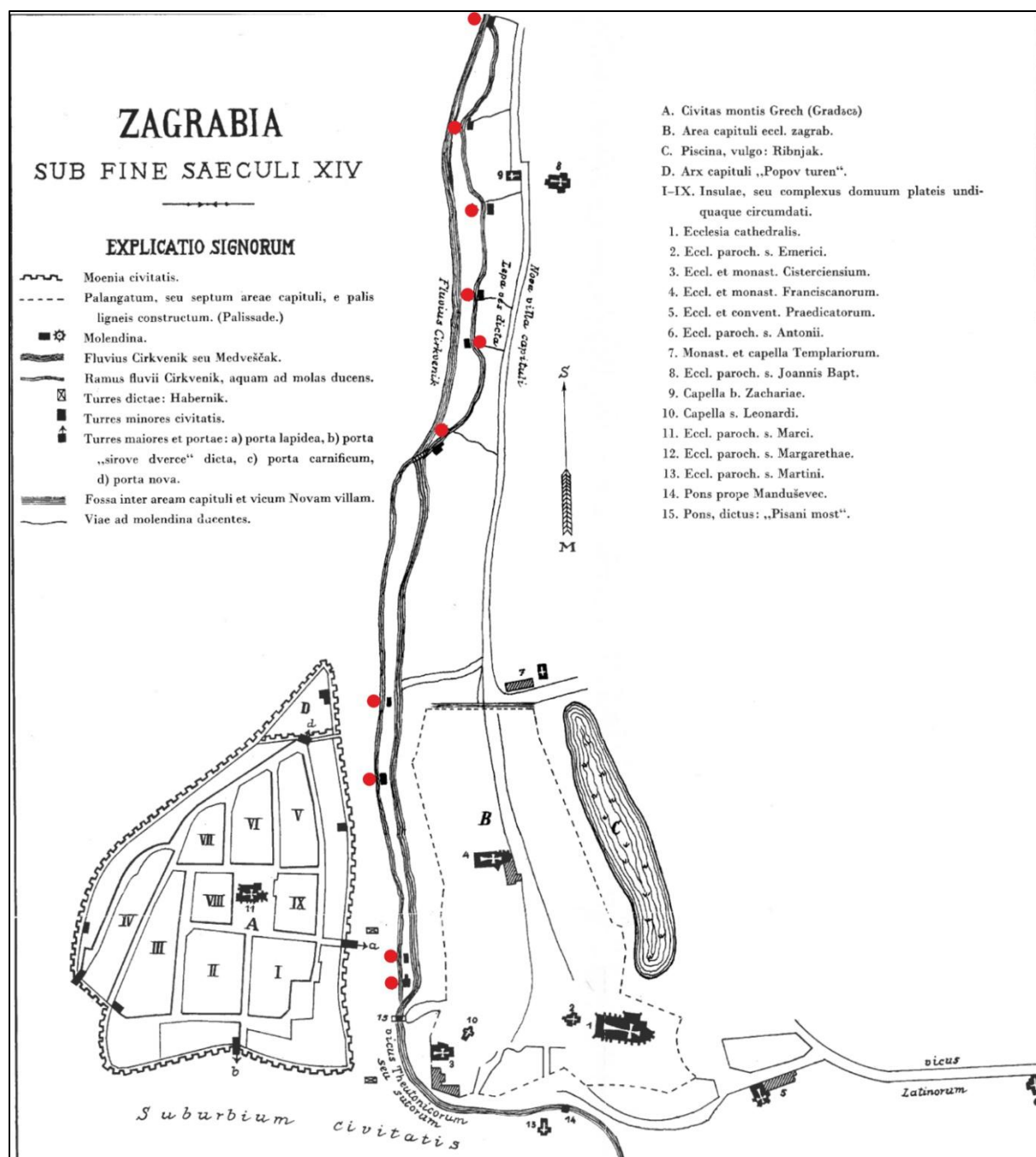


Fig. 7. The mills of Zagreb in the Middle Ages (after Igor Karaman)

In the 1420s, the struggles between Kaptol and Gradec seem to have reignited and took more violent forms than before. From 1422, a number of documents attest to bloody conflicts between the inhabitants of the two settlements.³⁰⁸ The hostilities seemed to have continued after the violent actions in 1422. In 1423, the citizens of Gradec were accused by a certain George, canon of the chapter of Zagreb, of, amongst other things, digging a ditch in

³⁰⁸ MCZ, vol. 2. 28 no. 30, 28 no. 31, 27 no. 29, 29 no. 31, 29 no. 31, and 28 no. 31 (ZsO, vol. 9. 171 no. 531, 172 no. 533, 221 no. 691, 235 no. 733, 237 no. 739, and 253 no. 795).

order to redirect the flow of the stream.³⁰⁹ Similar accusations came in 1475 but in reverse. This time, the inhabitants of the chapter town seem to have diverted the original river's flow towards their mills and fields, drying out the artificial channel used by the citizens of Gradec.³¹⁰

The example of the mills and the related disputes in Zagreb indicates how important small urban rivers and streams were for local economies. The River Sava, running in the vicinity of Zagreb was also exploited both for catching fish and building mills. It was also important in the southern defenses of the town. Nonetheless, the Sava mills were never the real motors of the local economy of Zagreb as they lay too far from the densely inhabited areas.³¹¹ Thus, despite the significant runoff and the potential for building ship mills, Medveščak stream lay at the center of the economy and town conflicts.

3.2.2.1. Budafelhévíz and its Hot Springs

The case of Budafelhévíz is similar to that of Zagreb in the sense that the settlement did not mostly profit from the major river flowing nearby but rather from a lesser stream. Budafelhévíz and its waters, as noted above, represent a special, but hardly unique example, not only because of the settlement lay next to the major town of Buda (and Óbuda), but also because the water flow at the center of its economy was fed by hot springs. One of the musts for anyone visiting modern Budapest is a visit to a thermal bath on the Buda side, many of which were founded in the Ottoman period.³¹² The thermal springs feeding these spas were known and used already before the Ottomans' arrival in the region in the mid-sixteenth century. The most important sign of this earlier knowledge is the settlement of Budafelhévíz. Its Latin name was *Aquae calidae superiores* (meaning "upper hot springs"). The area

³⁰⁹ *Fluvium Chirkvenik de suo cursu per idem fossatum fluere permisissent* MCZ, vol. 2, 44 no. 36. (the original of the document is lost)

³¹⁰ *Venerunt ad nos cives civitatis zagrabiensis in modo gravis querele, quomodo aquas ipsis ab antiquo spectatas violenti manu occuparetis, quod nostra credulitate de vobis non fuisset spectaturi, cum et alia colloquia habuimus simul, in quibus talia minime fuerunt perpetrata, sicuti domino Georgio de Bexin, bene notum est, quod nulla parciū alteri parti absque quod aliquod preiudiciū aut dampnum inferret, quod in nostri absencia minime observatum est, ex quo utique aliud non vultis, quam serenissime regie maiestatis civitatem iuribus privare et ipsos condemnare.* MCZ, vol. 2. 364–365 no. 295.

³¹¹ Karbić, and Bruno Škreblin, "Grad na rijeci."

³¹² Adrienn Papp, "Oszmán-török fürdők Budán – A Rudas és Rác fürdő régészeti kutatása (2004–2006)," [Ottoman bathing houses at Buda – archaeological research of the Rudas and Rác bathing houses, 2004–2006] in *A középkor és a kora újkor régészete Magyarországon*, 2 vols [Archaeology of the Middle Ages and the Early Modern Period in Hungary], eds. Elek Benkő, and Gyöngyi Kovács (Budapest: MTA Régészeti Intézet, 2010), vol. 1. 207–220, Adrienn Papp, "Fürdők a török kori Budán." [Bathing houses at Ottoman-period Buda] (PhD-diss., Eötvös Loránd Tudományegyetem, 2014).

between medieval Óbuda and Buda was particularly rich in thermal springs the usage of which date back to the Roman period.³¹³ The waters from some of these springs were backed up to form a small pond, probably by the thirteenth century at the latest. – This pond still exists today and is called Malomtó (meaning “Mill Lake”). It created an even water-level on the small stream that ran from the pond towards the Danube (*see* Fig. 8).³¹⁴ This stream, called Malom (“Mill”) Stream was no longer than circa one hundred meters. Because of the presence of the potential for water power, as well as its proximity to major markets, both in terms of population concentration and the most important wheat markets of Buda, the area was particularly attractive for building water mills. The places suited for milling, thanks to royal donations, were gradually transferred to ecclesiastic institutions, which were, as was also clear from the example of Zagreb (as well as other towns) were particularly keen on acquiring mills.

³¹³ Paula Zsidi, “A Duna szerepe Aquincum topográfiájában,” [The role of the Danube in the topography of Aquincum] *Budapest Régiségei* 41 (2008): 57–83.

³¹⁴ Nicolas Marcel de La Vigne, *Bvdae ac Pesti ichonographica descriptio tvm etia(m) earv(m) vicinarv(m), castrorv(m), aggerorv(m), fossarv(m), prospectv(m), nvda, ac recta scenographica delineatio, aliarvmve dictae Bvdae obsidionis particvlaritatv(m) à sac(ratissimi) caes(arei) mai(estatis) exercitv, eivsque praecelsorvm foederatorvm copiis factae* ([Vienna] [?], 1686). Held at: Budapesti Történeti Múzeum [Budapest History Museum], Metszettár [Collection of prints]. György Rózsa, *Budapest régi látképei. 1493-1800. Alte ansichten von Budapest* (2nd ed. Budapest: Új Művészet Kiadó, 1999), Cat. 27, 121, 150, and H. Bredekow, *Geometrischer Grundt-Riß der Neunmahl Bekriegten Undt Blutig Besiegten Königlichen Ungarischen Resitends Stadt Buda vel Offen* [Vienna] [?] 1686). Held at: Hessisches Staatsarchiv Marburg, Wilhelmshöher Kriegskarten, vol. 6. no. 20. See for their recent editions at: András Végh, *Buda I. kötet, 1686-ig* [Buda, I. Until 1686] (Magyar Várostörténeti Atlasz, 4) (Budapest: Budapesti Történeti Múzeum, Pázmány Péter Katolikus Egyetem Bölcsész- és Társadalomtudományi Kar Régészeti Tanszék, and Archaeolingua Alapítvány, 2015). For these representations, see also: Adrienn Papp, “Török kori lőpormalom Budán,” [Ottoman-period gunpowder mill at Buda] *Keletkutatás 2015* (Tavaszi [Spring]): 105–113.



Fig. 8. Felhévíz and the Malomtó (Millpond) represented on two late seventeenth-century illustrations (by H. Bredekow)

The conflicts around the use of the waters of this very small stream are particularly well documented mostly because of the above-mentioned interests of church institutions. While the archives of medieval Buda are almost completely lost, the archives of the monastic and other ecclesiastic bodies that functioned in the territory of present-day Budapest are much better preserved. This is particularly true for the documents of the Dominican nuns of Margaret Island, who had numerous interests in the water related incomes in the surroundings of their nunnery.³¹⁵ In the case of Budafelhévíz, not only are the sources particularly well preserved, but one of the great connoisseurs of medieval Buda and Pest, András Kubinyi,

³¹⁵ Cf. István Kenyeres, "The Fate of the Medieval Archives of Buda and Pest," in *Medieval Buda in Context*, 52–68.

dedicated a monographic study to the development of this medieval settlement.³¹⁶ Following in his footsteps, a number of studies also addressed the issue of the mills erected here.³¹⁷

The earliest institutions with interests in using the waters at this spot were the Dominican nuns of Margaret Island and the Holy Spirit Hospital. The latter institution lay close to the pond and was most probably founded on royal initiative. The hospital not only had mills on the Malom Stream, but also built a bathing house, common extensions of hospitals in medieval Europe. It is safe to assume that the presence of the hot springs was the most important factor in their choosing to settle at Felhévíz.³¹⁸ The earliest reference to a mill in the area comes from somewhat earlier than the first data on the Holy Spirit Hospital, the existence of which can only be confirmed from the end of the first third of the fourteenth century.³¹⁹ The first mill established by the pond belonged to a certain Peter, son of Uza of the Kurszán clan, who donated an mill at Felhévíz to the Dominican nuns some time before 1276.³²⁰ The next mill by this short stream mentioned in the sources is particularly interesting from the point of view of what has been discussed in Chapter 3.1. The mill, called Hévízfő (meaning the “head of hot spring”), probably stood by the outflow of the pond. However, at the time of the donation (or actually the leasehold) by King Charles I, there was no standing mill, and the document which tells of the transaction did not refer to the site as a *locus molendini*, which could have implied the previous presence of a mill but rather as an “empty mill plot” (...*nos quemdam vacuum fundum molendini Hevezfeö vulgariter nuncupatum*).³²¹ The mill was given to citizens of Buda, who built not one but two wheels there, which

³¹⁶ András Kubinyi. “Budafelhévíz topográfiája és gazdasági fejlődése,” [Topography and economic development of Budafelhévíz] *Tanulmányok Budapest Múltjából* 16 (1964): 85–180 (published under the same title in *Tanulmányok Budapest középkori történetéről*, vol. 1. 115–182).

³¹⁷ Benda, “A kereskedelem épületei a középkori Budán, 3,” Szende, “Mills and Towns,” and Végh, *Buda*.

³¹⁸ For hospitals in medieval Hungary, see: Judit Majorossy, and Katalin Szende, “Hospitals in Medieval and Early Modern Hungary,” in *Europäisches Spitalwesen. Institutionelle Fürsorge in Mittelalter und Früher* (Neuzeit Quelleneditionen des Instituts für Österreichische Geschichtsforschung, 5), eds. Martin Scheutz et al. (Vienna and Munich: Oldenbourg, 2008), 409–454. For the Holy Spirit Hospital, see: Lajos Pásztor, *A magyarság vallásos élete a Jagellók korában* [Religious life of the Hungarians in the Jagiello age] (Budapest: [N.p.], 1940), 53 and 56, Zoltán Somogyi, *A középkori Magyarország szegényügye* [Taking care of poors in medieval Hungary] (Palaestra Calasanciana, 37) (Budapest: Stephaneum, 1941), 37–48, and Kubinyi, “Budafelhévíz,” 123–129. More recently, see: Judit Lászlai, and Adrienn Papp, “Investigations in the Budafelhévíz baths,” in *Régészeti kutatások Magyarországon 2007 / Archaeological Investigation in Hungary 2007*, ed. Júlia Kisfaludi (Budapest: Kulturális Örökségvédelmi Hivatal and Magyar Nemzeti Múzeum, 2008), 63–84.

³¹⁹ MES, vol. 3. 157–158. Végh, *Buda*, 49. See also: Kubinyi, “Budafelhévíz,” 123–124.

³²⁰ BTOE, vol. 1. 151, 181, 241–242, and 246. Kubinyi, “Budafelhévíz,” 130 note 336 raised that in the latter confirmation mills are referred to in the plural. He suggested that the other mills may have been elsewhere, but this probably only is the traditional plural that is prevailing in similar lists of utilities and belongings. Cf. Chapter 2.

³²¹ CD, vol. 8/4. 369–372 no. 182. For the first reference of a standing mill there, see: CD, vol. 8/4. 292–294 no. 134.

according to the related documents, stood in separate buildings.³²² None of these mills stayed in the hands of citizens of Buda for long, as in the 1360s, after a lasting lawsuit, they finally came into the hands of the Poor Clares convent in Óbuda, which enjoyed the strong support of the mother of King Louis I, Elisabeth of Poland.³²³ There was at least one further mill erected in this location. This mill was in the possession of the royal castle of Óbuda from the mid-fourteenth century onwards. The mill's exact location, however, remains unclear. The earliest references to the mill locate it between two other mills by which the document certainly means two of the above-mentioned mills on the Malom Stream.³²⁴ Later documents, however, are less clear about its location. In 1389, the mill is described as being close to the Holy Spirit Hospital,³²⁵ while in 1420, the mill is mentioned as standing close to the Danube and the lands of the Poor Clares of Óbuda.³²⁶ The localization of the mill is further complicated by two documents dating to 1430, in which the mills are said to stand by the bath house of the nuns of Margaret Island.³²⁷ As the localization of these buildings is anything but precise, for a want of better information and based on the reference that it stood between two mills, I suggest this mill was also built by the Malom Stream. In the meantime, some of the mills that were built here in the course of the late fourteenth century were probably abandoned or fell into disrepair. This situation is suggested by a donation of three mills or mill sites to the Poor Clares of Óbuda granted by King Sigismund. The nature of the donation of Sigismund is somewhat unclear as the documents in some cases refer to three mills, while in other instances are called mill-places.³²⁸ It is likely that the nuns then erected new mills or rebuilt them since

³²² CD, vol. 8/4. 292–294 no. 134, and CD, vol. 8/4. 369–372 no. 182.

³²³ Herta Bertalan, "Das Klarissinnenkloster von Obuda aus dem 14. Jahrhundert," *Acta archaeologica Academiae Scientiarum Hungaricae* 34 (1982): 151–176, and Brian McEntee, "Queen Elizabeth of Hungary (1320–1380) and Óbuda: Patronage, Personality and Place," in *La diplomatie des états Angevins : aux XIIIe et XIVe siècles / Diplomacy in the countries of the Angevin Dynasty in the thirteenth – fourteenth centuries : actes du colloque international de Szeged, Visegrád, Budapest : 13–16 septembre 2007*, eds. Zoltán Kordé, and István Petrovics (Rome and Szeged: Dipart. di Storia Ungh. del Medioevo e della prima Età Moderna Univ. degli Studi di Szeged and Accademia d'Ungheria in Roma Istituto Storico "Fraknói", 2010), 209–218 (with reference to the prolific literature in the topic).

³²⁴ *Eiusdem molendini in Calidis Aquis prope Ecclesiam hospitalis Sancti Spiritus Budae inter duo molendina in ipsis Calidis Aquis existentia habitum*. MNL OL DL 5289. See also: MNL OL DL 6370, 6625, 6755 with locating it to the same place. Cf. Végh, *Buda*, 55 (locating it to the latter place).

³²⁵ *Molendinum in qualidis aquis existens circa sanctum Spiritum*. MNL OL DL 7564, edited in: BTOE, vol. 3/1. 38–39 no. 91.

³²⁶ *Quoddam molendinum in fluvio Calidarum aquarum superiorum a parte Danubii habitum religiosus dominabus sanctimonialibus claustris beate virginis de Veteribuda*. MNL OL DL 10 956, edited in BTOE, vol. 3/2. 50–51 no. 771.

³²⁷ *Molendini in superioribus Calidis aquis, in fine eiusdem aque prope balneum religiosarum dominarum sanctimonialium de Insula ieporum*." MNL OL DL 12 317. (erroneously indicated as MNL OL DL 12 327 at Kubinyi, "Budafelhévíz," 131 note 339). BTOE, vol. 3/2. 161 no. 978 and MNL OL DL 12 325, edited in: BTOE, vol. 3/2. 163 no. 982.

³²⁸ MNL OL DL 15119, edited in CD, vol 11. 70–73 no. 20, and BTOE, vol. 3/2. 298 no. 1189. Cf. Kubinyi, "Budafelhévíz," 131.

when the mills were again illegally confiscated on the order of the treasurer, Michael Gúti Ország, by a member of his noble retinue, Nicholas Szász (*Zaaz*), they were referred to as standing mills.³²⁹ One of these mills was then given to Anthony, a glassmaker from Buda.³³⁰ Despite the attempts of the Poor Clares to get their mill back, they finally agreed to lease the mill (this time again referred to as a mill-place) to Anthony.³³¹ András Kubinyi has shown that it similarly took great efforts by the Poor Clares to get back the remainder of their former mills (mill-places at the time).³³² The fifteenth century brought numerous further lawsuits. These, however, exclusively concerned property rights rather than water rights. By the early sixteenth century, because of the number of mills, waves of lawsuits were brought to the royal courts addressing the right to use the waters of the Mill Stream by different property owners. At least one mill was rebuilt by the Poor Clares themselves, and their third mill-place was also leased. One further ecclesiastical institution, the chapter of Buda, appears as a mill owner in a document dated to 1481. According to this document, their mill was seized by the court judge of Buda, Benedict Pider, on the orders of King Matthias.³³³ It probably is not a complete coincidence that the most important element on the coat of arms of Pider acquired not much before, is a mill wheel, possibly an allusion to his previous occupation.³³⁴ Pider's mill stood between the mill of the castle of Óbuda and a mill owned by the Poor Clares suggesting the above mentioned, not clearly localized mill of the Óbuda castle, also lay somewhere on this short stream, probably upstream from the mills of the Poor Clares. The large number of functioning mills led to water use conflicts from the early sixteenth century onwards.

The first of the three lawsuits analyzed by Kubinyi took place in 1502. The Poor Clares laid complaint against a man called Caspar Zsemlyesütő (meaning “bun baker”) who moved the sluice of the nuns' mill. As is clear from this document, Zsemlyesütő – whose relative, Andrew also possessed a mill at Felhévíz – had raised the height of the sluice, backing the stream waters so much, that it flowed back to the mill of the nuns, hindering its

³²⁹ MNL OL DL 13179, edited in BTOE, vol. 3/2. 299. no. 1192.

³³⁰ MNL OL DL 13 188, edited in BTOE, vol. 3/2. 300 no. 1194. Katalin Holl-Gyürky, “The Use of Glass in Medieval Hungary,” *Journal of Glass Studies* 28 (1986): 77–78.

³³¹ MNL OL DL 13 207, edited in BTOE, vol. 3/2. 302–303 no. 1199. The lease contract: MNL OL DL 13 299, edited in BTOE, vol. 3/3. 309–310 no. 1214.

³³² Kubinyi, “Budafelhévíz,” 131.

³³³ Kubinyi, “Budafelhévíz,” 131.

³³⁴ His grant of arms from 1476: MNL OL DL 50 534. Edited in *Monumenta Hungariae Heraldica. Magyar czimeres emlékek*, 3 vols, eds. Antal Áldásy, and László Fejérpataky (Budapest: Franklin, 1901–1926), vol. 2. 61–62. Cf. Dániel Kálmán, “A középkori magyar armálisok címerei 1437–1490 között,” [Coats of arms of the medieval Hungarian grants of arms between 1437 and 1490] in *Micae mediaevales V. Fialat történészek dolgozatai a középkori Magyarországról és Európáról* [Studies of young historians on medieval Hungary and Europe] (ELTE BTK Történelemtudományok Doktori Iskola Tanulmányok – Konferenciák, 9), eds. Laura Fábíán et al. (Budapest: ELTE BTK Történelemtudományok Doktori Iskola 2016), 149–150.

operation.³³⁵ The nuns reasoned that the height of their mill sluice was the same as it had been in the old days (*veteri et antiquo*), which in light of what has been discussed in Chapter 3.1, is no surprise. The efforts of the Poor Clares proved successful over the long run as in 1509 Zsemlyesütő was forbidden to cause further damage to the nuns' mill property. The rebuilding – or as it turns out, the extension of the mill into a two wheeled mill – of the nun's mill that followed this decision was an opening move in a new lawsuit. The other two ecclesiastical institutions, the Dominican nuns and the chapter of Buda sued the Poor Clares for having decreased the water-levels in the Malomtó (Mill Lake) that according to them belonged to all the mills. The numerous – almost fifty – witnesses – amongst them probably not by chance bun-bakers and millers³³⁶ – claimed that both the mill of the Dominican nuns and that of the chapter of Buda had lost a significant part of their water-supplies and that grinding the same amount of grain took almost twice as long as it had previously. The document testifies to the presence of a fairly complex water system which included underground water cisterns (*cisternas subterraneas*) as well as channels (*canales*) that brought water to the Poor Clares' mill.³³⁷ The palatine, Emeric Perényi, in whose court the case was heard, decided that the Poor Clares should restore the hydrological conditions predating their intervention. Not much later, a group – again including millers – investigated whether the Poor Clares had completed their task, but not surprisingly found that the work had come to a halt.³³⁸ The lawsuits continued at Felhévíz, probably not independently from completing the restoration works on the Poor Clares' mill. In 1511, Caspar Zsemlyesütő sued the nuns again because the mill he held as a lease, the royal mill (the previously mentioned mill of the castle of Óbuda), suffered losses because of the restoration works carried out by the nuns. While the investigation showed no diminution in the output of Zsemlyesütő's mill, he nonetheless received 20 gold florins from the Poor Clares as compensation, while another institution, the chapter of Buda, probably because of the earlier losses they suffered, received 50 gold florins from the nuns.³³⁹

The numerous charters that document the long-lasting struggles to control the waters of the short Malom Stream demonstrate how important water was as a property, even close to major rivers such as the Danube. Hot waters, of course, were not the only important resources at Budafelhévíz, but throughout Europe, where waters froze over in winter,³⁴⁰ these

³³⁵ MNL OL DL 22 546.

³³⁶ See: Chapter 4.

³³⁷ MNL OL DL 26 131. Kubinyi, "Budafelhévíz," 135.

³³⁸ MNL OL 22 014, edited with omissions in: Knauz, "Budai regeszták," 50–52 no. 77.

³³⁹ Kubinyi, "Budafelhévíz," 135 note 355. See also: Knauz, "Budai regeszták," 72 no. 94.

³⁴⁰ E.g. the case of the mills along the River Tapolca around Pápa: István Wöller, *A Tapolca vízimalmi Pápán és környékén* [The water mills of the River Tapolca at Pápa and its surroundings] (Fejezetek Pápa város

watercourses were amongst the most contested of water resources because of their value in building water mills as well as bath houses.³⁴¹

3.2.3. Urban Moats and Water-Use³⁴²

As demonstrated in the previous two subchapters, even in the Kingdom of Hungary, where urbanization, or at least the number of people living in major settlements lagged well behind Western Europe or Byzantium, water use was a crucial issue in urban space and every potential water was exploited by local economies. There has been research on a variety of uses for rivers of different sizes but there was another kind of water body that was present in many towns in Europe but only partially discussed in the literature in the context of water-use, that is, moats. Moats surrounding medieval towns (and castles) were important elements in their defenses. However, by the late medieval period, the overwhelming majority of towns in Western and Central Europe had expanded well beyond their walls.

With the ever-growing population in the suburbs as well as with increasing economic production in towns, moats gradually merged into the urban fabric. Not everywhere, and not always to the same extent, but in many cases, moats became part of urban economies. They were used in at least three different spheres of urban economies: for milling and, less frequently, as fish ponds, and as sites for ports. These uses of moats have received considerably less attention in the scholarship than their military and architectural aspects since the available sources seldom refer to their non-defensive uses. This paucity of information, however, does not mean that there are no references to these secondary uses of moats in regional urban contexts. This subchapter will provide an overview of moats and their water use based on cartographic and written evidence. I will then focus on two towns in the territory of medieval Hungary, Sopron and Prešov. I will argue that moats were also systematically

történetéből, 1) (Pápa: Pápa Város Önkormányzata, 1994), or by the River Hévíz at Oradea: Renáta Skorka, “A váradi ferences rendi kolostorok topográfiája,” [Topography of the Franciscan friaries of Oradea] in *Nagyvárad és Bihar az Anjou-korban* [Oradea and Bihar in the Angevin period] (Tanulmányok Biharország történetéről, 5), ed. Attila Zsoldos (Nagyvárad: Varadinum Kulturális Alapítvány, 2018), 175–181 and 281 (map).

³⁴¹ Magnusson, and Squatriti, “The Technologies of Water in Medieval Italy,” 253–254.

³⁴² Parts of this subchapter have already been published: András Vadas, “Economic Exploitation of Urban Moats in Medieval Hungary with Special Regard to the Town of Prešov,” *Mesto a Dejiny* 6 no. 2 (2017): 6–21, and idem, “Városárkok és vízgazdálkodás a késő-középkori Közép-Európa városaiban,” [Urban moats and water management in the towns of Central Europe in the Late Middle Ages] *Urbs. Magyar Városhistória Évkönyv* 10–11 (2015–2016): 323–353.

exploited in medieval urban economies and should not be regarded only as defensive elements.

There are very few monographs and edited volumes that discuss urban moats, but there is a relative rich literature on the urban fortifications at individual settlements.³⁴³ This research was either published as individual studies or as chapters in ‘town biographies’. Urban archaeology concentrated on the study of fortifications that protected medieval towns. This can partly be attributed to the fact that in many cases the only town parts that were relatively accessible for archaeological excavation in towns were fortifications because were not built over, even in modern towns. Accordingly, dozens of German, Austrian, Czech, Polish or Hungarian studies address the building histories of the urban fortifications of specific settlements based on archaeological data, in some cases complemented by the analyses of the iconographic and/or written evidence. However, there is an almost complete gap on the economic aspects of medieval (urban) moats. Richard Holt, in a previously mentioned study on the aquatic economies of medieval England even if only shortly, refers to the building of moats around castles, manor houses and towns. He points to two important aspects of moats. First, in England, moats were just as much prestige investments as defensive constructions³⁴⁴ and second, that they were used in the local economies. He shows that in England most moats used ground waters and only the more significant ones were fed by flowing waters through ditches. He gives the example of the moat of medieval Birmingham, that the moat was used as mill pond. However, he suggests Birmingham’s moat was more an exception than a rule. British research has also pointed to the moats used as ports.³⁴⁵

In the French territories, a historian of technology, André Guillerme referred to moats in a comparative perspective. Choosing some settlements in present-day France, he provides analyses of the relationship between towns and water. The monograph employs methods from two fields, the history of technology and environmental history. Guillerme is one of the few authors who address the problem of the different needs of the local economies and defensive needs when it came to use of moats in local economies. He demonstrates that the period

³⁴³ E.g. *Die Befestigung der mittelalterlichen Stadt* (Städteforschung, A 45), eds. Gabriele Isenberg, and Scholkmann, Barbara (Cologne, Weimar, and Vienna: Böhlau, 1997), Oliver Creighton, and Robert Higham, *Medieval Town Walls. An Archaeology and Social History of Urban Defence* (Stroud: Tempus, 2005), or *City Walls: the Urban Enceinte in Global Perspective*. ed. James D. Tracy (New York: Cambridge University Press, 2000). For East Central Europe, see the overview of Teodor Octavian Gheorgiu, *Cetatile oraselor: apararea urbana în centrul si estul Europei în Evul Mediu* [Castle towns: urban defense in Central and Eastern Europe in the Middle Ages] (București: Editura Simetria, 2000).

³⁴⁴ Holt, “Medieval England’s Water Related Technologies,” 79ff.

³⁴⁵ Mark Gardiner, “Hythes, Small Ports, and Other Landing Places in Later Medieval England,” in *Waterways and Canal-Building*, 90.

starting with the Hundred Years' War in France brought fundamental changes in the exploitation of urban waters. From that time, military aspects were to dominate over economic interests for a long period.³⁴⁶ This is relevant in the context of the Kingdom of Hungary, as a somewhat similar process can be observed in the context of the Ottoman-Hungarian wars. A widely debated monograph, by Charles Coulson is worth mentioning here, not so much in the context of towns, but rather castles and their moats. He considers defenses built around castles in late medieval France, England, and Ireland to be primarily prestige investments.³⁴⁷ With that he breaks with traditional approaches in the study of these buildings from an architectural history perspective.³⁴⁸ As he saw castle fortifications as prestige objects he also addressed what economic benefit these investments could have had. Coulson refers to a number of examples of moats exploited in local economies. In the overwhelming majority of the cases, however, monographs and studies on the fortifications of towns address very little more than register the presence of urban moats. They seldom include specific references concerning the way the moats were used or the way waters were regulated to provide moats with a constant water supply. Before turning to a brief overview of the research carried out in Hungary on urban fortifications, and moats in particular, reference must be made to a valuable research aid that will be used extensively in this subchapter, the volumes of the European Historic Town Atlas Series. The more than 550 atlases produced for individual settlements is one of the best tools for studying the economic exploitation of moats in pre-modern Europe. As for mills, moats are also, more or less, systematically registered in the volumes.³⁴⁹

Hungary, as most regions in Europe, lacks any comprehensive work on (urban) moats and to my knowledge no such literature exists for moats in neighboring countries.³⁵⁰ There is a considerable gap in the scholarly literature on the defensive structures of towns in medieval Hungary. In recent years, fortifications in Transylvania, including urban fortifications were

³⁴⁶ Guillerme, *The Age of Water*.

³⁴⁷ Charles L. H. Coulson, *Castles in Medieval Society Fortresses in England, France, and Ireland in the Central Middle Ages* (Oxford: Oxford University Press, 2003).

³⁴⁸ For the problem, in a mostly German context, see Matthias Untermann, "Erscheinungsformen der Stadtbefestigung," in *Die Befestigung der mittelalterlichen*, 3–25.

³⁴⁹ On the series, see: *Lords and Towns in Medieval Europe, the European Historic Towns Atlas Project*, eds. Annagret Simms, and Howard B. Clarke (Farnham: Ashgate, 2015), and Nick Millea, Keith Parry, and Adrian Phillips, "The European Historic Towns Atlas Project," *IMCoS Journal* no. 153 (2018): 26–36. For the atlases published so far: <http://www.historictownsatlas.org.uk/content/bibliography> (last accessed September 26, 2019)

³⁵⁰ See for exceptions, the example of Freistadt in Upper-Austria: Elisabeth Gruber, *Raittung und außgab zum gepew. Kommunale Rechnungspraxis im oberösterreichischen Freistadt. Edition und Kommentar der Stadtgrabenrechnung (1389–1392)* (Vienna: Böhlau, 2015), and on Vienna: Ferdinand Opll, Heike Krause, and Christoph Sonnlechner, *Wien als Festungsstadt im 16. Jahrhundert. Zum kartografischen Werk der Mailänder Familie Angielini* (Vienna, Cologne, and Weimar: Böhlau, 2017), esp. 176–177.

reviewed in a number of publications.³⁵¹ There is a less exhaustive catalogue of the castles and urban fortifications in sixteenth-century Hungary³⁵² as well but these works can hardly be said to comprehensively cover the medieval Kingdom of Hungary geographically or chronologically. There are a number of county castle cadastres that have been gathered in the past decades but they seldom refer to moats. Most of the relevant literature has been written on the fortification systems of individual towns such as Pest, Trnava, Košice, Sopron, or Kőszeg where archaeological excavations have been carried out.³⁵³ Despite excavations taking place in recent years on urban fortifications, with the exception of the urban moat of Sopron, these excavations revealed little information on moats.³⁵⁴ The dissertation of the architect Péter Rabb provided an overview of the urban fortifications in medieval Hungary. Although very briefly, he did refer to moats. His work, however, has limited applicability as primary sources were entirely disregarded by the author as well as to a large extent archaeological excavation results.³⁵⁵

3.2.3.1. Building Moats, Using its Waters – A Short Overview

By the late medieval period, most of the major towns in Western Europe were not only surrounded by a wall but also possessed a protective moat, an indispensable element in the defense of settlements from the period of the widespread use of firearms.³⁵⁶ This rather self-

³⁵¹ Adrian Andrei Rusu, *Castelarea Carpatică. Fortificații și cetăți din Transilvania și teritoriile învecinate (sec. XIII–XIV)* [Carpathian Castelaria. Fortifications and citadels in Transylvania and the neighbouring territories] (Cluj-Napoca: Editura Mega, 2005), and Ákos Karczag, and Tibor Szabó, *Erdély, Partium és a Bánság erődített helyei* [Fortified places in Transylvania, Partium and Banate] (2nd ed. Budapest: Semmelweis, 2012).

³⁵² Endre Marosi, *XVI. századi váraink, 1521–1606* [Castles in 16th-century Hungary] (Miskolc: Hungária-Európa Alapítvány and Borsod-Abaúj-Zemplén Megyei Levéltár, 1991).

³⁵³ For an overview of the results: Katalin Szende, “A Kárpát-medence középkori városainak régészeti kutatása az elmúlt két évtizedben,” [Archaeological research into medieval towns in the Carpathian Basin since 1990] in *A középkor és a kora újkor régészete Magyarországon*, vol. 1. 149–150. For earlier research see also: Imre Holl, “Feuerwaffen und Stadtmauern. Angaben zur Entwicklung der Wehrarchitektur des 15. Jahrhunderts,” *Acta Archaeologica Academiae Scientiarum Hungaricae* 33 (1981): 201–243.

³⁵⁴ Imre Holl, “Sopron középkori városfalai,” [Town walls in medieval Sopron] *Archaeologiai Értesítő* 94 (1967): 155–183, 95 (1968): 188–205, 98 (1971): 24–44, 100 (1973): 180–207. The most important from the point of view of this chapter is 95 (1968): 198–204. On the fortification of the towns in Slovakia with reference to moats: Martin Miňo, “Niekoľko postrehov k fortifikačným prvkom miest stredoslovenskej banskej oblasti,” [Some notes on the fortification elements of central Slovakian mining towns] *Archaeologia historica* 36 (2011): 289–302. On Banská Bystrica: Igor Graus, “Vývoj fortifikácie Banskej Bystrice do konca 16. storočia v podmienkach špecifík pasívnej obrany stredoslovenských banských miest,” [Development of the fortifications of the town of Banská Bystrica until the end of the 16th century under the specific conditions of passive defense of the Middle-Slovakian mining towns] *Vojenská história* 4 (2000): 3–21.

³⁵⁵ Péter Rabb, “Városi védművek a középkori Magyarországon, 2 vols,” [Urban fortifications in medieval Hungary] (PhD-diss., Budapesti Műszaki Egyetem, 2005), on fortification moats, see vol.1. 47–48.

³⁵⁶ See: Guillaume, *The Age of Water*.

evident character of moats is clearly reflected in the architectural treatise of the Italian humanist, Filarete. According to his treatise the building of the ideal town begins as follows:

“I have ordered that, the first thing tomorrow morning, everyone is to come with mattocks, shovels, and picks. I want you to be the first to begin the work of digging the moats. These will be ten braccia away from the wall. I think they ought to be 30 braccia wide if the dimensions are satisfactory to you. As soon as this is done the moat should be walled up on both sides. The wall toward the city will be as high from the ground as the battlements of the wall, that is, three braccia high from the ground level, and then the battlements. On the opposite side, it will only be as high as ground level, no more no less.”³⁵⁷

Although the Italian treatise was probably never a basis for the building of towns in medieval Hungary, the text was not unknown here either. Filarete’s work was translated into Latin and preserved in one of the codices in King Matthias’s library, the Bibliotheca Corviniana.³⁵⁸ The most important lesson within the text as far as moats are concerned relates not so much to the circulation of the text but rather to the fact that by the fifteenth century it was self-evident that a town had to possess more complex fortification system than a wall. Of course, as with many fortification elements, the role of moats in the self-representation of a community, as a prestige investment, should also be considered.³⁵⁹ Moats however were significant investments that had little short-term benefit. Probably this is the reason the author of a chronicle of the lives of bishops of Auxerre chose a rather unconventional way to argue why Hugo of Noyers, an influential bishop at the turn of the twelfth and thirteenth centuries, ordered one of his smaller residences to be surrounded by a moat:

“Because it was unprotected and was vulnerable to the attacks of plunderers [Hugo of Noyers] rebuilt the old walls, and constructed moats and high towers in order to fortify Varzy, his famous town. Next to Saint Eugene’s Church he erected new buildings for the bishopric with strong walls, great houses, towers and bastions. In order to protect the bishops, he built even stronger walls, with more solid walls, towers and outworks. The inner keep boasted towers, fortifications and advanced defenses of impregnable strength, surrounded by wide, spring-filled

³⁵⁷ *Filarete’s Treatise on Architecture : Being the Treatise by Antonio di Piero Averlino, Known as Filarete*, 2 vols, ed. John R. Spencer (New Haven, CT: Yale University Press, 1965), vol. 1. 52–53.

³⁵⁸ Norbert Mátyus, “Filarete és Bonfini. Egy humanista építészeti tankönyv Itáliában és Magyarországon,” [Filarete and Bonini. A humanist architectural treatise in Italy and Hungary] in *Techné. A szakképzés módszerei az ókorban és a középkorban* [Techné. Forms of crafts’ knowledge transfer in the Ancient Times and the Middle Ages], eds. Márta Munding, Kornél Szovák, and László Takács (Piliscsaba: Avicenna Közel-Kelet Kutatások Intézete, 2018), 345–370.

³⁵⁹ Holt, “Medieval England’s Water Related Technologies,” 79–82.

ditches. Thanks to the abundance of [water] sources that feed the moat it is not only no small augmentation of the fortifications, but, by reason of the multitude of fish they provided, by the mills the bishop built there, and other profitable assets, they greatly improve the entire establishment.”³⁶⁰

There is limited information available on the building costs of fortification moats, but based on an account from Sopron from 1540 to be discussed in Chapter 4 and similar sources from Austria (Freistadt), their construction probably represented a significant financial burden. Unlike town walls, moats had the potential to generate income since their waters could be exploited in the ways noted above. This was not merely a potential source of exploitation. In dozens of towns in Europe moats were considered a well defined, predictable source of income. In order to have at least some insight on how general it was to use moats in local economies I studied the volumes of the European Historic Town Atlas series. I had access to 337 atlases when preparing this subchapter of the dissertation. This sample provides a relatively good geographical coverage to see whether it was normal to use moats as milling waters and as fish ponds, or rather exceptional. Of the studied 337 settlements, 207 possessed some kind of at least partly artificial – that is dug – protective ditch, and of these, 136 had moats, filled with water at least part of the year. Of the roughly fifty percent of the towns where moats appear, there were attempts to use the moats in the local economies. However, due to lack of sources, the use of moats as fish ponds was only seldom mentioned while these atlas being, more or less, systematic in discussing and representing mills (from cadastral maps). Of the 76 towns where moats had connected mills, there were two different positions for mills on moats (as in the case of Sopron to be discussed hereafter). Mostly, mills were built on a rather arbitrarily chosen section of the moat. In roughly one third of the cases however, the mills and their sluices may have served as the main element in the regulation of the water-levels in stretches of the moats themselves. In some cases, of course, mills could be found in both positions on urban moats. Providing the moats with a constant water flow was a crucial issue because if water-levels remained low for long periods they could easily silt up

³⁶⁰ *Castrum suum nobile Varziacum, quod, propter loci immunita, prius frequentibus patebat depredantium incursibus, muros reparando antiquos et fossas turribus ingentibus circumsepsit. Domos episcopales juxta ecclesiam beate Eugenie muro solido, magnificis edificiis, turribus ac propugnaculis a primis condidit fundamentis. Presidium quoque episcopale ulterius muro solidiori, turribus munitioribus et antemuralibus in tutam et ad expugnandum difficilem munitionem provexit, et fossis mire amplitudinis vallavit in girum, in quibus, grata aquarum exuberantia ex fontibus circumfluentibus eas replens, non modicum facit ad munitionis augmentum; et tum ex piscium multitudine qui ibi nutriuntur optimi, tum ex molendinis que edificavit ibidem, tum ex aliis utilitatibus suis, episcopo totique municipio multe commoditatis existunt.* Louis M. Duru, *Bibliothèque historique de l'Yonne; ou, Collection de légendes, chroniques et documents divers pour servir à l'histoire des différentes contrées qui forment aujourd'hui ce département*, vol. 1 (Auxerre: Perriquet, 1801), 431–450, and Coulson, *Castles in Medieval Society*, 70.

and clearing them could be expensive (see the example of Sopron). Most towns tried to create moats with an constant water circulation water in them.³⁶¹ The permanent flow of water was even more important in moats used for keeping fish. This was probably a widespread practice in medieval Europe but it is rather rare to find references to moats as places to keep fish in the secondary literature. Town monographs sometimes make reference to the problem, but no such systematic study was carried out for the more than 300 towns in the atlas series. On the one hand, there are indications that fish keeping in moats occurred at individual settlements from relatively early on. Just to mentioned but to well known examples, both at Quedlinburg, and at Vienna a number of sections of the moats were rented out to different fisheries, suggesting the practice was not unique.³⁶²

Urban history in Hungary in the last half a century has been preoccupied with what makes a town a town. If the presence of stone walls is accepted as one of the most important features of a *civitas*, there were only a few dozen towns in the region before the fifteenth century, and even by the early sixteenth century, there may not have been more than ca. fifty such settlements.³⁶³ There is less information on the moats that surrounded these towns as, just as in other parts of Europe, most had been filled in by Modern times as these towns expanded well beyond their medieval limits. Which of these moats were filled with water and which were dry can, in the majority of the cases, be inferred based on hydrogeographic conditions. Despite the fact that there were only about fifty towns surrounded by stone walls in medieval Hungary, there were a good number of towns and villages that had earth and wood fortifications or wooden palisades, in many cases combined with moats. If these settlements are also considered, there were probably well more than a hundred protective moats around settlements and castles in the Kingdom of Hungary by the end of the Middle Ages. The gradual occupation of the Ottomans from the beginning of the sixteenth century started a new wave of fortification construction as well as moats in the Carpathian Basin. Some of these towns certainly used their moats both as milling waters and as fisheries, something I shall demonstrate for two free royal towns, Sopron and Prešov.

³⁶¹ For similar data from Hungary, see: Jankovich, “Adatok a Körösvidék középkori vízrajzához,” 323.

³⁶² Otto Brunner, *Die Finanzen der Stadt Wien: von den Anfängen bis ins 16. Jahrhundert* (Vienna: Dt. Verl. für Jugend u. Volk. 1929).

³⁶³ András Kubinyi, “Városhálózat a késő középkori Kárpát-medencében,” [Urban network in the late medieval Carpathian Basin]. *Történelmi Szemle* 46 (2004): 17–18, and see the detailed overview of the relevant research history: Bálint Lakatos, *Mezővárosi oklevelek: Települési önkormányzat és írásbeliség a késő középkori Magyarországon, 1301–1526* [Market town charters. Urban autonomy and literacy in late medieval Hungary] (Budapest: Bölcsészettudományi Kutatóközpont Történettudományi Intézet, 2019), 11–16. See also: Rabb, “Városi védművek,” esp. its appendix. Many of its data have to be modified in light of the recent work: Karczag, and Szabó, *Erdély, Partium és a Bánság*.

3.2.3.2. The Case of Sopron

The first example is the town of Sopron on the western border of the Kingdom of Hungary.³⁶⁴ The town has a rather peculiar settlement history; it originates from a Roman settlement called Scarbantia. The Roman town was encircled by a wall in the Late Roman period. After the Romans left Pannonia in the early fifth century, the fortification was abandoned for centuries; however, when in the tenth century, Hungarian settlers inhabited the area, the fortification was still visible. Hence a royal stronghold, adding a timber and earthwork rampart to the Roman fortification was founded there sometime in the eleventh century. Several villages that served the military and administrative population were established in the vicinity of the fortified area. However, in the thirteenth century, the settlement's function changed. The fortified area was transformed into a royal town, and plots of regular sizes were measured out there and in the suburbs as well.³⁶⁵ The walled area, with its significant civic population, became one of the best protected Hungarian towns with a triple wall system and a moat. The archive of the town has the richest holdings concerning the Middle Ages and the Early Modern times in the territory of present-day Hungary. Archaeological research has also been carried out in the area of the fortifications.³⁶⁶

³⁶⁴ Jankó, Kücsán, and Szende, *Sopron*, Gazetteer: 2 (legal status), 7 (population), 26 (mills). References to archival data on mills can be found in this publication.

³⁶⁵ Katalin Szende, "Neighbourhoods, Suburbs and Ethnic Quarters in the Hungarian Towns of the Thirteenth to Fifteenth Centuries," in *Cities – Coins – Commerce: Essays presented to Ian Blanchard on the Occasion of his 70th Birthday*, ed. Philipp Robinson Rösener (Stuttgart: Franz Steiner Verlag, 2012), 43–64.

³⁶⁶ Jankó, Kücsán, and Szende, *Sopron*.

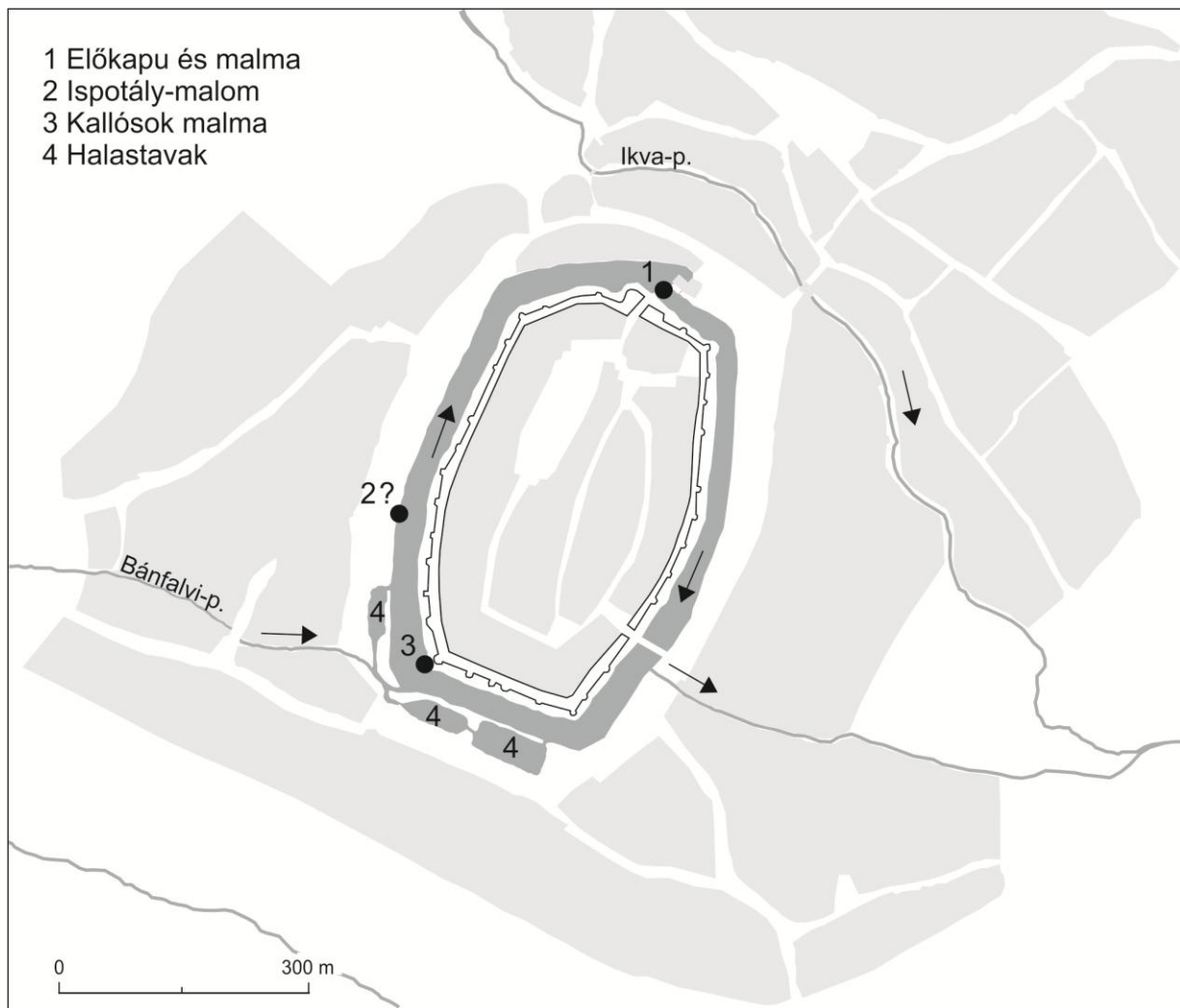


Fig. 9. The town of Sopron in the late medieval period with the urban moat, the fish ponds and the approximate location of the mills
(1 – Foregate and its mill; 2 – Hospital Mill; 3 – Fullers' Mills; 4 – Fish ponds)

Sopron, despite the fact that it had more than 4000 inhabitants by the late medieval period, was not rich in waterways. There were two streams flowing through the territory of the town, the northwest-southeast running Ikva Stream, that carried more water and crossed the town on the north and the Bánfalvi- or Rák Stream that ran west-east. Not only the moat but also both streams were exploited for building water mills from the Middle Ages onwards.³⁶⁷ Because of geomorphologic conditions, the Bánfalvi Stream was used for feeding water to the town's moat. The water from the stream circulated around the moat through a sluice system.³⁶⁸ The town was surrounded by a moat some time in the middle of the fourteenth century. In 1340, King Charles I supported the construction of the moat by

³⁶⁷ Szende, "Mills in Towns," 496 – 497, Jankó, Kücsán, and Szende, *Sopron*, passim and 82 (Gazeteer: Mills).

³⁶⁸ Imre Holl, "Sopron (Ödenburg) im Mittelalter," *Acta Archaeologica Academiae Scientiarum Hungaricae* 31 (1979): 110–119.

providing the town with half of the income from the customs paid at Lake Fertő.³⁶⁹ The grant only mentions *fossatum*, but does not describe whether it should be a moat or only a ditch. Scholars think the ditch or moat was completed by 1344 but this date is only approximate based on the fact that Charles I granted this income for five years of construction. One of the most important elements of the moat was the sluice that regulated the water-levels on the western side of the moat. It was part of the building complex of the Foregate (see Chapter 4 as well) at the northernmost point of the fortification. According to a fragmented account book from 1437, a mill was also connected by then to the building.³⁷⁰ Probably this was the largest mill on the moat but certainly not the only one. In 1438 and in the following year, the Hospital Mill (*Spitalmühl*) also appears in the sources. It stood in the western side of the moat in a rather favorable position, right next to the grain market (*Kornmarkt*).³⁷¹ From the sixteenth century onwards, more mills were built into the moat and sources refer to the mills of the fullers. According to an entry in the account book of the town from 1589, the fullers had a new mill built in the southwestern part of the moat, which ran with three wheels.³⁷² The number of mills rose further in the seventeenth century as well.³⁷³

The moat in Sopron was not used for milling activities but also for keeping fish as attested in the sources. The first reference to fish also dates to the fifteenth century and is preserved in the so-called Notebook (*Gedenkbuch*, a mixed content, municipal book). According to an entry from 1496, the town council decided to withdraw Jacob Pilsner from taking care of the fish ponds (or rather small inlets).³⁷⁴ Based on the entry, it is clear that the

³⁶⁹ MNL OL DF 201 756, January 16, 1340. Házi, *Sopron*, vol. 1/1. 76–77 no. 136.

³⁷⁰ *Item dem Vlreich zimermann hab ich geben 4 tagion per 20, das er dy rinnen zu der mul bey dem voderntor hat gemacht, facit LXXX den.* Házi, *Sopron*, vol. 2/3. 83 no. 10.

³⁷¹ *Item Thomas Zenikel vnd Johannes Zeniekel geprueder von gурmennt rugent an stat ir selbs auf die nachgeschriben stucken vnd gueter auf halben tail [von wegen Stephan des Zeniekel purger zu Odenburg vnd fr(awen) Margareten die dann sein hausfr(aw) gewesen ist] von erst auf ain mayerhoff gelegen am Korenmarkt vor der Stat Odenburg zenachst der spitalmül. Gerichtsbuch. Birósági Könyv 1423–1531 (Sopron Város Történeti Forrásai, A/2), eds. Jenő Házi, and János Németh (Sopron: Győr-Moson-Sopron Megye Soproni Levéltára, 2005), 107–108 no. 29 (1438). See also *Gerichtsbuch*, 117 no. 43 (1440). *Item desselben tags hab ich geben dem Hanns mulner, das er an der mül im graben geczimert hat, dem hab ich becztalt IX taglon per XX, facit VI sol. den.* Házi, *Sopron*, vol. 2/3. 345 no. 23 (1440–1441), and the tax paid by the miller, Hanns: Házi, *Sopron*, vol. 2/3. 345 no. 27 (1442).*

³⁷² On the fulling mills see: István Dávidházy, “A soproni posztókallók,” [The fulling mills of Sopron] *Soproni Szemle* 43 (1989): 193–205. This is taken over by Jankó, Kücsán, and Szende, *Sopron*, 27 Fig. 10. For the exact site of the mill, see recently: József Kücsán, “A Várkerület belső ívének beépítése, 1766–1801,” [The building up of the inner line of the Grabenrunde, 1766–1801] *Soproni Szemle* 69 (2015): 329, and 331. Fig. 5.

³⁷³ Dávidházy, “A soproni posztókallók,” *passim*.

³⁷⁴ *Anno domini M CCCC Im LXXXXVI-ten Jare Am mitichen Goczleichnambsabent habenn die herrenn den Teicht Im Attengraben so etwan Cristoff härb seliger gehabt hat Widerumb von dem Erberen Jacob pilsner eingenommen vnd Im <vnd seinen Erben,> all versessen Zynns so gemainer stat da von gefallen werdenn gancz nachgelassen, Auch da für gebenn das allt Od gemeir hinder des Khörnmarkh gelegenn mit garten vnd annder aller zugehorung des Nachper ist des Jacob Joachim seligen einsetz, vnd an der anderen seitten Wolfgang Osterperger Einseczs ledig vnd frey Actum vtsupra. Gedenkbuch. Feljegyzési könyv 1492–1543 (Sopron Város*

three basins where fish were kept had been created earlier. The basins were located between the row of houses of present-day Ógabona Square and Újteleki Street, and got their water from the Ditch of the Fullers, which was connected to the moat itself.³⁷⁵ The use of the fish basins did not cease in the late fifteenth century but were probably used well up to Early Modern times. In 1570, a complaint was laid, according to which the mill belonging to the houses by the *Lange Zeile* had caused great losses to the fisheries and therefore should not be re-installed. The *Lange Zeile* was connected to the southern part of the Inner Town, and was probably associated with the ponds mentioned earlier.³⁷⁶ It is not clear what source of the conflicts was, but was probably related either to the amount of the water let into the channel by the mill owners or pollution from the mill. The small ponds are not only mentioned in these sources but can also be identified on views of the Early Modern town (see: Fig. 10). The final source for the fisheries in the moat dates to the early seventeenth century. The last entry of the rather unique (auto)biography of the mayor of the town, Christoph Lackner, concerns the fisheries in the town: “in the same year [in 1618] to the great benefit and in a good manner he had the fish pond cleaned which had been filled with mud from the side of the new tower, and had it strengthened all around with pales and fences.”³⁷⁷ The lake mentioned here can be located in the southern part of the town – also visible on the town views. It lay here well up to the eighteenth century.³⁷⁸ It is quite clear that the moat in Sopron was intensively integrated within the local economy and represented an important part of town water-use. Despite the relatively rich source material, the only water use conflict we know of was that between the mill owners along the *Lange Zeile* and the owners of the fisheries. However, not only could

Történeti Forrásai, A/3), eds. Károly Mollay, and Károly Goda (Sopron: Győr-Moson-Sopron Megyei Levéltár Soproni Levéltára, 2006), 60 no. 61 (June 1, 1496). See also: Dávidházy, “A soproni posztókallók,” Fig. 10, and Jankó, Kücsán, and Szende, *Sopron*, 27 Fig. 10, and 82 (Fish ponds). For the fish keeper see also: Károly Mollay, “A Tómalom középkori előzményei (Fejezet a soproni határ történetéből),” [Medieval predecessors of the Tómalom (An episode from the history of the borders of Sopron)] *Sopron Szemle* 46 (1992): 154.

³⁷⁵ See also: József Tirmitz, and Anita Szakács, *Sopron város tanácsa bírósági jegyzőkönyveinek regesztái I. 1533–1554* [Summaries of the protocols of the court of law of the town of Sopron, 1] (Sopron: Győr-Moson-Sopron Megye Soproni Levéltára, 1996), 8 (preface of the editors).

³⁷⁶ Anita D. Szakács, *Sopron város tanácsa bírósági jegyzőkönyveinek regesztái III. 1570–1579* [Summaries of the protocols of the court of law of the town of Sopron, 1] (Sopron: Győr-Moson-Sopron Megye Soproni Levéltára, 2011), 21–22 no. 2 (MNL GyMSML SL IV. A. 1002. a. III. 309–310. p.).

³⁷⁷ *Eodem anno piscinulam, e regione turris novae coeno refertam, denuo fructuose et utiliter expurgari fecit, circumquaque palis et sepibus bene munivit. Lackner Kristófnak, mindkét jog doktorának rövid önéletrajza. Vitae Christophori Lackner I. U. D. Homini, brevis consignatio* (Sopron Város Történeti Forrásai, C/5), ed. Gergely Tóth (Sopron: Győr-Moson-Sopron Megyei Levéltár Soproni Levéltára, 2008): 138–139 cap. 38. See also: Gergely Tóth, “Előre megírt emlékezet: Lackner Kristóf különös önéletrajza,” [The memory written untimely: the curious autobiography of Kristóf Lackner] in *Lackner Kristófnak, mindkét jog doktorának rövid önéletrajza* 16, and 31.

³⁷⁸ Mátyás Bél, *Sopron vármegye leírása / Descriptio Comitatus Semproniensis*, 3 vols (Sopron Város Történeti Forrásai, C/4), ed. Katalin Mária Kincses (Sopron: Soproni Levéltár, 2006), vol. 3. 172–173 and 186–187. Cf. Jankó, Kücsán, and Szende, *Sopron*, 82.

the different ways waters could be exploited lead to conflicts, but as I shall show in the following subchapter so did the various needs of a town and the citizens who tried to exploit the waters of a moat.

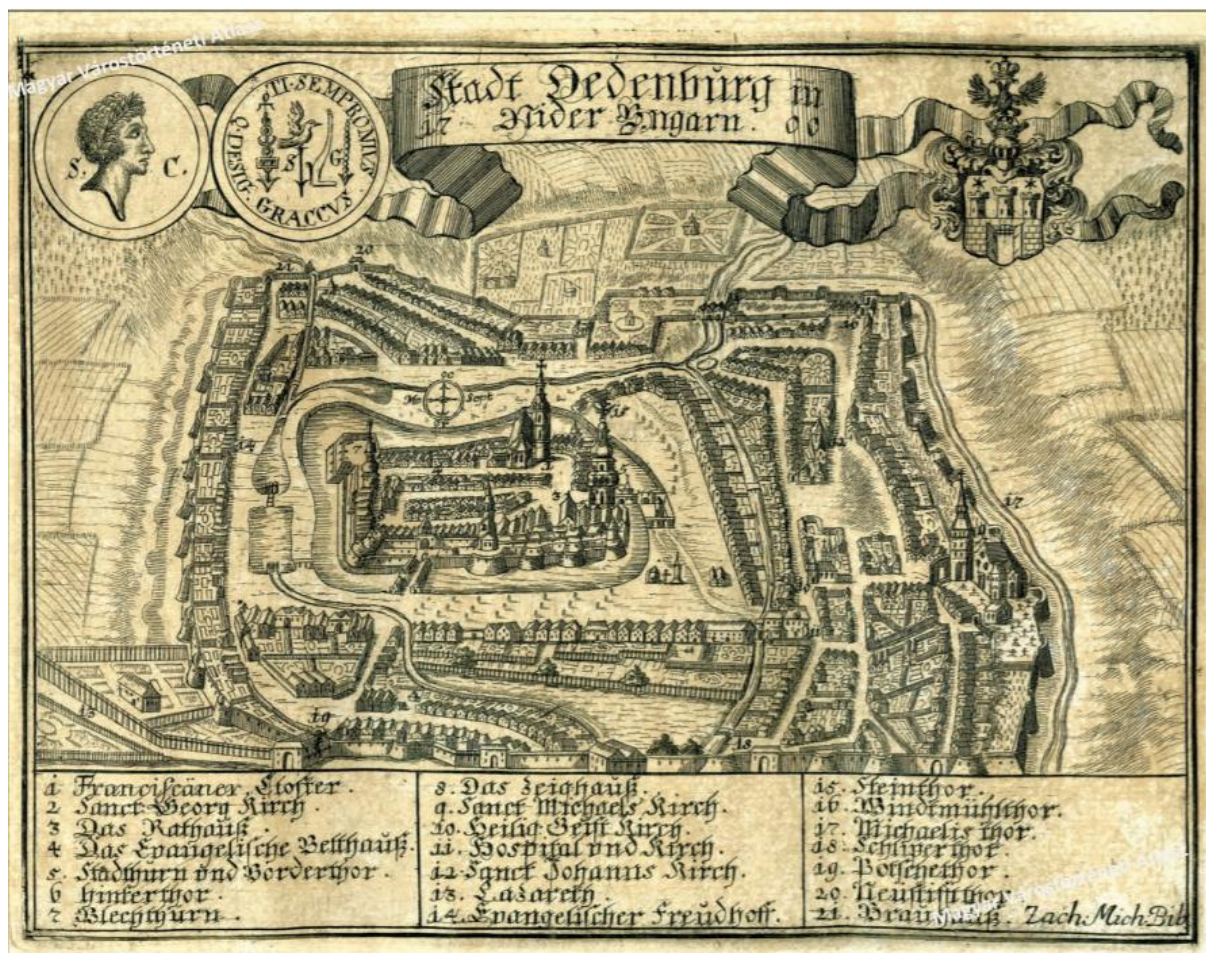


Fig. 10. Zacharias Michel's Bird's eye view of Sopron in 1700 (after Jankó, Kücsán, and Szende, *Sopron*, Plate C.4)

3.2.3.3. The Case of Prešov

This subchapter will focus on the town of Prešov, a town in the northeastern part of medieval Hungary. As with Sopron, the use of defensive moats in the local economy is well documented. In this case, the analysis of the mills and the moat can also help significantly in reconstructing urban topography and the town's development. The town began to grow somewhat later than Sopron. The first references to the settlement date back to the thirteenth century. At this time, it was already in royal hands although no data exists on the wider

freedoms of the settlement which then probably not significant at all. Nonetheless, importantly, the settlement core already lay in the area of the later town, something suggested earlier but recently confirmed through archaeological excavations.³⁷⁹ It probably grew to be a rather significant settlement in the late thirteenth and the early fourteenth century. The town lies by an important trade route that connected Lesser Poland with the Kingdom of Hungary. By the late medieval period, the town of Prešov belonged to a group of Hungarian towns that enjoyed the widest possible liberties (that is free royal towns) despite the fact that it never was among the most populous settlements in the country.

The building history of the urban fortifications of Prešov is probably amongst the best-known from the territory of medieval Hungary. This is not primarily due to its conservation as virtually nothing remains of the medieval fortifications, but because of the particularly detailed written evidence on the fortifications preserved in the local archives, and only partially exploited in recent years historians. Apart from medieval documentary evidence, Early Modern visual source material also significantly contributes to our understanding of the structure of the fortification.

Both Hungarian and Slovak researchers showed an interest in the medieval history of the town, however, not independent of the survival of the medieval sources, only some questions were highlighted in this research.³⁸⁰ Since the fundamental two-volume publication by the archivist Béla Iványi on the medieval records of the Prešov's archive, research has drawn on the substantial evidence published in his work.³⁸¹ Using this rich source material, a number of works have been dedicated to different aspects of the history of the town, from its ethnic composition through its legal history to some elements of the urban topography from the beginning of the twentieth century. The most important works until recently were based

³⁷⁹ Marián Uličný, and Peter Harčar, "Počiatky mesta Prešova na základe výsledkov najnovších archeologických výskumov," [The origins of the town of Prešov deduced from the results of the latest archaeological research] *Archaeologia historica* 35 (2010): 393–403.

³⁸⁰ See most importantly the monograph of the town: *Dejiny Prešova*, 2 vols [The history of Prešov], ed. Imrich Sedlák (Košice, and Prešov: Východoslovenské Vyd. v Košiciach – Muzeum Slovenskej Republiky Rád v Prešove, 1965) vol. 1, and Alžbeta Gácsová, "Spoločenská štruktúra mesta Prešova v 15. storočí a v prvej polovici 16. storočia," [The social structure of Prešov in the 15th century and in the first half of the 16th century] *Historický časopis* 18 (1970): 347–378. See also: Marcela Domenová, "Daňové písomnosti a sociálno-ekonomické pomery mesta Prešov v období stredoveku," [Tax lists and socio-economic processes in the town of Prešov in the Middle Ages] in *Zborník vedeckých prác katedry ekonómie a ekonomiky Anno 2009* [Proceedings of scientific works of the Department of Economics, University of Prešov in 2009] (Prešov: Prešovská univerzita, 2009), 231–255. See more recently: Marcela Domenová, "Prešov," in *Lexikón stredovekých miest na Slovensku* [Historical lexicon of Slovakian towns], eds. Martin Štefánik, and Ján Lukačka (Bratislava: Historický ústav SAV, 2010), 331–351. For the early sixteenth century: Marcela Domenová, "K hospodáreniu mesta Prešov na základe daňovej-účtovnej knihy z rokov 1528–1537," [To the economy of Prešov on the basis on the book of income and expenditure from the years 1528–1537] *Annales Presovienses* 11 (2011): 25–59.

³⁸¹ *Eperjes szabad királyi város levéltára, 1245–1526*, 2 vols [Archive of the free royal town of Prešov], ed. Béla Iványi (Szeged: Szegedi Városi Nyomda és Könyvkiadó, 1931–1932).

on the testaments that survived in relatively high numbers from the late medieval period. However, these documents do not add to our image of urban fortifications or their economic exploitation.³⁸² Recently, a Hungarian historian, László Szabolcs Gulyás, gathered some data on the history of the fortifications of the town, mostly based on Iványi's collected materials.³⁸³ However, he made no reference to the moats. Since he focused on the Middle Ages, he made no use of town views either, a relatively rich source from the seventeenth–eighteenth centuries which help in the identification of some of the medieval topographical elements connected to moats.³⁸⁴

There are a number of questions that are not clear with regard to Prešov's fortification moats which could be important for the history of the town in general. Precisely when was the town surrounded by a moat? Did it fully surround the town and was it filled with water? Following this train of thought, how was the moat exploited in the local economy? As I will show in the coming subchapter, sources on the construction and the extension of the moat of Prešov can contribute to our understanding of the growth of some Central European towns connected to long-distance trade routes in the fifteenth century, as well as show how the use of the moat by individuals led to conflicts with the town.

The thirteenth-century settlement may not have been much more significant than a village but probably due to its favorable location by the eastern route connecting newly emerging centers in the region, Kraków and Buda, it grew in importance as a trading post, along with Košice.³⁸⁵ Košice, in all likelihood, became important somewhat earlier than Prešov, from the end of the thirteenth century and continued to grow both in terms of its privileges and importance throughout the late medieval period.³⁸⁶ With the emergence of

³⁸² Katalin Szende, "Gyermekek, testvérek, házastársak. Családi viszonyok és örökösödési szokások Eperjesen a középkori végrendeletek tükrében," [Children, siblings, spouses. Family ties and testamentary practices in Prešov in light of medieval last wills] *Történelmi Szemle* 46 (2004): 113–140 (with reference to the author's other works in the topic). See also: Marcela Domenová, "Prešovské testamenty do roku 1526. (Diplomaticko-obsahový rozbor)," [The last will from Prešov until 1526 (diplomatic content analysis)] *Historica Carpatica* 33 (2002): 29–68.

³⁸³ László Szabolcs Gulyás, "Városfalépítés a középkori Eperjesen," [Town wall construction at medieval Prešov] in *Falak és választóvonalak a történelemben* [Walls and division lines in history] (A Nyíregyházi Főiskola Történettudományi és Filozófia Intézete Kiadványai. Terminus Könyvek, 1), eds. Attila Buhály, Gábor Reszler, and György Szoboszlay (Nyíregyháza: Nyíregyházi Főiskola Történettudományi és Filozófia Intézet, 2014), 127–142.

³⁸⁴ Béla Szalai, and Lajos Szántai, *Magyar várak, városok, falvak metszeteken, 1515–1800*, 3 vols [Hungarian castles, towns and villages on cuttings] (Budapest: Múzeum Antikvárium, 2006), vol. 2. 70–72.

³⁸⁵ On the routes, see: Katalin Szende, "Kraków and Buda in the Road Network of Medieval Europe," and István Draskóczy, "Highways between Buda and Kraków," in *On Common Path*, 31–37, and 38–41 respectively.

³⁸⁶ Erik Fügedi, "Középkori magyar városprivilegiumok," [Medieval Hungarian urban privileges] *Tanulmányok Budapest múltjából* 14 (1961): 27–28, and more recently, see: Attila Zsoldos, "The Path of Košice to the Privileges of 1347," and Boglárka Weisz, "The legal background of the trade life of Košice in the Middle Ages," in *Košice in the Coordinates of European History*, eds. Mária Hajduová, and Martin Bartoš (Košice: Kancelária Ústavného súdu Slovenskej republiky, 2013), 34–49, and 94–111 respectively, Boglárka Weisz, "Kassa

Košice, Prešov may also have gradually developed some importance. However, references to the early history of the town are not very marked in the sources. The fact, however, that the first known initiative to surround the settlement with a wall dates back to as early as 1370 reflects the fact that Prešov also grew relatively quickly. The source is a mandate issued by King Louis I the Great to the nobility of Sáros County to provide lime, stone, and wood to build the walls of Prešov.³⁸⁷ Although suggested in part of the secondary literature, the document does not refer to either a ditch or a moat – that was probably only dug somewhat later.³⁸⁸ By the first third of the fifteenth century, however, Prešov was certainly surrounded by a moat as well. This is clearly reflected by the tax list of 1428 which refers to the taxpayers of the houses “by the ditch” (*in fossato*). Whether this was a moat or only a dry ditch, the tax list of course does not reveal.³⁸⁹ The town’s expenses concerning the building of the ditch in 1429 provide further proof of the existence of a more complex fortification system for the town. As will be highlighted later, the mills referred to as standing by the moat leave no doubt that by this time the town, at least on its western side, was protected by a moat.³⁹⁰

Another source, likewise from the period of King Sigismund’s reign, also contains a good number of details about the fortifications, and especially the urban moat. In a charter from 1435, Sigismund gave permission to reconstruct the fortifications of the town in response to the recurrent Hussite threat.³⁹¹ The walls of the town as well as the moat were then extended. The extension of the moat, however, created a problem. At this time, there were at least two water mills that depended on the moat’s water. When the moat was

kereskedelmi életének jogi háttere a középkorban,” [The legal background of the trade life of Košice in the Middle Ages] in *Arcana tabularii: Tanulmányok Solymosi László tiszteletére*, 2 vols [Studies in honor of László Solymosi], eds. Attila Bárány, Gábor Dreska, and Kornél Szovák (Debrecen and Budapest: ELTE BTK, 2014), vol. 2. 899–908.

³⁸⁷ MNL OL DL 41 829.

³⁸⁸ Kornél Divald, and Béla Iványi, “Az eperjesi Szent Miklós-templom,” [The St Michael’s Church at Prešov]. *Az Országos Magyar Szépművészeti Múzeum Évkönyvei* 4 (1924–1926): 38.

³⁸⁹ MNL OL DF 228 604, edited in: *Eperjes*, vol. 1. 79–92 no. 211, for the inhabitants of the Ditch Street, here: 90–92. The row of houses in tax lists were recurrently referred to as standing by the moat. E.g., MNL OL DF 228 989. 6. p. (1486) or MNL OL DF 229 008 (1488). See on these tax lists: Domenová, “Daňové písomnosti.”

³⁹⁰ *Item dedimus XX, den. pro reformatione pontis circa molendinum medians inter alia duo molendina*. MNL OL DF 228 612. See also *Eperjes*, vol. 1. 93–103 no. 220, for the relevant part, here: 97–98.

³⁹¹ MNL OL DF 229 042, for its at some points erroneous editions, see: Carolus Wagner, *Diplomatarium Comitatus Sarosiensis* (Posonii and Cassoviae: Sumtibus Joannis Michaelis Landerer, 1780), 228–231 no. 17 and CD, vol. 10/7. 656–659 no. 305. Its regesta: *Eperjes*, vol. 1. 109–110 no. 237. On the case, see: *Dejiny Prešova*, vol. 1. 94, Norma Urbanová, *Prešov. Pamiatková rezervácia – Prešov* [Monument guide: Prešov] (Pamiatky mestských rezervácií, 8) (Bratislava: Tatran, 1986), 10–15 and Árpád Nógrády, “A középkor végi Magyarország mindennapi kenyere (Beregszász lakosságának gabonavásárlásai 1530-ban és a Jagelló-kori malomvámok),” [The everyday bread of Hungary at the end of the Middle Ages. The grain acquisition of the inhabitants of Berehove in the 1530s and the mill customs of Jagiellonian period] *A Nyíregyházi Jósa András Múzeum Évkönyve* 42 (2000): 162. On the wars of the period, see: Pál Tóth-Szabó, *A cseh-husza mozgalmak és uralom története Magyarországon* [The history of the Czech-Hussite movements and rule in Hungary] (Budapest: Hornyánszky ny. M. Tud. Akadémia, 1917).

extended, the mills had to be moved. Sigismund gave the town permission to dismantle the two mills and put them up elsewhere in Prešov. As most of the mill parts were made of wood, moving them was not considered an impossible task in the Middle Ages.³⁹² The water mills were not originally built by the town's authority but were in the hands of two burghers, Peter Langwart and Peter Blume – according to the tax lists both were wealthy citizens.³⁹³ Of course, according to Sigismund's permission, these men had the right to rebuild their mills elsewhere. The mills were indeed re-erected as it was the town itself which took action to rebuild the water mills. The town saw an opportunity in the relocation of the buildings and decided to compensate the burgers with some share in the capacity of the mills.³⁹⁴ Only a limited proportion of the income from the mill went to their previous owners but neither did the town own a majority share in the mills. Most of the income from the two mills was shared between different ecclesiastical institutions in Prešov from that time onwards. The town finally came into full possession of the mills half a century later, in 1494. These conditions remained the same until modern times.³⁹⁵

From the point of view of urban topography, localization of the original sites of the mills as well as their new sites from the 1430s onwards is of major importance. Knowing where the mills were originally placed could identify other topographical elements and contribute to understanding how the town developed.³⁹⁶ According to the documents issued concerning the relocation of the water mills, one was originally located right next to the Upper Gate (*molendinum ante superiorem portam*). There are a number of data on this mill from the second third of the fifteenth century onwards and especially from 1494 onwards when the mill was acquired by the town. The exceptionally detailed accounts of the town from the late fifteenth century refer to the mill as the Upper Mill (*Obermoell, molendinum superior*; see: Figs 8a and 8b).³⁹⁷ Apart from this mill that can be localized relatively

³⁹² E.g. the case of a mill at Čachtice: *Extunc prefatus dominus Georgius plebanus et sui successores plebani habeant potestatem ipsa molendina iterum cum tot rotis quibus fuerit eorum voluntas translocandi et transformandi in eodem flumine ad alium aptiorem et commodiorem locum ubi ipsis et ecclesie melius videbitur expedire, neque aliquod aliud molendinum in derogamen et preiudicium illius per nos aut successores nostros fundari poterit in futurum*. MNL OL DL 65 946, edited in: József Teleki, *A Hunyadiak kora Magyarországon*, vol. 11 [History of the age of the Hunyadis in Hungary] (Pest: Emich, 1855), 395–397 no. 501. See also: Chapter 3.1.

³⁹³ On the two burghers, see: MNL OL DF 228 604, edited in: *Eperjes*, vol. 1. 79–92 no. 211; MNL OL DF 228 669, edited in: *Eperjes*, vol. 1. 127–129 no. 283.

³⁹⁴ MNL OL 228 631, for its regesta: *Eperjes*, vol. 1. 110–111 no. 240; MNL OL DF 228 633, for its regesta: *Eperjes*, vol. 1. 111 no. 242; MNL OL DF 228 634, for its regesta: *Eperjes*, vol. 1. 111 no. 243.

³⁹⁵ MNL OL DF 229 078, for its regesta: *Eperjes*, vol. 2. 288 no. 714. See also: Nógrády, “A középkor végi,” 162. On the mill incomes after 1526, see: Domenová, “K hospodáreniu mesta Prešov,” 36–37.

³⁹⁶ On the topography of the town, see: Václav Mencl, *Středověká města na Slovensku* [Medieval towns in Slovakia] (Bratislava: Universum, 1938), 98, and *Dejiny Prešova*, vol. 1.

³⁹⁷ Discussed in: Nógrády, “A középkor végi.”

precisely to the surroundings of the Upper Gate, the location of the other mill which fell victim to the extension was called the Middle Mill (*molendinum medium*) can also be ascertained with a good degree of certainty. A fragment of an account from 1429 mentions expenses related to the bridge close to the Middle Mill. This bridge probably stood next to the so-called Middle (or Small) Gate of the town, so the mill was named in a similar manner to the Upper Mill. From the very same year, the town protocol refers to a street by the Middle Mill by the town wall.³⁹⁸ The relocation of this mill, however, raises some problems. Unlike the Upper Mill, it was probably moved somewhat further away from its original location. Instead of standing in front of the Middle Gate, it was moved to the lower part of the town after the extension of the town, hence the new name of the mill: Lower Mill (*Niedermoell, molendinum inferior, mola vero civitatis inferioris*).³⁹⁹ This suggestion concerning the location of the mills in various time periods can be confirmed by one of the first detailed views of the town from 1768. The town view clearly marks the spots of the Upper and the Lower Mill, both probably operating in the same spots from the mid-fifteenth century onwards (see *Figs 11a* and *11b*).⁴⁰⁰

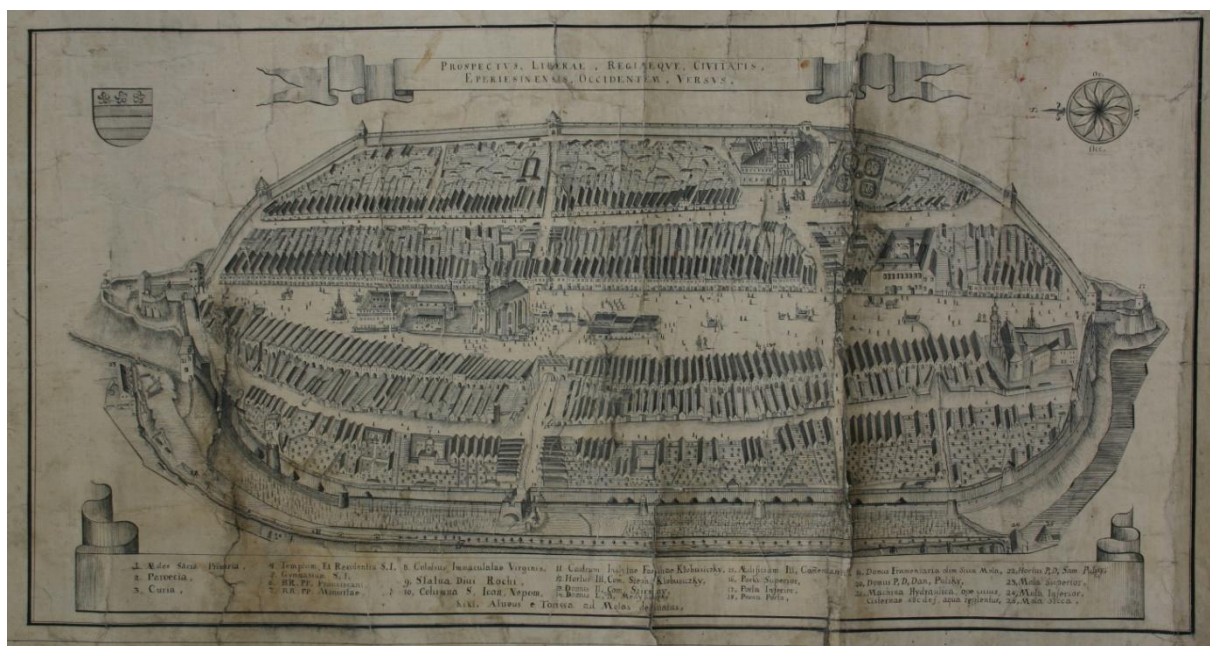


Fig. 11a. View of the town of Prešov from 1768 by Gaspar Caspar

³⁹⁸ *In plathea medii molendini penes murum civitatis*. MNL OL DF 282 529. 4. p. The relevant entry – with the omission of important words – in the town protocol book was edited in: Béla Iványi, “Eperjes szabad királyi város jegyzőkönyve, 1424–1509,” [The protocols of the free royal town of Prešov, 1424–1509] *Történelmi Tár* 10 (1909): 121–122.

³⁹⁹ For the latter, see e.g. MNL OL DF 282 538. fol. 112^r. See also *Figs 8a* and *8b*.

⁴⁰⁰ The town view was not included in the collection of Szalai and Szántai: *idem, Magyar várak*, 70–72 despite the fact that it has already been published in 1965: *Dejiny Prešova*, vol. 1. For the original town view, see: Prešov, Štátny archív v Prešov, Magistrát Prešov, Zbierka máp a plánov (Inv. č. 2). I am thankful to Blanka Szeghyová for her help with identifying the map published in: *Dejiny Prešova*, vol. 1. without referring to its repository.



Fig. 11b. Detail of the view of the town of Prešov with the Upper Mill (no. 23) from 1768 by Gaspar Caspar

Apart from these two mills that functioned for centuries in the western section of the town's moat, other mills were also constructed in the town in the Middle Ages. The town's accounts repeatedly refer to a fulling mill (*molendinum pannificum*). The location of this mill is unknown, but lacking other water resources within the town, this mill may also have used the moat waters. The early sixteenth century accounts also refer to a smith's stone (*de lapide vero quo utuntur fabri or cotes fabrorum*).⁴⁰¹ This statement, based on the modest income connected to it, suggests that this mill may have been connected somehow to the fulling mill, or perhaps to the Lower Mill.⁴⁰² From the fifteenth century onwards, apart from the two flour mills and the fulling mill, recurrent references were made to a gunpowder mill in Prešov. Whether this mill used water as a source of energy for the production of saltpeter is unclear. Neither it is evident whether this was a completely separate mill that exclusively produced

⁴⁰¹ For these two, see: Domenová, "K hospodáreniu mesta Prešov," 37–38.

⁴⁰² Domenová, "K hospodáreniu mesta Prešov," 38.

gunpowder, or rather a wheel in another mill, or a flour mill that was used temporarily for another purpose. There are a number of examples from medieval and Early Modern Hungary, which suggests that the latter may be more likely. Based on accounts from 1533/1534, Iványi suggested that the building stood next to a friary. The only mendicant friary that operated in town in the late medieval period was a Carmelite institution. The building stood by the town gate on the road leading to Solivar, a settlement lying somewhat to the southeast of Prešov.⁴⁰³ The medieval sources are unclear as to whether a moat also ran on this side of the town or not. The water in the moat section running by the mills on the west side of town originated from the nearby River Torysa, (sources do not refer to mills by this more significant river). This channel can be easily identified on Early Modern maps, including the relevant sheet of the First Military Survey from the late eighteenth century. The eastern section of the moat was probably not connected to the River Torysa or the western section of the moat. However, according to the eighteenth-century description of the town by Matthias Bel, left as a manuscript,⁴⁰⁴ the whole town at that time was surrounded by a moat.⁴⁰⁵ If true, because of the local geographical conditions, the water in the eastern section of the moat probably came from a source other than the River Torysa as this area lies at a somewhat higher elevation. The water may have come from the hills east of the town. It is equally possible that the gunpowder mill close to the town wall was a dry mill, something that cannot be ruled out for the fulling mill either. There is no clear evidence for the source of energy used by these industrial

⁴⁰³ The Carmelites took over the building from the Franciscans. On the friary, see: Beatrix F. Romhányi, *Kolduló barátok, gazdálkodó szerzetesek: koldulórendi gazdálkodás a késő középkori Magyarországon* [Mendicant brothers, farming friars. Mendicant economy in late medieval Hungary] (Budapest: Martin Opitz, 2018), passim and Kund Regényi, “Az eperjesi Szentháromság karmelita konvent története,” [History of the Holy Trinity Carmelite convent at Prešov] in *Tanulmányok a középkori magyar történelemről. Az I. Medievalisztikai PhD-konferencia (Szeged, 1999. július 2.) előadásai* [Studies in medieval history. Proceedings of the 1st PhD conference in medieval studies, Szeged, 2 July 1999], eds. Sarolta Homonnai, Ferenc Piti, and Ildikó Tóth (Szeged: Szegedi Középkorász Műhely, 1999), 103–113. On the relationship of the Franciscan friary and the Carmelite convent: Romhányi, *Kolostorok és társaskáptalanok*, 23.

⁴⁰⁴ On Bél’s description of Sáros County, see: Gergely Tóth, “Bél Mátyás Sáros vármegyeről,” [Matthias Bel on Sáros County] *Gesta. Fiatal miskolci történészek folyóirata* 6, no. 2 (2006): 30–49, and idem, “Bél Mátyás ‘Notitia Hungariae novae...’ című művének keletkezéstörténete és kéziratának ismertetése, 2 vols [Creation history of Mátyás Bél’s ‘Notitia Hungariae novae...’ and description of its manuscripts] (PhD-diss., Eötvös Loránd University, 2007), vol. 2. 247–251.

⁴⁰⁵ *Moenia murus geminus, alter altero sublimior et solidior incingit, suffulcientibus eos propugnaculis quorum duo praecipua mercatorum unum, alterum victorum, non parum addunt ornamenti urbeculae, ut nihil dicamus de reliquis, quae sartoribus, carnificibusque nomen habent: ea enim pariter singulari munimento moenia, et urbem ornant. Praeterea adstant portae, superior una, altera inferior, adiecta una portula a latere, quae omnia turritis tectis condecorant urbis compagem. Totam eam ambiunt fossae, alte satis depressa, quarum una, quae Tarcza vicina est, oppletur aquis ad summum.* Országos Széchényi Könyvtár Kézirattár Fol. Lat. 3783. 34^{F-V} (Descriptio Comitatus Sarosiensis per Matthiam Belium adornata). On the manuscript, see: Tóth, “Bél Mátyás,” vol. 2. 251.

complexes although a dry mill certainly existed in the town as confirmed by an entry in the town accounts from 1521.⁴⁰⁶

The account books refer to two further mills, but neither the location nor the power source they employed is clear. The first mill to appear chronologically in the sources was a mill that ground the malt to provide the burghers with beer. As sources mention this mill as being a “malt mill and a wine house” (*malzmühle und weinhaus*) the building must have held one of the town pubs.⁴⁰⁷ Sources in the 1510s also refer to another mill (*de molendino bursatili*), that only functioned for a couple of years but neither its location nor whether it was a water mill is known (see: Fig. 12).⁴⁰⁸

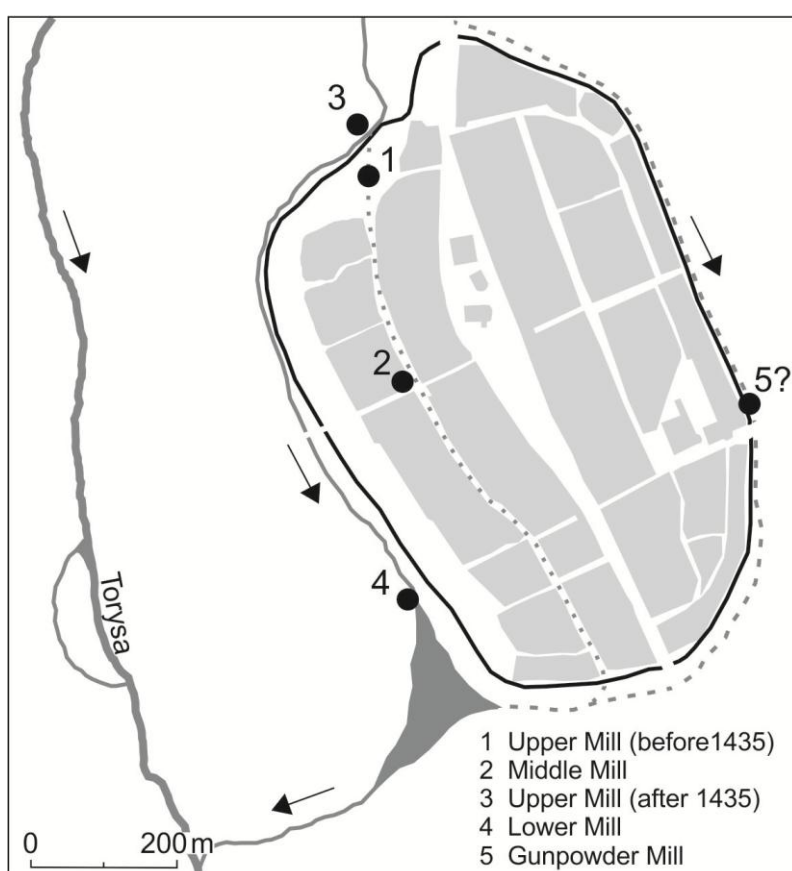


Fig. 12. Topography of Prešov in the late medieval period with the relocation of the mills and the probable direction of the western section of the urban moat before and after 1435

The moat in Prešov, given the lack of any other water resources in the walled area of the town, became an integral element of the local economy. It seems that the citizens who held plots along the moat tried to take advantage of their easier access to water. This access

⁴⁰⁶ MNL OL DF 282 538.

⁴⁰⁷ MNL OL DF 282 535.

⁴⁰⁸ MNL OL DF 282 538 (image: 533, 625 and 703).

became complicated when the town walls were extended. The citizens could partly extend their right to have mills by the moat, again returning to the principle of the earlier acquired right, but the town saw an opportunity in the relocation process to acquire at least part of the income from milling.

3.2.3.4. Moats, Urban Topographies and Mills – Some Conclusions

In this subchapter I showed that urban economies in pre-modern Europe not only used major waterways and minor streams, but likewise urban moats to generate income. Moats were part of the defenses of the towns, although as expensive investments and therefore often elements in the status representation of the settlement, they still produced no income. As their military uses were only temporary, many urban economic interests started to exploit them in different ways. The military needs differed from the needs of the people who used moats for their economic benefits⁴⁰⁹

Of the two cases analyzed in detail, Sopron offers rather general lessons, most of all that many of the actors in local industries were interested in having access to the moat water. Fishermen and the fish market – often found in the proximity of the fisheries⁴¹⁰ – as well as the grain market and the fullers all wanted to take advantage of the waters flowing around the town. The lessons that the example of Prešov provides is at least twofold. One is related to the topography of the town and urban water use in general. First, King Sigismund's permission and the two individual agreements with the mill owners, Peter Langwart and Peter Blume, can be used to date the extension of the town walls and the streets of the town itself. In this period, a new street and a row of houses was most probably added to the previously existing settlement, hence the need to relocate the mills. The documents related to the mills highlight the fifteenth-century development of town itself. While the Upper Mill probably only had to move a few meters, the Middle Mill had to be moved further to the south, allowing a significant extension of the town towards the west. The documents related to the extension of the fortifications along with the detailed account books of the town from the late fifteenth and early sixteenth century allowed data to be gathered on mills in the town. They also revealed that despite the relatively small population of the town compared to that of other free royal

⁴⁰⁹ See Guillerme, *The Age of Water*.

⁴¹⁰ Szende, "The Sopron Fish Market."

towns in Hungary, Prešov possessed a high number of such complexes. Whether some of these mills used water or some other source of energy remains unclear.

This survey of the moats and the exploitation of the waters surrounding Sopron and Prešov also highlighted some general features regarding urban water management. Population concentrations such as walled towns in Hungary had to use the waters within their borders very efficiently to provide various industries with energy, and of course water was necessary for many of the crafting processes. This hunger for water power led to an increasing number of mills erected by the edge of moats in the Middle Ages. Researchers identified a number of similar buildings in dozens of towns in Western as well as Central Europe. The moats of some towns in the Kingdom of Hungary were also exploited; the examples discussed above are among the best studied, but the waters running around the castles of Moson and Óvár also supplied major mills with power⁴¹¹ while a section of the moat of Cluj in Transylvania was also used as a mill race in the late medieval period. In this latter case, however, the use of this semi-artificial riverbed probably pre-dated the time a moat was established around the town.⁴¹² From the sixteenth century onwards with the appearance of the Ottomans and new fortification techniques, military requirements became more significant than the needs of local economies. However, partly because of the strategic importance of the proximity of mills to castles and towns, as well as the lasting period of wars of variable intensity, mills and fisheries kept operating in moats up to Modern times in the Kingdom of Hungary.

3.3 Rivers in Mining Areas - Abundance of Water versus Lack of Access?⁴¹³

Mining towns form a particular settlement type in the medieval Kingdom of Hungary. These settlements were granted privileges connected to prospecting for and exploitation of metal ore found within the bounds of their territories. This aspect marked a common element among such towns as opposed to the many and varied privileges a settlement could acquire

⁴¹¹ On Magyaróvár: Ágnes Aszt, “A mosonmagyaróvári Bástya utcában végzett régészeti feltárás történeti tanulságai,” [Historical lessons of the archaeological excavations at Bástya Street in Mosonmagyaróvár] *Moson Megyei Műhely* no. 3 (2001): 29–32.

⁴¹² On Cluj: Elek Benkő, *Kolozsvár magyar külvárosa a középkorban* [The Hungarian suburb of Cluj in the Middle Ages] (Erdélyi Tudományos Füzetek, 248) (Kolozsvár: Erdélyi Múzeum Egyesület, 2004).

⁴¹³ An earlier version of this chapter has been published in Hungarian: András Vadas, “A középkori Magyar Királyság bányavárosai és a malmok különös tekintettel Körmöc- és Újbányára,” [The mining towns of medieval Hungary with special regard to Kremnica and Nová Baňa] in *Márvány, tárház, adomány. Gazdaságtörténeti tanulmányok a magyar középkorról* [Marble, storage house, donation. Studies in the economic history of medieval Hungary], eds. Boglárka Weisz, Renáta Skorka, and István Kádas (Budapest: MTA BTK Történettudományi Intézet, 2019), 483–506.

from kings or other landlords. The geographical distribution of these mining settlements is therefore closely associated with mountainous areas of the Carpathian Basin, most importantly, the territory called Upper Hungary (partly coinciding with is today Slovakia) in the pre-modern period as well as large parts of Transylvania. In the Middle Ages, this distinction between mining towns and other privileged settlements was not as clear-cut as it is seen today. These towns were never officially associated with each other. However, two groups of mining settlements in Upper Hungary frequently formed alliances from the late medieval period onwards in order to achieve their political and especially economic goals. Modern scholars refer to these two town groupings as Lower Hungarian mining towns (*Alsó-magyarországi bányavárosok* in Hungary), namely: Kremnica, Banská Štiavnica, Banská Bystrica, Nová Baňa, Pukanec, and Ľubietová, and Upper Hungarian mining towns (*Felső-magyarországi bányavárosok* in Hungary), namely Gelnica, Smolník, Rudabánya, Jasov, Telkibánya, Rožňava, and Spišská Nová Ves (see *Fig. 13*). The formation of these alliances at the very end of the Middle Ages does not mean these towns represent a clear group of settlements marked by common features in terms of their privileges, economies, political life or their appearance. There are a number of fundamental differences in the way each town developed while there are also a number of towns, also involved in mining that never became part of these alliances. This is particularly true for towns in Transylvania where the different mining centers never formed alliances with each other.⁴¹⁴

⁴¹⁴ Boglárka Weisz, “A nemesérbányászathoz kötődő privilégiumok az Árpád- és az Anjou-korban,” [Privileges connected to precious ore mining in the Árpadian and Angevin periods] *Történelmi Szemle* 50 (2008): 141–162. For a slightly modified version of this study, see: eadem, “A nemesérbányászathoz kötődő privilégiumok az Árpád- és az Anjou-korban,” [Privileges connected to precious ore mining in the Árpadian and Angevin periods] *Bányászattörténeti Közlemények* 6 (2008): 13–43, eadem, “A bányaváros, mint önálló várostípus a 14. században,” [Mining town as a distinct type of town in the fourteenth century] *Bányászattörténeti Közlemények* 19 (2015): 31–57, and eadem, “Mining Town Privileges in Angevin Hungary,” *Hungarian Historical Review* 2 (2013): 288–312.

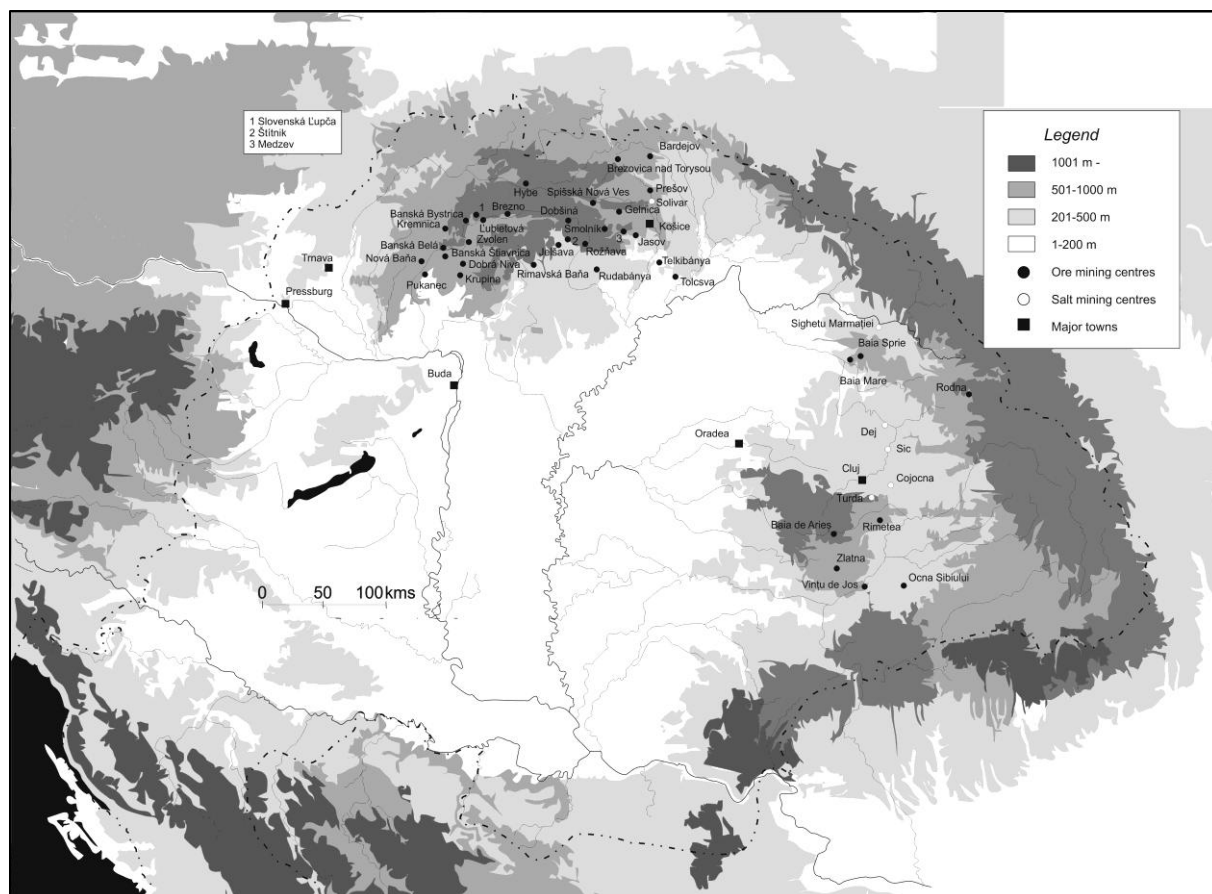


Fig. 13. Mining towns in medieval Hungary

The settlements to be discussed in the coming subchapter nonetheless have at least one common feature: they were founded and/or developed in order to exploit the ores discovered on their territories, in this case, primarily gold and silver. These settlements, mostly founded at the initiative of kings in the thirteenth and fourteenth century, received privileges reified in charters. These privileges connected to the exploitation of the ore, however, quite often they also put other sorts of economic privileges down in writing beyond prospecting rights. For the most part, these privileges concern forest and water resources. The importance of forests for timber is almost self-evident for a newly founded settlement, but of course for such towns, timber was also necessary to line mine shafts, for building crushing mills, saw mills, and countless other buildings connected to mining.⁴¹⁵ This chapter focuses, however, on the other natural resource discussed in some of the foundation charters, that is, water. This resource, as I shall argue, was of crucial importance to mining towns for fishing, for transportation, but most importantly, for water power used to grind grain and process metal ore as well as lift material from the mine shafts to the surface and pump water from the mine shafts.

⁴¹⁵ For this, see Weisz, "Mining Town Privileges."

In the first part of the chapter I focus on the charters of privilege given to mining towns – and some other royal towns – to see whether the problem of access to water appears or not. And if it does, how. I aim to understand why we have relatively few references in these privileges to the right to build water mills or generally exploit water although such commentary is particularly emphatic in the pragmatic textual sources connected to these mining towns, especially in documents issued by the settlement authorities.

Following this discussion, I will use the examples of the water mills of two mining towns, Kremnica, and partly Nová Baňa to address the importance of water power exploitation in the life of the towns. By studying the documents that include information on the early water mills in the towns, it becomes possible to ask who had the right to build and to own mills in the these two towns and in the villages founded by the town of Kremnica and located in its proximity. By analyzing the privileges and the early documents of mining towns I argue that although with only two exceptions, the privilege charters of the mining towns do not make reference to building mills, the settlers in these towns indeed practiced this freedom.

3.3.1. Mining Town Privileges and Water-Use

There is a significant literature on privileging settlements in the thirteenth and fourteenth centuries in general,⁴¹⁶ and recently, a number of detailed studies addressed the privileges of mining towns specifically.⁴¹⁷ Thus, scholars are in a relatively good position to study the medieval privileges issued to mining towns. The overwhelming majority of the first charters and later privileges were published in cartularies in the last century and a half, and most of them were included in good quality cartularies. Accordingly, it is not that hard to

⁴¹⁶ Erik Fügedi, “Középkori magyar városprivilegiumok,” [Medieval Hungarian urban privileges] *Tanulmányok Budapest Múltjából* 14 (1961): 17–107, Katalin Szende, “A magyar városok kiváltságolásának kezdetei,” [The beginnings of privileging towns in Hungary] in *Debrecen város 650 éves: Várostörténeti tanulmányok* [Debrecen is 650 years old. Studies in urban history] (Speculum Historiae Debreceniense. A Debreceni Egyetem Történelmi Intézet Kiadványai, 7), eds. Attila Pál Bárány, Klára Papp, and Tamás Szálkai (Debrecen: DE BTK Történelmi Intézet, 2011), 32–56, Katalin Szende, “Power and Identity. Royal Privileges to the Towns of Medieval Hungary in the Thirteenth Century,” in *Urban liberties and citizenship from the Middle Ages up to now: Libertés et citoyenneté urbaines du moyen âge à nos jours* (Beiträge zur Landes- und Kulturgeschichte, 9), eds. Franz Irsigler, and Michel Pauly (Trier: Porta Alba, 2015), 27–68, Katalin Szende, “Mennyit ér a kiváltság? Városprivilegiumok kibocsátása és rendelkezéseik betartása I. Károly alatt,” [How much are the privileges worth? The issuing and the implementing of urban privileges during the reign of Charles I] in *Pénz, posztó, piac: Gazdaságtörténeti tanulmányok a magyar középkorról* [Money, cloth, market. Studies in the economic history of medieval Hungary], ed. Boglárka Weisz (Budapest: MTA BTK Történettudományi Intézet, 2016), 285–340, and Attila Zsoldos, “Károly és a városok,” [King Charles I and towns] in *Pénz, posztó, piac*, 267–283.

⁴¹⁷ Weisz, “A nemesércbányászathoz kötődő privilegiumok,” eadem, “A bányaváros,” and most recently: eadem, “Az alsó-magyarországi bányavárosok kiváltságai a Zsigmond-korban,” [Privileges provided to the Lower Hungarian mining towns in the age of King Sigismund] *Urbs. Magyar Várostörténeti Évkönyv* 12 (2018): 21–48.

gather mining town privileges from the thirteenth and fourteenth centuries. The task is somewhat more complicated in the period of King Matthias and the Jagiellonian Dynasty; nevertheless most of the privileges of these towns date to a time before 1400. From the point of view of this chapter, it is rather the early settlement phase of the s that is important. Our collection (included in the Appendix) not only includes settlements later described as the Lower- and Upper-Hungarian mining towns, but every mining settlement that acquired a relatively broad range of privileges. Most of these settlements date to the century between 1250 and 1350. As many of the settlements receiving privileges in this period inherited the freedoms of their ‘older brothers’ – such as Banská Štiavnica or Partizánska Ľupča (earlier called Nemecká Ľupča) – they have many commonalities.

As mentioned earlier, these charters of privileges often refer to the freedom to exploit natural resources lying within the limits of the settlements. Because of need for timber to start mining activity, as well as the need for timber to build dwellings, the reason behind receiving freedom to exploit timber resources is somewhat unambiguous. Thus, taking note of such privileges was almost as important to consider as the freedom to mine. A Hungarian historian, Boglárka Weisz recently showed that mining towns, beyond what went on within their own borders, were usually granted authorization to cut timber within a certain radius to extract timber from the forests to line mine shafts, or for other mining related needs (but usually not to build houses for the inhabitants). The extent of the area, however, could vary significantly depending on the location, the needs, the presence of forests within the limits of settlements, and other factors. There are cases where one-, one and a half-, two-, and three-mile radius zones were provided for in the privileges. Most commonly found in the charters was the two-mile zone. Despite this tendency, the privilege charter of Baia de Arieș from 1325 refers to the one and the half-mile zone that the town received as the “usual zone” for mining towns.⁴¹⁸ It is probably more important that the mining folk in these towns could exploit the forest resources in these areas provided without hurting the interest of another party – that is other landowners whose property fell within the radius mentioned. This qualification is in accordance with the principle in the Hungarian legal tradition discussed above that the right acquired earlier had primacy over the later one.

Gusztáv Wenzel, a pioneer in the study of the history of mining in Hungary and a great expert source editor demonstrated that the freedoms granted were probably frequent

⁴¹⁸ *Urkundenbuch zur Geschichte der Deutschen in Siebenbürgen*, 7 vols. Eds. Franz Zimmermann et al. (Hermannstadt and Bucharest: Michaelis and Verlag der Rumänischen Akademie, 1892–1991), vol. 1. 396.

sources of conflict,⁴¹⁹ using the example of the Dóczy family and their conflicts with the mining towns. However, without the presence of forests and timber in the close proximity of towns, opening a mine would have been significantly more costly. Written as well as iconographic evidence suggests that by Early Modern times, absence of forest resources in the hinterland of mining towns became a recurrent problem. For example, the artist of the Saint Anne altar of the Assumption of the Virgin Mary Cathedral at Rožňava (finished in 1513) set the scene for the Nativity in the landscape of Rožňava itself. Because of the timber cut for the mine shafts dug into the hills around the town, the painter depicted a barren hill, devoid of trees. The image is probably over-exaggerated but clearly shows that cheap, locally accessible forests were heavily exploited by the mining settlements (see Fig. 14).⁴²⁰



Fig. 14. The so-called Saint Anne altar at the Virgin Mary Cathedral at Rožňava (detail)

In processing the ores unearthed in the mines, however, another resource, water power, was also of crucial importance. Apart from grinding grain to produce flour, water

⁴¹⁹ Gusztáv Wenzel, *Az alsó-magyarországi bányavárosok küzdelmei a nagylucsei Dóczyakkal, 1494–1548* [The struggles of the Lower Hungarian mining towns with the Dóczy family of Nagylucse] (Értekezések a Történeti Tudományok Köréből, VI/6) (Budapest: MTA, 1876).

⁴²⁰ Cf. István Batta, “Középkori bányászatunk és kohászatunk a Metercián,” [Medieval Hungarian mining and metallurgy on the Metercia] *Bányászati és kohászati lapok. Kohászat* 121 (1988): 275–285. On the forest management of the Lower Hungarian mining towns, see: Eszter Magyar, *A feudalizmus kori erdőgazdálkodás az alsó-magyarországi bányavárosokban, 1255–1747* [Feudal-age forest management in the Lower Hungarian mining towns, 1255–1747] (Értekezések a Történeti Tudományok Köréből, Új Sorozat, 101) (Budapest: Akadémia, 1983). Because of numerous errors in the parts of the book concerning medieval forest management, the work is only relevant in the parts on the Early Modern period.

power was used in at least two other spheres of economic life in these settlements. The processing of the major stone blocks brought to the surface started by crushing and grading the resulting rubble. From the fourteenth century onwards this was most effectively done by ore-crushing or stamp mills.⁴²¹ Many of such mills could be found in these towns, comparable in number to the quantity of wheels dedicated to grinding grain. Saw mills also were important constructions as the cheapest way to prepare the timber needed for mine shaft construction. The presence of ground water in the deeper lying mine shafts caused significant problems in mines throughout Central Europe from the fourteenth and fifteenth century onwards.⁴²² Water power was also used to pump water out. Animal power, especially horse power, could also be used in such machineries. Finally, just like horse mills, water power was also used to bring the ore to the surface.⁴²³ Of all the possible ways to harness water power in mining, all were probably present in the medieval Kingdom of Hungary although probably some uses only appeared much later than their original foundation at the turn of the thirteenth century.

Apart from the uses of water power in the mining industry, the local population also had to be supplied with flour. Supplying some of the mining towns with flour – especially the most populous, late medieval Banská Bystrica, Banská Štiavnica, and Kremnica in Upper-Hungary, and Baia Mare in Transylvania – in itself required numerous wheels that processed not ores but grain. It is difficult to estimate the population of these towns. Nonetheless, if one accepts that a mill wheel could provide approximately 200 to 300 people with flour, some of the mining towns had at least five, but in many cases ten, wheels that were used for grinding

⁴²¹ On the possible forms of metal processing, see: Georgius Agricola, *De re metallica libri XII* (Basileae: Hieronymus Froben & Nicolaus Episcopius, 1556). For its English translation, see: idem, *De re metallica*, eds. Herbert Clark Hoover, and Lou Henry Hoover (New York: [N.p.] 1950). For the existing forms and their connections to the milling industry: Adam Lucas, “Industrial Milling in the Ancient and Medieval Worlds: A Survey of the Evidence for an Industrial Revolution in Medieval Europe,” *Technology and Culture* 46 (2005): 1–30, and Zsuzsa Teke, “L’energia idraulica nella siderurgia medioevale ungherese,” in *Economia e energia sec. XIII–XVIII. Atti della “Trentaquattresima Settimana di Studi”, 15–19 aprile 2002*, ed. Simonetta Cavaciocchi (Florence: Le Monnier, 2003), 335–341.

⁴²² Oszkár Paulinyi, “A bányavíz leküzdése érdekében létesített első tározómedencék és váltókerekék,” [The first water reservoirs and water wheels in the fight against mine water] in *Gazdag föld – szegény ország: Tanulmányok a magyarországi bányaművelés múltjából* [Rich soil – poor country. Studies in the history of Hungarian mining industry] (Gazdaság- és Társadalomtörténeti Kötetek, 3), eds. István Draskóczy, and János Buza (Budapest: Corvinus Egyetem, Budapesti Közgazdaságtudományi Egyetem Alapítvány and Miskolci Egyetem, 2005), 315–335.

⁴²³ Agricola, *De re metallica*, 313–317. See also: Attila Szemán, “A reneszánsz bányászatának technikai fejlődése,” [Technological development of Renaissance mining] in *Olvasókönyv a magyarországi reneszánsz bányászatához. Tanulmányok a 2008-as „Reneszánsz év” tiszteletére* [Textbook on the history of mining in Renaissance Hungary. Studies in honor of the “Renaissance year” of 2008] (Központi Bányászati Múzeum Közleményei, 6), ed. Balázs Schuller (Sopron: Központi Bányászati Múzeum Alapítvány, 2009), 49–78.

grain. In addition, other uses of water power, including various industries such as textiles, paper producing, gunpowder, and last but not least, brewing, should not be forgotten.⁴²⁴

Although I have argued above that water power played a crucial role in the effective functioning of mining and in supplying the related population, Hungarian mining town privileges with two exceptions, fail to refer to the right of settlers to build mills on rivers within the town limits. This lacunae in the texts does not mean these sources remain silent on water rights in general while they are detailed with other rights. A number of the charters of privileges listed in the Appendix do not specify the privileges of the founded settlement at all. They not only remain silent on economic, but also on legal and ecclesiastic matters. They do, however, grant the freedoms of other, mining settlements inhabited earlier. Water-related freedoms are also not specified in the privileges granted to mining towns which refer to the liberties of other royal towns.⁴²⁵ The adoption of the freedoms of other mining settlements or royal towns is particularly interesting as the different gold and silver mining towns that served as models were sometimes given highly differing privileges. As mentioned above, the freedom to exploit either forest or water resources were anything but consistent.

Fishing and the rights to mill construction, two different kinds of water-use, need to be discussed in details despite that there are only two privileges that refer to these activities. The extent to which newly founded mining settlements had the right to use the waters within their limits is particularly interesting in light of the fact that settlers were provided with the right to use water for fishing or other purposes in numerous charters of privilege issued for *hospites* (foreign settlers) in the Árpáadian period as well as during Angevin rule.⁴²⁶ In addition, there are a number of privileged settlements other than mining towns that only received partial rights to use the waters within their limits.

The earliest mining town privilege that contains a relevant passage for this chapter was held by the settlers of Banská Bystrica from 1255 issued by King Béla IV. The privileges the king provided the settlers with included both rights to forest resources and water. However, in the case of the liberties related to water-use, fishing from the River Hron, known to be rich in

⁴²⁴ László Makkai, “Östliches Erbe und westliche Leihe in der ungarischen Landwirtschaft der frühfeudalen Zeit,” *Agrártörténeti szemle* 45 [Supplementum] (1974): 45. See also: Walter Endrei, “A magyar malomipar, 1550–1800,” [Hungarian milling industry, 1550–1800] in *Műszaki innovációk sorsa*, 48–54. On the question, in details, see: Vadas, *A Landscape of War*.

⁴²⁵ See for instance, the case of Baia Mare (Asszonypataka), see: Weisz, “A nemesércbányászathoz kötődő privilégiumok,” 142 and 148.

⁴²⁶ For *hospites*, see: Erik Fügedi, “Das mittelalterliche Königreich Ungarn als Gastland,” in *Die Deutsche Ostsiedlung des Mittelalters als Problem der europäischen Geschichte : Reichenau-Vorträge : 1970-1972* (Vorträge und Forschungen / Konstanzer Arbeitskreis für Mittelalterliche Geschichte, 18), ed. Walter Schlesinger (Sigmaringen: J. Thorbecke, 1975), 471–507.

fish, was not permitted. Nonetheless, as part of the rights to prospect for precious metals, the king also listed – although only at the end of the list of possible forms of prospecting – gold-panning in the rivers as well as all other water-related rights for people moving into the area. What these latter rights were was not specified in the privilege charter. I shall argue in the coming pages that these rights may have included the right to erect mills along the rivers.⁴²⁷

In other mining town privileges, those freedoms that refer to water use rights in detail mostly focus on the matter of fishing. In the highly interpolated and long-debated charter of privilege given to Partizánska Ľupča, King Béla IV provided the settlers with the rights to free fishing on the River Revúca and, just as above in the case of Banská Bystrica, provided the settlers with the right to prospect for gold, silver, and other metals in the waters.⁴²⁸ It is rather unclear how to interpret the free rights to fishing in the Revúca as the River Váh flowed closer to the settlement. It may be worthwhile mentioning that the similarly problematic charter given to the settlers of Hybe provided by King Béla in 1265 contains provisions similar to those of Banská Bystrica in terms of prospecting but also forbids fishing in the Váh.⁴²⁹ The charter of the settlers of Gelnica, reissued in 1287 by King Ladislav IV, also refers to the problem of fishing rights. In this document, following the privileges issued by Ladislav himself, Béla IV, and Stephen V, unlimited fishing rights were provided to the fishermen of the town within the limits of the settlement as described in the charter.⁴³⁰ In 1318, the settlers of Ružomberok, while receiving the privileges of Partizánska Ľupča in general and having been provided with the right to fish, were also forbidden from fishing in the River Váh.⁴³¹

⁴²⁷ *Item aurum, argentum et omnia alia metalla per totum comitatum de Zolum infra metas suas exquirere poterunt tam in terris quam in nemoribus, silvis, aquis, ac liberi sint infra subscriptas metas in omnibus utilitatibus suis excepta venacione et piscium capcione.* CDES, vol. 2. 340–341 no. 491.

⁴²⁸ *Item concessimus, quod ab omnium iudicum, baronum et specialiter comitum de Lyptou iudicio et descensu penitus sint exempti et quod nullus super eosdem descensum presumat facere violentum. Preterea aquam Reuce piscacioni congruentem reliquimus eisdem hospitibus. Ceterum concessimus, ut in silvis nostris et aquis liberam habeant facultatem querendi mineram auri, argenti et cupri ubicunque poterunt invenire. De omnibus, cum invenire poterunt nobis servient secundum, quod de aliis aurifodinis et argentifodinis regie consueverunt impedire servicium maiestati.* VMMS, vol. 1. 44–45 no. 29. On the problems of the charter and its transcriptions, see: RA, vol. 2/1. 57–64 no. 1933, and Ferdinand Ulicný, “Mestské privilégia Nemeckej Ľupce a otázka ich pravosti,” [Urban privileges of Partizánska Ľupča and the question of their authenticity] *Historické štúdie* 5 (1959): 302–324.

⁴²⁹ *Item concessimus eisdem hospitibus, ut ipsam totamque terram Hybe, protu est et adiacet, possideant et liberam in silvis et in aquis intra metas suas eiusdem terre Hybe contentas versus Scepes venandi et piscandi habeant facultatem, excepta aqua Vag, in qua nullus ex eis piscari poterit ullo modo.* VMMS, vol. 1. 49–50 no. 33.

⁴³⁰ RA, vol. 2/2–3. 385–387 no. 3464. For its edition, see: VMMS, vol. 1. 67–68 no. 66. See also: Tibor Almási, “Megjegyzések Gölnicbánya Kun László királytól elnyert privilégiumához és megerősítéseihez,” [Notes on Ladislav the Cuman’s privilege to Gelnica and its confirmation] *Acta Universitatis Szegediensis de Attila József nominatae. Acta Historica* 102 (1995): 43–49 (with the edition of the different variants of the document: 46–49).

⁴³¹ *Item totam terram Rosumbergh, prout est et adiacet, possidebunt et liberam in silvis et in aquis intra metas eiusdem terre contentis venandi et piscandi liberam habebunt facultatem, excepta aqua Wagh, in qua nullus ex eis piscare poterit ullo modo.* VMMS, vol. 1 91–92 no. 103.

That settlements were not provided with full access to all waterways for fishing may be connected to the fact that fishing was a significant source of income for royal counties up to the mid-fourteenth century. Charters provided for *hospes*-settlements also refer to bans on fishing in general, or at least fishing using certain equipment.⁴³² It is certainly important that the 1318 privilege charter of Ružomberok, by banning fishing on the River Váh, allowed inhabitants of the town to fish in the River Revúca, similarly to what was granted to Partizánska Ľupča half a century earlier. It is not exclusively in the Kingdom of Hungary that settlers only received rights to some of the rivers lying within their borders. In the medieval Polish urban privileges, this feature appears recurrently and, moreover, a privilege charter exists – granted to the town of Dobczyce in Lesser Poland – that only allowed fishing when the ruler was not present.⁴³³

The situation is more ambiguous in the 1340 charter given to the inhabitants of Ružomberok who were granted full rights to fishing. Some lines later however, the document refers to the right to fish on the Revúca but the Váh was not mentioned. The 1340 charter of Ružomberok is not only important from the point of view of fishing rights, but is one of the two charters of privilege provided to mining towns that refers to the right to build mills. When reference was made to water use rights they did so mostly in the context of fishing or in connection with the prospecting rights. The 1340 privilege, however, extended the rights of the inhabitants of Ružomberok and granted the townspeople with the right to build mills.⁴³⁴ Interpretation of this grant is critical in this subchapter. Did this right to exploit water for milling represent the acquisition of a new right which the settlers did not have previously or an existing right that was clarified? This is no less interesting from the point of view of understanding what the remaining water rights, not specified in the Banská Bystrica charter, may have been.

One possible explanation is that the burghers of Ružomberok did not have a mill at their disposal or the one they used had not been built by them. The former is highly unlikely as in the period between the first liberties and their extension, twenty-two years passed during

⁴³² See for instance the case of the *hospes* privilege of the settlers of Koroleve in Ugocsa County: CD, vol. 5/1. 176–178. Cf. Degré, *Magyar halászati jog*, 58. On the diplomatic analysis and criticism of the charter, see: Fügedi, “Középkori magyar városprivilegiumok,” 45–46.

⁴³³ Urszula Sowina, *Water, Towns and People*, 79–82. For the privilege: *Akta Grodzkie i Ziemskie z czasów Rzeczypospolitej Polskiej z Archiwum tak zwanego bernardyńskiego we Lwowie*, 25 vols (Lwów: Towarzystwo Naukowe, 1868–1914), vol. 3. 29–31 no. 12.

⁴³⁴ *Concessimus eciam, ut iidem hospites nostri intra metas eorum infrascriptas, absque preiudicio iuris alieni, ubique locorum venandi, aves capiendi, piscandi et molendina construendi liberam habeant facultatem ... Preterea aquam Reuce, piscacioni congruentem, reliquimus eisdem hospitibus piscandi.* VMMS, vol. 1. 132–133. no. 161.

which the town could not have functioned without a water mill. Moreover, it is true that by 1325 the settlement was certainly inhabited. A burgher of Ružomberok appears as a witness in a privilege charter issued for another *hospes* community.⁴³⁵ The other possibility is that there were mills built between 1318 and 1340, but as before 1340 their construction was a seigniorial right and they would have been built by Doncs, the *ispán* of Zólyom County, who initiated the settlement process. This latter possibility – apart from the fact that there is no surviving written evidence about a mill – seems unlikely as there are no parallels to in other mining towns. Neither is there evidence of the king, nor their *ispáns*, building mills in any of the towns founded by them in order to exploit the ores discovered in their territories. I believe the 1340-charter should rather be understood as an indication of a claim by the burghers to secure a right that they may have already been practicing, that is, the free building of mills in order to grind grain and process ore. This idea is supported by the fact that in 1340, after the death of Doncs, the settlers of Ružomberok managed to get the king to issue a privilege including a perambulation and the right to prospect without any reference to the *ispán*'s 1318 privilege.⁴³⁶ I will revisit the question when I discuss the lawsuits connected to the mills belonging to the settlers of Nová Baňa.

Importantly, none of the early privileges specifically forbade settlers from building mills, as this was certainly one of the water-related freedoms mentioned in the context of the Banská Bystrica charter. Alajos Degré, in his monograph cited above on fishing in medieval Hungary, suggested that these privileges were restricted to drawing water from the rivers and watering animals. However, nothing suggests that water rights were only limited to these two elements.⁴³⁷ It is very much possible that when the charter issued to the burghers of Ružomberok in 1340 referred to their right to build mills, it was not an extension of the rights, but a clarification of an already existing but not clearly defined privilege.

The fact that apart from the water privileges accorded to the burghers of Ružomberok only a few settlements – not only mining towns, but privileged settlements in general – acquired rights to build mills does not mean that others were denied these rights, but rather that until the mid-fourteenth century it may not have been considered crucial to specify this right in charters.⁴³⁸ The fact that in 1340 it was included in the privilege can probably be

⁴³⁵ Petrus de Rozemberk: VMMS, vol. 1. 105–106 no. 125.

⁴³⁶ Szende, “Mennyit ér a kiváltság?,” 301–302 notes 70–71.

⁴³⁷ Degré, *Magyar halászati jog*, 58.

⁴³⁸ Fügedi, “Középkori magyar városprivilegiumok,” 48.

attributed to the growing number of mills built by the Revúca and other rivers in the region.⁴³⁹ Moreover, because of the clarification of the customary law on mill construction discussed in Chapter 3.1, it became increasingly important for the burghers to have mills built without major disputes on the rights to water-use. This tendency seems to be confirmed by another privilege, similar to that awarded in 1340 to the burghers of Ružomberok. The document in question is a charter issued in 1376 by King Louis I to provide privileges to the Transylvanian mining towns of Baia Mare and Baia Sprie. The antecedent of the charter is an earlier privilege issued by the same king in 1347 which refers back to an even older privilege that was supposedly later consumed by fire. The document, as opposed to what has been suggested in earlier literature⁴⁴⁰ has survived.⁴⁴¹ The 1347 document contains detailed information concerning rights to forest use but is silent on the subject of utilities connected to water.⁴⁴² While in Upper Hungary, the fish catch from the rivers, especially from the River Váh, may have supplied the royal court or the county castles' population, the fish supply may have been less important at Baia Mare, an area which was further from the area that the kings regularly visited.⁴⁴³ It is therefore unlikely that local fishing regulations would have been stricter. The lack of reference to the right to use the water is unlikely to have implied a ban on fishing or on the construction of mills. The 1376 privilege, however, brings the question of water rights to the fore. The charter secures the rights of Baia Mare and Baia Sprie to build water mills on the rivers within their borders. Apart from the water mills themselves, the document lists all related utilities that the king provided the burghers with. These, apart from mills, included “forges, furnaces, laundrys, allodia and other buildings.” The meaning of two of the Latin words in the list of buildings, *casa* and *balneum*, is anything but self-evident.⁴⁴⁴ The latter is probably easier to decipher because of the context. It is unlikely to be connected to a bath house, but rather was a place for panning, despite the fact that from the late medieval

⁴³⁹ There is no data on mills, but there is on mill stone mine from the period: MNL OL DL 102 943. For the summary of the document, see: AOKlt, vol. 9. 168 no. 296.

⁴⁴⁰ Cf. AOKlt, vol. 31. 457–458 no. 883.

⁴⁴¹ Arhivele Naționale ale României, Serviciul Județean Maramureș, Fond Primăria orașului Baia Mare, Seria 2 – Documente privilegiale, no. 1 (the document is not available at the Medieval Digital Archive of Romania (<http://arhivamedievala.ro/>) however can be accessed at the moment on the website of the archive: <http://arhivelenationale-maramures.ro/webcenter/portal/Maramures> [last accessed: November 7, 2019]). I am thankful to Péter Levente Szöcs for providing information on the document.

⁴⁴² *Documente privind istoria României. C. Transilvania. Veacul XIV*, 12 vols (Documenta Romaniae historica) București: Acad. Republicii Populare Române, 1953–1985), vol. 4. 673–676 no. 577. For its summary, see. AOKlt, vol. 31. 457–458 no. 883.

⁴⁴³ Cf. Fügedi, “Középkeleti magyar városprivilegiumok,” 47–48.

⁴⁴⁴ *Quod iam dicti ciues, et hospites nostri dictarum duarum ciuitatum nostrarum molendinum, casas, fornaces, Balnea, allodia, et alias quaslibet haereditates aedificari facientes, ordinandi, acea in perpetuum ritu aliarum nostrarum montanarum conseruandi habeant potestatem.* CD, vol. 9/5. 96–101 no. 39. Cf. Weisz, “A nemesérbányászathoz kötődő privilegiumok,” 157.

period one finds bath houses in numerous mining towns.⁴⁴⁵ The exact meaning of the other word, *casa*, however is not evident at all. Boglárka Weisz identified it as some kind of storage building meant for keeping mining tools. I suggest this is not the most likely meaning of the word in this context as the other elements listed are all directly related to water use itself. The word *chaza* or *casa* appears in a number of other contemporary documents that concern mining towns.⁴⁴⁶ On the one hand, a document from Kremnica issued in 1331 to be discussed in detail below, suggests that the word was a building directly associated to water-use.⁴⁴⁷ On the other hand, the late medieval accounts of Banská Bystrica repeatedly refer to *casae* in the form of *locus casae*. The wording, *locum casae*, suggests a more specific building than a store house for tools, especially because the building needed a special *locus*, probably one directly by running water.⁴⁴⁸ Last but not least, the 1376 charter of privilege listed this utility between different water-related ones which suggests a building that was directly water-related in the case of *casa* as well, probably some kind of forging mill.⁴⁴⁹

Accordingly, the charter allows the burghers of Baia Mare and Baia Sprie to use the waters of the towns for milling. This right was probably of importance for the mining and the processing of the ores. King Louis I provided this right to the two mining towns, not as a special liberty, but in accordance with the “customs of other mining communities” (*ritu aliarum nostrarum montanarum*). These words are crucial from the point of view of this subchapter because to date only one privilege known to provide this right is the 1340 charter of Ružomberok. Not even that charter, however, listed the water-related utilities to the level of detail discussed above. Thus, the picture is anything but clear. Based on analysis of documents predating the 1376 privilege, there are no grounds to suggest that the right to erect mills was a commonly owned privilege. Nevertheless, based on what has been suggested above regarding possible ways of interpreting the rather general privileges regarding water

⁴⁴⁵ On urban bath-houses see: Judit Majorossy, “A test és a lélek fürdője. A középkori pozsonyi fürdőkről,” [The bath of body and soul. On the medieval bathing houses of Bratislava] in „*Köztes-Európa*” vonzásában: Ünnepi tanulmányok Font Márta tiszteletére [In the attraction of “Mitteleuropa.” Studies in honor of Márta Font], eds. Dániel Bagi, Tamás Fedeles, and Gergely Kiss (Pécs: Kronosz, 2012), 343–356.

⁴⁴⁶ This meaning of the word is not referred to in the *Lexicon Latinitatis Medii Aevi Hungariae*. See the online database: http://clph.elte.hu/llmaeh/mklsz/simpleserach_b_hu.php (last accessed: January 3, 2020).

⁴⁴⁷ MNL OL DF 250 152. Michal Matunák, *Z dejin Slobodného a Hlavného Banského Mesta Kremnice* [History of the privileges and the town of Kremnica] (Kremnica: Slobodné a hlavné banské mesto, 1928), 455–457 no. 4.

⁴⁴⁸ László Fejérpataky, *Magyarországi városok régi számadáskönyvei (Selmeczbánya, Pozsony, Besztercebánya, Nagyszombat, Sopron, Bártfa és Körmöcbánya városok levéltáraiból)* [Old account books of Hungarian towns (from the archives of Banská Štiavnica, Bratislava, Banská Bystrica, Trnava, Sopron, Bardejov and Kremnica)] (Budapest: MTA, 1885), 85, 88, and 101. See also on that Miroslav Minárčic, “Metačná listina svätoantonského panstva z roku 1266 a jej výpovedná hodnota k dejinám banskoštiavnického baníctva,” [A document from the year 1266 on the estate of Svätý Anton and its significance in the history of the mining industry at Banská Štiavnica] *Montánna história* 2 (2009): 46–69.

⁴⁴⁹ Cf. Schweineköper, “Cum aquis aquarumve decursibus,” 22–56, Härtel, “Von Wasser- und Mühlenrecht,” 221, Anikó Kiss, “A gyulai vár birtok malmainak története, 270. See Chapter 2.

use and the note from the 1376 charter, one may argue that the settlers of mining towns in the late Árpadian as well as in the Angevin periods practiced the right to use water for their own purposes, or at least for building mills

In the following subchapter, I analyze the privileges given by kings to other towns than those enfranchised for mining and some charters of privilege issued to *hospites* to see how general it was in the thirteenth and early fourteenth century to provide the settlers with the right to build mills in order to make an argument either for or against the latter assumption.

3.3.2. Early Urban Privileges and Water Use

As already indicated above, it was not only mining town privileges that seldom refer to the issue of mill construction. Other royal charters privileging towns or a group of settlers do not deal with this question either.⁴⁵⁰ With the exception of the charter of Vinohradiv from 1262, Árpadian period charters of privilege remain silent on the right of settlers to build their own mills. Nor do numerous extant documents refer to fishing rights.⁴⁵¹ Apart from the mining town charters discussed above, only the 1261 charter of Újhely,⁴⁵² that of Vinohradiv (1262), the one given to the *hospites* of Győr (1271),⁴⁵³ those given to the settlers of Vasvár (1279, 1283),⁴⁵⁴ and the privilege of Bratislava (1291)⁴⁵⁵ refer to it. The privilege of Újhely allows the settlers of the town to fish in the River Bodrog, however, the text neither refers to

⁴⁵⁰ On *hospes*-privileges, see: Fügedi, “Középkori magyar városprivilegiumok,” 61–64, László Solymosi, “Hospesprivilegium 1275-ből,” [Hospes privilege from 1275] in *Tanulmányok Veszprém megye múltjából* [Studies in the history of Veszprém County], ed. Lajos Madarász (Veszprém: Veszprém Megyei Levéltár, 1984), 17–19, and more recently: Zsoldos, “Károly és a városok,” 271ff.

⁴⁵¹ ÁÜO, vol. 8. 31–32 no. 23. For details of the charter, most recently, see: László Szabolcs Gulyás, *Városfejlődés a középkori Máramarosban* [Urban development in medieval Maramureș] (Erdélyi tudományos füzetek, 280) (Kolozsvár: Erdélyi Múzeum-Egyesület, 2014), 29–39.

⁴⁵² István Tringli, “Sátoraljaújhely első kiváltságai,” [First privileges of Sátoraljaújhely] in *Tiszteletkőr: Történeti tanulmányok Draskóczy István egyetemi tanár 60. születésnapjára* [Lap of honor. Studies in history in honor of the 60th birthday of István Draskóczy], eds. Gábor Mikó, Bence Péterfi, and András Vadas (Budapest: ELTE Eötvös Kiadó, 2012), 251–259, István Tringli, *Sátoraljaújhely* (Magyar várostörténeti atlasz, 2) (Budapest: MTA Történettudományi Intézet, 2011), 7–9. Its edition: EFHU, vol. 3/2. 52–54 no. 43.

⁴⁵³ For its recent critical edition, see: Boglárka Weisz, and Attila Zsoldos, “Másolatok és kiadások. Győr 1271. évi kiváltságlevelének ma ismert szövegváltozatai,” [Copies and editions. The known variants of the text of the 1271 privilege of Győr] in *Márvány, tárház, adomány. Gazdaságtörténeti tanulmányok a magyar középkorról* [Marble, storage house, donation. Studies in the economic history of the Middle Ages], eds. Boglárka Weisz, Renáta Skorka, and István Kádas (Budapest: MTA BTK Történettudományi Intézet, 2019), 247–256.

⁴⁵⁴ EFHU, vol. 3/2. 71–72 no. 59, and 78–79 no. 63.

⁴⁵⁵ Vladimír Horváth, *Bratislavské mestské privilegium* [The urban privilege of Bratislava] (Bratislava: Archív hlavného mesta SR: Obzor, 1991). For a recent diplomatic study on the interpolated charter, see: Žofia Lysá, “Privilegium pre Bratislavu z roku 1291,” [The privilege of the town of Bratislava from 1291] *Historický časopis* 59 (2011): 189–214.

other waters nor to other water-related rights. The former is especially important as the river which ran directly by the newly settled town was not the Bodrog, but rather the smaller Ronyva River. The waters of the Ronyva had been exploited for milling from the time of the foundation of Újhegy at the latest, or perhaps even earlier. The first two mills by the river were donated by the king to the Paulines and to the Augustinian friars, respectively. The fact that in this case the River Ronyva is not specified in the privilege may be connected to the early foundation of the Paulines in the area, as well as the donation of the mill to the friars. The town quarter inhabited by the Paulines enjoyed immunity up to their dissolution in the late eighteenth century which may indicate an earlier presence than the date the burghers settled in the area.⁴⁵⁶ Given these special characteristics of the area where the people were settled, the reason kings did not give full freedom to use waters everywhere within the borders of Újhely seems rather clear.

The right to use water is rather emphatic in the privilege charter of Vinohradiv mentioned above in the context of the freedom to build mills. Not only does the not particularly lengthy charter refer to the right to build mills, but permission is also given to the community to fish in the rivers as well as build a harbor. The fact that the privilege goes to this level of detail on water-related matters, similarly to the Győr charter, may be connected to the fact that the most important resource in the life of the settlements was water itself. The 1271-privilege given to the settlers of Győr is important as this is a document which defines the access of settlers to different resources in probably the most exact terms of all contemporary charters from Hungary. This precision may be due to the fact that by that time, the settlement was already the center of a county and of a bishopric and the different status of social groups living within the borders of the town had to be clearly reflected in the document.⁴⁵⁷ According to the Győr charter, settlers received two pieces of land around the

⁴⁵⁶ István Tringli, “Sátoraljaújhely egyházai a reformáció előtt,” [The churches of Sátoraljaújhely before the Reformation] in *Erősségénél fogva várépítésre való. Tanulmányok a 70 éves Németh Péter tiszteletére* [Proper for castle building for its strength... Studies in honor of Péter Németh for his 70th birthday], eds. Juan Cabello, and Norbert C. Tóth (Nyíregyháza: Szabolcs-Szatmár-Bereg Megyei Önkormányzat Múzeumok Igazgatósága, 2011), 377–396, Tringli, *Sátoraljaújhely*, 74–75. (Gazetteer: mills), Katalin Szende, “Malmok a városban. Az energiatermelés topográfiája négy magyar városban az iparosodás előtt,” [Mills in towns. The topography of energy production in four Hungarian towns before the industrialization] in *Mesterségek és műhelyek a középkori és kora újkori Magyarországon. Tanulmányok Holl Imre emlékére / Crafts and Workshops in Hungary during the Middle Ages and the Early Modern Period. Studies in Memory of Imre Holl*, eds. Elek Benkő, Gyöngyi Kovács and Krisztina Orosz (Budapest: MTA BTK Régészeti Intézet, 2017 [2018]), 488–489, and Katalin Szende, “Mills and Towns,” 492–496.

⁴⁵⁷ Cf. Erik Fügedi, “Győr városának 1271. évi kiváltságlevele,” [The 1271-privilege charter of the town of Győr] in *Győr. Várostartörténeti tanulmányok* [Győr. Studies in the history of the town], eds. Lajos Dávid, Alfréd Lengyel, and László Z. Szabó (Győr: Győr Megyei Jogú Város Tanácsa, 1971), 109–117, and Weisz, and Zsoldos, “Másolatok és kiadások,” (the latter with the literature of the privilege).

castle for their use, with all the associated utilities. These included parts of Malomsok⁴⁵⁸ bordered by the Danube and the uninhabited piece of land belonging to the Seraphin monastery of Hronovce (Lékér)⁴⁵⁹ situated by the River Rába. On the one hand, the charter certainly included the right to fish in the river waters but given the proximity to the River Rába, construction of mills may also have been an important source of income for the settlers. The settlers of Vasvár received their privilege from King Ladislas IV in 1279. In it the king provided the people living in the territory of the chapter to catch fish and to use the forests along the Rába – an area particularly rich in forests up to modern times⁴⁶⁰ – as well as any other utilities connected to the latter.⁴⁶¹ However, other utilities mentioned in the charter only included those connected to forests not water. The same is true for the partly recapitulated privilege of the Vasvár settlers issued in 1283.⁴⁶² Finally, the charter given to the settlers of Bratislava in 1291 provided rights to catch fish – obviously in the Danube – a third of which however they had to hand over as tithes to the *ispán* of Pozsony County.

In sum, while early urban and *hospes* privileges sometimes referred to the right to use the waters within a certain area in a relatively detailed manner, most regulations concern fishing rights, and these regulations only indirectly refer to the construction of water mills. Why might this be so? Erik Fügedi, in his still fundamental study on the thirteenth-century charters of privilege, argued that despite their donations, rulers usually remained the owners of the land itself. According to Fügedi, kings only gave away particular pieces of lands, i.e. plots, to tenants as well as certain other rights – such as access to forests or waters. This donation pattern is clearly visible in the privilege from Újhely, in which the issuer, at that time junior king, kept some of the waters in his hands and endowed church institutions with connected rights and utilities as a landlord. The same is true for the *hospes* community of Győr. In some parts of the town, the settlers were not entitled to use waters for their own benefit, while on other estates given to the settlers the king provided all connected privileges and utilities such as rights to the forests and waters. The latter pattern seems to have become

⁴⁵⁸ ÁMTF, vol. 2. 607.

⁴⁵⁹ ÁMTF, vol. 2. 598. See: Beatrix F. Romhányi, *Kolostorok és társaskáptalanok a középkori Magyarországon* [Monasteries and Collegiate Chapters in Medieval Hungary] (Budapest: Pytheas, 2000), 41.

⁴⁶⁰ Lajos Juhász, “A Vas megyei Farkaserdő a XVII–XVIII. században,” [Farkas Forest in Vas County in the seventeenth–eighteenth centuries] *Századok* 71 (1937) [Supplement]: 553–575 [37–69].

⁴⁶¹ *Concessimus etiam, ut in silva Raba ligna recipiendi pro usibus suis necessaria, falcandi fenum et herbas et utendi usu aque sine exactione et impedimento aliquo liberam habeant facultatem.* EFHU, vol. 3/2. 68–71 no. 59.

⁴⁶² *Hospites in eadem villa Castri Ferrei ad prepositum et capitulum predictae ecclesie Beati Michaelis pertinentes ac alii iobagiones, equites, populi, liberi et conditionarii ubique locorum constituti ad eandem spectantes ecclesiam in aquis, piscationibus fluminum Rabe et Macua, fenetis, cesu lignorum ac aliis utilitatibus quibuscunque in silva Rabe liberum et securum habeant.* EFHU, vol. 3/2. 89–79 no. 63.

increasingly common with such royal donations,⁴⁶³ which is well reflected in the royal charter privilege given to Ružomberok in 1340.

However, the picture is anything but clear based on what has been discussed in the subchapter so far. Two almost entirely different conclusions may be drawn. The first possibility is that in the majority of the cases, the king kept his rights as a landlord so that he could provide the settlers or some of the settlers with different benefits, either as donations or leases. These may have included the rights to fishing in the rivers, in some cases only permitted to fishermen or to build mills by a certain river which serviced either the whole community or privileged institutions. The other possibility is that despite the fact that most of the charters do not discuss the issue in detail, in the majority of the cases, settlers did receive all rights and privileges connected to a certain piece of land unless otherwise specified.

As pointed out in earlier research, early Hungarian urban privileges only rarely refer to the adoption of foreign legal traditions such as the Magdeburg Law or other urban privileges.⁴⁶⁴ This does not mean, however, that elements from these sets of freedoms could not be identified in the privileges of towns in the Kingdom of Hungary populated by German settlers.⁴⁶⁵ The contracts and foundation charters that survive in the Polish territories and in Bohemia, however, are sometimes much more detailed concerning the issues of water and forest resources than their Hungarian counterparts. In most cases, the *sculteti* or *advocati* or the community received rights to waters, including the construction of water mills. In one example, the well-known and much studied foundation charter of Kraków from 1257 explains in great detail the rights of different groups to the water, either for fishing or building mills. The document is especially detailed on the right to use the water of the River Vistula, the most significant river that surrounded the early residence of the Piasts on Wawel Hill. According to the charter, the *locatores*, called *advocati* in the charter, were given significant rights connected to water-use, and especially building mills. The issuer of the charter, Bolesław V the Chaste, donated four mills to the *advocatus*. The mills were constructed before the foundation of Kraków: two were held by the king himself, one which was owned by the Knights Templar of Miechow, and one had previously belonged to the Cistercian abbey

⁴⁶³ Cf. Fügedi, “Középkori magyar városprivilegiumok,” 47.

⁴⁶⁴ Cf. Katalin Szende, “Town Foundations in East Central Europe and the New World: the Use of the Grid Plan in a Comparative Perspective,” in *Medieval East Central Europe in a Comparative Perspective: From Frontier Zones to Lands in Focus*, eds. Gerhard Jaritz, and Katalin Szende (New York: Routledge, 2016), 161–172.

⁴⁶⁵ On German settling and its legal background, see: Fügedi, “Das mittelalterliche Königreich Ungarn,” and Katalin Szende, “Iure Theutonico? German settlers and legal frameworks for immigration to Hungary in an East-Central European perspective,” *Journal of Medieval History* 45 (2019). Paper: 10.1080/03044181.2019.1612195.

of Jedrzejow.⁴⁶⁶ Apart from that, and this may be even more important from the point of view of this subchapter, the duke provided the *advocati* with the right to build other mills within the borders of the area specified by the charter, after which the owner had to pay one *ferto* silver annually to the duke. According to the privilege, the mills would not have to be built or maintained by the *advocati* themselves, but rights to them could be transferred to others, including the obligation to pay one *ferto* silver in tax. Thus, the building rights and their maintenance fell into the burghers' hands. The Kraków-case is not exceptional, similar wording can be found in numerous charters of privilege from the thirteenth and fourteenth century in Central Europe, including the contracts concluded between the abbey of Hronský Beňadik and the settlers of the mining areas surrounding the lands of the Benedictines to be discussed later. The Kraków-charter, however, contains one of the most detailed descriptions and not by chance. The area to which Bolesław V invited settlers was anything but a no man's land. There were a number of institutions that had previously operated in the area, as well as settlements that had already stood there before the Mongol invasion of 1241.⁴⁶⁷ Therefore, it may have been crucial to precisely outline the rights of the different parties to the various sections and banks of the river. The case was somewhat different concerning most of the settling processes in Hungary discussed above. Here, with a few but notable exceptions, the foundation charters did not refer to pre-existing settlements or institutions, suggesting that there was no real competition for resource-use in these areas at the time the areas were settled.

Accordingly, I propose that of the two possible conclusions, it is most likely that despite the fact that the privileges in the Kingdom of Hungary seldom refer to the right to build water mills of the settling agents or the settlers of newly founded settlements, it was the norm to practice this freedom. In order to argue for the validity of this assumption, I will discuss the water mills built in two mining towns, Kremnica and Nová Baňa, in the next two

⁴⁶⁶ *In eodem etiam fluvio concedimus advocatis, vel quibus ipsi contulerint, duo nostra molendina et tercium, quod fuit olim fratrum de Meccovia, nec non quartum, quod fuit monachorum de Andreowe, et si plura (sint) in eodem fluvio molendina sine aliorum tamen nocumento et prejudicio aedificare poterint, eam eis jure hereditario concedimus facultatem, ita, quod de qualibet rota tam presentium quam futurorum molendinorum fertonem usualis tunc argenti nobis annuatim persolvere teneantur.* Its best edition: *Kodeks dyplomatyczny miasta Krakowa 1257–1506*. vol. 1 [Cartulary of the town of Kraków], ed. Franciszek Piekosiński (Kraków: Akad. Umiejętności, 1879), 1–3 no. 1.

⁴⁶⁷ On the foundation-period history of Kraków, see: F[rancis] W. Carter, *Trade and Urban Development in Poland. An Economic Geography of Cracow from its Origins to 1795* (Cambridge Studies in Historical Geography, 20) (Cambridge: Cambridge University Press, 1994) 57–61, Marcin Starzyński, *Das Mittelalterliche Krakau. der Stadtrat im Herrschaftsgefüge der polnischen Metropole* (Städteforschung, 92) (Cologne: Böhlau, 2015), 15–41, and most recently: Jacek Zinkiewicz, “Creatio. Foundation of Kraków,” in *On Common Path: Budapest and Kraków in the Middle Ages. Exhibition Catalogue, Budapest March 18 – July 24, 2016*, eds. Judit Benda et al. (Budapest: Budapest History Museum, 2016), 87–92.

subchapters. The charters of privilege for these settlements are either unknown or did not contain references to the rights of the settlers to build their own mills.

3.3.3. Kremnica and Its Water Mills

The case of the water mills in Kremnica seems most telling. On the one hand, changes in the number of mills over time within the borders of the town are exceptionally well documented; on the other hand, there are data on the existence of such buildings within a very short time after the town's foundation. In the coming pages, I survey the surviving documentary evidence that concern the water mills within the borders of the town in order to demonstrate how, when and by whom were these buildings built, and how important they were to the town's development.

Before going into detail concerning development of the mills at Kremnica, let me shortly refer to the foundation of the town itself. The development of the town begins in 1328, when, on November 1, King Charles I issued a privilege for the settlers. The Hungarian ruler enfranchised settlers who came from Kutná Hora (Kuttenberg) in Bohemia. Their settling in Hungary was probably initiated as part of the diplomatic meetings of Charles I and John of Luxemburg, the king of Bohemia in 1327. The miners and minters – who probably were mostly Germans, and the latter group probably Italians⁴⁶⁸ – and those who might settle in the future were provided with rights similar to those discussed above, such as access to the use of the surrounding forests. The document, however, includes stipulations that were anything but usual in the medieval Hungarian legal environment. To wit, in questions not covered in the privilege, the rights of Kutná Hora are identified as authoritative.⁴⁶⁹ Accordingly, the charter fails to discuss numerous aspects of the foundation of the town, including the right to use the waters found within the borders of the settlement. The burghers of Kutná Hora in general could use the privileges provided in the summary of the medieval Bohemian royal mining

⁴⁶⁸ See e.g. the example of Petrus Gallicus de Siena: Katalin Szende, “Királyi kényszer vagy közösségi akarat? Hivatali írásbeliség a magyarországi bányavárosokban a 13–14. században,” [Royal pressure or common will? Pragmatic literacy in Hungarian mining towns in the 13th–14th centuries] in *Márvány, tárház, adomnány*, 519. For him, see also: Attila Zsoldos, “Sienai ötvösből szepesi alispán. Olaszok és itáliaiak a Druget-nádorok szolgálatában,” [A Sienese Goldsmith as Alispán of Szepes: Italians in the Service of the Druget Palatines] *Vlăgtörténet* 7 [39] (2017): 61.

⁴⁶⁹ Hans-Wolfgang Strätz, “Kuttenberger Bergordnung,” in *Lexikon des Mittelalters*, vol. 5, eds. Robert Auty et al. (Munich: Artemis, 1991), 1594.

right (*Bergrecht*), the so-called *Ius regale montanorum*.⁴⁷⁰ This legal text, however, also remains silent on water rights as well as water mills within the limits of mining towns. Despite this lack of data, similarly to Kremnica, numerous burghers from Kutná Hora built and owned mills within the territory of their town.⁴⁷¹

The first document that refers to water mills in Kremnica was issued in 1331. By this time a good number of mills operated within the boundaries of the recently founded town.⁴⁷² The document is a pledge contract concluded between a certain Stephen Marsilii and Ieclinus of Olf, both probably burghers of Kremnica, in front of Lupoldus (Hyppolit) master of minting and chamber count of Kremnica⁴⁷³ as well as judges and jurors of the town. While the name of Marsilii suggests an Italian origin, a group whose presence is less frequently discussed for mining towns in Hungary, Ieclinus may be one of the settlers who arrived from the town of Olpe in the Rhineland.⁴⁷⁴ According to the contract, Ieclinus of Olf agreed to repay his debt representing a significant amount of cash and other goods, according to the details specified in the document, while Marsilii accepted a number of immovable goods from Ieclinus as a pledge. As customary for similar pledge contracts, apart from the debt-scheduling, the document also lists the immovable estates that were pledged. Amongst these immovables, and in order to identify these buildings, a number of mills are mentioned in the contract in two areas in the town, in the so-called Soler⁴⁷⁵ and Collner⁴⁷⁶ valleys (see *Fig. 15*), both formed by branches of the Kremnický Stream, the only significant waterway within the borders of Kremnica.⁴⁷⁷

The document lists the following water mills:

⁴⁷⁰ For its edition, see: *Ius regale montanorum* in *Codex juris Bohemici*, ed. Hermenegildus Jireček (Prague: Kober, 1867), 266–435. On the codification process, see: Kaspar von Sternberg, *Umriss einer Geschichte der böhmischen Bergwerke* (Prague: Haase, 1836–1837), Adolf Zycha, *Das böhmische Bergrecht des Mittelalters*, 2 vols (Berlin: Vahlen, 1900) (with another edition of the text in the second volume), and more recently: Guido Pfeifer, *Ius regale montanorum: ein Beitrag zur spätmittelalterlichen Rezeptionsgeschichte des römischen Rechts in Mitteleuropa* (Ebelsbach: Aktiv Druck & Verlag, 2002), and Jan Libor, *Václav II. a struktury panovnické moci* (Brno: Matice moravská, 2006), 79–162. I am indebted to Renáta Skorka for drawing my attention to these works.

⁴⁷¹ See the database: <http://vodnimlyny.cz> (last accessed: November 13, 2018). See also: Kateřina Vavrušková, “Po stopách mlynářů v Kutné Hoře,” [In the footsteps of the millers in Kutna Hora] *Krásné Město* no. 2 (2011): 14–18. Online: <https://www.cms-kh.cz/po-stopach-mlynaru-v-kutne-hore> (last accessed: November 13, 2018)

⁴⁷² MNL OL DF 250 152. Edited in: Matunák, *Z dějin Slobodného*, 455–457 no. 4.

⁴⁷³ On him, see: Martin Štefánik, “Italian Involvement in Metal Mining in the Central Slovakian Region from the Thirteenth Century to the Reign of King Sigismund of Hungary,” *I Tatti studies* 14/15 (2011–2012): 19–20.

⁴⁷⁴ Minářčic, “Metačná listina svätoantonského panstva,” 50.

⁴⁷⁵ Referred to today as Skalka Stream, an east-west running river in the borders of Kremnica, and a tributary to the Kremnický Stream. More mills are indicated by this stream by Györffy (ÁMTF, vol. 1. 455) as well as Martin Štefánik, “Kremnica,” in *Lexikon stredovekých miest na Slovensku* [Lexicon of medieval towns in Slovakia], eds. idem and Ján Lukačka (Bratislava: Historický Ústav SAV, 2010), 221.

⁴⁷⁶ North-south running of the Kremnický Stream.

⁴⁷⁷ ÁMTF, vol. 1. 454–456, Štefánik, “Kremnica,” 221 and 223.

- A mill in the Soler valley owned by Ieclinus⁴⁷⁸ with one sixth of the river⁴⁷⁹;
- The mill of Kadold⁴⁸⁰ in the Soler valley⁴⁸¹;
- Two mills and a furnace owned by Ieclinus in the Soler valley, around the mill of Kadold⁴⁸²;
- A mill next to the estate of Mazaldrus owned by Ieclinus in the Collner valley;
- The mill of the judge of Pukano (Pukanec)⁴⁸³ in the Collner valley;
- The mill of Ieclinus next to that of the judge of Pukano in the Collner valley;
- Ore stamp mill called Kolbe in the Collner valley above the previous one;
- Ore stamp mill owned by Nicholas Putner, probably also in the Collner valley.



Fig. 15. The mills and the urban topography of Kremnica in the mid-fourteenth century (after György Györffy)

⁴⁷⁸ He may be identical with a man referred to as a burgher of Hybe: Iván Borsa, *A Szent-Iványi család levéltára 1230–1525* [Cartulary of the Szentiványi family] (Magyar Országos Levéltár kiadványai, II. Forráskiadványok, 14) (Budapest: MOL, 1988), 27 no. 38.

⁴⁷⁹ Probably meaning the right to one sixth of the water of the river.

⁴⁸⁰ As an *urburarius* of Pukanec: AOKIt, vol. 29. 296–296 no. 480. (MNL OL DF 237 039). He owned a mill by the Büksavnica Stream close to Nová Baňa, to be discussed hereafter. Later, he became chamber count of Kremnica: http://www.corycats.sk/mint/index.php?go=grofi_is (last accessed: November 15, 2018).

⁴⁸¹ Later called the Upper Mill (1365, 1366, 1372, 1373) which had four wheels by 1373. Cf. MNL OL DF 249 435.

⁴⁸² They are probably do not represent two mills, but rather a single mill with two wheels.

⁴⁸³ For Pukano – Bakabánya: Katalin Fehértói, “RATA és TILO,” [RATA and TILO] *Magyar Nyelvőr* 122 (1998): 66. Lajos Kiss, *Földrajzi nevek etimológiai szótára* [Etymological dictionary of geographic names] (Budapest: Akadémiai, 1978), 76 (Bakabánya).

The above list provides a number of important lessons from the point of view of the main question of this subchapter. First, water mills probably began to be erected within the town boundaries from the moment settling began. Based, however, on the number of mills and their ownership by burghers in other towns, it is very possible that some of the mills even predate the issuing of the foundation charter. This situation would not be exceptional as I shall demonstrate using the example of the mills within the boundaries of Nová Baňa. The half dozen grain mills and the further ore stamp mills and furnaces suggest that the settlement became significant within a very short period of time. Considering that by its very nature the contract could not have recorded every mill, the population of the town may have grown rapidly representing one of the most successful town foundations in the region at the turn of the thirteenth century. Second, the ownership of these mills is important. Somewhat typically, the picture is anything but clear, as there is little information on the people mentioned in the above and similar other documents. However it is clear mills were either in the hands of the burghers of Kremnica or held by burghers in other nearby mining towns.⁴⁸⁴ Third, although this is just partially important for the main argument here, the document is one of the most important sources on the early topography of the mining town. Based on the contract, it seems clear that the town grew rapidly from early on and parts of the settlement were found over a relatively extended area, within two small valleys, one running north-south and the other east-west.

The number of mills as well as their relative situation could be identified based on the document, however, the source does not refer to their actual positions along the two streams. The Hungarian historian, György Györffy as well as Slovak researchers mostly use this contract when trying to visualize the extent of the town in the period of its foundation. Györffy suggested that there were five water mills along each of the streams. In the case of the Collner valley this number is probably right. In the Soler valley, however, there were probably only three mills, two of which had a single wheel while the third, apart from two wheels that grounded grain and a third that crushed ore was placed within the same building.⁴⁸⁵ Having wheels for different functions housed under the same roof not exceptional

⁴⁸⁴ Such as the judge of Pukanec and Kadold, who was also active at Pukanec (see below).

⁴⁸⁵ *Item molendinum circa Mazaldrum situm et infra molendinum iudicis de Pukano ipsum Jeclinum contigentem, pro quinquaginta marcis eciam Regii pagamenti. Item unum confum, quod wlgariter Kolbe dicitur in eadem aqua inferius sita et ibidem Nycolaus dictus Putner habet unum contum, pro quinque marcarum pagamenti estimamus...* and *Primo unam rotam cum sexta parte aque in valle Soler pro triginta marcarum pagamenti. Item duas Rotas et chazam in superflui aqua circa molendinum Kadoldi sitam, pro quadraginta marcarum Regii pagamenti.* Matunák, *Z dejin Slobodného*, 455–457 no. 4.

and was, in fact, quite normal in the late medieval period. Most importantly, all these mills were already operating within three years after the foundation charter of the town was issued.

Apart from the mills built within the town itself, from the middle of the fourteenth century onwards, mills were also erected in villages founded by or with the involvement of the burghers of Kremnica within the boundaries or close to the town.⁴⁸⁶ One of the first ones may have been in the village of Kunešov (at that time Szentmihály), settled by a certain Vernher of Potska in 1342. Apart from initiating the settling, he and his heirs received jurisdiction over the villagers.⁴⁸⁷ The settlers did not receive the rights of Kremnica, but those of Žilina where the privilege dated back to 1321.⁴⁸⁸ The settlers of the newly founded Kunešov, however, could enjoy a freedom that was not specified by King Charles I for Žilina, but was additionally granted to the locator and the settlers of Kunešov, namely the right to build along the water.⁴⁸⁹ This likely signified that soon after the foundation of Kremnica, its burghers realized how important it was to ensure this right, which as discussed was not specified in the town's charter of privilege, but was nonetheless probably treated as an existing right from early on. In the coming decades, numerous new villages were founded in the neighborhood of Kremnica, and the contracts connected to their foundations are all indicative of the liberties that the settlers could usually enjoy. Similarly to Kunešov, the village of Sklené was founded with the support of Kremnica by the nobles of the later abandoned Felsőmutna under the leadership of the *locator* Peter Glaser. Similarly to the settlers of Kunešov, the people who settled in Sklené were also granted the freedoms of Žilina. The charter emphasized that the new villagers also received the freedom to build their own mills among their other rights.⁴⁹⁰

One other village founded around that time was settled by a certain John (*Johannes*), hence the original name of the settlement, Johannesberg (called Kremnické Bane nowadays).⁴⁹¹ The exact date of the foundation is unknown, but it probably occurred around the middle of the fourteenth century. John Göldner, a burgher of Kremnica, came into possession of the settlement in 1361. Apart from the right to build on the water, he got

⁴⁸⁶ For the *hospes*-villages and their foundations in Upper Hungary, see: Adrienne Körmendy, *Melioratio terrae : vergleichende Untersuchungen über die Siedlungsbewegung im östlichen Mitteleuropa im 13.–14. Jahrhundert* (Prace Komisji historycznej / Poznańskie Towarzystwo przyjaciół nauk, Wydział historii i nauk społecznych, 48) (Poznań: Wydawn. Poznańskiego Towarzystwa przyjaciół nauk, 1995).

⁴⁸⁷ Matunák, *Z dejin Slobodného*, 458 no. 6. See also here: 457–458 no. 5.

⁴⁸⁸ VMMS, vol. 1. 97–98 no. 110.

⁴⁸⁹ *Insuper iudici praedicto et suis villanis contullimus, quod quantum in aqua sursum et deorsum poterunt aedificare, nemo eos audeat infestare*. Matunák, *Z dejin Slobodného*, 458 no. 6.

⁴⁹⁰ Matunák, *Z dejin Slobodného*, 459–461 no. 8.

⁴⁹¹ On John/Johannes, see: Štefánik, “Kremnica,” 230.

possession of a then four-wheeled mill that had been built in the settlement.⁴⁹² When Göldner came into possession of the settlement, he also inherited the rights of Žilina for the settlement.

One further settlement foundation in the neighborhood of Kremnica took place in 1364. The nobles in the above-mentioned settlement of Felsőmutna this time intended to found villages in the forests belonging to their rather extensive estates. The Mutna – or by its Árpadian-period name *Chernakou*⁴⁹³ – forest lay in the southernmost area of historical Turóc County and was divided into two parts by the river bearing the same name as the county (Turiec by its modern name).⁴⁹⁴ The river proved to be an important asset in settling the area as its runoff by far exceeded that of the rivers in the borders of Kremnica. This fact and the richly forested land were the most important factors in settling the area. Settlement itself took quite a while as in 1263, the land of the Mutna Forest had been given to new settlers during the reign of King Béla IV in return for fishing and hunting services they provided the king.⁴⁹⁵ In the middle of the fourteenth century, plans to settle the area were finally concluded. The settling was organized under the leadership of Nicholas, son of Matthew, with the intent to found village or villages in order to exploit the resources in the uninhabited forest areas. Nicholas as *advocatus* received significant benefits, amongst other things two empty plots and a place suitable for a mill (*locus molendini*, see Chapter 3.1) – i.e. the right to build a mill – in the territory of the forest, as well as a place for a mill outside of the forest by the River Turiec, the latter including a plot for the miller's house. The settling this time was different because the *hospites* were given the rights of the mining town of Krupina.⁴⁹⁶ However, the *advocatus* and his heirs had a special right to receive every sixth denar of the taxes the settlers paid to the landlords as well as one sixth of the gifts given to the landlords. Since this latter stipulation is not included in the original privileges of Krupina, this is referred to in the *hospes*-privilege as a custom of Žilina. Accordingly, while in general, the charter refers to the rights of the settlers as being the same as for the inhabitants of Krupina, in one particular instance the charter still refers to Žilina's privileges as authoritative.⁴⁹⁷

⁴⁹² Matunák, *Z dejin Slobodného*, 461–462 no. 9. Cf. Štefánik, “Kremnica,” 218.

⁴⁹³ RA, vol. 1/3. 396 no. 1398, 416 no. 1354, 461 no. 1516, and 474 no. 1551. For the early history of the landownership in the area, see: Elemér Mályusz, *Turóc megye kialakulása* [The formation of Turóc County] (2nd ed. Máriabesnyő–Gödöllő: Attraktor, 2005), 99–101, and Béla Bráz, *A nagycsepcsényi és muthnai Vladár-család története és leszármazása* [The history and genealogy of the Vladár family of Veľký Čepčín and Mutna] (Turócszentmárton: Magyar Ny., 1907), passim.

⁴⁹⁴ For a map of the area, see: Ján Št. Šikura, *Miestopisné dejiny Turca* [Historical geography of Turóc]. (Bratislava: Slovenská akadémia vied a umení, 1944).

⁴⁹⁵ RA, vol. 1/3. 416 no. 1354. Its edition: ÁUO, vol. 8. 56. See also: RA, vol. 1/3. 415 no. 1351, its edition: ÁUO, 8. 55.

⁴⁹⁶ Cf. Szende, *Trust, Authority and the Written Word*, 66, 168, and 219.

⁴⁹⁷ MNL OL DF 249 547 (for its summary, see: AOKlt, vol. 48. 287–288 no. 546).

It is no surprise that the nobles of Mutna made major efforts to settle the area in that period. The rapid growth of close-by Kremnica must have brought previously unprecedented economic benefits for the settlers in the forest. The proximity to Kremnica, however, was not only an economic benefit, but over the long run proved a major threat as well, since the wealthy town, from the beginning of the fifteenth century onwards, made numerous efforts to get ownership of the villages in the area.⁴⁹⁸ Kremnica managed to expand its land holdings in the area, not only in the early fifteenth century, but they continued to do so in the coming century as well. In the late fifteenth century, the landlords of Mutna – referred to as *predium* (perhaps meaning, but not necessarily, a lost settlement⁴⁹⁹) at the time – claimed that the burghers of Kremnica hired mercenaries to take over their territories.⁵⁰⁰ Not much later, in the 1520s, the authority of Turóc County forbade Kremnica from seizing any part of the village of Felsőmutna.⁵⁰¹

From the point of view of mills, one further *hospes*-settlement is worth mentioning, the village of Dolný Turček, also founded in the Mutna Forest. The settlement, lying few kilometers north of Kremnica, had significant mills as the above mentioned River Turiec crossed the village. According to a document from 1371, the settlement had two mills by then, one running with as many as eight wheels and another one with six wheels.⁵⁰² The document, apart giving information about one of the largest milling complexes in fourteenth-century Hungary, also contains an exceptional clause: it annuls every previous document issued by Kremnica concerning rights to the river. This passage is important in two respects; first, it strongly contradicts contemporary customary law, which – as discussed in Chapter 3.1 – accepts the earlier acquired right as superior to the one acquired later in water rights and other spheres of daily life. Second, the document implies there were earlier decisions of Kremnica concerning the rights to water in Dolný Turček, documents that are probably lost. I will refer to the latter problem in the conclusion of this subchapter, as this passage may be of crucial importance to the present enquiry. The last *hospes*-village that is worth mentioning is Horná Štubňa, called Újlehotka at the time. The name is telling as the word is a compound one, consisting of ‘új’ (meaning “new” in Hungarian) and ‘lehotka’ (a word of Slavic origin,

⁴⁹⁸ On this, see: ZsO, vol. 2/1. 41 no. 328, 295 no. 2537, 359 no. 3056, 367 no. 3112, 375–376 no. 3181, 461 no. 3838, 465–466 no. 3866, vol. 2/2. 36–37 no. 5431, 230 no. 6718, and vol. 3. 217 no. 697.

⁴⁹⁹ Árpád Nógrády, “Az elakadt fejlődés,” [Halted development] in *Keresztesekből lázadók : Tanulmányok 1514 Magyarországról* [From crusaders to rebels. Studies on Hungary in 1514], eds. Norbert C. Tóth, and Tibor Neumann (Budapest: MTA BTK Történettudományi Intézet, 2015), 11–30.

⁵⁰⁰ MNL OL DL 95 433. (August 21, 1498)

⁵⁰¹ MNL OL DL 98 227. (March 30, 1525)

⁵⁰² Matunák, *Z dejin Slobodného*, 462–463 no. 10.

meaning forest clearance, used as a loanword in Hungarian).⁵⁰³ The settlers in 1390 were granted the rights of Krupina, and the leader of the settling process, a certain Bartos and his heirs, had the right to build mills freely.⁵⁰⁴

As is evident from the list of settlements discussed above, the burghers of Kremnica acquired significant properties in the neighborhood of the mining town and had a number of mills built on these estates. The mills within the borders of Kremnica, however, were not solely in the hands of the burghers of Kremnica. A number of them were owned by burghers in other mining towns. For instance, Nicolas Smyt, a burgher from Nová Baňa, came into the possession of a, by then, four-wheeled water mill, previously owned by the aforementioned Kadold.⁵⁰⁵ Soon afterwards, Smyt sold it to a burgher from the town of Louny in Bohemia.⁵⁰⁶ He was not the only person alien to the town who had a share in the milling industry within the borders of Kremnica. Burghers from Buda,⁵⁰⁷ as well as the archbishopric of Esztergom owned a significant number of mills in the mining town. The latter institution got its hands on a large mill in the town in the 1460s, after which they leased it to Kremnica. They bought the mill for 4000 florins and leased it back to the town for as much as 300 golden florins a year,⁵⁰⁸ the greatest single source of income from mills in the whole of the archbishopric.⁵⁰⁹

Apart from the fact that a number of mills were owned by individuals other than the burghers of Kremica including the largest of such mills in the town, there were more mills for grinding grain and to crush the ore mined locally in the burghers' hands. The well-preserved fifteenth-century account books of the town usually registered the mills and their owners precisely (see *Fig. 16*), also noting by which of the two above-mentioned streams (in the Soler and Collner valleys) the mill was functioning. Although a detailed analysis of the individual mills would reveal something regarding the historical topography of the town, from the view point of this subchapter it is less relevant. However, their very existence is certainly important for understanding water rights in general.

⁵⁰³ János Melich, "Három helynévről: Lehota, Vólya, Ohába," [On three placenames: Lehota, Vólya, Ohába] *Századok* 41 (1907): 321–324.

⁵⁰⁴ For an edition of the document, see: Matunák, *Z dejin Slobodného*, 463–464 no. 11.

⁵⁰⁵ MNL OL DF 249 435.

⁵⁰⁶ See further, on the interests of the burghers of Nová Baňa in the mills of Kremnica: MNL OL DF 249 443. Cf. Stefánik, "Nová Baňa," in *Lexikon stredovekých*, 298.

⁵⁰⁷ Mihály Matunák, "Eredeti oklevelek a körmöczbányai püspöki malomról," [Original charters on the bishop's mill at Kremnica] *Magyar Történelmi Tár* 8 (1907): 321–324. Cf. András Kubinyi, "A budai német patriciátus társadalmi helyzete családi összeköttetései tükrében a 13. századtól a 15. század második feléig," [The social position of the German patriciate of Buda in the light of their family ties from the thirteenth to the second half of the fifteenth century] in idem, *Tanulmányok Budapest középkori történetéről*, vol. 2. 496 (published earlier under the same title at: *Levéltári közlemények* 42 [1971]: 203–269).

⁵⁰⁸ Erik Fügedi, "Az esztergomi érsekség gazdálkodása a XV. század végén. I–II. rész," [Farming of the archbishopric of Esztergom at the end of the fifteenth century, I–II] *Századok* 94 (1960): 102–103, and 536.

⁵⁰⁹ On the acquisition of the mill, see: Matunák, "Eredeti oklevelek," 324–326 no. 5.

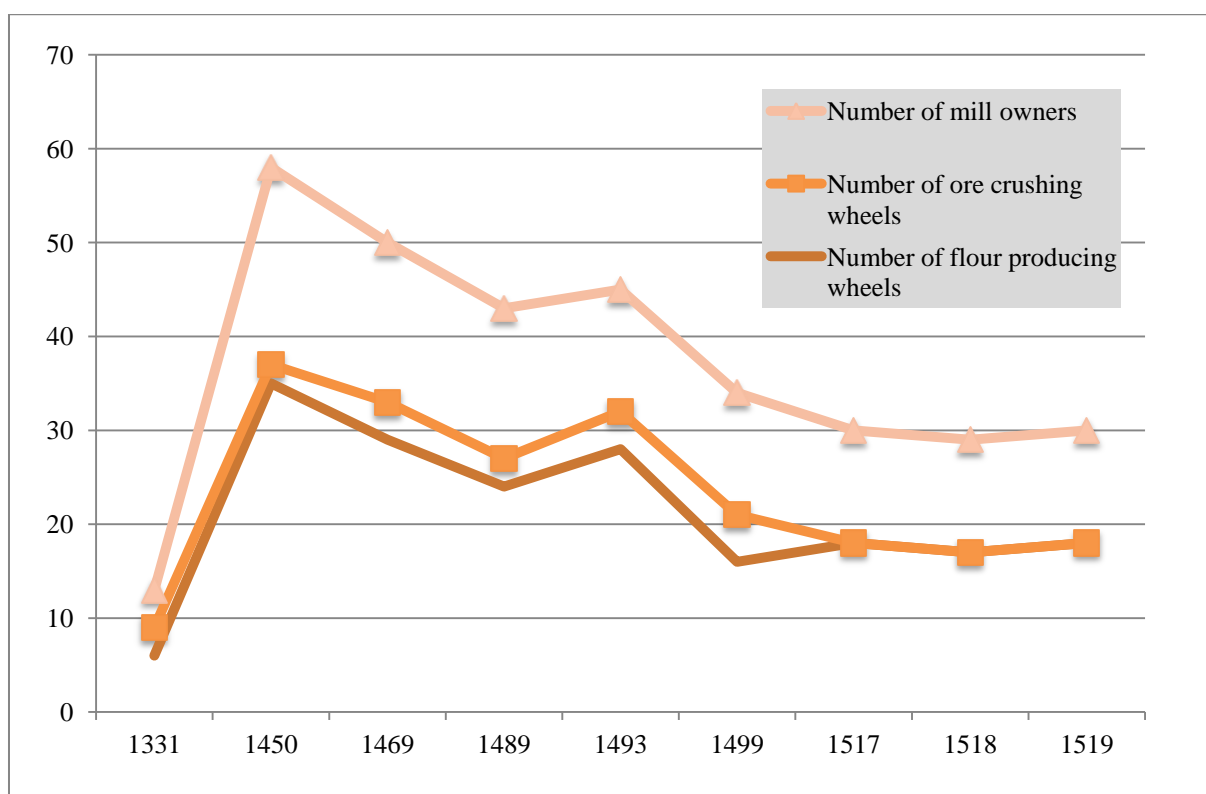


Fig. 16. The mills of Kremnica and their ownership (1331–1519)⁵¹⁰

Some lessons can be drawn based on the data discussed above. First, from the beginning of the existence of the town, the burghers of Kremnica possessed a number of water mills. In light of the 1331 pledge contract, it may be well worth considering that even if the privileges granted to Kremnica in 1328 did not refer to this privilege explicitly, the Germans and settlers from other areas lived with this freedom in practice. The existence of the freedom to use waterways to erect mills is confirmed by the fact that *hospes* villages founded under the leadership of Kremnica were also granted this freedom. Otherwise, the *advocati* from the different *hospes* villages would have acquired more freedoms than the burghers who commissioned them to lead the settling of the villages. The above-mentioned 1371 document on Dolný Turčák is of crucial importance here, as shows that the town of Kremnica had already proceeded with their own water rights before the end of the fourteenth century. In the next short subchapter, I will provide an overview of the history of the water rights related to the foundation of the mining town of Nová Baňa.

⁵¹⁰ Fejérpataky, *Magyarországi városok*, 625–626 (1442–1443), 625–636 (1450), MNL OL DF 250 101 (1469), MNL OL DF 250 088 (1489), MNL OL DF 250 090 (1499), MNL OL DF 250 102 (1517), MNL OL DF 250 076 (1518), MNL OL DF 250 077 (1519).

3.3.4. The Foundation of Nová Baňa and its Water Mills

Unlike the water mills of Kremnica, which despite of the relative abundance of the available sources, have not been extensively studied, the mills of Nová Baňa have been the subject of several thorough analyses. In the absence of a foundation charter, the most important source on the early history of this mining town is the lawsuit that unfolded between the settlement as it was developing and the Benedictine abbey of Hronský Beňadik concerning water and property rights.⁵¹¹ Even if the foundation charter has not survived, the issuing of the document can be very precisely dated to either August or September 1345.⁵¹² As such, it represents a relatively close parallel to Kremnica, founded less than twenty years before. The settlement had already probably started to grow some years before, in the late 1330s, when the burghers of Pukanec began to settle people in the area in order to exploit the ore that had been discovered.

Along with the beginning of mining activity in the area, the formation of the settlement right on the border of the royal estate and the lands of the Benedictines of Hronský Beňadik, also began. The basic problem was that the most important water resources for the new town sprang from the estate of the Benedictines, and as it is evident from the example of Kremnica, water resources were crucial for founding a mining settlement. It seems that the Benedictines at first did not mind the presence of the miners at all, as the abbey expected some income from a part of their estate which had not been economically viable until then. The expectations of the abbey first seemed to have been well founded, as not long before 1340,⁵¹³ the abbey managed to let a mill-place by the Büksavnica Stream to two burghers of Pukanec who wished to use it in the service of the newly opened mine on the nearby royal

⁵¹¹ For the most important works: Dezső Csánki, and Neda Relković, “Újbánya város levéltára és rövid története,” [Short history of Nová Baňa and its archive] *Levéltári Közlemények* 2 (1924): 86–107, ÁMTF, vol. 1. 482, Kristóf Keglevich, *A garamszentbenedeki apátság története az Árpád- és az Anjou-korban, 1075–1403* [The history of the abbey of Hronský Beňadik in the Árpadian and Angevin Periods, 1075–1403] (Capitulum VIII.) (Szeged: Szegedi Tudományegyetem Történeti Intézete, 2012), 88–90, idem, “A garamszentbenedeki bencések és Újbánya polgárai a 14. század közepén,” [The Benedictines of Hronský Beňadik and the burghers of Nová Baňa in the middle of the fourteenth century] in *Tiszteletkőr*, 137–144, Weisz, “A nemesércbányászathoz kötődő privilégiumok,” 147–148, *eadem*, “A bányaváros,” 34–35, and *eadem*, “Mining Town Privileges,” 291–292. Slovakian researchers have also discussed the circumstances of the town’s foundation: Richard Marsina, “Štúdie k Slovenskému diplomatáru. I. Druhá časť,” [Studies in Slovak diplomatics. I. Second part] *Historické štúdie* 18 (1973): 66–67 and more recently: Štefánik, “Nová Baňa,” 294–304.

⁵¹² Weisz, “A nemesércbányászathoz kötődő privilégiumok,” 147.

⁵¹³ MNL OL DL 25 169. For an earlier edition: CD, vol. 8/4. 273–274. The undated document, mostly based on Fejér’s *Codex diplomaticus* has been dated to 1337, erroneously. For its new edition, with a rather convincing argument on the dating, see: Kristóf Keglevich, *A garamszentbenedeki apátság 13. és 14. századi oklevelei (1225–1403)* [Thirteenth- and fourteenth-century documents of the abbey of Hronský Beňadik] (Capitulum, 9). Szeged: Szegedi Tudományegyetem Történeti Intézete, 2014), 333–335 no. 5.

estate. As emphasized in earlier research, the lease contract includes an important passage according to which the plot and the mill to be built was only a lease and not a property as it was not on the territory of the royal forest of Savnic. The abbey emphasized therefore that the customary law of the royal settlers had no legal relevance in the area nor would the future privileges received by the mining town and its burghers.⁵¹⁴ This passage is interesting as it alludes to the possibility of the settlers enjoying certain rights in the above case. These rights could have hardly been anything else than the freedom to exploit water resources – that is putting up a mill – within the borders of their settlement. Besides the leases to the burghers of Pukanec, from 1345 onwards the abbey started to systematically lease those of its lands suitable for building mills on. The abbey first provided its *provisor*, a certain Peter, a place for a mill by the Büksavnica Stream for payment of one florin annually.⁵¹⁵ Some weeks later, Abbot Siegfried leased another mill-place to a certain Nicolas, son of Leo and *Dytel dicto Moder* by the nearby Verence Stream,⁵¹⁶ and finally, again in the same period, the above-mentioned Kadold *urburarius* took out a lease for a mill-place by the Büksavnica.⁵¹⁷

The question of the border between the lands of the abbey and of the king soon became a source of conflicts. Already, in 1345, King Louis I warned Nová Baňa to respect the property rights of the monastery. The mills probably were already completed in 1345, and in order to settle the dispute in 1347, King Louis ordered the leaseholders to pay one florin of rent to the abbey of Hronský Beňadik after each mill built on their estate. The burghers of Nová Baňa, despite their repeated promise to do so, did not pay the rent regularly. The related lawsuit has been studied in detail recently by Kristóf Keglevich therefore I will not discuss every aspect of this case.⁵¹⁸ The most important question in this subchapter is why the burghers of Nová Baňa may have chosen not to pay the one florin rent. The territory, on which the mills stood, as discussed above, lay within the borders of the Benedictine abbey's lands. However, after Nová Baňa became populated, the leaseholders of mills, probably lacking detailed perambulations, treated these mills as buildings belonging to their own town. In response to such claims, King Louis I repeatedly warned the burghers not to violate the borders of the abbey. However, if the mills stood within the borders of Nová Baňa (and of course because in their own interests, the leasers argued that), they would not have had to pay

⁵¹⁴ Cf. Weisz, "A nemesérbányászathoz kötődő privilégiumok," 147. *Nulla iustitia vel libertatis prerogativa, si quam ipsorum concives in Bakabanya vel hospites in novis montaniis Schewnycze vocatis ex consuetudine vel ex donatione regali haberent vel in posterum habere possent.* See: Keglevich, *A garamszentbenedeki apátság*, 334 no. 5.

⁵¹⁵ For the best edition, see: Keglevich, *A garamszentbenedeki apátság*, 335. no. 6.

⁵¹⁶ Keglevich, *A garamszentbenedeki apátság*, 336 no. 7.

⁵¹⁷ Keglevich, *A garamszentbenedeki apátság*, 336–337 no. 8.

⁵¹⁸ Keglevich, "A garamszentbenedeki bencések és Újbánya polgárai."

this rent.⁵¹⁹ If the mills would really belonged to Nová Baňa, the settlers could have owned them in their own right, without paying any connected duty, which probably was the customary law in similar cases.

3.3.5. Mills in Mining Towns: Who Was Entitled to What?

In the previous pages, based on examples from some of the mining towns in medieval Hungary, populated in the thirteenth and fourteenth centuries, I aimed to demonstrate the importance of the rights and the legal disputes that surrounded the construction of water mills and using waters for different purposes in general. As evident from the examples of Kremnica and Nová Baňa, having mills built in the settlements right after their foundation in order to ground grain, process the ore mined in the area as well as for preparing timber for building the mine shafts, was already a crucial issue. Accordingly, despite the fact that in the charters of privilege of the Upper Hungarian and Transylvanian mining towns, the right to construct mills and use water resources in general only rarely appear in charters although such questions are discussed in the early legal documents of the settlements with a strikingly high frequency. This is also true in the case of the early pragmatic written documents from Kremnica and Nová Baňa discussed above, where at least half of the documents issued by the authority of the two towns contain references to related issues.⁵²⁰

Previous researchers attempted to collect the economic and other privileges of mining and other royal towns that appear in the foundation charters in order to show what freedoms certain communities acquired in medieval Hungary. Despite the fact that charters given to mining communities rarely include passages on rights to build mills and exploit the water resources in general, I hope to have demonstrated in the previous subchapters that for the settlements founded in the thirteenth and fourteenth centuries, the right to build mills was actually taken for granted and exploited by the settlers. Therefore, there may be good grounds to accept the hypothesis suggested in the introduction to the subchapter. One further problem has to be redefined to some extent: to what degree can the foundation charters of these settlements be used to understand the economic privileges the settlers received? Apart from concrete references in them, which of course should not be underestimated, it is very possible

⁵¹⁹ Cf. Keglevich, “A garamszentbenedeki bencések és Újbánya polgárai,” 142–143.

⁵²⁰ Katalin Szende, “Királyi kényszer vagy közösségi akarat? Hivatali írásbeliség a magyarországi bányavárosokban a 13–14. században,” [Royal compulsion or common will? Official literacy in the Hungarian mining towns in the 13th and 14th centuries] in *Márvány, tárház, adomány*, 522, and 535–536 (Appendix).

that these documents only included some of the freedoms and economic benefits burghers possessed in a mining town.

3.4. Rivers as Borders – Another Minefield?⁵²¹

“This river [Tiber] moreover circles that splendid mountain on which the city of Perugia is situated and while flowing a great distance through its district, the river itself is bordered by plains, hills and similar places (...) when I was resting from my lecturing and in order to relax, was travelling towards a certain villa situated near Perugia above the Tiber, I began to contemplate the bends of the Tiber, its alluvion, the islands arising in the river, the changes of the river-bed as well as a host of unanswered questions which I had come across in practice. (...) I began to consider in various ways what the legal position was, not believing that I would take it any further (...) while I slept that night, I had a vision near dawn that a certain man, whose countenance I found gentle, came to me and he said the following: ‘Write down what you have begun to think about and since there is a need for illustration, provide mathematical diagrams.’”⁵²²

The quotation above is from the prologue of a treatise by Bartolus of Sassoferrato (Saxoferrato), one of the most celebrated jurists of the fourteenth century. Bartolus, who was probably one of the most influential and, by 1355 (when this text was written), busy professors at the University of Perugia, decided to take some time off during the year. As is mentioned in the text, he headed to a villa (the location of which has not been identified by historians) overlooking the valley of the Tiber. There, he began considering the question of who the islands emerging in the river belonged to and what happened with the ownership of a certain piece of land when the river which constitutes its border starts to meander along a different path, eroding parts of one person’s property and adding to the far bank. The present subchapter, although extending the problem to (semi-)artificial riverbed changes, addresses the same question. What happened with the ownership of these lands, and to what degree was that a source of conflict in the medieval Kingdom of Hungary? Was there a customary law

⁵²¹ An earlier version of this subchapter has been published: András Vadas, “Border by the River – But Where is the River? Hydrological Changes and Borders in Medieval Hungary,” *Hungarian Historical Review* 8 (2019): 336–360.

⁵²² Paul Jacobus du Plessis, “An Annotated Translation of Bartolus’ *Tractatus de Fluminibus seu Tyberiadis* (Book 1),” (MA-Th., Potchefstroomse Universiteit, 1999), 35. (I consulted the translation, but corrected it at certain places). For the best edition of the prologue, see Osvaldo Cavallar, “River of law: Bartolus’s *Tiberiadis* (De alluvione),” in *A Renaissance of Conflicts: Visions and Revisions of Law and Society in Italy and Spain*, eds. John A. Marino, and Thomas Kuehn (Toronto: Centre for Reformation and Renaissance Studies, 2004), 84–116. For the printed editions of the work, see Bartolus de Saxoferrato, *Tractatus de fluminibus seu Tyberiadis* (Bononiae: Johannes Roscius, 1576), and idem, *Tractatus de fluminibus seu Tyberiadis*, ed. Guido Astuti (Turin: Bottega d’Erasmus, 1964) (with the reprint of the 1576 edition of the text).

concerned with adjudging similar cases or was the problem so rare that no stable norm formed in the Middle Ages? As I have argued in previous chapters, the process of building mills and creating obstacles in rivers can be traced back to the Árpadian period. However, these issues were far less evident with border and riverbed changes.

As suggested by the above prologue, filled with a variety of tropes, Bartolus first thought it was an eccentric idea to discuss an issue like this in a treatise until a mysterious man urged him to do so. Though the anecdotal story behind the inspiration of the treatise known as *Tractatus de fluminibus seu Tyberiadis* (or sometimes referred to in an abbreviated form simply as *Tyberiadis*) may not have had much connection to what actually happened, it is difficult to believe that the whole treatise was completed in just a few weeks' time as Bartolus suggests. Existing scholarship on the treatise attributed major importance to the circumstances surrounding the formation of the work, especially the possible holiday and the location of the villa mentioned.⁵²³ These questions are important, of course, from the point of view of Bartolus himself, but they are probably less crucial with respect to the issue of rivers as borders. More interesting, is simply that a major authority on Roman law at this time engaged in writing a work dedicated to the topic. It seems from the above quote that he did not consider the question worthy of similar treatment (*Et circa multa dubia que de facto occurrerant et alia ego ipse ex aspectu fluminis excibatam, quid iuris esset, cepi aliquantulum intueri, non tamen credens ultra procedere, ne recreationem propter quam accesseram impedirem*).⁵²⁴ The prologue is somewhat controversial, as Bartolus also states that he encountered similar problems during his legal practice.

Bartolus' work consists of three parts and focuses on two questions: who owns the land if an island emerges from a river and, when the river changes course, how should the borders of connected estates be demarcated? One of the most important features of the treatise is that, in its argumentation, it combines legal reasoning and geometry. Bartolus drew numerous geometric figures with which he meticulously described how newly emerging islands or newly emerging lands connected to the existing lands should be divided. There are several variants of these drawings (connected to the manuscript tradition), but an autograph

⁵²³ For the political context of the writing, see Helmut Walther, "Wasser in Stadt und Contado. Perugias Sorge um Wasser und der Flußtraktat Tyberiadis des Perusiner Juristen Bartolus von Sassoferrato," in *Mensch und Natur im Mittelalter*, 2 vols (Miscellanea Mediaevalia, 21), eds. Albert Zimmermann, and Andreas Speer (Berlin: de Gruyter, 1991), vol. 2. 889–890. See also: Cavallar, "River of law."

⁵²⁴ Cavallar, "River of Law," 84. (Appendix)

fragment from the *Tyberiadis* preserved many figures which can be associated with Bartolus himself.⁵²⁵

Although as noted above, historians have tended to focus on the circumstances of the creation of the work and have dealt less with the text itself, the problem of shifting boundaries touched upon it, comes up in a number of law codes, customary law collections, and various documents related to lawsuits. And as mentioned, the very fact that Bartolus engaged in writing such a work suggests that the problem meandering waterways was not as rare as it seems at a first glance. To what extent were the questions he was raising important as matters of theory? To what extent did he mean to offer an example, with this text, of the potentials of combining geometry and law instead of simply addressing a legal problem? Does the Hungarian source material offer insights into similar problems? How were such cases resolved in medieval Europe and in Hungary? In this subchapter, I discuss these issues on the basis of land-related disputes from the Kingdom of Hungary that preserve such cases.

Despite the fact that Bartolus' work discusses in detail what happens if a piece of land emerges on the bank of a river because of alluvial activity, he partly disregards a difficulty which, in light of the Hungarian source material, appears to have been a recurring issue.⁵²⁶ He never considered what exactly happened if the piece of land in question used to be the property of the landlord from the other bank of the river, i.e. it did not emerge from the river, but was detached from one person's lands and attached by the river to a property belonging to someone else. In the cases Bartolus discusses, the principles of geometry can be applied using geometrical diagrams. The general principle he suggests is quite easy to explain in the sense that it aligns the ownership of the islands on a bank to the parallel landownership. In Bartolus' treatise, the same applies to lands which emerge from the river as a consequence of years of alluvial accumulation. This phenomenon in Roman law is usually referred to as accretion, and it was adjudicated in ancient legal tradition in the same manner as Bartolus.⁵²⁷ This issue was also important in the case of lands emerging along seashores.⁵²⁸ Of course, in the medieval Kingdom of Hungary and probably everywhere in Europe (with the exception of the Low

⁵²⁵ Cf. Cavallar, "River of law."

⁵²⁶ Although the problem of emerging islands also appear in Hungarian legal documents. E.g. AO, vol. 1. 94–95 no. 87, AO, vol. 4. 10–12 no. 10. See also the case referred to in note 39.

⁵²⁷ Joseph L. Sax, "The Accretion/Avulsion Puzzle: Its Past Revealed, Its Future Proposed," *Tulane Environmental Law Journal* 23 (2010): 305–367.

⁵²⁸ Beatry Augustyn, "Evolution of the dune ecosystem in Flanders during the Middle Ages: anthropogenic factors versus sea level change theory," online document: <http://www.vliz.be/imisdocs/publications/100070.pdf> (last accessed: April 8, 2018)., and eadem, "De evolutie van het duinecosysteem in Vlaanderen in de Middeleeuwen: antropogene factoren versus zeespiegelrijzingstheorie," [Evolution of the dune ecosystem in Flanders during the Middle Ages: anthropogenic factors versus sea level change theory] *Historisch-Geografisch Tijdschrift* 13, no. 1 (1995): 9–19.

Countries), the formation of new lands was a consequence of shifts in the flow of rivers rather than the movement of seawaters. This process in legal tradition is usually referred to as avulsion, a special form of accretion. Bartolus did not suggest a definitive solution to this question. It is not clear why this issue was partly omitted by Bartolus. It can probably be connected to the fact that the most important motivation for his work was to demonstrate the possibilities of integrating geometry and law. This works well in classical cases of accretion, but for avulsion, the legal principle is paramount with little space left for geometry. Even if Bartolus disregarded this particular problem, it was nonetheless clearly a recurrent issue in historical times going back to the beginnings of pragmatic literacy.

As a consequence of this, historians have devoted at least some attention to the problem for quite some time now. It has been discussed in at least three quite distinct fields of research: property rights in general, history, and geography/geomorphology. Historians were the first to study the problem. In most cases, they analyzed emblematic events on a local scale and considered how the processes in question impacted societies and economic and political structures. The most important example was a major hydrological change in the valley of the River Po. The event, usually referred to as *Rotta della Cucca* (the Cucca breach), first attracted the attention of Italian historians in the eighteenth century. Ludovico Antonio Muratori, one of the pioneers of the study of medieval Italy, was the first historian to discuss the Cucca breach.⁵²⁹ The basis for the assessment of the event is a chapter in Paul the Deacon's *History of the Lombards*, in which Paul describes the floods of AD 589. As he notes, in this year, several floods occurred along a number of rivers in Italy of which the most dangerous was the floods of the River Adige.⁵³⁰ Scholarship, building strongly on the work of Muratori, saw the event as the driving force in the transformation of the riverine landscapes and the courses of the Rivers Po and Adige. It created extensive marshlands in the surroundings of the mouth of the two rivers and transformed the borders of properties in the Veneto. In recent decades, historians have criticized this oversimplifying view of landscape

⁵²⁹ For Muratori's reading of the 589 floods see Lodovico Antonio Muratori, *Annali d'Italia, dal principio dell'era volgare fino all'anno MDCCL*, vol. 3/2 (Rome: Stamperia degli eredi Barbiellini, 1752), 339. On this, see Paolo Squatriti, "The Floods of 589 and Climate Change at the Beginning of the Middle Ages: An Italian Microhistory," *Speculum* 85 (2010): 801.

⁵³⁰ *Eo tempore fuit aquae diluvium in finibus Veneciarum et Liguriaie seu ceteris regionibu Italiae, quale post Noe tempore creditur non fuisse. Factae sunt lavinae possessionum seu villarum hominumque pariter et animantium magnus interitus. Destructa sunt itinera, dissipatae viae, tantum tuncque Atesis fluvius excrevit, ut circa basilicam Beati Zenonis martyris, quae extra Veronensis urbis muros sita est, usque ad superiores fenestras aqua pertingeret [...] Urbis quoque eiusdem Veronensis muri ex parte aliqua eadem sunt inundatione subruti.* Paulus Diaconus, *Historia Langobardorum* III. 23. For its edition, see Paulus [Paul the Deacon], *Historia langobardorum* in *MGH Scriptores Rerum Germanicarum*, vol. 48, ed. Georg Waitz (Hannover: Hahn, 1878), 127–128.

changes in the region and have tended to see it as a long process during which the channel system maintained by the Roman administration and taken over by the Lombards was intentionally abandoned. The marshes that came into being as a consequence of the end of the maintenance works, proved useful as a form of protection for the northern Italian territories against the Exarchate of Ravenna.⁵³¹

In the explanation of the processes involved, the change in the landholdings was only a marginal issue, but it nonetheless drew the attention of scholars to the fact that riverine landscapes were not nearly as fixed in the Early (or High or Late) Middle Ages as they became in the twentieth and twenty-first centuries, by which time most of the rivers in the densely inhabited areas of Europe had undergone long regulation processes though canalization. These landscape changes brought about by position shifts in riverbeds is probably is the most thoroughly studied medieval landscape change, but at least one other area is worth considering. In the nineteenth century, research on the changing waterscapes of the Low Countries also generated interest among Dutch and Flemish historians. As was true in the Italian case, the most important element of the geographical processes which caught the attention of historians from the nineteenth century onwards was not primarily the change in individual estate borders, but rather the major transformation of long stretches of seashore. Administrative and cartographic documents were the first sources used by historians in the Low Countries, but as was true in the case of Italy, in the last half century, research done by geographers and geomorphologists has significantly widened the opportunities to study the hydrological processes of the Holocene, or in this case, the Late Holocene. Geographers, in most cases working together with historians, have shown the potential of research on the avulsion histories of particular rivers in the Low Countries,⁵³² southern France,⁵³³ and other parts of Europe.⁵³⁴

⁵³¹ Until now the most detailed treatise of the problem is: Squatriti, “The Floods of 589,” 799–826. With a thorough criticism of the earlier secondary literature.

⁵³² Maarten G. Klein, Henk J. T. Weerts, and Kim M. Cohen, “Avulsion in action: reconstruction and modelling sedimentation pace and upstream flood water levels following a medieval tidal-river diversion catastrophe (Biesbosch, The Netherlands, 1421–1750 AD),” *Geomorphology* 118 (2010): 65–79. See also: Torbjörn E. Törnqvist, “Middle and late Holocene avulsion history of the River Rhine (Rhine-Meuse delta, Netherlands),” *Geology* 22 (1994): 711–714, Tim Soens, “The origins of the Western Scheldt. Environmental transformation, storm surges and human agency in the Flemish coastal plain (1250–1600),” in *Landscapes or seascapes? The History of the Coastal Environment in the North Sea Area Reconsidered* (Comparative Rural History of the North Sea Area 13), eds. Erik Thoen et al. (Turnhout: Brepols Publishers, 2013), 287–312, and Winfried Trusen, “‘Insula in flumine nata.’ Ein kanonischer Zivilprozeß aus den Jahren 1357 bis 1363/64 um eine Insel im Mittelrhein,” *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte: Kanonistische Abteilung* 68 (1982): 294–338.

⁵³³ Mireille Provansal, Georges Pichard, and Edward J. Anthony, “Geomorphic Changes in the Rhône Delta During the LIA: Input from the Analysis of Ancient Maps,” *Sediment Fluxes in Coastal Areas* (Coastal Research Library, 10), eds. Mohamed Maanan, and Marc Robin (Dordrecht: Springer Netherlands, 2015), 47–72 and Jean-

The use of written, cartographic evidence combined with geomorphology not only lead to studies on changes in riverine landscapes and, accompanying this, the associated land holding structures in Western Europe, but also produced studies addressing the problem in Central Europe and Hungary in particular. A number of works were dedicated to the changes in the waterscape around Vienna in the late medieval period and Early Modern times, changes which resulted in a number of lawsuits between landowners by the River Danube,⁵³⁵ and research also demonstrated significant changes in the riverine landscapes in the Carpathian Basin in historical times, including other sections of the Danube,⁵³⁶ the Tisza,⁵³⁷ the Rába,⁵³⁸ the Mura,⁵³⁹ and the Dráva River⁵⁴⁰ valleys. Most of the above-mentioned studies, however, addressed changes in riverbeds and the alluvial development of major rivers in Central Europe. Much less attention has been dedicated to minor rivers and streams, despite their potential relevance to these boundary issues. There is ample or adequate source material available, in part because, like the major rivers, in many cases minor rivers also formed boundaries of estates, as is evident from the hundreds of perambulation documents, boundary

Michel Carozza et al., “Lower Mediterranean plain accelerated evolution during the Little Ice Age: Geoarchaeological insight in the Tech basin (Roussillon, Gulf of Lion, Western Mediterranean),” *Quaternary International* 266 (2011): 94–104.

⁵³⁴ *Landscapes or Seascapes? The History of the Coastal Environment in the North Sea Area Reconsidered* (Comparative Rural History of the North Sea Area, 13), eds. Erik Thoen et al. (Turnhout: Brepols Publishers, 2013).

⁵³⁵ Christoph Sonlechner, Severin Hohensinner, and Gertrud Haidvogel, “Floods, fights and a fluid river: the Viennese Danube in the sixteenth century,” *Water History* 5 (2013): 173–194, Severin Hohensinner et al. “Two steps back, one step forward: reconstructing the dynamic Danube riverscape under human influence in Vienna,” *Water History* 5 (2013): 121–143, and iidem, “Changes in water and land: the reconstructed Viennese riverscape from 1500 to the present,” *Water History* 5 (2013): 145–172.

⁵³⁶ E.g. Peter Pišút, “Príspevok historických máp k rekonštrukcii vývoja koryta Dunaja na uhorsko-rakúskej hranici (16.–19. storočie),” [Contribution of historical maps to the reconstruction of the Danube channel evolution near the old Hungarian-Austrian Border (16th–19th centuries)] in *Historické mapy* [Historical maps], ed. Ján Pravda (Bratislava: Kartografická spoločnosť SR– Geografický ústav SAV, 2005), 167–181, Peter Pišút and Gábor Timár, “A csallóközi (Žitný ostrov) Duna-szakasz folyódinamikai változásai a középkortól napjainkig,” [Hydrological changes of the Danube in the area of the Žitný ostrov from the Middle Ages to the present] in *Környezettörténet. Az utóbbi 500 év környezeti eseményei történeti és természettudományi források tükrében* [Environmental history. Environmental events of the past 500 years in light of historical and scientific sources], ed. Miklós Kázmér (Budapest: Hantken Kiadó, 2009), 59–74 or Balázs Székely, “Rediscovering the old treasures of cartography – What an almost 500-year-old map can tell to a geoscientist,” *Acta Geodaetica et Geophysica Hungarica* 44 (2009): 3–16.

⁵³⁷ E.g. Gábor Timár, Pál Sümegi, and Ferenc Horváth. “Late Quaternary Dynamics of the Tisza River: Evidence of Climatic and Tectonic Controls,” *Tectonophysics* 410 (2005): 97–110.

⁵³⁸ Vadas, *Körmen és a vizek*, 22 and 67.

⁵³⁹ Bence Péterfi, “Debates Concerning the Regulation of Border Rivers in the Late Middle Ages: The Case of the Mura River,” *Hungarian Historical Review* 8 (2019): 313–335, and Renáta Skorka, “On Two Sides of the Border. The Hungarian–Austrian Border Treaty of 1372,” *Hungarian Historical Review* 8 (2019): 290–312.

⁵⁴⁰ “*Per sylvam et per lacus nimios*” – *The Medieval and Ottoman Period in Southern Transdanubia, Southwest Hungary: the Contribution of the Natural Sciences*, eds. Gyöngyi Kovács, and Csilla Zatykó (Budapest: MTA BTK Régészeti Intézet, 2016), esp. the contribution by István Viczián, “Geomorphological research in and around Berzence, on the border of the Drava valley and inner Somogy microregion, Hungary,” in “*Per sylvam et per lacus nimios*,” 75–91.

markers, and cartographic data.⁵⁴¹ The Hungarian source material, especially up to the late fourteenth century, is somewhat exceptional in this sense, as perambulations make up probably as much as seven to eight percent of the whole of the medieval legal source material. When legal disputes concerning riverbed changes occurred, this group of sources is of crucial importance to this discussion, as perambulations were often carried out as stages in legal disputes, and one of the most important kinds of disputes (if not the most common) involved changes in riverbeds. These legal disputes concerned not only natural changes in the hydrological conditions, but also artificial riverbed modifications for mill races, fish ponds, irrigation, etc. which in some cases resulted in changes to the borders of estates. Along with historians and geomorphologists, legal writers also devoted attention to the legal problems created by changing riverbeds in sections where the rivers themselves acted as boundaries. These scholars mostly contributed to the problem by analyzing collections of Roman law and considering the contemporary implications of avulsion.⁵⁴²

All of these approaches listed above are important, as they often contribute to the contextualization of the results based on the Hungarian source material. In the next pages, drawing on source material from the medieval Kingdom of Hungary, I will argue that the problem raised by Bartolus is not entirely theoretical, and there was a, more or less, stabile customary law concerning how to resolve similar disputes, even if the law was not based on the principles he argued for.

3.4.1. The Border between L'ubotín and Orlov – What Can a Single Case Reveal?

In 1349, one of the landlords in Sáros County, Rikalf son of Rikalf, wrote a supplication to King Louis I according to which, the River Poprad had detached a tract from his land called L'ubotín (Lubotény). While the river had demarcated his land from the king's village of Orlov (Orló), when the river's course changed, flowing through his estate, L'ubotín (see *Fig. 17*). The question of who owned the lands of L'ubotín may have not been simple, as only a quarter of a century earlier, the family had had to appeal to King Charles I when Phillip Druget, the influential Italian nobleman and member of the king's entourage, attempted to

⁵⁴¹ On the source type, see Péter Szabó, "Sources for the Historian of Medieval Woodland," in *People and Nature in Historical Perspective* (CEU Medievalia, 5), eds. József Laszlovszky, and Péter Szabó (Budapest: CEU Press – Archaeolingua, 2003), 268–271. On the proportion of perambulation documents in the surviving documentary evidence, see: Péter Szabó, "Medieval Trees and Modern Ecology: How to Handle Written Sources." *Medium Aevum Quotidianum* 46 (2002): 12–17.

⁵⁴² E.g. Sax, "The Accretion."

obtain some of the lands belonging to L'ubotín.⁵⁴³ The endeavor of the Drugets may not have come as a surprise, as this was the period in which the family rapidly extended its power in the region. The River Poprad's changing riverbed may not have been among the potential threats with which Rikalf had calculated.⁵⁴⁴ In answer to the appeal, King Louis ordered Sáros County to investigate the case. The investigation was led by Tivadar, a noble county judge (*iudex nobilium* or *szolgabíró* in Hungarian) and a delegate (*homo provinciae*), a certain Jacob, son of Sükösd.⁵⁴⁵ Over the course of the investigation, they interrogated the local nobility and tenant peasants, especially those living in two nearby settlements, Plaveč (Palocsa) and Gerlavágása (meaning "Gerla's clearance", a lost settlers' village somewhere close to three previously mentioned settlements). The investigation came to the conclusion that the supplicant was right and the River Poprad had indeed incorporated pieces of lands detached by river action from Rikalf's property.⁵⁴⁶ According to the documents, the changes in the riverbed were not caused by human intervention but were probably connected to floods which changed the hydrography of the area, although this was never explicitly stated in the sources.⁵⁴⁷

⁵⁴³ MNL OL DL 68 795 (10 April 1324). Cf. Attila Zsoldos, "Hűséges oligarchák." [Faithful oligarchs] in *A történettudomány szolgálatában. Tanulmányok a 70 éves Gecsényi Lajos tiszteletére* [In the service of historical research. Studies in honor of Lajos Gecsényi on his 70th birthday], eds. Magdolna Baráth, and Antal Molnár (Budapest and Győr: Magyar Országos Levéltár Győr-Moson-Sopron Megye Győri Levéltára, 2012), 347.

⁵⁴⁴ On the Drugets, see Attila Zsoldos, *A Druget-tartomány története, 1315–1342* [The history of the Druget lands, 1315–1342] (Magyar történelmi emlékek. Értekezések) (Budapest: MTA Bölcsészettudományi Kutatóközpont Történettudományi Intézet, 2017).

⁵⁴⁵ On the noble judges of Sáros County, see István Kádas, "Sárosi 'reform' Miklós fia Miklós ispánsága idején (1374–1380)?" ['Reform' in Sáros County during the countship of Miklós son of Miklós (1374–1380)?] in *Micae mediaevales V. Fiatal történészek dolgozatai a középkori Magyarországról és Európáról* [Studies of young historians on medieval Hungary and Europe] (ELTE BTK Történelemtudományok Doktori Iskola Tanulmányok – Konferenciák, 9), eds. Laura Fábíán et al. (Budapest: ELTE BTK Történelemtudományok Doktori Iskola, 2016), 127–144. For Tivadar see here: 135.

⁵⁴⁶ MNL OL DL 68 895. (For a summary, see AOkl, vol. 33. 255 no. 505), MNL OL DL 68 894. (For a summary, see: AOkl, vol. 33. 335–336 no. 684), and MNL OL DL 98 895 (for a summary, see: AOkl, vol. 33. 364 no. 745).

⁵⁴⁷ On similar cases, and the role of floods in that, see Kiss, *Floods and Long-Term Water-Level Changes*.



Fig. 17. The surroundings of Lubotin and Orlov on the sheet of the First Military Survey

Despite the verification of Rikalf's claim, the dispute was probably not settled. Ten years later, in 1359, the issue was again brought to the court by Rikalf's family. Based on the documents issued in 1359, it is safe to assume that during the ten years between the cases, the lands in question were used by the kings' tenant peasants and the territories in question were never returned to Rikalf and his family. Obviously, in 1349, Rikalf's intention was to get the disputed lands back. The investigation concluded with the acknowledgement that these lands had originally been part of his possessions. This suggests that in such cases, land was thought to belong to the original owners, in this case Rikalf. But apparently it took ten years to regain these pieces of land in answer to Rikalf and Peter son of Ladislaus' complaints, both from the same family. In the end, the lands were reassigned not (or not only) because they originally belonged to Rikalf's family, but because of the merits of the family in service to King Louis I. This outcome was more beneficial for the king than donating a piece of land which, according to the custom, belonged to Rikalf's family.⁵⁴⁸ This time, the document clearly referred to the reason for the change in the location of the riverbed. As already seemed likely from the 1349 documents, the main flow of the River Poprad had not been modified artificially, but was due to the rapid current flow of the river. This time, the case was settled by reinstating the

⁵⁴⁸ MNL OL DL 68 916 and MNL OL DL 68 917.

previous owners to the lands in question in the presence of a deputy of the chapter of Szepes (Spišská Kapitula) and a *homo regius*. As usual, a new perambulation of the disputed land was carried out where part of the land is described as the former bed of the River Poprad.

Even if, in 1359, the land seems to have been clearly reassigned to Rikalf and his family, the case was not settled for the remainder of the Middle Ages. Almost fifty years after this episode, in 1405, at the diet of Abaúj and Sáros Counties held in Košice, the noble judges and *alispáns* (*vicecomites*) of the latter county testified that the same lands which had been disputed in 1349 and 1359 originally belonged to Ľubotín and, thus, rightfully belonged to the Rikalf's successors.⁵⁴⁹

The set of documents relating to the lands lying by the River Poprad between Ľubotín and Orlov reveals a number of important issues. In 1349, according to the surviving sources, Rikalf attempted to prove that the River Poprad had changed its course because demonstrating this would have allowed him to keep using the lands despite the fact that by then, they lay on the opposite river bank. The existence of this legal case suggests that even if the changes in the course of the River Poprad were part of a natural process, landownership was still not impacted. However, the picture is less clear in lawsuit from 1359 when the lands in question were (re)instituted to the Rikalf sons in return for services rendered to the crown and not because they had originally belonged to the family. Nonetheless, the fact that the same lands were returned back to the Rikalf family suggests that the question was also somehow connected to the notion of previous ownership. In light of these seemingly contradictory documents, it is certainly worth considering whether a customary law existed in medieval Hungary, applicable to similar cases.

3.4.2. Riverbed Changes and Estate Borders – Was There a Medieval Customary Law in Hungary?

As previously noted, István Tringli not only discussed mill construction but also devoted some attention to the problem I am addressing here. He suggested that changes in estate borders as consequence of riverbed changes may have been a problem of minor importance in medieval Hungary, and these issues were certainly minor compared to the lawsuits concerning water mills. Simply, the number of lawsuits related to the two problems

⁵⁴⁹ MNL OL DL 68 950. (For a summary, see ZsO, vol. 2/1. 641 no. 5091). For an edition of the document, see the appendix (no. 3).

shows that milling rights were certainly disputed more often than lawsuits related to riverbed changes. As discussed in Chapter 3.1, by the thirteenth century and especially by the early fourteenth century, the number of mills in Hungary was great enough that the buildings sometimes obstructed each another. Formation of a relatively well-defined customary law related to the use of waters and the construction of water mills was the obvious result. However, the lasting struggle for ownership of the lands between L'ubotín and Orlov suggests that with regard to riverbed changes, the norm was either ambiguous or that the tenants of Orlov, on the king's land, attempted to use their favorable position against L'ubotín. A single case cannot clarify this issue in the same way as results from multiple legal disputes. Before doing so, I will turn to the seemingly most self-evident source one can touch upon when discussing whether a customary law existed concerning a specific question, Stephen Werbőczy's *Tripartitum*. Werbőczy discusses the question in a surprisingly extensive manner compared to its seemingly minor significance:

‘Then, as the boundaries and borders of many free cities, villages, estates and many towns and deserted lands are set and defined by rivers and streams; and by the flood and force of these waters often large pieces of land, meadows and woods are separated, carried away and attached to the area of another neighboring city, town or estate; since the river, driven by vehement flood often strays and spills from its usual course, flow and bed into a new bed; so some people think and believe that the lands, meadows and woods that were annexed and attached to the area of another neighboring free city, town or village due to a change in the flow, course or bed of the river ought to belong to and come into the possession of that free city, town or village; arguing and stating that their boundaries are set by the flow, course and bed of the river. But this opinion is not correct.

[1] For, this way many frauds could be committed, and the waters and rivers—with hidden canals, and sometimes by making shallow dikes, or raising dams or filling up the bed—could be driven into a new course and bed in any direction, according to will; thus someone could easily usurp another's lands, woods and meadows.

[2] Therefore the opposite opinion shall be accepted as correct (...)⁵⁵⁰

⁵⁵⁰ Werbőczy, *Tripartitum*, Book 1. Ch. 87. 168–170.

These points in Werbőczy's work were first discussed in the nineteenth century. In his discussion of this part of the *Tripartitum*, Rezső Dell'Adami, a professor of civil law, suggested that, as opposed to most of this work, in this particular case, Werbőczy applied the principles of Roman law and not Hungarian customary law to land boundary disputes connected to changes in the course of water streams.⁵⁵¹ In the 1930s, the already mentioned Alajos Degré returned to the question and also drew attention to the fact that Hungarian customary law was different from the Roman law that Werbőczy actually applied. Unlike Dell'Adami, Degré gathered a number of documents which support this contention.⁵⁵² Following in the footsteps of Degré, Tringli also accepted that the origin of this part of Werbőczy's work lay in Roman law. Roman law and the Digest itself is not as unambiguous on this question as Werbőczy's text or what has been suggested by later scholars.⁵⁵³ The Saxon Mirror (*Sachsenspiegel*) compiled in the early thirteenth century, offers a similar resolution to the problems as the solution proposed in the *Tripartitum*, but in German customary law compilation, research has shown that the influence of the Digest was more clear-cut.⁵⁵⁴ When addressing changes to the waterscape, all three law sources start from the principle that when the course of a river changes rapidly, the detachment of a piece of land from one person's property and its reattachment to someone else's property should not result in a change in landownership. However, while these two medieval customary law collections did not include any exception to this principle, the Digest did include a very important one, namely what happens if this shift in the flow of the river proves lasting.⁵⁵⁵

From the point of view of this subchapter, the most important question is whether the points made by Werbőczy represented the practice that existed in the late medieval period or not. The picture that unfolds on the basis of an analysis of court cases from the period up to the early sixteenth century is not straightforward. Based on the above example from the River Poprad valley, it seems, Werbőczy summarized existing customs. I will discuss, however, a

⁵⁵¹ Rezső Dell'Adami, *Az anyagi magyar magánjog codifikációja. I. A nemzeti eredet problémája. Külön lenyomat a «Magyar Themis»-ből* [Codification of the Hungarian common law I. The problem of the national origin. Separatum from the Magyar Themis] (Budapest: Eggenberger, 1877).

⁵⁵² Degré, *Magyar halászati jog a középkorban* and Tringli, "A magyar szokásjog a malomépítésről."

⁵⁵³ See e.g. Johannes Engels, "Der verklagte Flußgott Mäander." *Historia: Zeitschrift für Alte Geschichte* 51, no. 2 (2002): 204 and Sax, "The Accretion/Avulsion Puzzle."

⁵⁵⁴ 2. Svat so dat water afschevet deme lande, dat hevet die verloren des dat lant is. Bricit it aver enen nien agang, dar mede ne verluset he sines landes nicht. § 3. Svelk werder sik ok irhevet binnen enem vliete, svelkeme stade he nar is, to dem stade hort die werder; is he vormiddes, he hort to beiden staden. Dat selve dat die agang, of he verdroget. – *Sachsenspiegel Landrecht*. in *Monumenta Germaniae Historica. Fontes iuris Germanici antiqui, Nova series Fontes iuris N.S.*, 1.1., ed. Karl August von Eckhardt (2nd ed. Göttingen: Musterschmidt, 1955), II. 56.

⁵⁵⁵ Dig. 41.1.7.2. For its English translation, see: *The Digest of Justinian*, eds. Alan Watson, Theodor Mommsen, and Paul Krueger (Philadelphia, PA: University of Pennsylvania Press, 1985).

number of cases showing that in many respects, the chief justice applied a different principle in law to what prevailed in his time.

The most important step was to gather a sufficient number of cases for quantitative analysis. The existing secondary literature only refers to a few cases, but by analyzing the cartularies discussed in Chapter 1.2.2, I managed to identify almost sixty relevant cases (see their list in the Appendix). There would be no point in discussing each case individually, mostly because, little information is provided on the background of each legal case. I chose to analyze either cases which seemed important for an understanding of the different legal norms or cases which reveal shifts in practice. Based on these individual cases, two questions arose. First, did (natural) changes in the flow of rivers mean land boundaries were altered as well in Hungarian legal practice in the Middle Ages? Second, how were natural and artificial modifications in riverbeds distinguished from each other? The answer to the latter seems obvious at a first sight although but based on the sources I suggest this issue lay at the heart of numerous lawsuits.

The earliest lawsuit to illustrate the application of customary law dates from 1338. As indicated in the document, a certain Ivánka, son of John Turóci, submitted a complaint to the *ispán* of Zólyom County, Master Doncs. According to Ivánka, his interests were harmed by a land transaction that had taken place on Galovany, an estate neighboring his own. Provost Paul, son of Gele and Gál, son of Jacob, son of Albert agreed to exchange certain pieces of land. According Ivánka's complaint, Paul came into possession of a piece of land that neighbored his own. While Ivánka grew crops, Paul herded animals, and according to Ivánka, Paul's animals caused losses to his plough lands and meadows. Paul, however, claimed that Ivánka had erected boundary markers on fields which he (Paul) had received from *ispán* Doncs himself. Ivánka insisted that it was Paul who had erected these boundary markers. Doncs called Paul and fifty witnesses to appear at the convent of Turóc (Kláštor pod Znievom) and testify that it was Ivánka who had erected the boundary markers. The case was further complicated by the fact that Paul was the notary of *ispán* Doncs. It turned out that it was Paul himself who penned the charter and that it was Ivánka who had erected the markers. This element of the case became somewhat obsolete because the boundaries themselves later changed when the Porouathka stream changed course and detached a piece of land from Ivánka's estate, attaching it to Paul's lands.⁵⁵⁶ This strongly suggests that, according to both

⁵⁵⁶ MNL OL DF 249 510. (For a summary, see AOklt, vol. 22. 12–13 no. 5).

parties, independent from the boundary markers, that the border between the two properties changed with alterations in the location of streambed.

Another case from the following year suggests that similar cases were not always considered the same way in the Angevin period. In 1339, a case unfolded concerning the border running between two estates, Čoltovo and Lekeňa (part of present day Bohúňovo) in Gömör County, not very far from the lands involved in the previous case. The Hablucapataka stream marked the boundary between the two estates in one section was until the point where it flowed into the Sajó River (see *Fig. 18*). The litigants were Paul, son of Gallus, who owned Čoltovo, and the sons of Nicholas Forgách, Andrew and Nicholas, who owned Lekeňa. Both parties contended that the other side had taken possession of lands which belonged to them. According to Andrew, Paul artificially moved the stream into a new riverbed. Witnesses, however, testified that the change in the course of the river had rather been caused by flooding. The alluvium carried by the floods filled up the former bed of the stream, and thus, the water changed course. The importance of proving that the change in the riverbed was artificial or natural shows that the two cases were assessed differently. It was the change in the natural riverbed that was accepted as a illegitimate boundary shift in the period and not the artificial modification of the riverbed. Despite the fact that in this case the riverbed change should have resulted in change to the ownership of this piece of land, this did not actually happen. It turned out during the trial that the entire area in question really fell in the lands of Andrew Forgách. Thus, the disputed territory remained in his hands.⁵⁵⁷

⁵⁵⁷ MNL OL DL 102 905 (September 4, 1339) For the edition of an incomplete version of the document (MNL OL DL 58 505): AO, vol. 3. 597–598 no. 394. For a summary, see AOklt, vol. 23. 250–251 no. 529. See in the context of floods Kiss, *Floods and Long-Term Water-Level Changes*, 245–246. The document is fully edited in the appendix (no. 1).



Fig. 18. Čoltovo and Lekeňa on the sheet of the First Military Survey

From the very same decade, however, there is a case which suggests that for the parties involved not even natural changes to the course of a river resulted in a change in landownership. For instance, in 1340, when the boundary between Szentmárton and Kóród was demarcated (today both lands lie along the border of Coroisânmărtin), a section of the boundary was formed by the River Holt-Küküllő (a branch or backwater of the River Târnava Mică). Probably because of the less clearly defined riverbed, the two parties decided they would erect boundary markers in the dry section of the bed together. They did so in order to fix the boundary between the lands in case floods washed away the riverbed.⁵⁵⁸ This indicates that even natural changes to the boundaries were not associated with a change in ownership or at least that sometimes parties could come to an agreement that went against such a custom. Probably, it was in the interests of both parties to exercise caution, as it may not have been evident which path the river would choose if the old riverbed were filled in. Neither of the landlords would have known if they would win or lose territory. It is difficult to identify the exact reason for this kind of agreement, as by the time of the First Military Survey (and

⁵⁵⁸ MNL OL DL 11 742 (January 2, 1340). For a summary, see AOklt, vol. 24. 9 no. 2.

therefore the first precise mapping of the area), this branch of the River Târnava Mică had disappeared entirely (see Fig. 19).



Fig. 19. Szentmárton and Kóród on the sheet of the First Military Survey

Even clearer proof of the not fully crystallized customary law regarding these cases is provided by a boundary dispute from 1347. The two parties involved were the bishopric of Eger and Stephen, son of Paul of Ónod. One section of the boundary between Ónod and Hídvég (present day Sajóhídvég) was the bed of the River Sajó. However, as time passed, the hydrological conditions of the area changed, and two islands emerged with usable lands (*duabus angulationibus vulgo Zygeth vocatis*) as well as a place that had good fishing (*loca piscaturarum*) on the Ónod side of the river. As part of this hydromorphological change, the main course of the River Sajó started to run within the borders of Hídvég. The sheet of the First Military Survey did not permit the identification of this former bed of the River Sajó between Hídvég and Ónod, but a detailed mid-nineteenth century manuscript map of the area does (see Fig. 20).⁵⁵⁹ The bishopric of Eger tried to take possession of the above mentioned land which was worth 13 marks, but Stephen raised objections to the bishopric's claim. Paul Nagymartoni, the chief justice of Hungary, obliged Stephen and thirteen other nobles to swear an oath that the land in question had belonged to him. As Stephen took the oath along with the required noble witnesses, the lands in question were returned to him. Furthermore, because he

⁵⁵⁹ MNL OL S 73. no. 102. (Pál Szattmári, *Borsod megyebeli Ónod m. város és határának szabályozás előtti térképe*, 1852 [The map of the town of Ónod and its borders before water regulations, 1852]). Available online: <https://maps.hungaricana.hu/hu/MOLTerkeptar/11395/> (last accessed: December 14, 2018).

had made a false claim, Nicholas Dörögdi, the bishop of Eger, was fined 13 marks.⁵⁶⁰ This suggests that, according to the chief justice, the case was clear, and ownership of the land was not changed simply by the fact that changes in the course of the river had shifted the land from one bank of the river to the other. The fact that the bishop had to pay a fine suggests that Nagymartoni considered this the norm. In light of the few cases discussed above, this issue was not as clear as suggested by the chief justice's decision. Rather, this case may have been part of an attempt to create a custom for evaluating similar cases.



Fig. 20. The border between Ónod and Hídvég in the mid-nineteenth century with the former bed of the Sajó in the center⁵⁶¹

Analyses of every single case in which similar issues were involved would be superfluous, as very few considerations would arise, not found in the disputes discussed above. The mid-fourteenth-century cases show in relatively good detail that there was no clearly established customary law for evaluating similar issues at the mid-fourteenth century. This was the time when rights related to water mill construction were clarified and customary law on building obstacles in rivers and streams came into existence. The fact that it is hard to

⁵⁶⁰ *Autem dominum Nicolaum episcopum Agriensem pro indebita earundem particularum terrarum litigiosarum requisicione in emenda estimacionis earundem, scilicet in predictis tredecim marcis contra eundem Stephanum filium Pauli commisimus sentencialiter aggravari.* MNL OL DL 3932. (September 14, 1347), Edited (with parts left out): AO, vol. 5, 118–120 no. 55; For a summary, see AOKlt, vol. 31. 445–447 no. 862. See on the document, Kiss, *Floods and Long-Term Water-Level Changes*, 259–260.

⁵⁶¹ MNL OL S 73. no. 102.

find similarly established legal customs connected to riverbed changes and landownership can be attributed to the fact that such lawsuits were less common.⁵⁶²

From the late fourteenth century on, however, there were only a few cases in which a change in the riverbed did not result in change in the ownership of the lands in question.⁵⁶³ Of course, this does not mean that similar riverbed changes did not prompt lawsuits. Probably a few hundred similar cases are preserved in the late medieval legal evidence from Hungary. In all likelihood, these lawsuits point to the same process identified here and would provide a more solid foundation for the conclusions I am suggesting here. Some of the examples discussed above, apart from the fact that they point to practices at variance with the late medieval cases, are exceptional from another perspective as well. Among the almost sixty cases discovered, there are only about a dozen connected to natural riverbed changes. In the majority (about three fourths) of these legal disputes, at least some human intervention contributed to the formation of the new riverbeds. Most of the related arguments were centered on the nature of the riverbed modifications. Sometimes, the line between artificial and natural modification was not that evident, which was probably a hotbed for illegal actions. Probably due to the less regulated flow of rivers in the Carpathian Basin, the rivers changed their beds much more frequently than they did in the nineteenth and twentieth centuries, when major regulation works were carried out. This is not only true for the smaller river branches but also for major rivers. Shifts in the riverbeds of smaller rivers and streams were probably almost everyday processes, especially in the lowlands and abutting hilly areas of the Carpathian Basin. The question was frequently not the change itself, but whether the river would find its way back to its old bed and would continue to flow in it or not. This is probably why Domitius Ulpianus' *Edict*, which was included in Justinian's *Digest*, forbade any intervention that would change the flow of a "public river" (as he and Roman authors usually refer to permanent waters) after a flood or under any other circumstance. This attitude goes back to the assumption that rivers that changed course would eventually return to their original beds, presumably when the water-levels were at their lowest, generally during the summer months.⁵⁶⁴ This is why the *Digest* contained different principles on the basis of which short-term and long-term modifications of riverbeds which also constituted estate borders were adjudicated.

⁵⁶² Tringli, "A magyar szokásjog a malomépítésről," and Chapter 3.1 in the present work.

⁵⁶³ MNL OL DL 98 381 (for its summary, see ZsO, vol. 8. 251–252 no. 859). See Kiss, *Floods and Long-Term Water-Level Changes*, 293.

⁵⁶⁴ Dig. 43. 12., 13. 1-13., 15. For an English translation, see *The Digest of Justinian*.

Riverbeds were also often through earthwork building which caused rivers to move to a new bed. Sometimes these works may have been difficult to identify, as indicated by the legal evidence from a number medieval Hungarian lawsuits.⁵⁶⁵ Some pieces of land of considerable size became attached to other pieces of land in this manner.⁵⁶⁶ Because of the major income that was foreseen from the disputed lands, the river banks were torn down and channels dug to divert the waters. As many of the lawsuits were centered on the way in which a river's flow had been modified, apparently the two instances were treated differently in the legal practice of the late medieval period, i.e. while the change of a river's flow as a consequence of natural hydromorphological processes without direct human intervention resulted in a change in ownership, in opposite instances – with direct human intervention to a river's flow demonstrated during court cases –, the ownership of the lands in question was not impacted.

These deliberate, man-made alterations to the flow of rivers were probably not always intended as a way of gaining possession of someone else's land. A case from the early fifteenth century indicates the extent to which some of the interventions to a river had unexpected and, more importantly, unwanted consequences, even for those who actually carried out the intervention. In 1405, two sons of Pető of Gerse, John and Thomas, submitted a complaint regarding the construction of a new channel by the Sárvíz Stream between their Gerse and Sármelléke estates (now both part of Gersekarát) and the estates of the nobles of Telekes. The Pető-sons had dug out the new channel, which was meant to provide water for a new mill they had built. The stream most probably had a small discharge, so the whole of its

⁵⁶⁵ E.g. MNL OL DL 52 420, 91 893 (For a summary, see ZsO, vol. 2, 186 no. 61), MNL OL DF 207 457 (for its summary, see ZsO, vol. 1, 15, no. 138; edited in: Gábor Dreska, "A pannonhalmi konvent hiteleshelyének működése a Zsigmond-korban: a pannonhalmi konvent hiteleshelyének 1387 és 1437 között készült kiadványai a Pannonhalmi Bencés Főapátsági Levéltárban," [The functioning of the place of authentication of the abbey of Pannonhalma in the Sigismundian period: the documents issued by the place of authentication of Pannonhalma between 1387 and 1437 in the Archive of the Benedictine Archabbey of Pannonhalma] *Levéltári közlemények* 68 [1997]: 13), DL 53 871 (For a summary, see ZsO, vol. 5, 191 no. 571, edited: Tivadar Ortvy and Frigyes Pesty, *Oklevelek Temesvármegye és Temesvár város történetéhez. I. 1183–1430* [Documents to the history of Temes County and the town of Timișoara] [Temesvármegye és Temesvár város története, 4] [Bratislava: Eder István Könyvnyomdája, 1896], 511–512), 53 984. (For a summary, see ZsO, vol. 6, 380 no. 1377, edited: Ortvy and Pesty, *Oklevelek Temesvármegye és Temesvárváros történetéhez*, 543), DL 53 990 (ZsO, vol. 6. 405 no. 1499), 66 938, 16 498, 39 456 (for a summary, see Antal Fekete Nagy, "A Petróczy levéltár középkori oklevelei: első közlemény," [Medieval documents of the Petróczy Archive. Part I] *Levéltári közlemények* 8 [1930]: 261–262 no. 202), DL 36 393 (here: 87–88, no 2. For a summary, see Zsigmond Jakó, *A kolozsmonostori konvent jegyzőkönyvei, 1289–1556*, 2 vols [The protocol of the abbey of Kolozsmonostor] [Magyar Országos Levéltár kiadványai, II, Forráskiadványok, 17] Budapest: Magyar Országos Levéltár, 1990), vol. 1. 717–718 no. 2022), DL 17 372 (Ferenc Olexik, "Középkori levéltártörténeti adatok," [Medieval archival history data] *Levéltári Közlemények* 13 [1935]: 270–271 no. 9), DL 65 632, 83 932, 95 726, 106 744. (K. Németh, "Vizek és vízgazdálkodás, I.," 7 and idem, "Vizek és vízgazdálkodás, II.," 9. [erroneously dating the document to 1505]), DL 29 981, and 63 037.

⁵⁶⁶ E.g. MNL OL DL 30 554.

flow was diverted into this artificial channel. It is reasonable to assume that the original natural stream was small, since today, the valley stream in question only has intermediate water in it and only fills after rainfall. The construction of mills by similarly small streams was not unique to pre-modern times. Later, these mills were often referred to in Hungarian as *pokolidő* (meaning “storm time”) or *felhőt kiáltó* (“sky squalling”) mills.⁵⁶⁷ Because of the diversion of the water, the old riverbed, which from that time on probably received no water for most of the year, started to silt up. The nobles of Telekes used this change to their advantage. They began to consider the channel as the new riverbed and border between Telekes and the estates of the Petős. The nobles started to treat the meadows between the two branches of the river as their own. Even if the new riverbed was meant to serve the interests of the Pető family, it resulted in detachment of part of their estate and the occupation of these areas by the nobles of Telekes.⁵⁶⁸

3.4.3. Riverbeds and Borders – Some Conclusions

This subchapter offered an overview of medieval Hungarian legal customs connected to a special legal circumstance. The issue of shifting river courses and land boundaries raised by Bartolus in his treatise, marginal as it may seem, probably had some actual practical relevance in daily practice. Thus, when the first treatise on geodesy was written on in the Kingdom of Hungary at the turn of the fifteenth century by the humanist, Peter Lossai, he attributed the birth of this profession to the annual floods of the Nile in the Ancient times. According to this author, these floods transformed the boundaries of estates each year, requiring the plots to be re-measured.⁵⁶⁹ In addition to this unique source, the legal evidence

⁵⁶⁷ Anon., “Vízimalmok,” 169–187. Available online: <http://mek.niif.hu/02100/02152/html/03/23.html> (last accessed: May 16, 2019) and Sándor Takáts, *Művelődéstörténeti tanulmányok a XVI–XVII. századból* [Studies in the intellectual history of the 16th–17th centuries], ed. Kálmán Benda (Budapest: Gondolat, 1961), 177, and 350.

⁵⁶⁸ MNL OL DL 92 239. (For a summary, see ZsO, vol. 2/1, 446 no. 3726). See the edition of the document in the appendix (no. 2).

⁵⁶⁹ OSZK K Cod. Lat. 197. 2^f. Edited in: Petri Lossai, *Notationes et Delineationes 1498. Az Országos Széchényi Könyvtár Cod. Lat. 197 jelű kódexe* [Notationes et Delineationes 1498. The Cod. Lat. 197 of the Széchényi National Library], eds. Zoltán Poronyi, and Alajos Fleck (Pécs: Pécsi Geodéziai és Térképészeti Vállalat, 1969). For Lossai and his treatise, see: Levente Takács, “A magyar földmérés(i irodalom) kezdetei és az ókori hagyomány,” [The beginnings of geodesy (geodetic literature) in Hungary and the Ancient tradition] in *Hunyadi Mátyás és kora* (Memoria Hungariae, 12 = Studia Folkloristica et Ethnographica, 75), eds. Attila Bárány et al. (Debrecen: MTA-DE Lendület „Magyarország a középkori Európában” kutatócsoport, 2019), 24–33, and Bálint Lakatos, “Lossai Péter,” [Peter Lossai] in *Magyar művelődéstörténeti lexikon* [Lexicon of cultural history in Hungary], 14 vols, ed. Péter Kőszeghy (Budapest: Balassi, 2003–2014), vol. 7. 84–85. On the codex, see: Anna Boreczky, “Mikor és hol készült Lossai Péter kódexe?,” [When and where was Peter Lossai’s codex produced?] *Magyar Könyvszemle* 113 (1997): 249–265.

also suggests that the problem was more practical than theoretical. Although the almost sixty cases identified and partially presented here are anything but comprehensive, they provide a sample which allowed identification of a variety of practices and customs. A systematic study of a greater proportion of the available source material would probably have yielded similar results, although it might have been possible to present the formation of legal customs in similar cases in a more nuanced manner.

The sources discussed above suggest that from the Angevin period onwards, changes in the location of riverbeds caused recurrent property disputes. While the disputes in the fourteenth century do not display a clear pattern, from the fifteenth century on, changes in the location of a riverbed went hand in hand with a change in the ownership of the connected piece of land in an overwhelming majority of court cases. By the fifteenth and early sixteenth century there existed a, more or less, settled customary law on the basis of which similar cases were adjudicated. For the preceding period, the sources also suggest that most of these riverbed changes were not or not solely the outcomes of natural hydromorphological processes, but rather resulted from intended interventions in the flow of the rivers. The legal customs mentioned here did not apply in these instances.

It was often not easy, to identify such human interventions, especially because, as shown above, these processes were sometimes partly artificial and partly natural. At times, these changes were not even intended by the persons who ordered earthworking or construction work along a river. Although none of the above-mentioned lawsuits suggest this problem *per se*, changing riverbeds may have been caused indirectly by interventions at entirely different sections of the same water flow. The rather ambiguous nature of these changes was already recognized in the Middle Ages, which is probably why Werbőczy attempted to change the existing legal customs in his *Tripartitum*. To some extent, he applied Roman law by building on some of the points of Justinian's *Digest*. In contrast to what has been suggested in the earlier secondary literature, however, he did not fully accept the Roman legal tradition, but modified it to clarify similar situations as much as possible. By stabilizing the borders of estates even in instances involving changes to the bed of border river, he probably hoped he had found a way to put an end to similar disputes.

Although the focus of this chapter is not the Early Modern period, it is certainly worth considering the relevance of the conclusions I have drawn to similar legal procedures in the sixteenth and seventeenth centuries. However, the body of lawsuits collected for this later period is not yet comprehensive so at this point it would be foolhardy to generalize. However, at least one thing is clear from the few sources which the existing literature has drawn on.

First, in the century following the compilation of the *Tripartitum* and the fall of the medieval Kingdom of Hungary to the Ottomans, the legal principles written down by Werbőczy were not systematically applied. Rather, the *consuetudo* was in effect.⁵⁷⁰ Nonetheless, almost 150 years after the completion of Werbőczy's *Tripartitum*, his principles were accepted as law. In 1655, Act 81 took the relevant passages of the *Tripartitum*: "With regard to lands which by [flash] floods or floods that happened or happen slowly were carried away from a land and were attached to another, Book 1 Title 87 of the *Tripartitum* has to be applied."⁵⁷¹ Although by this time, many points of the *Tripartitum* had become standard points of reference in law and many of them were also accepted as laws of the Kingdom of Hungary, the practice in the problem of shifting river-based land boundaries discussed above was still not applied consistently.

Two further sources are discussed here that prove the latter point. However, as the present collection is anything but comprehensive for the Early Modern period, these sources can probably serve as no more than indications that other cases might be revealed uncovered by a more systematic analysis of similar sources. The first of the two cases mentioned here comprises a letter from the year in which Act 81 was accepted by King Ferdinand III, suggesting the problem was still unresolved. Although the most important threats in the area from the beginning of the sixteenth century onwards were the advancement and the raids of Ottomans, this was not the only direction in which hostilities occurred. Vas County marked the western border of Hungary as far back as the Árpáadian period. This border was no less contested than the southern border of the Kingdom of Hungary. As has recently been discussed in detail, from the thirteenth century onwards, there were recurrent border disputes between the Holy Roman Empire, the Habsburg territories and the Kingdom of Hungary. This unrest, apart from a number of peace treaties, gave rise in the Angevin period to border committees that met regularly.⁵⁷² Nobles on both sides of the border actively engaged in plundering and, from time to time, occupied lands of landlords of the other side of the border. In December 1655, the *provisor* of one of the most influential noble families in Transdanubia

⁵⁷⁰ For legal practice that was not in accordance with the *Tripartitum*, see e.g. Lajos Szádeczky, Szádeczky Lajos. *Székelly oklevéltár V. kötet (1296–1603.)* [Székelly cartulary, vol. 5] (Kolozsvár: Ajtai K. Albert Könyvnyomdája, 1896), 61–63 no. 935 and 63–65 no. 936 (Cf. Degré, *Magyar halászati jog*, 138 and Tringli, "A magyar szokásjog," 262. [1547]). See also Péter Tóth, *Vas vármegye közgyűlési jegyzőkönyveinek regesztái I. 1595–1600* [Summaries of the minutes of the gatherings of Vas County, I] (Vas megyei levéltári füzetek, 2 (Szombathely: Vas Megyei Levéltár, [N. d.]), 243 no. 719 (November 23, 1600)

⁵⁷¹ *In facto territoriorum, per exundationem; vel sensim factam aut fiendam alluviam aquarum, ab uno territorio avulsorum, et alteri adjectorum; observetur tit. 87. partis I. §. 1608–1657. évi törvényczikkek / Corpus Juris Hungarici 1608–1657*, ed. Dezső Márkus (Budapest: Franklin, 1900), 632.

⁵⁷² Skorka, "On Two Sides of the Border," and Péterfi, "Debates Concerning the Regulation of Border Rivers."

the, Batthyány family, was involved in a lawsuit in Dobersdorf (part of present-day Rudersdorf) which concerned pieces of land lying by the River Lafnitz. In the letter, it was Magdalene, the sister of Adam Batthyány (1610–1659), the landlord of the family's estate complex, who informed him of this property dispute. According to the letter, the family insisted that even if the river shifted its course, their lands would not change hands.⁵⁷³ The opposing party, however, took a different position, perhaps because the River Lafnitz along this section marked the border between the Kingdom of Hungary and the Austrian duchies⁵⁷⁴ where the legal practice was also different. In such cases, there was no reason to give priority to the Hungarian legal system.

Another similar case is preserved from a somewhat later time. In 1680, the nobles of Vas County met at as usual in Murska Sobota, for their annual gathering to discuss legal matters and the state of defenses against the Ottomans. The debates this time concerned pieces of land that lay by the River Mura, which along some of its sections comprised the border between the Kingdom of Hungary and Styria from the Árpadian period onwards. In our modern understanding, the River Mura may have done good service as a state and estate border, however, this area frequently saw disputes, not only because the landlords there were hungry for plunder but also because the river was prey to extremely rapid hydrological changes. The frequent floods of this alpine river and the characteristics of the area lying along the border of Styria and Hungary lead to fundamental changes in the location of riverbeds and the flood plains on a number of occasions in the Middle Ages and the Early Modern period. The changing nature of this landscape is very well represented by numerous eighteenth- and early nineteenth-century manuscript maps that show this section of the River Mura. They were produced to clarify which islands and peninsulas belonged to which estate and state. In many cases, the maps not only mark the state of the river at the time the maps were drawn, but make note of which estate the various pieces of lands formerly to belong to.⁵⁷⁵

The case from 1680 concerned two estates, Felső-Petánc (part of present-day Petanjci) on the left bank, which belonged to the Kingdom of Hungary and the Styrian village of Szatóc

⁵⁷³ *S egiebirantis az Dobrai földeket azide valo hatarhoz szakasztotta az raba visza de attal ugian nem idegenithetik el Dobrától.* (The Rába did attach the lands in the borders of Dobra to our borders but it does not mean that they could be alienated from Dobra). The letter of Magdolna Batthyány to Ádám Batthyány, MNL OL P 1314 no. 5104. (December 30, 1655).

⁵⁷⁴ Cf. the recent works of Péterfi, "Debates Concerning the Regulation of Border Rivers," and Skorka, "On Two Sides of the Border." See also: Vörös, "Ein Grenzkonflikt zwischen Steiermark und Ungarn."

⁵⁷⁵ E.g. OSZK TK no. 1397. (del And. Locatelli, *Planum incipit ad terrena Petánc, et Lafeld, de sinique ad i[n]clytum co[m]i[t]a[tum] Zaladiensem seu terrenum Deklesin, linea sic dicta Theresiana hinc inde interrupta* [Vienna: (1790?)]), MNL OL S 11 no. 635/1. (*Planum VII. Mappa exhibens limites inter Cottum. Castriferrei et Circulum Marburgensem seu a Lapide 34 usque 55 juxta Basim Linæ Theresianæ* [1829])

(Šratovci [Schrottendorf] on the border of present-day Radenci) on the right bank of the River Mura. The investigation carried out on the authority of Vas County, focussed on an island of about a hundred acres in size. The land originally belonged to the village of Felső-Petánc, but thirty or forty years before the dispute unfolded, the frequent floods of the River Mura tore it from the lands of Felső-Petánc and attached it to the village of Szatóc. It seems that from the 1640s or 1650s to 1679 the landlords, the Nádasdy family, took no measures to regain their lands. For these thirty years, the inhabitants of the Styrian village used the lands as if it was their own. Then, in 1679, Andrew Nádasdy (a member of the less well-off Darabosi branch of the family) decided to take back the lands in question. Austrian and German territorial law, similarly to the Hungarian, for this particular problem was probably influenced by Roman law by the mid-seventeenth century.⁵⁷⁶ Therefore, similarly to the Hungarian legislation discussed above, the law of the land would have confirmed Nádasdy's claim to the land. Andrew Nádasdy, however was probably either unaware of the Styrian customs in this case or did not want to engage in a lasting lawsuit against the landlords of Szatóc, the Eggenbergs, at the time, one of the richest families in Styria. It may have seemed easier to try to reoccupy his lands by force. His retinue did not stop at simply occupying the lands, however, but also cut the ropes of the ferry run by the Styrians between the two banks of the Mura. The noble judge (*juratus assessor*) of Vas County, Peter Körmendi inquired after the original status of the land suggesting that he was aware of the legal principles to be followed in such cases, but this probably was not true for Nádasdy.

These two short episodes are anything but unique along river borders in the Middle Ages and the Early Modern period. What is remarkable and probably worth considering, however, is the awareness of the Batthyánys and Andrew Nádasdy's ignorance concerning the judicial possibilities in such cases. Despite the fact that twenty-five years had passed since the law was passed it may not yet have been common knowledge by 1680. This may further demonstrate the point made above that in vases that evidently did not recur often, sometimes even legal experts – for instance noble judges – lacked a solid knowledge of the norms. In the Dobersdorf as well as the case of Felső-Petánc, the problems were further complicated by the fact that the lands not only changed landlords and estates but also the State they belonged to. Despite these jurisdictional issues the way the procedure was considered in either case does not seem to have affected. Both sources must remain simple snapshots of a larger picture and

⁵⁷⁶ Cf. Gunter Wesener, *Einflüsse und Geltung des römisch-gemeinen Rechts in den altösterreichischen Ländern in der Neuzeit (16. bis 18. Jahrhundert)* (Vienna and Cologne: Böhlau, 1989).

it may well be that the Styrian party eventually appealed against the occupation of the lands if their customs were different.

3.5. Conclusions

In this chapter I addressed the main questions of the dissertation, namely, how the use of water bodies by different actors in rural and urban landscapes of the Kingdom of Hungary in the Middle Ages led to conflicts and negotiated resolutions. The subchapter's organization reflect the different sorts of resource-use conflicts that arose in rural and urban contexts around water exploited for different purposes such as milling, fishing, defense, or navigation by both major rivers and small streams. The case studies presented show how the conflicts were resolved and especially, what legal principles were followed by the judicial bodies that passed judgments in various cases.

Whether a landowner or farmer sowed oats or barley on a particular estate was a private decision with hardly any impact on surrounding estates. Of course, where herd animals were kept, it always was the owner's duty to keep them within the bounds of a designated pasture.⁵⁷⁷ Felling trees on one's own property may have eventually changed the hydrological conditions, the rates of erosion in areas outside the estate, but this slow degradation lead to few regulations or lawsuits in Central Europe in pre-modern times. The exploitation of forest resources also remained within the realm of property rights all throughout in the Middle Ages.⁵⁷⁸

Waterways, especially navigable ones, going back to Roman legal tradition, were treated differently than plough lands or forests. These entities were never considered private property, but rather belonged to the ruler. Rulers, of course, granted certain related utilities to institutions, groups or individuals such as fishing rights along the Danube in the territory of present-day Budapest or the rights of the settlers to use the waters for fishing or building mills in some of the mining towns of Upper Hungary and Transylvania. The ownership of minor – non-navigable – rivers and streams, however, also differed from plough lands, meadows, or forests. The many kinds of possible interventions in the flow of rivers as demonstrated in

⁵⁷⁷ E.g. Kyra Lyublyanovics, *New Home, New Herds : Cuman Integration and Animal Husbandry in Medieval Hungary from an Archaeozoological Perspective* (Archaeolingua. Central European Archaeological Heritage series, 10) (Oxford: Archaeopress, 2017).

⁵⁷⁸ Nonetheless, related problems certainly did appear in mining areas in different parts of Central Europe. See: Kiss, *Floods and Long-Term Water-Level Changes*, 104–114.

Chapter 3.1, lead to changes in water-levels, water-regimes, siltation, the fish catch, navigation possibilities, etc.⁵⁷⁹ If a person intentionally modified a water flow it could often lead to unintended consequences. Of course, many intended changes directly harmed the interests of other persons as shown in the examples in this chapter. Because of the nature of waterways, these consequences could affect large areas and sometimes territories quite distant from the location of the obstacle built into a river.

Accordingly, the organization of water use on both major waterways, and minor rivers and streams had to be negotiated between all the actors with interests along these water bodies. Despite the numerous lawsuits connected to such conflicts, very few medieval laws focused on water-related questions. Nonetheless, a variety of lawsuits often show that, more or less, established norms existed for lawful water manipulation. Of course, the absence of direct regulations led to numerous lawsuits from the beginning of legal literacy in Hungary. Those cases which have been preserved provide at least some insights into the ways water-related conflicts were resolved. In many cases, as shown in the previous subchapters, only parts of the lawsuits have come down to us. There is often little information on the implications of these decisions. The snapshots offered by these legal debates, clearly demonstrate the importance of securing rights to water and related utilities for the different persons and institutions. The growing number of water use related disputes shows that the waters of the Carpathian Basin were used with increasing intensity over time.

Can any patterns be observed in the numerous legal cases discussed in the previous subchapters? Were there regions or time periods with more conflicts or were there regional differences in the resolution of such disputes? There are clearly overrepresented areas of conflict, but these basically overlap with areas which either have more surviving documentary evidence or are simply regions for which the sources have been more systematically published in the past centuries in cartularies. These areas include more urbanized areas, most importantly the environment of free royal towns as well as mining towns on the one hand, and regions with a denser network of ecclesiastical institutions – most importantly monasteries and chapters – on the other (see *Fig. 21*).

⁵⁷⁹ Hans-Rudolf Bork et al., *Landschaftsentwicklung in Mitteleuropa : Wirkungen des Menschen auf Landschaften* (Gotha and Stuttgart: Klett-Perthes, 1998), 159–214.

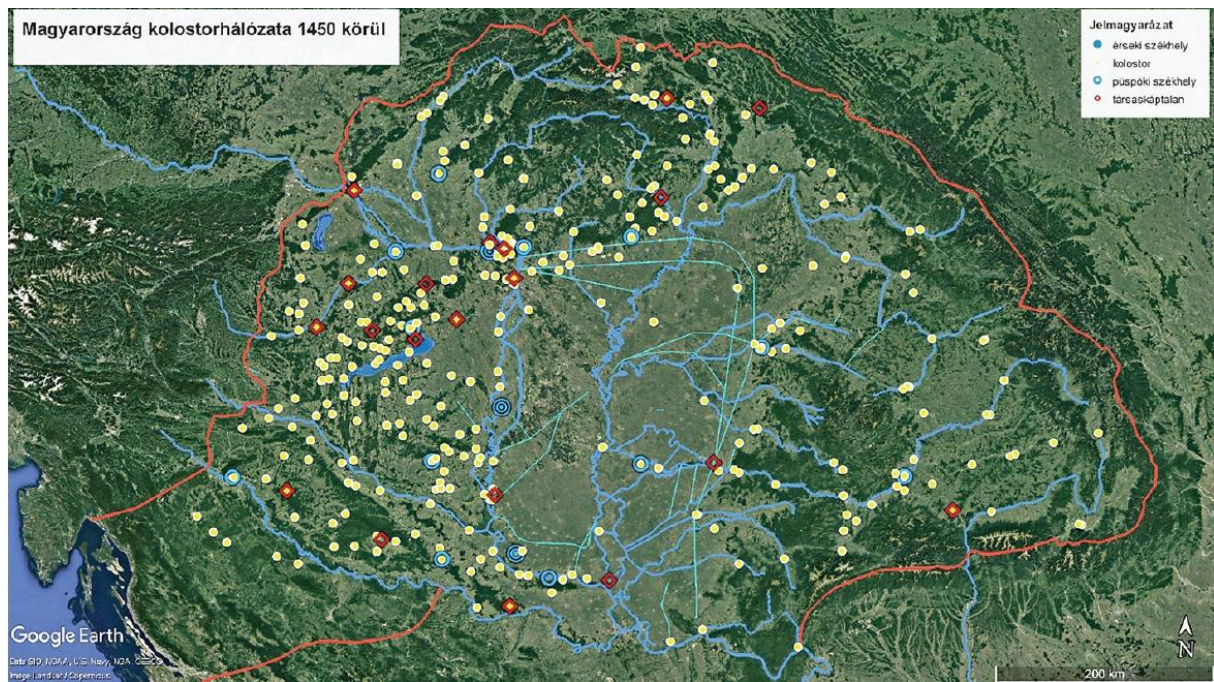


Fig. 21. Monasteries and chapters in the Kingdom of Hungary in the Late Middle Ages (after Beatrix Romhányi)

Areas which appear to have had fewer conflicts overlap with parts of the country that produced a smaller body of written evidence, either because they were less densely populated and therefore fewer legal disputes arose, or because the related sources suffered more destruction than others. Examples include mountain and hill areas such as the Carpathians and the Bihar Mountains, etc. These areas certainly were less densely populated than the rest of the Carpathian Basin and many sections of these mountains comprised frontier areas until the end of the Árpáadian period.⁵⁸⁰ The other badly underrepresented area from the point of view of legal sources is the Great Hungarian Plain. The absence of sources requires more explanation. First, the population density of the area, especially in the late medieval period, the period most surviving documents come from, was certainly lower than other parts of the central basin area, most importantly Transdanubia.⁵⁸¹ Second, in the absence of free royal towns, and having only a few ecclesiastical institutions entitled to issue legally binding

⁵⁸⁰ On the population of the mountain areas, see: Körmendy, *Melioratio terrae*.

⁵⁸¹ Cf. Tamás Vajda, "Meghatározható-e a Dél-Alföld késő középkori lélekszáma?," [Is it possible to give an estimate of the late medieval population of the Southern Great Hungarian Plain] in *Műhelyszemináriumi dolgozatok I* [Research seminar papers, 1], eds. Éva Révész, and Szilvia Kovács (Szeged: SZTE BTK Történelemtudományi Doktori Iskola, 2013), 145–180, Beatrix F. Romhányi, "Szempontok a Kárpát-medence térszervezésének változásaihoz (5–14. század)," [Considerations on the changes of the spatial organization of the Carpathian Basin (5th–14th centuries)] in *Hatalmi központok az Avar Kaganátusban – Power Centres of the Avar Khaganate*, eds. Csilla Balogh, József Szentpéteri, and Erika Wicker (Kecskemét: Katona József Múzeum – MTA BTK MÖT, 2019), 399–420, and Beatrix Romhányi, "A középkori magyar plébániák és a 14. századi pápai tizedjegyzék," [The medieval parishes in Hungary and the 14th-century papal tithe records] *Történelmi Szemle* 61 (2019): 339–360.

documents, only a relatively sparse documentary evidence survives from the region. This paucity was certainly strengthened by the fact that this area was most heavily impacted by the Ottoman occupation, which again influenced the survival of the probably also relatively limited array of documents produced here. Third, and probably most importantly, the area's hydrography differed significantly from the rest of the Carpathian Basin. The few major rivers in the area, the Danube and the Tisza rivers as well as, to some extent, the streams in the watershed of the River Körös, had rather slow currents and were of limited importance for running mills. Apart from these waterways, there were large expanses of marsh that lacked waterways suited to building mills on. These waterways were mostly used for fishing, which thanks to the clearer related rights lead to fewer lawsuits. Therefore, instead of emphasizing the importance of certain geographical areas in water use conflicts, it is probably more precise to argue that water bodies were certainly more highly contested resources in urban environments and hilly areas in the countryside.

The picture is not much clearer if the temporal distribution of the cases analyzed here is examined. Periods where the sources are more common also produce increasing numbers of legal disputes. However, even more importantly, the distribution of the sources edited in various cartularies studied and discussed in Chapter 1.2.2 is highly uneven. The majority of the Árpáadian period sources were either published *in extenso* or in the form of summaries. The same is true for the first two thirds of the Angevin period. It is not true for the period from ca. 1365 and 1387, for which sources have only been partially gathered in cartularies. Thanks to the efforts of a research group, the first forty years of the reign of Sigismund are again better covered. Consequently, more lawsuits concerning water rights have come to light. However, the period starting from the mid-1420s onwards is less systematically covered in the various cartularies. The sources surviving from the reign of King Matthias are particularly lacking in source editions, with the exception of sources dealing with the diplomatic relations of the Kingdom of Hungary. This uneven distribution may lead to false conclusions. Even if the majority of the cases discussed in the previous subchapters fall between the late thirteenth and the mid-fifteenth century, this does not mean that this is a period with more water-related lawsuits. It rather indicates that legal documents for this period are more accessible. Nevertheless, from the fourteenth century onwards, not only was there a steep rise in the number of surviving documents but there were also concomitant attempts by various institutions and individuals to secure their rights in connection to water-use.

Even if there is not much possibility to identify spatial and temporal patterns in the development of water-related disputes and related customary law in the Carpathian Basin in

the Middle Ages, these conflicts seem to have been increasingly present in legal literacy and in the everyday life of the people and institutions that depended on, or expected, incomes from industrial and transport activities on water bodies. The fact that there are so very many water-related cases in the in the first parts of the summary of medieval Hungarian customary law, the *Tripartitum*, clearly indicates the role water played in the economic life of medieval Hungary.

How long this customary law held on has not yet been discussed. As before, I will briefly refer to a case that will demonstrate how long-lasting these medieval norms were. The case concerns the Nádasdy family, mentioned above in the context of violent trespass towards Styria in the 1680s. This time, however, the case records a dispute that concerned the more prominent heirs of this important Early Modern family. The case is connected to an appeal made by Francis Nádasdy (1708–1783) and addressed to Veszprém County in September 20, 1770. His appeal concerned a new mill built by the village of Berhida, at the time owned by the chapter of Veszprém. According to his claim, the newly built mill caused losses to the water mills of Kiskovácsi (part of present-day Berhida) that he held at the time. The new mill's dam, according to Nádasdy's claim, affected the mills at Kiskovácsi because it changed the fall of the water reaching the mills at Kiskovácsi located downstream by the Séd Stream, by which they stood.⁵⁸² In response to the appeal, a committee was sent to investigate whether there were grounds for the complaint or not. As the answer confirmed his claims, in the document mentioned above, Nádasdy demands the chapter's mill be torn down. The case is interchangeable with dozens if not hundreds of other cases from the Early Modern or Modern times. The source, if it was in Latin and not Hungarian, which by then had become a frequently used language in administrative and legal claims under the jurisdiction of the counties, could have easily been a late medieval document as well. The way such cases were handled remained virtually the same until Modern times, when water mills themselves gradually became obsolete.

⁵⁸² MNL OL P 507 Nádasdy család nádasdladányi levéltára [Nádasdladány archive of the Nádasdy family] Levelezés [Letters] II. 341. 1770.

4. The Men behind the Wheel... Building on Water in the Middle Ages

As discussed in the introductory chapter to the dissertation, water regulation works can be attested from the period of the foundation of the Hungarian state in the Carpathian Basin. In this context, the research of Károly Takács that pointed to extensive water-regulation works in the Árpáadian period is certainly of major importance. In case of accepting his points, ditch systems, water reservoirs and fisheries were built and maintained the latest from the eleventh or the twelfth centuries in different lowland areas of the Carpathian Basin.⁵⁸³ He suggested that though in different forms, but dug channel systems existed not only in parts of the Little Hungarian Plain which he studied in details, but even in the Transtisza region (the lowland areas east of the Tisza). Although on examples from much later period, research suggested the existence of channel systems – different in nature than the dug channels described by Takács – in many other parts of the Carpathian Basin.⁵⁸⁴ Also from the eleventh century onwards, as has been discussed in Chapter 2, apart from channel systems, water mills also started to function. However who planned these channels, mills, and other elements of water-related infrastructure, and who ran them has not been discussed so far. In the present chapter, using mostly late medieval and in some cases Early Modern source material, I discuss the men, and as will be highlighted by a rather unique source, sometimes women, behind the water regulation works. Although scattered data refers to persons who took part in similar works in the early centuries of Hungarian statehood, it is only from the fourteenth century that there is relatively high number of documents that tell of the professions that are directly related to water construction. The main question I aim to highlight in the coming pages is what specific knowledge these professions required, and what kind of specific skills these people had. How did they try to overcome or prevent the disputes that could potentially arise in consequence of their interventions in waterways? Were there steps in planning and at the constructions that meant to mediate potential problems?

In doing so, I discuss the representatives of two professions. First, the operators of water mills, millers will be in the focus, who, as I shall point to, had a number of other duties than supervising the grounding of grains and other raw materials. Second, an in research a previously highly underrepresented group ditch and pond diggers (and pond masters) are discussed. The roles of the practitioners of these professions are first highlighted by a specific

⁵⁸³ Takács, “Árpád-kori csatornarendszerek kutatása,” and idem, “Medieval Hydraulic Systems.”

⁵⁸⁴ See Andrásfalvy, *Duna mente népének ártéri gazdálkodása* and the debate that unfolded on the flood plain economy of pre-modern Hungary such as *Korall* no. 1 (2000).

source, a part of the account book of the town of Sopron from 1540. Then, using other evidence – legal sources, account books, terriers, and letters, I highlight the different kinds of activities they were involved in when practicing their professions. All these sources add some points to our understanding of the professions, and the ways in which water use was planned in different contexts. The sources also highlight the high level of integration between the different professions in water construction in the medieval and Early Modern Kingdom of Hungary.

4.1. The Renovation of the Moat of Sopron in 1540 – A Unique Source

The water management and the water mills in the town of Sopron have been discussed in details in Chapter 3.2.3.2. Here I am not intending to discuss the mills of the town in general, but connected to the rebuilding of the moat of the town and the above mentioned Foregate Mill (*Előkapu*) provide some insight in who was involved, and how in a sixteenth-century water construction project. The moat of the town, as already discussed above in Chapter 3.2.3.2, was built from the 1340s onwards, and two centuries later, according to the account book of Sopron, needed major renovation. The sluice at the Foregate may have been there from the fourteenth century, as it probably was the key infrastructural element in providing permanent water-level and current in the moat. The permanent flow in the moat, as has also been touched upon earlier, was important in hindering its silting up as well as in the usage of the mill connected to the gate.

This latter building was probably not working by the 1540s, and the rebuilding of the part of the moat was a precondition to the usage of the lost water mill. The works were carried out in the 1540s, which based on the account book of the Sopron from that year, was one of the largest expenses of the town, certainly the biggest of the not-regular expenditures.⁵⁸⁵ The source provides insights to the organization of labor on the one hand, and the ways how experts were involved in water construction works on the other. First the building work itself will be presented, followed by a short discussion of the work organization. In this subchapter I

⁵⁸⁵ MNL GYMSML SL IV. 1009. a. vol. 6. 1540/1541. 76–82. p. (the account is also accessible as a microfiche copy: MNL OL X 591 – MNL OL Box 5202). For the source, see also: Szende, “Malmok a városban,” 446–449. See the edition of the text in the Appendix (no. 5) of the present work. It has been published in: András Vadas, “Vízépítés és munkaszervezési formák a késő középkori és kora újkori Magyar Királyságban,” [Water construction and labor organization in late medieval and early modern Kingdom of Hungary] in *Techné: A szakképzés módszerei az ókorban és a középkorban* [Techné: forms of practical education in the Ancient times and the Middle Ages] (Studia Philologica, 5), eds. Márta Munding, Kornél Szovák, and László Takács (Piliscsaba: Avicenna Kutatási Non-profit Kft., 2018), 477–510.

will shortly discuss what professionals were involved in the different work phases and in what forms they worked together on the project. As the source allows insights, I will also discuss the wages of the different persons, which sheds light on the prestige and the different level of expertise the work in question required. This will be followed by a detailed analysis of the sources from late medieval and Early Modern Hungary on the practitioners of the above mentioned two professions, millers and ditch diggers (and pond masters).

As mentioned previously, the rebuilding works at the Foregate took place in the year 1540, and this is when the related payments were registered in the account book of Sopron. A ten folio long list of expenditures is preserved in the account book,⁵⁸⁶ and for some reason, right after this, two folios registered the expenses of the previous years – 1539 – on the moat.⁵⁸⁷ The latter, based on the different items probably registers a regular, annual work that was done to keep the moat clean and to provide permanent water current. This work was carried out under the supervision of the pond master (*teichtmaister*) called Sigismund. The account on these folios registered the payments he and his underlings received. The sum is not significant, and nothing points to the connection between the major rebuilding and this minor work apart from the fact that they were copied into the account book one after the other. The total sum of the 1540-works amounted to dozen times the expenditures of 1539. Based on this, and the listed persons involved it is more or less clear that the works done in 1539 were not meant for any rebuilding, but to carry out the regular maintenance.

The major rebuilding work preserved on ten folios of the account, however, tells numerous details about the works, and their organization, and especially the importance of the miller in the building process. The document registers the expenses in three different parts, arranged according to the main stages of the work. The first part of the account registers the building of the moat itself. The work started in the end of February in 1540. In this phase of the work, neither millers, nor the pond masters were involved as basic works had to be carried out at the beginning. Then mostly the stone-cutters and his workers were actively involved. The leading stone-cutter, certain Bartholomew was first paid on the 21st of February (Saturday),⁵⁸⁸ which means, he started to work at the beginning of that week, that is, the 15th of February. After the stone-cutter, the pond digger was the next master involved in the works. The man, called Martin (Martl) Pehem was referred to in the German text as

⁵⁸⁶ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 76–85. p.

⁵⁸⁷ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 86–87. p.

⁵⁸⁸ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 76. p.

deichtknecht. His task was digging and removing ground from the *zwinger*.⁵⁸⁹ His name, Pehem is certainly interesting, as it alludes to his Bohemian origin. This may be important because as has been discussed in the introductory part of the dissertation, fish ponds were particularly important in the Bohemia in the late medieval economy.⁵⁹⁰ The construction works at Sopron began relatively early within the year, already in late February. Because of the sometimes frozen soil these works were usually carried out in later months of the year. However the weather was particularly mild in February that year, as is suggested by numerous sources from Central Europe.⁵⁹¹

The stone-cutter and his assistant continued their work in the following weeks. Bartholomew, the stone-cutter, for a day was not working on preparing the bigger blocks for the bed of the moat, but was breaking smaller stones, which probably also were necessary in major quantities during the rebuilding. Although the paleography of the word in the account book is not entirely certain, but it seems that the cutter supervised the breaking of the tombstones of the Jewish cemetery (*iud[en]hof* [?]) of the town.⁵⁹² That probably was the easiest and cheapest way to get ballast at the time, and as the Jewish community of the town was forced to leave the city after the battle of Mohács (1526), consequently, there was no objection against the act.⁵⁹³ The cemetery in question stood next to the Saint Michael's Gate in the suburb and the above line in the account book is not the only testimony to its usage as a quarry. The first data that points to that comes from 1539. Then, as witnessed by the account book of Michael Törtl, stone was brought on four rounds from the cemetery to the construction works of the nearby Saint Michael's Church between the 20th and the 30th March.⁵⁹⁴ In light of this, it is well possible that a year later the cemetery's remaining stones

⁵⁸⁹ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 76. p.

⁵⁹⁰ Andreška, "Development of Fish-Pond Culture," Graus, *Dějiny venkovského*, vol. 2. 32–35 and 483–486. See also: Hoffmann, "Economic Development and Aquatic Ecosystems," 660.

⁵⁹¹ Petr Dobrovolný et al., "Monthly, seasonal and annual temperature reconstructions for Central Europe derived from documentary evidence and instrumental records since AD 1500," *Climatic Change* 101 (2010): 69–107. For the data from 1540, see: <https://www1.ncdc.noaa.gov/pub/data/paleo/historical/europe/dobrovolny2010/temperature.txt> (last accessed: January 22, 2017). The whole year was probably one of the warmest and driest in the last millennium: Oliver Wetter et al., "The Year-Long Unprecedented European Heat and Drought of 1540 – A Worst Case," *Climatic Change* 125 (2014): 349–363.

⁵⁹² MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 76. p.

⁵⁹³ Cf. "Katalin Szende: Scapegoats or Competitors? The Expulsion of Jews from Hungarian Towns in the Aftermath of the Battle of Mohács, 1526," in *Expulsion and Diaspora Formation: Religious and Ethnic Identities in Flux from Antiquity to the Seventeenth Century* (Religion and Law in Medieval Christian and Muslim Societies 5), ed. John Tolan (Turnhout: Brepols, 2015), 64–68. For the re-use of tomb stones in general, see Carsten Wilke, "Medieval Hebrew Inscriptions: Towards a European Database," *Jewish Studies at the Central European University* 7 (2013): 147–172. I am thankful to Ferenc Dávid for his suggestions made to this part of the account.

⁵⁹⁴ For the edition of this part of the account book, see: *Magyar-Zsidó oklevéltár*, 18 vols [Hungarian–Jewish cartulary], eds. Ármin Friss et al. (Budaest: Magyar Izraeliták Országos Képviselőlete, 1901–1980), vol. 5/2. 408–

were used as ballast for the rebuilding of the section of the moat around the Foregate. The breaking of the stones for ballast continued in the beginning of March and so did the digging of the ditch. In these weeks, the account contains paying offs for the two masters and their assistants alternately. The payment for a new master appears on the week of the 13th of March. From that time on not only the digging was done in the moat, but the works to build in the stones prepared by cutters also began. The stone-mason (*maurer*) started to work on building the mill race of the water mill at the Foregate.⁵⁹⁵ Most of the similar mill races were of timber, it is certainly worth to note that a more expensive and lasting material was chosen here. A few days later, on the 19th of March, a new master (or rather assistant, a *merterknecht*) appears in the account whose duty was to provide the mortar for the building work.⁵⁹⁶ He probably worked under the leadership of the stone-mason on building in the major blocks to the bed of the mill race by the moat. Although he is only referred to as assistant – *knecht* – from the fifteenth century onwards sources keep referring to persons working specifically on producing mortar in building works.⁵⁹⁷

The masons and the diggers worked continuously in March and April. A new person is involved in the works from the beginning of May that is the master builder of the town (*statmaister*).⁵⁹⁸ The function first appears in Sopron in the fifteenth century. They are mentioned first in 1427, and then again in 1432 in the accounts of the mayor Thomas Schadendorfer, as well as in the accounts of the chamberlain of the town, Ulrich Abenstorffer in 1466.⁵⁹⁹ Unlike most of the persons involved in the building work, he received a daily payment in 1540, which well reflects the prestige of his work. Apart from the daily payment, he and his assistants once received gratuity as well as bathing money.⁶⁰⁰ The parts of the

409 no. 15. For the fate of the Jewish cemetery and its stones: Sándor Scheiber, “Középkori zsidó sírkő-töredékek Sopronban,” [Medieval Jewish tombstone-fragments at Sopron] *Soproni Szemle* 14 (1960): 357–361.

⁵⁹⁵ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 77. p.

⁵⁹⁶ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 77. p. For mortars and other professions, see the illustrations of the *Hausbuch der Mendelschen Zwölfbrüderstiftung* from the same period as the Sopron account book analyzed here. For descriptions and illustrations of the different professions, see the online database: <http://www.nuernberger-hausbuecher.de/> (last accessed: June 12, 2016).

⁵⁹⁷ As *cementarius*, see for instance: Árpád Mikó, “Rész és egész. A magyarországi reneszánsz kőfaragóműhelyek és kutatásuk,” [Part and the whole. Hungarian Renaissance stone-carving workshops and research into them] in *Koppány Tibor hetvenedik születésnapjára* [For the 70th birthday of Tibor Koppány] (Művészettörténet – műemlékvédelem 10), eds. István Bardoly, and Csaba László (Budapest: Országos Műemlékvédelmi Hivatal, 1998), 218 (1491) and as a name István Draskóczy, “Az erdélyi sókamárák ispánjai, 1529–1535: az erdélyi sóbányák sorsa a Szapolyai korszakban,” [Counts of the Salt Chambers of Transylvania, from 1529 to 1535: the fate of the Transylvanian salt mines in the Szapolyai era] *Levéltári Közlemények* 75, no. 1 (2004): 30 (1532). For similar from Sopron: Házi, vol. 2/5. 98 (1498), and 438 (1524/25).

⁵⁹⁸ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 79. p.

⁵⁹⁹ Házi, vol. 2/2. 395, vol. 2/3. 3, and vol. 2/4. 262.

⁶⁰⁰ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 79. p. For the functions of the latter on the example of Bratislava, see: Judit Majorossy: “Church in Town. Urban Religious Life in Late Medieval Hungary,” (PhD-diss., Central European University, 2006), 236–240, and eadem, “A test és a lélek fürdője. A középkori pozsonyi

works connected to the moat itself finished in the middle of June, as that is the latest when expenses are recorded in the account. While the stone-cutters and masons probably were not involved in the planning of the water construction, but had rather been instructed to carry out well-defined tasks, the master builder probably had a key role in identifying the consequences, the interests in the work.

In parallel with the rebuilding of the moat and the construction of the mill race, the reconstruction of the mill building itself also began. This part of the work was supervised by the miller, a certain Urban Kümpf.⁶⁰¹ The first steps of its rebuilding also began in February just as the building works at the moat. In the first phase, apart from non-specified pay-offs, there are payments registered for the shipping of the timber to be built in to the mill. One of these pay-offs highlights that the first assistant of the miller was not from Sopron, but from one of the villages of which Sopron was the landlord called Ágfalva (Agendorf).⁶⁰² After February, timber for the building works still had to be brought to the site. Then a well-known burgher, Francis Siebenbürger was paid off, as his forest was used for felling the trees for the timber.⁶⁰³ Siebenbürger was from one of the most prominent families of Sopron; apart from having been known for his trade connections that pointed to well beyond the borders of Hungary he even became the mayor of the town.⁶⁰⁴ There is less information on the exact works done at the mill. Nonetheless the accounts testify to the weekly payment of the miller continuously during the building works, which shows his fundamental role in the planning and the supervision. It is probably him who had to continuously check whether the new bed and the race leading to the mill fitted the mill's and the moat's needs. Apart from the miller in the spring two assistants (*muelknecht*) were involved in the works, the first payment to whom was registered at Pentecost (27th of May).⁶⁰⁵

In the third part of the account related to the construction works done the costs of the materials and the shipping is listed. Apart from listing the different expenses here and there the accounts refer to the usage of the materials. This part of the source however contains some important additions to the location of the different works done by the moat. Based on one of

fürdőkről,” [The bath of body and soul. On the medieval bathing houses of Bratislava] in „Köztes-Európa” vonzásában: Ünnepi tanulmányok Font Márta tiszteletére [In the attraction of “Mitteleuropa” Studies in honor of Márta Font], eds. Dániel Bagi, Tamás Fedeles, and Gergely Kiss (Pécs: Kronosz, 2012), 354.

⁶⁰¹ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 80. p.

⁶⁰² MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 80. p.

⁶⁰³ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 80. p.

⁶⁰⁴ On him in details, see: Károly Goda, “A soproni városvezető réteg a 15–16. században. A polgármesteri és városbírói tisztség összehasonlító igazgatási és társadalomtörténete,” [The leading elite of Sopron in the 15th – 16th centuries. The administrative and social history of the positions of majors and town judges] (PhD-diss., Eötvös Loránd Tudományegyetem, 2011), 193–194.

⁶⁰⁵ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 82. p.

the expenses it is clear that works were also done at the fish pond, or fish hatchery. This was in the southwestern part of the town, and as discussed in Chapter 3.2.3.2 was connected to the water system of the moat.⁶⁰⁶ This shows that the works extended further than the immediate surroundings of the Foregate. It is possible that the fish hatchery and the channel that connected the small pond with the moat were covered over then. This would not have been exceptional in medieval Hungary as a similar construction was shown in the context of Budafelhévíz where probably more than one race leading to mills was covered over. For the works done in 1540 at Sopron fir as well as other timber materials were used. Probably the water in some parts ran in a timber joint which would be rather regular in case of similar mills. It is rather surprising that, as mentioned above, parts of the race may have been of stone. The account in this third part lists numerous further metal and wooden materials the usage of which however is not discussed in details. Part of the timber was certainly used for the covering up of the mill building.⁶⁰⁷ The acquisition of the millstone is an interesting part of the account and somewhat indicative of the roles and importance of millers. The millstone, one of the key elements of a mill, was acquired from as far as Vienna.⁶⁰⁸ This may seem somewhat surprising in light of similar acquisitions. There is relatively scarce data on the market of millstones in Hungary but by the seventeenth century – and probably already earlier – Győr was an important center in trading with this object. In majority of the cases the millstone of the mills in the neighboring Vas County were bought there,⁶⁰⁹ and in the late medieval and Early Modern period, an other close-by Hungarian town, Pápa is also referred in some cases as important in trading with millstones. In 1540, despite the customs (most importantly the *tricesima* or thirtieth customs to be paid at the border between Hungary and the Austrian duchies) they seem to have chosen Vienna to acquire the millstone.⁶¹⁰ This may be explained by the sometimes bad communication towards the Fertő and Hanság areas –

⁶⁰⁶ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 83. p. For the hatchery: Dávidházy, “A soproni posztókallók,” Fig. 5. This is used in: Jankó, Kücsán, and Szende, *Sopron*, 27. Fig. 10 and 82 (Fish ponds). For the ownership of the hatchery, see: Mollay, “A Tómalom,” 154.

⁶⁰⁷ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 83–84. p.

⁶⁰⁸ MNL GyMSML SL IV. 1009. a. vol. 6. 1540/1541. 85. p.

⁶⁰⁹ On millstone mining in Hungary: Gergely Csiffáry, “A gyöngyössolymosi malomkőbányászat története,” [History of mill stone quarrying at Gyöngyössolymos] in *Tanulmányok a kézműipar történetéből* [Studies in the history of craftsmanship], eds. idem, and Klára Dóka (Veszprém: Veszprémi Akadémiai Bizottság, 1999), 161–189. For the latter problem, see MNL OL P 1314 no. 7606 (September 6, 1637, Ladislav Bozay to Adam Batthyány) no. 33 860 (August 5, 1646 [this refers to the fair]), and no. 33 647 (September 28, 1646, both by Stephen Nemsem to Adam Batthyány).

⁶¹⁰ MNL OL P 1314 no. 43 747 (February 9, 1611, Andrew Somogy to Adam Batthyány). For the role of Pápa as a trade center, see: András Kubinyi, “A középkori Pápa,” [Medieval Pápa] in *Tanulmányok Pápa város történetéből. A kezdetektől 1970-ig* [Studies in the history of the town of Pápa. From the beginnings to 1970], ed. idem (Pápa: Pápa Város Önkormányzata, 1994), 75–124.

where Győr lay, however this usually was caused by wet weather, and as mentioned above, 1540 was one, if not the driest and warmest years of the last millennium.⁶¹¹

Even if, because of the nature of the source type, the account does not allow insight to many of the elements of the building work, the materials, the masters mentioned can help to understand how and who were involved in water construction works. Before discussing in details the role the different masters had in the building work and in general, the dimension of the work is discussed along these pages.

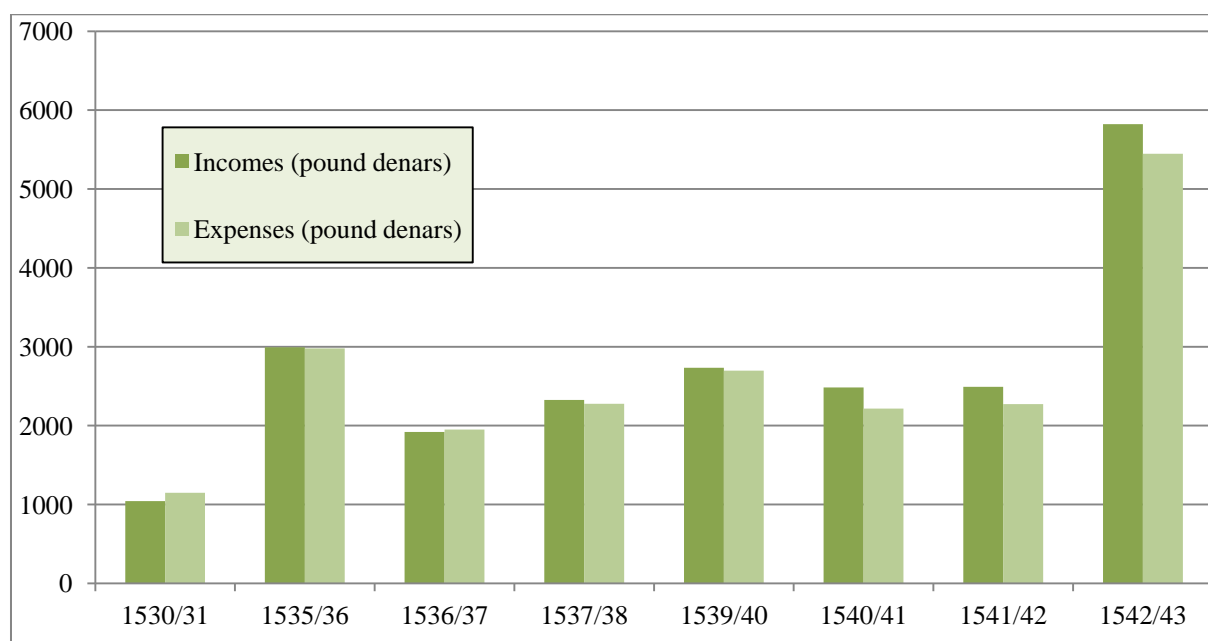
4.1.1. The Expenditures on the Work

The account discussed along these lines probably represents a whole rebuilding work from the removing of the first spit of ground to the completion of the renovation of the mill, its race and a section of the moat at Sopron. As the expenses are registered in the account with great care it is possible to understand the dimension of the building project, as well as to calculate the proportion of the different expenses, most important that of the wages and building material. This I hope will demonstrate how important it was to efficiently manage the water resources at a particular settlement. Although this is not directly connected to the problem of disputes, however the expenses made on one probably rather small (probably one wheeled) mill and its surroundings may explain the efforts the different actors of the society put into securing their rights to use waters.

In the rebuilding work, in the menace of the Ottoman threat probably military considerations – i.e. the proper functioning of the moat – were very important, but a significant part of the expenditures was directly connected to the exploitation of waters in the town. First, the total cost of the work is worth considering. The total cost of the work was 297 pound denars that is 170 golden florins. It would be worth to compare this to the cost of other contemporary building works in order to have a more precise idea of its dimensions but there is no research to my knowledge which evidently offers such possibility. What I could do however is to compare the costs of the work with the budget of Sopron in the year around the rebuilding works. As the account books of the town survived from the 1530s and 1540s there is an obvious source to do so. Very little research has been carried out on the account books of the town for this period. A scholar, István Baraczka analyzed the account book of the town

⁶¹¹ E.g. the directions of lime trade: Mollay, “A Tómalom,” 152–153 (map).

from 1535/1536 back in the 1960s,⁶¹² but since this work there was no study of the account books for the early sixteenth century. In the financial year of 1535/1536 the total income of the town amounted to ca. 2992 pound denars, while the expenses amounted to 2979 pound denars. This is however just one single year, which Baraczka analyzed, therefore I chose to study the account books for the period 1530 to 1543 (see *Fig. 22*). In the whole period, the incomes and the expenses both fluctuated between 2000 and 3000 pound denars, but there is a strong fluctuation in the fifteen years studied. The data of course is to be understood in the context of the political changes. The turbulent military and political situation in the aftermath of the battle of Mohács, and the struggles of the two contenders to the Hungarian throne, Ferdinand I and John I Szapolyai, left their marks on the town and its economy. The total expenditure in the financial year of 1539/1540 amounted to 2697 pound denars. The roughly 300-pound denar rebuilding work of Sopron's moat is exactly 11 per cent of the expenditure in that year. This is certainly a significant amount, and as noted, the biggest investment of the town in that year.



*Fig. 22: The incomes and expenses of the town of Sopron between 1530 and 1543 in light of its account books*⁶¹³

⁶¹² István Baraczka, "Az 1535/36. évi Sopron városi kamarai számadáskönyv néhány tanulsága," [Some lessons of the account book of the town of Sopron on the year 1535/1536] *Soproni Szemle* 23 (1969): 207–215.

⁶¹³ For the sources of the graph: MNL GYMSML SL IV. 1009. a. 1530/1531 117. p, 1535/1536 112. p, 1536/1537 143. p, 1537/1538 120. p, 1539/1540 50, 132. p, 1540/1541 46, 121. p, 1541/1542 38, 90. p, 1542/1543 55, 141. p.

It may be worthy to briefly refer to the proportion of the costs of the materials built in and the wages for the workers. In general, one may assume in a medieval context that the latter, in overwhelming majority of the cases, added up the majority of the building costs.⁶¹⁴ The building work at Sopron was no exception to that, which in light of the nature of the work itself is no surprise, as in the first phase major ground works took place which did not require building in any material. The wages paid off to the workers made up 82.4 per cent of the costs, while the remaining 17.6 per cent was spent on the building materials and the shipping costs. The proportion of the costs is somewhat more even in case of building houses.⁶¹⁵ The working days spent on the rebuilding of the moat are high, almost 1500 working days. There were weeks when about a dozen workers were involved in the digging and the building in of the different materials in the bed of the moat and the mill race. When the digging and the building of the mill went parallel this certainly rose to above fifteen workers a day. In light of all this, a relatively big building project unfolds. In the following subchapter the labor organization and the involvement of the different masters is discussed.

4.1.2. The Labor Organization

One of the problems closely connected to the costs of the work is organization of the different wage laborers. I give an overview of the ways the different people were organized in their work, got paid. My aim is to provide an insight to the prestige of the different laborers by analyzing the ways they were paid off, and to show the high esteem of the masters who had expertise in water construction. Jenő Szűcs, one of the most innovative Hungarian medievalists in the twentieth century, half a century ago wrote a detailed study on the work organization at a major rebuilding and extending of the castle of Bratislava in 1434. Based on the surviving accounts of half a year he pointed to the importance of studying professions which lacked guild organization in medieval Hungary. Building industry as well as millers certainly belonged to this group.⁶¹⁶ Despite that the works ordered by King Sigismund of Luxemburg at Bratislava, one of his important seats in Hungary close to the Holy Roman

⁶¹⁴ Cf. e.g. Christopher Dyer, *Everyday life in Medieval England* (London: Hambledon, 1994), 133–165. See also: Jenő Szűcs, “A középkori építészet munkaszervezetének kérdéséhez,” [To the question of the labor organization in medieval building industry] *Budapest Régiségei* 18 (1958): 320.

⁶¹⁵ See e.g. István Hermann, “Egy Pápa belvárosi ház felújítása az 1670-es években. (forrásközlés),” [Rebuilding of a house in the downtown of Pápa in the 1670s (source edition)] *Soproni Szemle* 70 (2016): 226 (here the ratio of costs of the material and the wages was 56 percent to 44 per cent).

⁶¹⁶ Szűcs, “A középkori építészet.”

Empire,⁶¹⁷ were different in scale to those at Sopron, this is by far the best comparative material. Even if the scale of the works at Sopron was more limited, a number of different professions were mentioned in the accounts. The accounts not only help identifying the different wages the professionals received for their work, but are also instrumental in understanding the organization of the work under the leadership of the different building masters. In most cases the accounts of 1540 tell of hired hands paid off daily under the leadership of a master, who usually got paid weekly. However in the masters' case, as previously noted connected to the master builder of Sopron, there were special single payments made as well. The various people involved had significantly different wages. It is therefore possible to understand the different degree of prestige, and probably the expertise the phases of the building work required.

At the works analyzed by Szűcs, the building master, Conrad of Erling's day wage was seven times of the wage of the hired hands, and he earned twice as much as the different masters (carpenter, smith, etc.).⁶¹⁸ In the case of Sopron, the difference is also significant; the miller's wage was five times the wage of the hired hands. The lowest day wage was those of women – I will come back to that – 16 denars, while the highest was that of the miller's (77.14 denars). One finds the representatives of other professions in the 30 to 44-denar category, followed by the assistants to the different masters, and finally the hired hands and women (see *Fig. 23*).

| <i>Labor</i> | <i>Wage calculated for a day (in denars)</i> |
|---|--|
| Miller (<i>mülner</i>) | 77.14 |
| Miller assistant (<i>mühlknecht</i>) | 40 and 44 |
| Pond master (<i>deichtmaister</i>) | 40 |
| Stone-mason (<i>maurer</i>) | 40 |
| Stone-cutter (<i>steinmetz</i>) | 40 (1539) |
| Pond/ditch master assistant (<i>deichtknecht; maisterknecht</i>) | 28, 30, 32 (1539) |
| Mortar maker assistant (<i>merterknecht</i>) | 4 and 28 |
| Stone breaker (<i>steinbrecher</i>) | 24 |
| Hired hand (<i>raicher</i>) | 16 and 24 |
| Female worker (<i>weib</i>) | 16 |

Fig. 23. Wages according to the 1539/1540-account book of Sopron

⁶¹⁷ See his itinerary on the frequency of his visits at Bratislava: Pál Engel and Norbert C. Tóth, *Királyok és királynék itineráriumai (1382–1438), Zsigmond király és császár (1382–1437)* [Itinerary of kings and queens, 1382–1438; King and Emperor Sigismund (1382–1437)] (Segédletek a középkori magyar történelem tanulmányozásához, 1) (Budapest: Magyar Tudományos Akadémia Támogatott Kutatóhelyek Irodája, 2005).

⁶¹⁸ Szűcs, "A középkori építészet," 328.

The day wage in similar accounts mostly depended on the season. In medieval Hungary, according to wages, two seasons – winter and summer half year – were considered, but as the source basically dates to after 22 February, that was considered summer season from the point of view of wages. This is the period when the daylight, therefore the number of working hours were significantly more than in the winter half year.⁶¹⁹ The difference in the payments for the same kinds of tasks in this case could therefore be explained by the different experience and proficiency.⁶²⁰

The appearance of female laborers in an account like this is certainly worthy of a note. While from Western Europe there is a relative abundance of data on the participation of women in building works, from the territory of the medieval Kingdom of Hungary there is an almost total lack in similar data.⁶²¹ Their wage according to the account book was significantly lower than men doing the same task, ca. 60 per cent of that, which is almost exactly the same to what has been shown in the case of female workers in English towns, such as Durham, Newcastle, Lincoln, or York.⁶²² There is but one counter example: when building the castle of Builth in Wales in 1278, women received only slightly less – ca. 15 per cent – than men. In England it is only from the seventeenth century onwards that women received

⁶¹⁹ Szűcs, “A középkori építészet,” 319–320. See for the winter and summer wages at Sopron: Dezső Dányi, and Vera Zimányi, *Soproni árak és bérek a középkortól 1750-ig* [Prices and wages from Sopron from the Middle Ages to 1750] (Budapest: Akadémiai, 1989), 448–507. By the nineteenth century the summer half year was between St George’s (24 April) and St Michael’s (29 September) day for which period significantly higher wages were paid. Cf. Ottó Domonkos, *Ár- és bérlimitációk Sopron városban és Sopron megyében, XVI–XIX. század* [Price and wage limitations at Sopron and in Sopron County, 16th–19th centuries] (Előmunkálatok a magyarság néprajzához 8) (Budapest: MTA Néprajzi Kutató Csoport, 1980), 111. In Austria, three seasonal wages were identified by research. Different wages were paid to hired hands in summer, winter and autumn-spring: Elisabeth Gruber: „Raittung und außgab zum gepew” *Kommunale Rechnungspraxis im oberösterreichischen Freistadt Edition und Kommentar der Stadtgrabenrechnung (1389–1392)* (Quelleneditionen des Instituts für Österreichische Geschichtsforschung, 14) (Vienna: Böhlau, 2015), 73.

⁶²⁰ For the different day wages in the case of masons, see e.g. Házi, vol. 2/5. 285.

⁶²¹ See for instance for the female laborers at Hall in Tyrol: Klaus Brandstätter, “Schwerarbeitende Frauen im Mittelalter: Bauarbeiterinnen in Hall in Tirol,” in Margarete „Maultasch”: zur Lebenswelt einer Landesfürstin und anderen Tiroler Frauen des Mittelalters; Vorträge der wissenschaftlichen Tagung im Südtiroler Landesmuseum für Kultur- und Landesgeschichte Schloss Tirol, Schloss Tirol, 3. bis 4. November 2006, ed. Jutta Hörmann-Thurn und Taxis (Innsbruck: Wagner, 2007), 277–281. For similar at Paris, see: Ilona Sz. Jónás, “Női munka a 13. század végi Párizsban,” [Female work in late-13th-century Paris] in eadem, *Sokszínű középkor. Természet, társadalom, kultúra a középkori Európában* [Colorful Middle Ages. Nature, society, culture in medieval Europe], eds. Balázs Nagy, and Veronika Novák (Budapest: ELTE Eötvös Kiadó, 2010), 341. With a number of examples from different parts of Europe: Shelley E. Roff, “‘Appropriate to Her Sex?’ Women’s Participation on the Construction Site in Medieval and Early Modern Europe,” in *Women and Wealth in Late Medieval Europe* (The New Middle Ages), ed. Theresa Earenfight (New York: Palgrave, 2010), 109–134. For female work in towns in Hungary, see: Katalin Szende, “A női munka a középkori gazdaságban,” [Female work in medieval economy] *Aetas* 11, no. 1–2 (1995): 179–193, and more recently: Judit Benda, “A csendes háttér. A nők munkalehetőségei a középkori Budán,” [The silent background. Possibilities of female work in medieval Buda] *Korall* no. 60 (2015): 11–40.

⁶²² Donald Woodward, *Men at Work: Labourers and Building Craftsmen in the Towns of Northern England, 1450–1750* (Cambridge: Cambridge University Press, 1995) 112. See also: Roff, “Appropriate to Her Sex,” 116.

approximately same wage for a days' work in the building industry as men.⁶²³ As mentioned, lacking in Hungarian data there is no grounds to offer similar comparative material, but it is certainly important to note that at Sopron, participation of women in similar works was probably normal. It is not only in this account that they appear, but in minor rebuilding works in 1541 the account book again testifies to their presence as hired hands.⁶²⁴ Not only women were paid daily, but with the exception of the miller, every master, assistant and hired hand. The miller however had a weekly wage that was fixed. In every case the masters of the professions received the highest wage, followed by their assistants, earning 2 to 4 denars less daily. Apart from the daily and weekly payments, as noted above already, there were single payments connected to different work phases. The biggest of these sums is the 10 pound denars (2400 denars) that the miller received for installing the millstone, for which he himself travelled to Vienna as mentioned beforehand. This well indicates how important this element was on the one hand, and how crucial the role of millers was in the building works on the other. This was on the one hand the most expensive element of mills, and probably the one that was the most important from the point of view of the milling process.

As this brief analysis showed there was significant difference in the prestige of the different professions. Some professions were esteemed higher than others which can be clearly attested in the salary of the different masters. The high salary of the miller well reflects the role they had in water construction works. In the following, using different kinds of written evidence these roles will be highlighted. Apart from the miller, the pond master also received higher wage than other masters. Their roles will be discussed similarly to that of millers'. While millers and their duties were highlighted in a number of studies, the tasks of pond masters and pond diggers has not been intensively researched. Based on the relatively high wages they received their roles probably were also important in planning and carrying out water construction.

4.2. Millers

Medieval and Early Modern millers probably were just as much carpenters to our modern understanding as the leaders of the grounding of grain or other products in the mills.

⁶²³ *The History of the King's Works. The Middle Ages*, 2 vols, ed. Howard M. Colvin (London: H. M. Stationery Office, 1963), vol. 1. 297.

⁶²⁴ MNL GYMSML SL IV. 1009. a. vol. 7., 1540/1541, 43–44. p (can be researched as a microfiche: MNL OL Box 5203).

It is no surprise than, that the building work of the mill at Sopron in 1540 was done under the guidance of the miller, Urban Kümpf.⁶²⁵ The same is highlighted by the testimony of one of the best known millers of all times, Menocchio. The miller of Friuli was eternalized by the classic work of Carlo Ginzburg in his *The Cheese and the Worms*. When Menocchio was asked about his profession during his inquisition trial, he answered as: “miller, carpenter, sawyer, mason, and other things...”⁶²⁶ It seems that in many cases the representative of miller and carpenter professions could complement each other, however could sometimes lead to tension between their practitioners. Perhaps it is not by chance that it is no one else than the otherwise not very positively represented, drunk miller who tells the story of the repeatedly cuckold carpenter in Chaucer’s *Canterbury Tales*.⁶²⁷ The close association of the two professions apart from the fact that in many cases they had common guilds is well represented by the fact that in medieval towns the living spaces of miller and carpenters in many cases coincided. For instance, as it has been demonstrated in the case of Bratislava, both carpenters and millers lived in the suburb close to the Danube.⁶²⁸

Even if sometimes sources tend to tell of tensions between miller and carpenters, one should not think that the two in medieval Hungary were clearly distinguished.⁶²⁹ In legal documents, one finds the merging of the two Latin terms – *molendinator* and *carpentarius* – in a number of cases, and one even finds millers mentioned as “Hungarian carpenters”.⁶³⁰ In Early Modern terriers (*urbaria*) from Hungary as well as in the list of the incomes of the estate complex of Gyula from 1525 one finds references to millers whose duty to their landlord was doing carpentry work.⁶³¹ In some cases millers were entrusted with very specific

⁶²⁵ For millers in general, with mostly Early Modern examples: Takáts, “A magyar molnár,” and idem “A magyar malom.”

⁶²⁶ Ginzburg, *The Cheese and the Worms*, 1.

⁶²⁷ Geoffrey Chaucer, *The Canterbury Tales* in *The Complete Poetry and Prose of Geoffrey Chaucer*, ed. John H. Fisher (New York: Holt, Rinehart and Winston, 1977), 57–68. For the reputation of millers: Paul Freedman, “The Miller,” in *Historians on Chaucer: The General Prologue to the Canterbury Tales*, eds. Stephen H. Rigby, and Alastair J. Minnis (Oxford: Oxford University Press, 2014), 368–385.

⁶²⁸ Judit Majorossy, “A foglalkozás topográfiája. A társadalmi tértől a személyes térig: a társadalmi mobilitás térbeli elemei a 15. századi Pozsonyban,” [Topography of employment. From the social space to the personal space: elements of the spatial mobility in 15th-century Bratislava] *Korall* no. 45 (2011): 102–135.

⁶²⁹ It probably was somewhat more clearly distinguished in medieval England. See: Holt, *The Mills of Medieval England*, 101.

⁶³⁰ *Magistros carpentarios videlicet molendinorum or molendinatoribus alias hungaris carpentariis. A nagy-károlyi gróf Károlyi család oklevéltára*, 5 vols [Cartulary of the Károly family of Carei], ed. Kálmán Géresi (Budapest: Nyomatott Kocsi Sándornál, 1882–1897), vol. 1. 362–367 no. 227. Cf. Tamás Vajda, “Vízimalmok építésével előidézett, mesterséges áradások,” 348, and Mihály Détshy, “Munkások és mesterek az egri vár építkezésein 1493 és 1596 között. 1. közlemény,” [Workers and masters at the building works of the castle of Eger between 1493 and 1596, I] *Az Egri Múzeum Évkönyve* 1 (1963): 190.

⁶³¹ Endre Veress, *Gyula város oklevéltára. 1313–1800* [Cartulary of the town of Gyula] (Budapest: Stephaneum, 1938), 89, and in terriers, see e.g.: MNL OL E 156 (Magyar Kamara Archívuma. *Urbaria et Conscriptiones*) a. Fasc. 089. No. 007. 4. p. (1565); MNL OL E 156 a. Fasc. 065. no. 090. 4, 9. p. (early seventeenth century); MNL

carpenter works for duty to their community. In Sopron for instance, according to a data from 1595 millers were in charge of building the gallows.⁶³² The less distinguished expertise of millers and carpenters is also highlighted by the fact, that in Hungary, when in the sixteenth century, the first miller guilds were founded some had carpenters as well as their members.

Despite the fact, that mills were one of the typical spaces of socializing in the Middle Ages and the Early Modern period,⁶³³ millers were not the most popular members of the society. The seigniorial ban on milling was costly for the tenant peasants,⁶³⁴ and a number of sources allude to millers intentionally harming the interests of people who came to their mills to ground their grain.⁶³⁵ The unpopular role of millers is mainly connected to their most evident role, the leading of the milling in the mill they were in charge of.

This, as has already been implied by the previous parts of the present chapter, however only made up a small part of the work of millers. The actual daily tasks at the mills were mostly carried out by their assistants. However, apart from this rather obvious role, at least three further roles some which have already been highlighted in the previous chapters can be associated with millers. First, as evident from the Sopron account books, was their role in planning the construction, and the leading of the building work of mills. This, and neither any of the ones discussed here was exclusive to millers. In some cases carpenters or masons could also be found as builders or rebuilders of mills.⁶³⁶ Nonetheless in most cases millers were in charge of building, and especially the maintenance of the building itself. In light of the 1540 account of Sopron, it is clear that there were phases that required the expertise of the miller himself. The most important of these was the acquisition and the supervision of the setting up of the millstone. These were almost always done by the miller in charge of the building in question.

OL E 156 a. Fasc. 037 No 057 31. p. (February, 1639); MNL OL E 156 a. Fasc. 036. No 016. 10, 12. p. (August 1, 1670); MNL OL E 156 Fasc 36. No 009 4. p. (April 6–9, 1718); MNL OL E 156 a. Fasc. 005. No 029c. 108. p. (July 6, 1720). For further examples, see: Takáts, “A magyar molnár,” *passim*.

⁶³² Elemér Winkler, *A soproni céhek története a XV–XIX. században* [Life of the guilds of Sopron in the 15th–19th centuries] (Sopron: [Tóth Kny.], 1921), 11.

⁶³³ Jeney-Tóth, “Erkölc és céhek a mindennapokban.”

⁶³⁴ For England: Lucas: *Ecclesiastical Lordship, Seigneurial Power*, 269–306. For Hungary: Vajda, “Földesúri jogok és kötelezettségek.”

⁶³⁵ With mostly English examples, see Bennett and Elton: *History of Corn Milling*, vol. 3. 106–176. The same is reflected in the 1812 price limitations of Sopron County, in which numerous fines connected to fraud with grain is mentioned: Domonkos, *Ár- és bérlimitációk*, 118–119. See also: Holt, *The Mills of Medieval England*, 104–105.

⁶³⁶ For the former, see e.g. the Bohemian carpenters paid by the king to build to mills (or a mill with two wheels) at Belgrade: *Registrum proventuum regni Hungariae: A Magyar Királyság kincstartójának számadáskönyve (1494–1495)*, ed. Tibor Neumann (Budapest: MTA BTK Történettudományi Intézet, 2019), 1111–1112, 1852, and 1948, or MNL OL E 41 1578. no. 317. For the latter, see e.g. Prímási Levéltár Esztergom, Acta Radicalia, Classis X.24. File 18. 49. p. (August 8, 1650, contract concluded with Balthasar Boniger, *murarius*). I am thankful to Bence Péterfi for drawing my attention to the source.

As part of an earlier work I managed to gather considerable amount of data on the mills in the Early Modern estate complex of Körmend, owned by aforementioned Batthyánys at the time.⁶³⁷ The rebuilding works of the two largest water mills in the estate complex, the manorial mill of Körmend and of Szecsőd (part of present-day Molnászecsőd) nicely demonstrate the roles the millers had in maintenance works. These mills, just like most of them, were frequently damaged by floods, especially ice-floods. In case the damage done by the flood was not bigger than usually, it was always the miller of the mill in question who was in charge of the rebuilding. In some cases however, when the losses were greater, others also appear in the works. For instance, the head of the administration at the estate complex (*provisor*) of Körmend, Stephen Nemsem, once traveled to the nearby Egervár – which also belonged to the same landlords then – to observe the building works of the underwater parts of the water mill there. So he seems not to have been in charge of supervising the works, but was rather sent there by his landlord to learn and apply the knowledge acquired there at the mills at Körmend and Szecsőd.⁶³⁸ The most frequently damaged part of mill complexes were mill dams. In case not only the logs that formed the upper part of a dam was damaged, but its foundations as well, the *provisors* along with the millers sometimes also called for the help of carpenters. This suggests that even if the millers were the chief experts in building a mill, the carpenters in general had more expertise with rebuilding a dam from its foundations. This is nicely demonstrated by the letters sent by the above mentioned Stephen Nemsem. The *provisor* informed the landlord, Adam Batthyány, that he had asked a carpenter to come over from a further estate of Batthyány, Strem to rebuild the foundations of the mill. The German carpenter prepared the timber needed and then left for home. The miller however could not decide which material the carpenter meant for the different functions.⁶³⁹ The letter emphasizes that the carpenter was German, while the miller was Hungarian so it may have had to do with that, or the different traditions in building, but the miller's expertise in this seemed to have been different from that of the carpenter's. Despite the few examples the sources pointed to, in the majority of the cases it was probably millers acted as the building masters of the mills they were entrusted of leading.

⁶³⁷ For a detailed analysis of the sources: Vadas, *Körmend és a vizek*.

⁶³⁸ MNL OL P 1314 no. 33 782 (June 25, 1650, Stephen Nemsem to Adam Batthyány).

⁶³⁹ MNL OL P 1314 no. 33 741 (August 12, 1649, Stephen Nemsem to Adam Batthyány).

Already beginning in the thirteenth century, there is a whole different task that millers can be associated with in Hungary. In case water related legal disputes, they were involved as experts to judge whether norms of water use were kept or not.⁶⁴⁰

It has already been mentioned with regard to the lawsuits at Budafelrhévíz that millers were asked as witnesses and experts, but the earliest example that confirms their role as advisors dates to as early as 1282. Two tenant peasants in the village called Patacs (in the borders of present-day Kamenný Most) in Esztergom County decided to have new mills built close to an existing one that was run by a certain Simon. Simon laid a complaint against the building of these new mills claiming that these would set back the functioning of his mill. The chapter of Esztergom, the landlord of the village sent the dean of the cathedral chapter, Serafin to investigate the case. He had to do so with the involvement of millers to find out whether Simon's claim was right or not. Serafin, along with the "expert millers and miller masters" (*cum peritis molendinariis et molendinorum magistris*), probably not independent of the fact that the chapter would have had an income from the new mills (probably indeed one mill with two wheels), did not approve Simon's claim. In the end, the chapter gave permission to the building of the mills on the condition that the dam of the new mill would not change the average water-level of the River Hron.⁶⁴¹

There are a number of cases documented from the Angevin period when millers were involved in water-related disputes as experts in the decision making. Just to mention but one, in 1325 a lawsuit unfolded between the Austin friars and the Paulines at the town of Újhely on the mills of the two institutions by the River Ronyva.⁶⁴² As the church institutions were under the authority of the diocese of Eger, the bishop, Csanád, was entrusted to investigate the case. The bishop appointed persons expert in milling (*in arte molendinaria peritos et expertos*), to help coming to a decision.⁶⁴³ Numerous other cases survive from the fifteenth and sixteenth centuries as well,⁶⁴⁴ from which one, studied previously in scholarship, is worth to be mentioned here. In the middle of the fifteenth century, a long lawsuit unfolded between a lesser noble, Nicolas of Szalonta and the Pauline monks of the close-by Lád. Nicolas, according to the monks had the dams of his new mill at Szalonta so high, that it prevents their

⁶⁴⁰ Tringli, "A magyar szokásjog a malomépítésről," and Vajda, "Vízimalmok építésével előidézett."

⁶⁴¹ MES, vol. 2. 152–153 no. 126. For the case: Vajda, "Okleveles adatok Árpád-kori vízimalmainkról," 202–203, idem, "Árpád- és Anjou-kori vízimalmaink tájalakító hatása," 65, and idem, "Vízimalmok építésével előidézett," 359.

⁶⁴² Tringli, *Sátorajáújhely*, 14, and Szende, "Mills and Towns," 492–496. See also Chapter 3.3.2.

⁶⁴³ MNL OL DL 2310 (June 10, 1325), edited in: AO, vol. 2. 201–203 no. 182. Cf. Vajda, "Hazai vízimalmaink," 198–199, and for the mills at the town, see: Tringli, *Sátorajáújhely* (Gazeteer: Mills) and Szende, "Mills and Towns," 492–496.

⁶⁴⁴ E.g. MNL OL DL 54 994, 18 275, 70 714, etc.

downstream mill at Keresztúr to function. According to the claim of the Paulines, not only did the mill hinder the functioning of the mill of Keresztúr, but the backed up water flooded lands of the Paulines along the river. Half a dozen documents survive that concern the case and most of them vividly demonstrate the role of millers in the investigation of the case.⁶⁴⁵ The above mentioned close association of millers and carpenters is well reflected in the fact that the forename of one of the appointed millers, John of Böcs was Ács (*Alch*) that is the Hungarian term for carpenter.⁶⁴⁶

This expertise in milling later got new forms and at some point gave birth to a new function, that is attested in Early Modern and Modern sources, the mill judge (*molendinae dominus*).⁶⁴⁷ In his recent book on the market towns in late medieval Hungary, Bálint Lakatos demonstrated the existence of such experts as early as the turning of the fifteenth century. He drew attention to a document from Vințu de Jos from 1510 in which the local Hungarian townspeople demanded forming parity in the self governance of the settlement, which according to the document would have included the election of a second mill judge.⁶⁴⁸ Their task based on Early Modern parallels may have included the supervision of the mills within the limits of their settlement as well as helping settling disputes connected to the use of water for milling.

In some cases millers were entrusted with rather specific roles. In the sixteenth and seventeenth centuries, a number of sources suggest, that millers by the River Rába in Western Hungary had important role in organizing the frontier defense system on the Hungarian side

⁶⁴⁵ MNL OL DL 14 969, 15 098, 15 133, 16 417, 16 288. The documents were summarized in: Zsuzsanna Bándi, “Északkelet-magyarországi pálos kolostorok oklevelei.” [Charters of the Pauline abbeys of northeastern Hungary] *Borsodi Levéltári Évkönyv* 5 (1985): nos. 86, 94, 95, 103, 105, and 106. The case is briefly mentioned in Éva Gyulai, “Miskolc középkori topográfiája,” [Medieval topography of Miskolc] in *Miskolc története I. A kezdetektől 1526-ig* [History of Miskolc, I. From the beginnings to 1526], ed. István Dobrossy (Miskolc: Borsod-Abaúj-Zemplén Megyei Levéltár, 1996), 215, and Tringli, “A magyar szokásjog,” 256–257.

⁶⁴⁶ Éva Gyulai, “Termelés és kereskedelem a középkori Miskolcon,” [Production and trade at medieval Miskolc] in *Miskolc története*, 312–313.

⁶⁴⁷ László Lukács, “Sokféle bírák. A faluközösség öngazgatásának „népi” tisztségviselői,” [Many kinds of judges. The “folk” office holders of the self-governance of the village communities] in *Halmok és havasok. Tanulmányok a hatvan esztendőös Bárh János tiszteletére* [Mounds and mountains. Studies in honor of the 60th birthday of János Bárh], eds. Dániel Bárh, and János Laczkó (Kecskemét: Bács-Kiskun Megyei Önkormányzat Múzeumi Szervezete, 2004), 405–407.

⁶⁴⁸ MNL OL DF DF 246 004 (January 2, 1510). Edited in: Gustav Gündisch, “Winz und die Sächsische Nationsuniversität,” in *Emlékkönyv Kelemen Lajos születésének nyolcvanadik évfordulójára* [Memorial book in honor of the 80th birthday of Lajos Kelemen] (A Bolyai Tudományegyetem kiadványai, I-1), eds. András Bodor András et al. (Bucharest and Cluj: Tudományos Könyvkiadó, 1957), 323–324. Cf. Bálint Lakatos, “Mezővárosi és falusi önkormányzati testületek Magyarországon a késő középkorban,” [Councils in late medieval Hungarian market towns and villages] *Századok* 148 (2014): 524, and idem, *Mezővárosi oklevelek*, 76 and 225 (no. 3).

of the Ottoman-Hungarian border.⁶⁴⁹ As their normal task required great expertise in regulating the water-level on the river, they knew the ways to back up the river. When from the mid-sixteenth century onwards, the Rába became the most important natural obstacle between the Ottoman Empire and the Kingdom of Hungary, with Vienna in its immediate hinterland hindering the Ottomans from the easy crossing at fords became a key issue. In that, millers were attributed major role.⁶⁵⁰

The first millers' guilds in Hungary came into existence only in the Early Modern period,⁶⁵¹ therefore it is likely that beforehand, and probably even afterwards, the most important place where millers learned their skills were mills themselves. Millers, before having been entrusted with a mill probably learned for many years in mills, acting as assistant to millers. A source from the estate complex of Körmend, along the River Rába, provides a good example of how long it may have taken for somebody to become a miller. In a letter, dated to 31 March 1650, the above mentioned Stephen Nemsem wrote a complaint to his landlord, Adam Batthyány in which he expressed his serious doubts about the new miller who had been sent to Körmend:

“My lord, if I may write you about the German miller whom Marko Simoncsics had sent to the local mill whether he known milling or not. My lord, the mill here is not for him to be a miller at, as the Rába is not like the Lafnitz [a minor left side tributary of the Rába], here a miller who learned at a mill by the Rába for 30 or 35 years is needed, as he knows how to catch water. The damage the Rába did here, I showed him, and when I asked how the water shall be regulated, he only suggested to fill it [probably the dam] again. Even if we solidify it again, we cannot back up the water, and the water simply flows underneath it [the structure of the dam]. He is not a person to become miller here, as he does not have any mastership, and even if so, he does not speak Hungarian and the people would not be able to answer him here.”⁶⁵²

⁶⁴⁹ Péter Dominkovits, “Folyóvizek és a XVII. századi vármegyei közigazgatás, bíraskodás (A nyugat-dunántúli törvényhatóságok példáján),” [Waterways and 17th-century county administration, jurisdiction (on the example of Western Transdanubian courts of laws)] in *Víz és társadalom*, 166 and 168.

⁶⁵⁰ See in details, Vadas, *A Landscape of War*.

⁶⁵¹ The earliest known millers' guilds: 1550: Sassin (part of present-day Šaštín–Stráže), 1570: Pápa, 1576: Vas County, 1577: Bistrița, 1581: Sibiu. Cf. *A magyarországi céhes kézművesipar forrásanyagának katasztere*, 2 vols [Cadastre of the sources of Hungarian guilds], eds. István Éri, Lajos Nagy, and Péter Nagybakay (Budapest: [N. p.], 1975–1976), vol. 2. (Millers guilds'), and *Magyar néprajz*, 3/2. 44–45 (map 5), and 199–207.

⁶⁵² *Kegmes Uram, Nagnak azt irhatom, Hogy Simonczicz Marko egy nemet molnart küldött az itt valo malomban, hogy megh probaliuk ha erti az molnarsagot avagy nem. Azert Kegmes uram ez nem arra valo hogy az itt valo malomban molnar lenni mert az Raba nem olyan minth az Lapincz, ide oly molnar köl az ki 30. s 35 eztendeigh az Raban valo malomban tanult, s, az víznek az eő cziniat tudgya. Az minemő szakasztast az Raba itten tett, mutattam neki, hogy mikepen köllene vizet el fogni, csak azt mondgya megh köl tölteni. elege töltiük de ugian nem tudgiuk az vizet el venni, mind alttá fol el az viz s alol szagattia, ez ataliaban nem ide valo molnar, mert sem mestersege semmi ninczen, mas az ha mestersege volnais magyarul nem tud s itt az emberek nem tudnak*

The letter, apart from being one of the most vivid of all sources referring to the problem of milling in the estate complex of Körmend, also adds a number of rarely discussed aspects to the position of millers and milling. The source testifies to the fact that milling was anything but a routine job especially not at a mill by a major, and at the time strategically important river such as the Rába. According to the source, unlike the leading official of Adam Batthyány, Marc Simoncsics, the *provisor* of Körmend, believed that milling by the river was a rather complex task. This probably was partly connected to the fact that the Rába had numerous rather disastrous floods in the previous period, and also with the above mentioned special role of the river in the defense strategy of the Kingdom of Hungary against the Ottomans.⁶⁵³ Learning milling, like many similar professions, probably started at a very young age. Even if thirty or thirty-five years of learning may sound somewhat over-exaggerating it probably took decades to someone from being an assistant to become the leader of a mill. This has similarly been shown in a number of professions, such as building industry.⁶⁵⁴ Milling, because of the specificity of the different rivers and landscapes – that is mentioned in the letter – probably was amongst the most complex professions that was not organized in a guild system in medieval Hungary but still was a highly esteemed profession as is attested by the wages provided by the town of Sopron.

4.3. Ditch and Pond Diggers and Pond Masters

Even if large-scale regulations that modified whole water systems in Europe were typical endeavors of Modern times, as was shown in the previous chapters waters were backed up, new channels were dug and in a number of other ways waters were manipulated in order to provide societies with water, water power, irrigation water, etc. The planning of these water construction works, however, remain almost invisible especially in the early medieval period despite that sources recurrently mention ditch and pond digging in Europe, and some of these written sources suggest that such construction works already from that time on were

valaszolni. MNL OL P 1314 no. 33 778. On the letter, see Vadas, “Környezettörténeti kérdések,” 158 and 266–267.

⁶⁵³ On floods, see: Vadas, “The ‘waters leave their beds’s”

⁶⁵⁴ Philippe Bernardi, “Apprentissage et transmission du savoir dans les métiers du bâtiment à Aix-en-Provence à la fin du Moyen Age (1400– 1550),” in *Actes du 1^{er} colloque du CRISIMA. Apprentissages, éducation, initiation, éducation au Moyen Age* (Les cahiers du CRISIMA 1) (Montpellier: [Univ. Paul-Valéry CRISIMA], 1993), 69–79.

considered to require special expertise.⁶⁵⁵ Although on no more than one instance, but already the *Domesday Book* mentions a ditch digger, a man called Herberd, whose profession was *fossator*.⁶⁵⁶ In England good number of written sources mentions people who worked as ditch digging masters having been in charge of planning major water regulation works. To mention but one, in 1277 King Edward I decided to surround the castle of Rhuddlan in Wales with the water of the sea, on the one hand to make it more protectable and to the castle with better communication possibilities on the other. For a while this project was supervised by a man named William of Boston, who hired diggers himself to complete the job. The scale of the work is well reflected by the fact that on an average 66 diggers were involved in the job. They worked six days a week for no less than three years (!). This altogether adds up to 20,000 working days. Although there are similar size projects from the early medieval period onwards, in most cases the sources remain silent about the work organization, and the people who planned and supervised them.⁶⁵⁷ Based on the complexity of this work English research suggests that by the thirteenth century, leading similar projects required a specific expertise, and it became a separate profession.⁶⁵⁸

From the numerous possible examples two is to be mentioned here to show that digging ditches and ponds required major planning and significant knowledge. In the thirteenth century, the town of Milan decided to engage in a major water-regulation project. Milan's access by waterways was virtually impossible which halted the town's development. Therefore the town council decided that Milan should be connected to the water system of the River Po. The best way to do so was by connecting Milan with a left tributary of the Po, the River Ticino that ran somewhat west from Milan heading from the north towards the Po. The town appointed no else, that the best known architect of the period, Giacomo Arribotti to lead the planning and its execution. The job was not solely about digging a ditch between Milan and the Ticino, but to create a channel (the later *Naviglio Grande*), that could serve ships that transported goods from and to Milan.⁶⁵⁹ In this case the job was much more than just

⁶⁵⁵ Paolo Squatriti, "Digging Ditches in Early Medieval Europe," *Past and Present* 176 (2002): 11–65.

⁶⁵⁶ K[atharine] S. B. Keats-Rohan, *Domesday People: a Prosopography of Persons Occurring in English Documents, 1066–1166. I. Domesday Book* (Woodbridge: Boydell, 1999), 251.

⁶⁵⁷ See the sources related to the building of the *Fossa Carolina*. Cf. Squatriti, "Digging Ditches."

⁶⁵⁸ Holt, "Medieval England's Water-Related Technologies," 80, and more recently: Keith D. Lilley, Christopher D. Lloyd, and Steven Trick, "Designs and Designers of Medieval 'New Towns' in Wales," *Antiquity* 81 (2007): 279–293, and James Bond, "Canal Construction in the Early Middle Ages: an Introductory Review," in *Waterways and Canal-Building*, 201. An other ditch digger master is mentioned in 1278: *The History of the King's Works*, vol. 1. 297.

⁶⁵⁹ For the building of the ditch: P[ietro] Ghinzoni, "Maestro Giacomo Arribotti e il Naviglio Grande reso navigabile," *Archivio Storico Lombardo* 20 (1893): 200–203, with the charter summarizing the works at 202–203. See further: Magnusson, and Squatriti, "The Technologies of Water in Medieval Italy," 229–230,

supervising the diggers. It required specific architectural planning, expertise in engineering and a number of other fields. The other example to be mentioned here is from England from the same period of time. The project is much smaller than the one at Milan, nonetheless a detailed account of the work makes it valuable for the present investigation. In the late thirteenth century, the Cistercian abbey, founded by King Edward I at Vale in England decided to have a fish pond built. The expenses on the construction were registered precisely, and the source survived in the archive of the monastery.⁶⁶⁰ The document, similarly to the above-discussed account from Sopron, registers the wage of the different laborers, and mentions the pond digger master and the diggers separately. While the former, William le Fox received 18 denars a day, the diggers received either 8 or 10 denars only.⁶⁶¹ So, even if in this case, the project was somewhat small, and that the pond digger master probably was also involved in the project as manual laborer, still received twice the wage of the others because of his mastership. In Central European context, the similar experts do appear somewhat later despite the fact that the above mentioned, supposedly Árpáadian-age channel system also required complex planning and execution. From the Late Middle Ages, as growing number of evidence tells of the building of channels, and most importantly fish ponds, growing need for similar masters can be attested.⁶⁶²

As mentioned above in Bohemia from the fourteenth century onwards hundreds of fish ponds were in function, and probably somewhat less, but the Kingdom of Hungary and Poland also exploited the rivers to create fish ponds. During the reign of the Luxemburg dynasty, and especially during the reign of Emperor Charles IV and Wenceslas IV almost hundred major fish ponds were built with royal support and by the end of the Middle Ages, almost 10,000 smaller and bigger ponds were in use in the Kingdom of Bohemia.⁶⁶³ The building of these ponds, especially the bigger ones were also done under the supervision of pond masters here. Research in Bohemia came to the conclusion, that because of the difficulty of digging, the day wage of diggers by the early sixteenth century was four times of the

Boucheron, "Water and Power in Milan," 180–193, for Arribotti see here 182–183. For the later usage of the Naviglio Grande, Fantoni: *L'acqua a Milano*, 27–60.

⁶⁶⁰ For the case, see: Magnusson: *Cities, Monasteries*, 57.

⁶⁶¹ *The Ledger Book of Vale Royal Abbey*, ed. John Brownbill (Manchester: [N. p.], 1914), 192–231. Online document: British History Online: <http://www.british-history.ac.uk/lancs-ches-record-soc/vol68/pp192-231> (last accessed: June 1, 2016).

⁶⁶² Hoffmann, "Medieval Fishing," and idem, "Economic Development and Aquatic Ecosystems."

⁶⁶³ Andreška, "Development of Fish-Pond Culture in Bohemia," 77–80, and Hoffmann, "Medieval Fishing," 382–383.

payment to average hand laborers in agriculture. Research here attributed this to the difficulty of the job, but it probably has much more to do with the specific knowledge it required.⁶⁶⁴

It is also from the late medieval period onwards that sources in the Kingdom of Hungary recurrently tell of ditch and pond diggers as well as pond masters. This of course does not mean that this is the time when the profession came into being, as noted it may have been there since the early Árpáadian period. Nonetheless written evidence only points to the existence of these professions from the fifteenth century onwards, which is true for hundreds of professions.⁶⁶⁵ By then they were considered as a group of professionals, who had more expertise in building water-related infrastructure and were mostly hired in projects like that. They do occur in account books of towns as well as in different other kinds of evidence.⁶⁶⁶ A Hungarian historian, László Szabolcs Gulyás in the recent years studied a large number of family names in late medieval sources in order to have at least some view of the professions which were present either in free royal or market towns but lacked guild organization (or sources on their guilds are lost). He considered pond masters as office holders and did not consider it a profession.⁶⁶⁷ It is important to emphasize that apart from sporadic data in town accounts majority of the references to pond masters as well as pond diggers are family names. However based on the surviving sources it relatively well definable, what tasks they had. Of course being a pond master was a largely different profession than being a pond digger, the former being a much more responsible task.

Based on evidence referring to pond masters, they must have been in charge of planning the date of harvesting the fish from the ponds, as well as the schedule the date of sluicing the ponds.⁶⁶⁸ This task required years of practice, and similarly to the task of the millers, pond masters also needed knowledge specific to the ponds they were looking after as the hydrological conditions differed significantly from one pond to another. Pond masters in some cases were certainly considered as practitioners of an independent profession. This is reflected again by an example from Sopron, and a fish pond of the town in its eastern suburb by the Ikva Stream. The first data referring to the pond comes from 1486 when a burgher of Sopron founded a chapel dedicated to Saint Sebastian close to the pond. However there is no

⁶⁶⁴ Andreška, "Development of Fish-Pond Culture," 81.

⁶⁶⁵ Cf. László Szabolcs Gulyás, "Középkori mezővárosi foglalkozásneveink forrásértékéről," [On the source value of profession names from medieval Hungarian market towns] *Századok* 142 (2008): 437–462.

⁶⁶⁶ Fejérpataky: *Magyarországi városok régi számadáskönyvei*, 214, 218–219, 240, etc.

⁶⁶⁷ László Szabolcs Gulyás, "A középkori magyar városfejlődés migráció- és ipartörténeti vonatkozásai a történeti személynévtan tükrében II. Személynévadás és kézműipar," [Migration and industrial historical aspects of medieval Hungarian urban development in light of historical onomastics, II. Personal naming and craftsmanship] *Névtani Értesítő* 37 (2015): 139.

⁶⁶⁸ Cf. Hoffmann, "Economic Development and Aquatic Ecosystems," 667–668.

further proof of the functioning of the pond. Almost half a century later, in 1525, the town council of Sopron decided that the pond should be exploited again. The town dedicated the job to an expert, a pond master, who however is not named in the source. This nonetheless suggests that even if not in every case, pond mastery was considered a profession.⁶⁶⁹

Most of the references to pond masters, as noted above, however, survive as family names in different sources. The first such reference is from 1418, when a source mentions a tenant peasant called Lawrence Tómaster (meaning “pond master” in Hungarian), and a man, Phillip who bore the same name according to a source from 1431.⁶⁷⁰ From the second half of the fifteenth century the name keeps recurring in sources, and a number of evidence suggests that the name of the profession (or office) became a standard family name. This is more or less clear in the case of George Tómaster who worked as a customs officer.⁶⁷¹ This assumption is supported by another case from the early sixteenth century when at an estate three tenant peasants bore the name Tómaster within a short period of time. Based on the size of the estate itself, it is highly unlikely that all three would have been able to earn their living as pond masters.⁶⁷²

It is rather difficult to say anything about the social status of pond masters as in most cases the name is the only evidence. Both burghers and tenants are mentioned as pond masters though. Only one person may be worthy of referring to here, the archdeacon of the cathedral chapter of Győr, Paul Pápay, who as part of his church office was also in charge of the ponds of the chapter, according to the sources not without mistakes.⁶⁷³ From his careless work, it is more important for the present analysis that he was of course highly educated, and literate. However in this case, pond mastership certainly was an office, not a profession for Pápay. As the chapter of Győr had significant share in the fishing business in the surroundings of the town, the chapter usually designated someone from the members of chapter to perform this task.⁶⁷⁴ In this case most probably the person designated worked together with the actual pond masters on the different estates the chapter owned.

⁶⁶⁹ *Ain ersame gemain begert, das ain ersamer rat den teucht bei Sand Sebastian sol machen lassen vnd mit teuchtmaister hanndlen, was gestaltt man den aufs nutzlichest, sol auffueren.* Házi, vol. 2/2. 198. Cf. Károly Mollay, “Kőszeg 1532. évi ostroma és Sopron,” [The siege of Kőszeg in 1532 and Sopron] *Soproni Szemle* 37 (1983): 208 note 28. For the location of the St Sebastian Chapel: Jankó, Kücsán, and Szende, *Sopron*, 68.

⁶⁷⁰ Zichy, vol. 6. 516, 518 (1418), vol. 8. 450 (1431), vol. 8. 473. (1432), etc. For further examples, see: Miklós Kázmér, *Régi magyar családnevek szótára, XIV–XVII. század* [Dictionary of old Hungarian family names, 14th–17th centuries] (Budapest: Magyar Nyelvtudományi Társaság, 1993), 1073.

⁶⁷¹ *Gregorius filius Johannis dicti Tomester tributarius de Zeremlyen.* Zichy, vol. 8. 604.

⁶⁷² *A Perényi család levéltára*, 354 (1509) and 376 (1513).

⁶⁷³ Vince Bedy, *A győri székeskáptalan története* [The history of the chapter of Győr] (Győregyházmegye múltjából, 3) (Győr: Győregyházmegyei Alap Nyomdája, 1938), 359.

⁶⁷⁴ Bedy, *A győri székeskáptalan*, 256.

Data on pond diggers is available from later than on pond masters. The earliest dates to 1466, and comes similarly from the town of Sopron. Payments are recorded for ditch diggers, who worked on the clearing of the above discussed moat of the town.⁶⁷⁵ Just like data on pond masters, most of the fifteenth-century data on pond and ditch diggers come from personal names.⁶⁷⁶ One source from the early sixteenth century, however, is certainly worth a consideration. The 1524-terrier of the bishopric of Veszprém exempts a tenant at the market town of Sümeg, certain Peter Tóásó (that is “pond digger” in Hungarian) from any seigniorial dues in exchange for taking care of the ponds of bishopric there.⁶⁷⁷ The relatively high number of references to pond diggers from the sixteenth century leaves little doubt that their task was considered a specific profession. The above analyzed building account also points to this as their significantly higher day wage than the average paid hands is hard to be explained otherwise. By the Early Modern period, the task of ditch diggers was clearly distinguished from that of simple building workers. Sources suggest how much the workers were experts in water construction was seriously considered when hiring someone. In the Early Modern period, the already mentioned Batthyány estate complex was one of the best-organized ones in the Kingdom of Hungary, and many of its estates had fish ponds. The estates of the family were governed from the estate complex of Güssing in present-day Austria from the mid-sixteenth century onwards. In a letter dating to 1545 sent by Francis Batthyány from Güssing, the head of the family and ban of Croatia and chief-*ispán* of Vas County at the time informs Christoph Batthyány, his nephew, of having sent a man with expertise in pond digging (*fodiator piscinarum*) to him to help building new ponds.⁶⁷⁸ As part of the economic reforms a century later Adam Batthyány introduced, numerous new fish ponds were built in the different estates of the nobleman. In the instructions given to the leading official of the estate complex of Güssing, Jeremiah Jobbágy, he warned his new officer to carefully choose the persons to dig the ponds at the estate he was supervising: “Try your best in hiring good and apt pond diggers, and hire them according to the conventions of *hospites*. If they find potential

⁶⁷⁵ *Item vmb I fuerder holcz zu sprewczen vnd grrüsten den teichknechten, als sy den graben gerawmbt haben, XXXII den. and Item den teichknechten von dem statgraben beÿm Sÿnnig Thoman ze rawmen XVIII sol. VI den. Item drein knechten, die den teichmaistern den ersten tag ze rüssten geholffen haben, XXXVI den.* Házi, vol. 2/4. 268.

⁶⁷⁶ Kázmér, *Régi magyar családnevek*, 1068–1069.

⁶⁷⁷ *Petrus Thoaso integram, exempta ab orani solutione, quia procurat cum piscinis domini reverendissimi etc.* László Kredics, and László Solymosi, *A veszprémi püspökség 1524. évi urbárium. Urbarium episcopatus Veszprimiensis anno MDXXIV* (Fontes Minores ad Historiam Hungariae Spectantes – Új Történelmi tár, 4) (Budapest: Akadémiai, 1993), 94.

⁶⁷⁸ MNL OL P 1314 no. 3609. (May 1, 1545, Francis Batthyány to Christoph Batthyány).

or lost ponds renew them and introduce fishes in them.”⁶⁷⁹ Despite the fact that pond diggers by training were most experienced in working in water constructions, sometimes were also hired at other construction sites. For instance, in 1634, when building a new manor house at Gattendorf according to the testimony of the building accounts, pond diggers were hired to dig out the foundations of the new building.⁶⁸⁰

Finally, it is important to have an understanding of the relationship between the pond masters and the pond diggers. Based on the above analyzed account book from Sopron, the two professions may have been different, which is crystallized in the considerably different wages they got. A source, again from the town Sopron however sheds partly different light on the question. The sources on the so called Tómalom (“Lake Mill” in Hungarian) and the connected fish pond tell of a Sopron burgher, certain John Schöberel. In 1495 he is mentioned in the sources as pond digger (*teichtknecht*), while the pond master was certain George (*teichtmaister*). Three years later, however, the pond master was no else than Schöberel. It is likely that after years of learning at the pond of the Tómalom as an assistant and a pond digger, he was appointed as master.⁶⁸¹ Even if pond masters were considered as masters, their job still was not amongst the ones valued the most in the building industry. The carpenter at the building works of the Tómalom at Sopron received 40 per cent higher wage than Schöberel.⁶⁸²

⁶⁷⁹ *Azonnis légy, hogy valahonét valami jó értelmes toásókat fogadj, azokkal hospes szerént konvenciót tégy, és ha oly alkalmas és pusztá halásztók taláztatnak avagy vannak azokat meg szépetesd és meg halasítsad* (Make sure to hire good, and smart pond diggers, and provide them with the rights of *hospites*. And if you find suitable and abandoned dish ponds or ones that still exist, have them restored and stock fish in them). MNL OL P 1322 (A herceg Batthyány család levéltára. Instrukciók) no. 131. Quoted in: Borbála Benda, “Táplálkozási változások a főúri udvarok és uradalmak étkezésében a 17. században,” [Changes in the diets of aristocratic courts and estate complexes in the 17th century] in *Környezetváltozás, termelés, fogyasztás: a történeti ökológia kérdései* [Environmental change, production and consumption: the questions of historical ecology] (Annales Tataiensis 5), eds. János Fatuska, Éva Mária Fülöp, and László Gyüsi, Jr. (Tata: Mecénás Kulturális Közalapítvány, 2006), 85 note 13, edited in: Elek Virágh, “A csicsva-vári udvarbíráknak, Eszterházy és Homonnay részről adott utasítása,” [The instructions to court judges of the castle of Čičva given by the Eszterházy and the Homonnay families] *Magyar Gazdaságtörténelmi Szemle* 4 (1897): 341. For the water management works of the Batthyány family, see: Vadas, *Körmend és a vizek*, and Károly Gaál, “Adatok a Batthyány-uradalmak halgazdálkodásáról és halkereskedéséről 1581 és 1657 között,” [Data to the fish farming and fish trade of the Batthyány estate complexes between 1581 and 1657] in *Kultúra a régióban. Válogatott néprajzi tanulmányok* (Fontes Castriferriensis, 3) [Culture in Western Hungary. Selected ethnographic studies], ed. idem (Szombathely: Vas Megyei Múzeumok Igazgatósága, 2006), 187–193.

⁶⁸⁰ *Az tó Asso legeninek ki az pincze fundamentumot segitet ásnj* (The pond diggers should help to dig out the foundations of the cellar.). Tibor Koppány, “A gátai számadáskönyvek. Adatok egy 17. század eleji dunántúli uradalom építkezéseihez,” [The account books of Gattendorf. Data to the building works of any early-17th-century estate complex in the Transdanubia] *Műemlékvédelmi Szemle* 10, no. 1–2 (2000): 150 and 153–154.

⁶⁸¹ For the building of the Tómalom, and the pond diggers and masters there: Mollay, “A Tómalom,” 155–156.

⁶⁸² Házi, vol. 2/5. 42, 61, 89 and 91. See also: Mollay, “A Tómalom,” 155 and idem, “Egy évtized soproni külkereskedelmének társadalomtörténeti háttere (1483–1489),” [The social historical background of a decade in the foreign trade of Sopron (1483–1489)] *Soproni Szemle* 49 (1995): 311.

In light of all this it is worth to come back to the question, how much pond masters and pond diggers can be considered as practitioners of a distinct profession. The answer is yes and no, as both positive and negative examples can be shown based on medieval and Early Modern source material. In some cases pond masters were clearly designated solely to supervise certain ponds but in some cases they, and probably even more frequently, pond diggers were hired in other kinds of building works.

4.4. Conclusions

This dissertation chapter provides some insights into the social groups involved in the water constructions discussed in previous chapters. First, I analyzed a unique source, the accounts of the rebuilding of the moat of Sopron from 1540. The varied professions mentioned in the source, as well as the number of water-related professions, made this source particularly valuable for the my analysis. The role of millers is particularly important in the source, as well as a previously little-discussed group of people, pond masters and pond diggers. These professions were then discussed in detail in light of a variety of still extant account books, terriers, and letters.

Millers, as is clear from these sources had responsibility for a number of other duties beyond supervising the milling which of course remained their most important task. They also took part a number of more complex tasks such as mill construction, and sometimes, they even were involved in water-related legal disputes as experts. The role of pond masters probably was less complex, but also required significant expertise and many years of practical experience. A number of other professions were involved in water construction in the Middle Ages and the tasks of probably many more people were related to water construction. In this chapter, I showed that although these professions in the Middle Ages were not amongst the most valued, they were, in fact, fairly complex, and required great expertise.

5. Conclusions and Outlook

In the previous chapters I have demonstrated that a fairly complex water-management system existed in the Carpathian Basin, going back at least to the period of Hungarian state foundation. The various needs of different actors gave rise to complex sets of norms and customs regarding the way water could be used. Despite the lack of detailed written regulations, many of the elements of the water rights were crystallized throughout the medieval period. Without specific laws on water construction, resolution of different legal disputes was based either on property rights partly influenced by Roman legal principles, or norms and customs. A recurring question is how consistent these customs were.

In the introduction to this dissertation, the question was raised of the extent to which water rights were conceived of as being different from rights to the exploitation of other natural resources. Numerous case studies demonstrated that water use customs certainly were perceived as being set apart by the land owners and before the law. The very nature of water as a substance lead to a great number of legal cases in the Hungarian Middle Ages as well as other parts of Central Europe. Any modification in waterways, whether obstacles or outlets for mill races, irrigation channels etc., may strongly impact other lands both up- and downstream and were therefore hotbeds of resource conflicts. Consequently, from the time of early statehood in Hungary, not independent of the impact of Roman law in Hungary, waterways were never fully conceived as private property. This process started to crystallize in the Árpáadian period along with the growing number of water mills and other water-related infrastructures, channels, dykes, fishponds, and bridges that appeared in the country. In Chapter 2, I argued that water mills, proved to be the most important infrastructural elements of built-up waterscapes in medieval Hungary, appeared some time in the first half of the eleventh century, and their spread lead to increasing conflicts from the second half of the Árpáadian period onwards. However, by the end of the Árpáadian reign, the frequency of mills along some the smaller rivers and streams may have reached a point when newly erected ones threatened the functioning of others. This threat may have been twofold. On the one hand, they could physically hinder the effectiveness of other mills by reducing the amount of necessary water or slowing down the current required to run the other water wheels. On the other hand, it may have been against the interest of other landlords to have more mills, as

despite the seigniorial ban on milling, people may have tried to grind their grain in other mills than those of the landlords if that proved cheaper.⁶⁸³

Some disputes arose, and norms were formulated, although these norms had probably already been accepted from the early Árpáadian period onwards. These principles certainly existed only as oral traditions that were transmitted by landowners from one generation to the other. In the second half of the Árpáadian period, as has been argued by earlier research, a Latin tradition also started to appear in the legal life of the country providing an impetus to register various disputes and their resolutions.⁶⁸⁴

From the fourteenth century onwards an increasing number of sources attest to water-use disputes. This is probably partly due to a general decrease in literacy, in the growing need to secure one's rights in writing, and lastly in the higher number of built infrastructural elements in waterways referred to above. Thus, the main chapter of the dissertation addressed the variety of conflicts that arose around water use from the fourteenth to the sixteenth century. The growth of literacy strongly suggests rather well-defined norms already existed with regard to the most important legal problem, the construction of obstacles in waterways. The legal experts by then had considerable knowledge and practice in providing guidance when it came to building mills, dams, bridges, sluices, etc. The legal principles that followed the established norms were rather clear, the earlier mill had primacy over the one built later and no one had the right to cause losses to another landowner's property by constructing obstacles in water flows. These principals were not particular to the Kingdom of Hungary. The problem must have been common since in other parts of Western and East Central Europe, smaller rivers and streams were likewise the most important watercourses for milling. The norms were very similar throughout Europe. Nevertheless, some attempts were made to create precise regulations, such as the regulations in Mecklenburg, in Florence and in some parts of France where the distance between the mills was fixed, while in other cases the maximum height of the dams to be built was defined.⁶⁸⁵ Nonetheless, the main principle seems to have been the same as in Hungary.⁶⁸⁶ I have argued, however, that while norms existed in the Kingdom of Hungary to deal with less frequently occurring issues such as property right changes connected to shifts in the course of riverbeds such knowledge was not so widespread among either legal experts or for the actors in legal disputes.

⁶⁸³ Vajda, "Földesúri jogok," 85.

⁶⁸⁴ Tringli, "A magyar szokásjog," 261–265.

⁶⁸⁵ Moldenhauer, "Mühlen und Mühlenrecht," or Gardiner, "Bateliers, pêcheurs et habitants des ports," 64,

⁶⁸⁶ Cf. Getzler. *A History of Water Rights*, 338.

While I hope to have clarified some of the points surrounding the norms of water use in medieval Hungary in Chapter 3, I also provided a detailed analysis of the issues surrounding the economic exploitation of waterways in a variety of environments. In Chapter 3.1 I sketched out the general norms with regard to the right of landlords to intervene in waterways in rural environments. The next two subchapters, Chapters 3.2 and 3.3 addressed urban environments. The archival and edited primary evidence show many of the water problems seemed to have occurred in towns – either free royal, mining or towns of other legal status. This is easy to explain by the fact that the needs of the higher number of people living within a relatively small area had to be fulfilled compared to the situation in the countryside. Urban industries, including grinding grain along with the need to catch and keep fish close to markets, protecting towns with moats, building harbors, navigation, draining wastewater as well as providing the people with drinking water lead to a number of resource conflicts in urban environments. The exploitation of urban waters lead to increased environmental pressure on urban environments as has been shown in different urban waterscapes throughout Central Europe.⁶⁸⁷ These environments proved to be the most important case study areas in this dissertation. The analyses demonstrated that by the Late Middle Ages complex systems existed for using urban waters in the most efficient way possible. The most important norms were established despite the fact that neither laws nor many of the privilege charters awarded to different urban communities explicitly mention water rights and privileges of using waterways. The problem in urban environments was somewhat different from the case of smaller rivers in the rural areas where most of the registered disputes concerned landlords with interests in the same activities, that being mostly milling or fishing. In many cases the conflicts in urban landscapes focused on the different interests of ferrymen, fishers, millers, etc. The lasting conflicts testify to the difficulty of tackling these conflicts.

The manipulations of the waterscapes lead to numerous intended and unintended consequences. The silting up of riverbeds, the lack of water to run water wheels, flooding other people's lands and mills and, the dis-annexation of lands all appear in the legal evidence. In Chapter 4, I demonstrated that many of the waterways in the medieval Kingdom of Hungary required complex sets of arrangements and actual water regulation works. Millers as well as ditch diggers may have played a considerable role in these processes. Millers were not only involved in milling, but were the key personnel in water construction, water regulation works in the pre-modern period.

⁶⁸⁷ Cf. Sowina, *Water, Towns and People*, or *Wasser Stadt Wien – Eine Umweltgeschichte*, ed. ZUG – Zentrum für Umweltgeschichte, Universität für Bodenkultur Wien (Vienna: Universität für Bodenkultur Wien, 2019).

The dissertation focused on the late medieval period but, in some cases, I could use seventeenth and eighteenth century lawsuits to demonstrate how long-lasting these norms were in Hungary. In fact, most of the problems studied in the context of the Late Middle Ages remained almost entirely the same up to the nineteenth century. With the development of the power grid however, most of the water mills were quickly abandoned. Very few of the buildings were left by the beginning of the twentieth century. Fewer constructions meant considerably less competition for water resources. Similar conflicts took different forms that will be followed up briefly in the epilogue to this concluding chapter.

5.2. The Politics of Water – An Epilogue

Conflicting interests in water use is not only a pre-modern phenomenon. After coal use began to spread throughout Europe, along with the power grid, water mills, which have been shown to be the most important factor in transforming riverscapes, especially along smaller rivers, were quickly abandoned. Despite the fact that mills running with the energy provided by water wheels became obsolete in the nineteenth and the early twentieth century, and fishing also lost most of its importance compared to the pre-modern period, conflicts around the use of waterways never ceased to exist. New actors and interests appeared in Modern times in the way waterways and the riverbanks were exploited. The rights of landowners along these water bodies created just as many conflicts as in the previous millennium.

A number of the factors that influenced legal conflicts around using waters did not change significantly between the Middle Ages and the Modern period. These factors include natural processes including hydromorphological changes. Struggles for the ownership of alluvial islands remained sources of conflicts, something recently demonstrated with the islands on the Danube between Bulgaria and Romania.⁶⁸⁸ Access to water and riversides kept on being just as important as in the pre-modern period. While in the pre-modern period, access to drinking water, the fish catch and the potential for milling were most critical, in the past one century and a half centuries a new use, recreation, has increasingly gained importance, followed by an even more recent aspect, environmental protection. Both factors

⁶⁸⁸ Stefan Dorondel, Stelu Serban, and Daniel Cain, “The Play of Islands: Emerging Borders and Danube Dynamics in Modern Southeast Europe (1830–1900),” *Environment and History* 25 (2019): 521–547 (with further modern examples).

are clearly illustrated by the Gabčíkovo–Nagymaros-dams mentioned in the introduction to the dissertation.

This dam construction proved to be one of the most controversial projects in the history of the past century, both in Hungary as well as in Czechoslovakia and Slovakia. The project had already been initiated in the interwar period. At that time the two most important motivations were better navigation along the Danube and the exploitation of the power of the river to produce electricity. However, partly for financial, and partly for political reasons the project never entered the phase of execution before the Second World War. In the 1950s, the project again gained traction, and with the Warsaw Treaty and the foundation of Comecon, the dam became a symbolic endeavor. In 1963, Czechoslovakia and Hungary signed a treaty to start the planning works. From the beginning of the project onwards, controversial opinions about the dams were presented. Increased navigation, cheap energy, flood protection, and even water-levels were the traditional arguments for the construction of similar dams. A new argument in this case was the potential increase in recreational possibilities. This idea was emphasized in the contemporary media in order to popularize the idea of similar dams.⁶⁸⁹ In the meantime, there was strong skepticism from a number of points of view from the beginning. Apart from technical questions, from the 1980s, environmental protection began to dominate the discussions compared to other sources of criticism. In the end, only part of the project was ever completed, leading to long-lasting political and legal struggles between Slovakia and Hungary in which the protection of the habitats in the floodplains of the Szigetköz area (in the northwestern part of the Hungary, on the border with Slovakia) became the most important aspect.⁶⁹⁰ This is not the only case when the protection of nature and natural habitats became an important source of conflicts. In past years, a flood control dyke system has been planned for the northern part of Buda, along the so-called Római-part (or “Roman Banks”). The controversial dyke construction that endangered one of the last, at least only partially built-up riverbanks in Budapest, were meant to protect some houses that were illegally built in the river flood plain. The house owners, of course, now have an interest in protecting their houses, while others are keen on preserving the riverbanks, partly for environmental reasons and partly because this is one of the most popular riverside recreational areas in Budapest. The list of modern water-resource conflicts could be further expanded *ad*

⁶⁸⁹ See e.g. an interview published in the journal of the Hungarian National Defense Sports Association (Magyar Honvédelmi Sportszövetség): *Look at what has been built on the Váh. See how the backed up water transformed the climate. All I could say, that is a fairy garden. (...) If we can do it at least at a comparable quality to that our northern and western neighbors did, I suggest, let's build as fast as possible.* Emil Kiss, “Mit jelent a 885 megawatt?,” [What does 885 Megawatts mean?] *Lobogó* June 14, 1979.

⁶⁹⁰ See Galambos, “An International Environmental Conflict,” and Fitzmaurice, *Damming the Danube*.

infinitum, but the aim of recalling these two recent cases was to show that problems with water raised in the context of pre-modern Hungary is anything but obsolete. The conflicts are still with us and their resolution does not seem to be any easier than in the Middle Ages.

Appendices

1. Documents

No. 1.

MNL OL DL 102 905. (transcription: MNL OL DL 58 505). Edited, with some gaps from the transcription in: AO, vol. 3. 597–598. no. 394., summary: AOklt, vol. 2. 250 no. 529.

Date: October 11, 1339

The palatine, Nicholas Druget orders to reinstall the sons of Nicholas Forgács to the lands between Čoltovo and Lekeňa (today part of Bohúňovo).

Villermus Drugeth palatinus et iudex cumanorum sincere sibi dilectis comitibus a quatuor iudicibus nobilium de comitatu Gumuriensi comitatu sue dilectionis plenitudinem cum salutem bene vobis constare credimus, quod quia Paulus filius Galli de Choltou in nostra congregatione generali universitati nobilium de comitatu Gumuriensi feria tertia ante festum beati Egidii abbatis in villa Gumur una nobiscum celebrata de medio universorum consurgendo, Nicolaum et Andream filios Nicolai dicti Fargach quandam particulam terre Choltou predictae occupasse dicebat, prohibendo eosdem ab occupatione eiusdem, et litere honorabilis capituli ecclesie Agriensis per utramque partem ibidem exhibite quandam rivulum Hoblukapataka vocatum pro meta assignatum inter possessionem eorumdem filiorum Nicolai Lekunye vocata et inter possessionem eiusdem Pauli Cholthou predictam incipiendo a metis filiorum Scheruh usque ad fluvium Sayo vocatum separantem lucide exprimebant, prefatus vero Andreas filius Nicolai prefatum rivulum Hablucapataka vocatum de suo antiquo meatu per eundem Paulum in alium cursum dimissum et eandem particulam terre intra suas metas scilicet intra verum et antiquum meatum eiusdem rivuli esse allegabat et Dominicus filius Thyba homo noster unacum Philippo filio Pangracii de Iwanussy uno ex vobis quatuor iudicibus nobilium ad videndam et sciendum inter partes super premissis veritatem per nos transmissi, redeundo retulerunt requisiti, quod predictus rivulus Hablukapataka descendens de medio quorundam moncium in declivio quarundam terrarum arabilium per inundationes aquarum de suo antiquo meatu per quandam supplecionem suam meatu in alium cursum non perhumanam operationem sed per proprium cursum declinasset ipsaque particula terre litigiosa inter antiquum meatum seu cursum eiusdem rivuli a parte possessionis eorumdem filiorum Nicolai Lekunye vocatam remaneret et usque nunc iidem filii Nicolai usi extitissent, prout a vicinis et commetaneis suis rescire potuissent sed nos una nobiscum a nobilibus dicti comitatus taliter decrevimus quod idem Paulus filius Galli cum iudicio trium marcarum eandem particulam terre eisdem filiis Nicolai prout eorum ius resignare teneantur eosdem idem Paulus prefatum hominem nostrum et vestrum inquisitores super premissis veritatis ad suum gravamen instanter mitti postularat, et insuper in estimatione eiusdem particule terre litigiose convictus habeatur contra filios Nicolai memorata quo circa petimus vos et nichilominus precipimus vobis firmiter per presentes mandantes quatenus presentibus unum vel duos ex vobis transmittatis quo vel quibus presentibus Gallus filius Thyba de Rekethye vel Georgius filius Johannis de Malah altero absente homo noster in octavis festi Sancti Michaelis archangeli [October 6] nunc venturis ad faciem predictae particule terre litigiose accedendo

eandem presentibus vicinis commetaneis suis legitime convocatis reambulando respectu omnium utilitatum eiusdem estiment in valore suo regni consuetudine requirente et statuatur eisdem filiis Nicolai dicti Fargach si non fuerit per aliquos alios contradictum contradictores autem si qui alii apparuerint ad nostram citet presenciam ad terminum competentem etc. post hec totius facti seriem si expediens fuerit nomina citatorum et terminum assignatum ad octavum diem predictarum octavarum in villam Wysul rescribatur. Datum quinto die congregationis predictae in loco memorato, anno domini millesimo trecentesimo tricesimo nono.

At the back, with different handwriting:

Sincere sibi dilectis comitibus et quatuor iudicibus nobilium de comitatu Gumuriensi pro Andrea filio Nicolai dicti Forgach super statuione cuiusdam particule terre in octavis sancti Michaelis archangeli nunc venturis fienda memorie octavas die ad iudicem.

No. 2.

MNL OL DL 92 239; summary: ZsO, vol. 2/1. 446 no. 3726.

Date: March 17, 1405, Buda

King Sigismund mandates the chapter of Vasvár to investigate the claim of John and Nicholas, sons of Pető of Gerse.

Sigismundus dei gratia rex Hungariae, Dalmatiae, Croatiae etc. marchioque Brandenburgensis etc. Sacri Romani imperii vicarius generalis et regni Bohemiae gubernator fidelibus suis capitulo ecclesiae Castriferrei salutem et gratiam dicunt nobis magistri Johannes et Thomas filii Petheu de Gerse ut quia ipsi pro molendinis ipsorum quendam fluvium Sarvize vocatum inter possessiones Gerse predictam et Sarmelleke ipsorum ac possessionem Telekus nobilium de eadem metaliter currere et separatae de antiquo suo alveo seu meatu per fossatum in superficie terre ipso possessionis Sarmelleke recepisset dictusque antiquus meatus seu alveus dicti fluvii per continuas inundationes aquarum et infusiones arenarum adimpleri coepisset ex eo nobiles de dicta Telekus dictum fluvium Sarvize in ipso fossato currere et metaliter separare et distinguere asserere cogerentur per quod factum magnam particulam ipsorum signanter pratorum occupare intenderant in preiudicium ipsorum valde magnum super quo fidelitati vestre firmiter precipiendo mandamus quatenus vestrum mittatis hominem pro testimonio fidedignum quo presente Johannes filius Andrea de Telekus praedictam vel Johannes de Sarfeu aut Brictius de eadem seu Paulus de Karathfeld allis absentibus homo noster ab omnibus quibus incumbit meram de premissis experiatur⁶⁹¹ veritatem quam tandem nobis fideliter rescribatur. Datum Budae feria tertia proxima post festum Beati Gregorii. Anno Domini millesimo quadringesimo quinto.

No. 3.

MNL OL DL 68 950; summary: ZsO, vol. 2/1. 641. no. 5091.

Date: November 5, 1406, Košice

The vice-ispán of Sáros County prove that the claim of John son of John son of Rikalf, and John son of Coloman, son of Rikalf was rightful and the lands that were driven by the Poprad to Orlov had originally belonged to them.

⁶⁹¹ The scribe accidentally repeated the word.

Nos Nicolaus de Gara regni Hungarie palatinus et iudex Cumanorum memorie commendamus quod in congregationem nostram generali universitati nobilium Abawjvariensis et de Sarus comitatum feria secunda proxima ante festum beatorum Symonis et Iude apostolorum prope civitatem Cassa celebrata Johannes filius Johannis filii Rykolphi ac alter Johannes filius alterius filii dicti Rykolphi de Tarkw de medio aliorum exurgendo proposuerunt eo modo quod particulam terre quam antiquus meatus fluvii Pabrad a possessione eorum Lybytynye vocata excidisse et ad possessionem regalem Orlw vocatam annexisse semper et ab antiquo ad dictam possessionem eorum Lybytynye pertinentes et usa extitisse (...) debet pertinere. Ut hoc vicecomiti nostro iudicibus nobilium iurisque assessoribus dicti comitatus de Sarus constaret evidenter petentes nos cum instantia ut iidem vicecomes necnon iudices nobilium iurisque assessores qualiter de premissis scirent per nos requisiti faterentur veritatem cumque nos eosdem vicecomitem nostrum iudices nobilium ac iuratos assessores super premissis requisitos habuissemus iidem ad fidem eorum deo debitam fidelitatemque domino nostro regi et suo sacro dyademati conservandam pro dicenda veritate et iustitia observandam (...) si dicta particula terre modo prehabito per dictum antiquum meatum ipsius fluvii Pabrad a dicta possessione Libitynye excisa et ad dictam possessionem Orlow annexa semper ab antiquo ad dictam possessionem Libitynye pertinens et usa extitisset et nunc deberet pertinere unanimi et concordi testificarunt affirmarunt in cuius assertionis testimonium presentes litteras nostras patentes eisdem utriusque Johanni duximus concedendas communi iustitia exigente. Datum duodecimo die congregationis nostre predictae in loco memorato. Anno domini millesimo quadringentesimo sexto.

No. 4.

MNL OL DL 15 540.

Date: January 9, 1461

The convent of Zalavár testifies that Ladislas Therek of Pat and Nicholas and Ladias, sons of Matthew of Mátésfalva agree on sharing their rights to build mills and fish ponds along the River Sárosd, that divides their estates.

Nos conventus monasterii beati Adriani martyris de Zala, memorie commendamus quod egregius Ladislaus Therek de Path, ab una parte vero ex altera, Nicolaus et Ladislaus filii Mathei de Mathesfalwa coram nobis personaliter constituti per eosdem communiter confessum extitit pariter et relatum in hunc modum quod si qua pars ipsorum in fluvio Sarusd inter predictas possessiones Path et Mathesfalwa vocatas decurrenti in Comitatu Simighiensi existenti molendinum seu piscinam ordinaret et appromtuaret aut ordinari et appromtuari faceret necnon uni et alteri eorum per inundationes aquarum exinde dampna evenirent, extunc nulla pars earundem, super unam et alteram eorum reacquirere ac uni et alteri eorum contradicere ac in piscinis unius et alteri ipsorum modo simili nulla pars contra partem alteram piscari facere valeat atque possit hoc etiam per ipsas partes specialiter declarato et specificato, ut si ipsi Nicolaus et Ladislaus, aut ipsorum heredes et posteritates universi predictam possessionem eorum Mathesfalwa, aliquando temporis in eventu perpetuum

vendere aut in concambium alieni vel aliquibus donare tradere et contulere [sic!] seu propignerii obligare conarentur extunc nulli alteri nisi praefato egregio Ladislao Therek aut suis heredibus et posteritatibus dare et conferri valeant atque possint e converso vero prefatus Ladislaus Therek aut sui heredes et posteritates universi possessionem suam Mendzenth vocatam in predicto Comitatu Symigiensi existentem modo simili aliquando temporibus [sic!] in processu perpetuo vendere aut in concambium aliorum vel aliquibus donare tradere et contulere seu propignerii obligare niterentur extunc nemini alteri, nisi solum modo prenominationis Nicolao et Ladislao aut ipsorum heredibus et posteritatibus dare et conferri valeant atque possint ad quod se partes praedictae sponte obligarunt coram nobis vigore et testimonio praesentium mediante. Datum feria sexta proxima post festum Epiphaniarum, domini anno eiusdem Millesimo quadingentesimo sexagesimo primo.

No. 5.

MNL GYMSML SL IV. 1009. a. vol. 6. 1540/1541. 76–82. p.⁶⁹²

The account of the rebuilding of the moat and the Foregate Mill at Sopron, 1540

[76. p.]

Hernach volgt, so ich ausgehen zu z dem paw der muel im graben beim Vorderthor auf stainmetzen, mauerer, deichtknecht, zimmerleut und umb holczwerg, stain und ander noturft darzue etc., anno 40.

Item dem Berthl stainmetzen und seinen gesellen gelont am samstag nach Invocavit [21 February] 6 tag stainhauen, je 1 tag 20 cr., facit 1 t. d.

Item adi gelont dem Mertl Peham deichtknecht und seinen gesellen 7 tag zu 7 cr. 4 tag in 6 cr. im zwingl die erd auszustechn und ausfuren, facit 1 tal. 1 sol. 22 den.

Samstag nach Reminiscere [28 February] den stainmetzen gelont stain hauen 12 tag zu 10 cr. facit

2 tal. den.

Adi ainem gelont, so inen im Judenhof geholfen stain brechen 1 tag

24 den.

Samstag nach Oculi [6 March] dem Frantzen und den andern stainmetzen stain prechen und hauen gelont 20 tag zu 10 cr., facit

3 tal. 2 sol. 20 den.

Adi dem deichtknecht 3 ½ tag zu 7 cr. seinen gesellen [5] 3 tag zu 6 cr. erd auszuschieben und den pastein zu schütten etc., facit

5 tal. 5. sol. 20 den.

⁶⁹² I am thankful to Bence Péterfi for his corrections made to the edition of the text. For the principles of the edition, see: Katalin Szende, “A magyarországi középkori német nyelvű források kiadásának elvei és gyakorlata,” [Principles and practice of editing medieval German-language sources in Hungary] *Fons* 7 (2000): 49–62.

Lateralis

13 tal. 2 sol. 26 den.

[77. p.]

Item samstag nach Letare [*13 March*] dem Frantzen und seinen gesellen gelont 12 tag an dem muelgraben zu mauern per 10 cr. ainem raicher, 5 tag zu 6 cr., facit
2 tal. 4 sol. den.

Adi dem deichtknecht gelont 5 tag zu 7 cr. seinen gesellen, 20 tag zu 6 cr., facit
2. tal. 4. sol. 20. den.

Item freitag nach Iudica [*19 March*] dem Frantzen gelont 19 tag zu 10 cr. ainem merterknecht, 5 tag zu 6 cr. ainem weib, so geraicht 4 tag zu 4 cr., facit
3 tal. 7 sol. 14 den.

Item adi dem deichtknecht 5 tag zu 7 cr., seinen gesellen 15 tag zu 6 cr., facit
2 tal. 20 den.

Item am osterabent [*28 March*] dem Frantzen mauern gelont 20 tag zu 10 cr., dem ~~raicher~~ merterknecht⁶⁹³ 5 tag zu 7 cr., den weibern so geraicht 15 ½ tag zu 4 cr., facit
4 tal. 7 sol. 28 den.⁶⁹⁴

Adi dem deichtknecht ~~12 tag zu 7 cr.~~ 6 tag per 1 sol., seinen gesellen 12 tag zu 7 cr., facit
2 tal. 1 sol. 6 den.

Am samstag darnach [*3 April*] gelont mauern 22 tag zu 10 cr., dem merterknecht 4 tag zu 7 cr., den weibern 8 tag zu 4 cr., facit
4 tal. 5 sol. 8. den.⁶⁹⁵

Dem deichtknecht 4 tag per 1 sol., seinen knechten 14 tag zu 7 cr., 8 tag zu 4 cr., facit
2 tal. 5 sol. 10 den.

Lateralis

25 tal. 4 sol. 18 den.⁶⁹⁶

[78. p.]

Item samstag nach Quasimodo [*10 April*] dem mauern gelont 34 tag zu 10 cr., dem merterknecht 6 tag per 7 cr., raich 8 taglon zu 4 cr., facit 6 tal. 7 sol. 6 den.

Item di dem deichtknecht 5 ½ tag per 1 sol., den knechten 21 tag zu 7 cr., 16 ½ tag zu 4 cr. facit

⁶⁹³ Added posteriorly to the margin of the line.

⁶⁹⁴ Miscount.

⁶⁹⁵ Miscount.

⁶⁹⁶ Miscount.

4 tal. 1 sol. 23 den.⁶⁹⁷

Samstag nach Misercordia [*17 April*] den maurern gelont 27 tag zu 10 cr., dem merter knecht 6 tag zu 7 cr., raich 12 tag zu 4 cr., facit 6 tal. den.

Adi dem deichtknecht 5 tag per 2 sol., 48 taglon zu 7 cr., 16 tag zu 4 cr., facit 7 tal. 2 sol. 22 den.⁶⁹⁸

Item freitag vor Georgii [*23 April*] den maurern gelont 23 tag zu 10 cr., ainem merterknecht und aim raicher jedlichen 5 tag zu 7 cr., mer 5 tag raich zu 4 cr., facit 5 tal. 2 sol. 20 den.

Adi dem deichtknecht 5 tag per 1 sol., den knechten 25 tag zu 7 cr., zwaien weibern 10 tag zu 4 cr., facit 4 tal. 2 sol. 20 den.

Freitag nach Georgii [*30 April*] dem maister Frantzen zalt mauern 19 tag werg zu 10 cr., dem raicher und merterknechten 8 tag werg zu 7 cr., 3 tag per 4 cr., facit 4 tal. 1 sol. 10 den.⁶⁹⁹

Lateralis 38 tal. 1 sol. 11 den.

[79. p.]

Ime dem statmaister und seinen gesellen von den gewellen umb schloss wein und zu ainem padgelt geben 2 sol.

Item adi dem Merten deichtknecht 5 taglon per 1 sol., seinen gesellen 29 tag zu 7 cr., den weibern 9 tag zu 4 cr., facit 4 tal. 4 sol. 24 den.⁷⁰⁰

Item samstag vor Exaudi [*8 May*] dem Merten gelont 4 tag zu 1 sol., seinen gesellen 20 tag per 7 cr., facit 2 tal. 6 sol. 20 den.

Samstag vor pfingsten [*15 May*] ime gelont 6 tag zu 1 sol., 29 tag zu 7 cr., facit 3 tal. 7 sol. 22 den.⁷⁰¹

Freitag darnach [*21 May*] ime gelont 3 tag zu 1 sol., seinen gesellen 13 tag zu 7 cr., den damm gar zu machen, facit 1 tal. 2 sol. 4 den.

Freitag vor Viti [*11 June*] 4 halb taglon gelont im graben bei der müel zu schutten und gleichen, facit 1 sol. 26 den.

⁶⁹⁷ Miscount.

⁶⁹⁸ Miscount.

⁶⁹⁹ Miscount.

⁷⁰⁰ Miscount.

⁷⁰¹ Miscount.

Item dem Mertel deichtmaister zu pesserung geben, das er die pastein, die dämm geschütt und öbristen ist gewesen, die knecht erhalten, facit 4 sol. den.

Lateralis

14 tal. 2 sol. 6 den.

[80. p.]

Vermerkt, was auf den maister Urban Kämpf mülner, so die müel paut und seine gesellen gangen, anno 40

Samstag nach Invocavit [14 February] hab ich ime 1 wochen lon geben, darumb er zu der arbeit wochenlich zu haben bestellt worden und mit weniger nemen, facit 2 tal. 2 sol. den.

Seinen gesellen 37 tag zu 10 cr., ainem von Agendorf⁷⁰² 2 tag 12 cr., dem Philippen 1 taglon 8 cr. holz zu schlagen zu der müell, facit 8 tal. 6 sol. den.⁷⁰³

Item samstag nach Reminiscere [28 February] ime dem maister Urban sein wochensolt geben 18 sol., seinen gesellen 9 tag zu 10 cr., das zimmerholtz aufzuschneiden, facit 3 tal. 6 sol. den.

Samstag nach Oculi [6 March] ime seinen wochensolt geben 18 sol., seinen gesellen 19 taglon, in her Frantz Sübenbürger waldholtz zu schlagen und zimern je 1 tag per 10 cr., facit 5 tal. 3 sol. 10 den.

Samstag nach Letare [13 March] seinen gesellen gelont, dann er ain Pfinstag darvor hinweg geritten, 36 tag zu 10 cr., facit 6 tal. den.

Freitag nach Iudica [19 March] ime dem maister Urban, dieweil er nit anhanng gewest, dise wochen nit bezaltn seinen gesellen 29 taglon bezalt per 10 cr., facit 4 tal. 6 sol. 20 den.

Lateralis

31 tal. den.

[81. p.]

Item am osterabent [28 March] ime dem maister die halb wochen gelont ~~vo~~ nach Letare, da er hinweg ist, und diese wochen thuet 1 ½ wochenlon, seinen gesellen 20 tag zu 10 cr., facit 8 tal. 10 den.⁷⁰⁴

⁷⁰² The village of Ágfalva close to Sopron.

⁷⁰³ Miscount.

⁷⁰⁴ Miscount.

Item samstag nach dem ostertag [3 April] ime sein wochensolt 18 sol., seinen gesellen 38 taglon zu 11 cr., dan er inen so viel verhaissen, facit 9 tal. 1 sol. 22 den.

Item samstag nach Quasimodo [10 April] sein wochenlon 18 sol., seinen gesellen 82 tag zu 11 cr., facit

17 tal. 2 sol. 8 den.

Samstag nach Misericordia [17 April] ime sein wochensolt 18 sol., seinen gesellen 74 ½ taglon zu 11 cr., facit

15 tal. 7 sol. 8 den.

Item freitag vor Georgii [23 April] ime sein wochensolt geben 18 sol., seinen gesellen gelont 58 tag zu 11 cr., facit

12 tal. 3 sol. 2 den.⁷⁰⁵

Item freitag nach Georgii [30 April] ime sein wochensolt geben 18 sol., seinen gesellen 69 tag zu 11 cr., facit

14 tal. 7 sol. 6 den.

Lateralis

77 tal. 5 sol. 26 den.

[82. p.]

Samstag vor Exaudi [8 May] ime sein wochensolt geben 18 sol., seinen gesellen 62 ½ taglon zu 11 cr., facit

11 tal. 3 sol. 20 den.

Samstag vor Phingsten [15 May] ime sein wochensolt 18 den., den gesellen 84 taglon zu 11 cr. thuet, facit

17 tal. 5 sol. 6 den.

Item adi seinen gesellen zu ainem padgelt, da sie gar fertig worden

4 sol. den.

Item in der phingstwochen [16 May–22 May] zwaien muelknechten gelont 12 taglon zu 11 cr., die müelstain zusammenzufüren und die müel gar zu fertigen, facit

2 tal. 1 sol. 18 den.

Item ime den maister Urban zu ainer pesserung und abfertigung auss beuelch meiner herren, dieweil er das paw erlich und wol verricht, geschenken, damit er auch was hinfüran doran zu wenden oder pessern zu thuen bewilligt und thuet.

10 tal. den.

Lateralis

41 tal. 6 sol. 14 den.

[83. p.]

⁷⁰⁵Miscount.

Umb holtzweg, eisenzeug und ander noturft zu der muel etc.

Item freitag vor Viti [*11 June*] zalt ich 18 laden schwartz grossen, die wasserrinnen auss der insetz zu bedecken und ander noturft, je ainen per 16 cr., thuet
4 tal. 6 sol. 12 den.

Item samstag darnach [*19 June*] dem waltpaurn der die rinnen pracht, den rest auf die 1 tal. 44 cr., so er vormals daran emphanen und ich verrait geben
1 tal. 5 sol. 4 den.

Ime umb 6 lang feichten laden zu 10 cr., ainen umb 5 rotferhen (?) laden zu 4 cr., geben
1 tal. 2 sol. 20 den.

Item mer kauft ich damals 8 dick rotferhen (?) laden zu 12 elen, je 1 per 10 cr., facit
1 tal. 2 sol. 20 den.

Samstag nach Colomanni [*16 October*] kauft ich mer 15 schwartz grossin laden, je ainen per 8 cr., facit
2 tal.

Item dem maister Urban fur die zerung auf 3 raisen, so er hieher gethan von wegen der müel und wassergraben zu besichten und das paw aufzunemen 2 tal. und, so er zu zwaien maln hie verzert, selbander 4 sol. den. thuet
2 tal. 4 sol. den.

Lateralis 13 tal. 4 sol. 26 den.

[*84. p.*]

| | |
|--|----------------|
| Item umb 50 flider laden, so maister Urban kauft, geben | 5 tal. den. |
| Item kamp rad laden 4, je 1 per 6 cr., facit | 3 sol. 6 den. |
| Umb 8 pieg (?) aufs rad | 1 tal. den. |
| Umb 10 melstetl laden zu 6 cr. geben | 1 tal. |
| Umb ain ler paumen grindel | 4 sol. den. |
| Umb ain par ärm | 2 sol. 20 den. |
| Umb 5 fuerder gemain laden, je ains per 4 sol. den., facit | 2 tal. 4 sol. |
| Item imb 300 nagel zum fliederrad | 1 tal. den. |
| Umb 7 dick laden, so er nachmals kauft | 7 sol. den. |

Item da die wägen nach den zeug gefaren und der mair mit dem statzug hat der wasserbauch und er verzert und zu maut gebn
5 sol. 6 den.

Montag nach Palmarum [*22 March*] umb 4 sol. latten zum muelhauss zu decken, geben
1 tal. 3 sol. den.

Dem Clement Irher umb 3 h. (?) leim umb 1 h. 5 cr. erben 2 sol. den.

Lateralis

14 tal. 7 sol. 2 den.

[85. p.]

Item den fuerleuten, so maister Urban bestellt von dem überigen holzwerk, so sie auf 4 wägen geführt, je von aim wagen 12 sol. den. und umb 1 fuer, so sie auch bracht 4 sol. 10 den. zu maut 4 cr., facit

6 tal. 4 sol. 26 den.

Item am montag Misericordia [12 April] kaufft ich zu Wienn ain par stain auf der müel, darumb geben 10 tal., dem jungen Simänl und seinen gesellen den fuer leuten darvon haimzuführen 1 tal. den., facit

11 tal. den.

Item am samstag nach pfingsten [22 May] mit maister Urban abgerait all ander zeug und noturft, so ime noch umbezalt ist beliben, 1 cr., 35 h. (?) eisen zeug, je 1 h. per 10 den., 40 kämp, je 1 per 1 den., 10 spindel, je aine per 1 den., 29 flider laden, je 1 per 7 cr., zwen ärm schwartz forhens(?) holz, so noch verhanden, 1 per 4 cr., thuet alles

9 tal. 2 sol. 24 den.

Lateralis

26 tal. 7 sol. 20 den.

2. List of Charters of Privilege studied in Chapter 3.4

| | <i>Date</i> | <i>Privileged settlement</i> | <i>Edition / Archival registry number</i> |
|----|--|------------------------------|---|
| 1 | Before 1241 | Rodna | - |
| 2 | (1243) – 1255 | Banská Štiavnica | Ilpo Tapani Piirainen, <i>Das Stadt- und Bergrecht von Banská Štiavnica/Schemnitz : Untersuchungen zum Frühneuhochdeutschen in der Slowakei</i> (Oulu: Universität Oulu, 1986), 31. |
| 3 | 1244 | Krupina | CDES, vol. 2. 113–114 no. 168. |
| 4 | 1255 | Banská Bystrica | CDES, vol. 2. 340–341 no. 491. |
| 5 | 1261 | Dej | ÁÚO, vol. 8. 9–11 no. 6. |
| 6 | 1265 | Hybe | VMMS, vol. 1. 48–50 no. 33. (B) |
| 7 | 1263 /1276 (?) | Partizánska Ľupča | VMMS, vol. 1. 44–45 no. 29. |
| 8 | 1268 | Rimavská Baňa | ÁÚO, 8. 212–213 no. 143. |
| 9 | 1287 | Gelnica | VMMS, vol. 1. 67–68 no. 66 and Almási, “Megjegyzések Gölnicbánya,” 46–49. |
| 10 | 1291 | Ocna Dejului | ÁÚO, vol. 5. 20–22 no. 13. |
| 11 | 1291 | Turda / Cojocna / Sic | <i>Urkundenbuch zur Geschichte der Deutschen</i> , vol. 1. 181–182 no. 249. |
| 12 | 1318, 1340 | Ružomberok | VMMS, vol. 1. 91–92 no. 103 and VMMS, vol. 1 132–133 no. 161. |
| 13 | 1325 | Baia de Arieș | <i>Urkundenbuch zur Geschichte der Deutschen</i> , vol. 1. 395–396 no. 437. |
| 14 | 1327 (confirmed in 1338) | Smolník | VMMS, vol. 1. 128–129 no. 155. |
| 15 | 1328 | Kremnica | VMMS, vol. 1. 115–116 no. 136. |
| 16 | Before 1329 (?) (confirmed in the fifteenth century) | Pukanec | CD, vol. 8/5. 425–426. |
| 17 | Before 1329 | Baia Sprie | Gusztáv Wenzel, <i>Magyarország bányászatának kritikai története</i> [Critical history of mining in Hungary] (Budapest: M. Tud. Akadémia Könyvkiadó Hivatala, 1880), 408–414. |
| 18 | 1341 | Telkibánya | Wenzel, <i>Magyarország bányászatának</i> , 346–349. |
| 19 | 1347 (before 1329) (confirmation) | Baia Mare | CD, vol. 9/1. 498. |
| 20 | 1349 | Zlatá Idka | VMMS, vol. 1. 163–164 no. 205. |

| | | | |
|----|------|------------------------|--|
| 21 | 1357 | Zlatna | MNL OL DL 36 543. |
| 22 | 1376 | Baia Mare / Baia Sprie | <i>Documente privind istoria României</i> , 673–676 no. 577. |
| 23 | 1380 | Brezno | CD, vol. 9/5. 390–391. |
| 24 | 1382 | Ľubietová | CD, vol. 9/5. 577. |
| 25 | 1453 | Banská Belá | MNL OL DF 235 588. |

3. List of Cases Studied in Chapter 3.5

| | <i>Date</i> | <i>Archival registry number</i> | <i>Summary / reference</i> | <i>Edition</i> |
|----|------------------------------|---|---|---|
| | April 6, 1305 | MNL OL DL 1687. | AOklt, vol. 1. 347–348 no. 719. | AO, vol. 1. 94–95 no. 87. |
| 2 | January 6, 1338 | MNL OL DF 249510. | AOklt, vol. 22. 12–13 no. 5. | – |
| 3 | September 4, 1339 | MNL OL DL 102 905. | AOklt, vol. 23. 250–251 no. 529 and Kiss, <i>Floods</i> , 347 and 628. | AO, vol. 3. 597–598 no. 394 and App. no. 1. |
| 4 | October 6, 1339 | MNL OL DF 248 651. | AOklt, vol. 23. 284–285 no. 614. See: Kiss, <i>Floods</i> , 628. | MES, vol. 3. 351–352. |
| 5 | January 2, 1340 | MNOL OL DL 11 742. | AOklt, vol. 24. 9 no. 2. | – |
| 6 | March 19, 1340 | MNL OL DL 58 506. | AOklt, vol. 24. 72–73 no. 154. | AO, vol. 4. 10–12 no. 10. |
| 7 | February 22 to March 7, 1347 | MNL OL DL 3932. | AOklt, vol. 31. 93–94 no. 131 and 445–447 no. 862. See: Kiss, <i>Foods</i> , 385–386. | AO, vol. 5. 118–120 no. 55. |
| 8 | May 21 and June 14, 1348 | MNL OL DL 64 031. | AOklt, vol. 32. 169 no. 291 and 194 no. 355. | – |
| 9 | August 31, 1348 | MNL OL DL 64 661, 68 880, and 68 881. | AOklt, vol. 32. 285–286 no. 573, 611. 303–304 no. 639, and 340 no. 694. | – |
| 10 | October 5, 1349 | DL 68 895, 68 894, and 68 917. | AOklt, vol. 33. 254–255 no. 504, 255 no. 505, 335–336 no. 684., and 364 no. 745. See: Kiss, <i>Foods</i> , 391–392. | – |
| 11 | November 6, 1354 | MNL OL DF 200 928, 200 929. and MNL OL DL 15 680. | AOklt, vol. 38. 338 no. 462. | AO, vol. 6. 244–249 no. 160. |
| 12 | January 11, 1357 | MNL OL DL 31 283. | AOklt, vol. 40. 250–251 no. 529. See: Kiss, <i>Floods</i> , 398. | AO, vol. 6. 525–529 no. 331. |
| 13 | May 19, 1359 | MNL OL DL 68 916. | MNL OL database | – |

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|----|----------------------|--|--|--|
| 14 | October 28, 1374 | MNL OL DL 70 662, 71 545, and 71 550. | Tringli, <i>A Perényi</i> , 89 no. 131. | <i>Oklevéltár a gróf Csáky család történetéhez</i> , 2 vols [Cartulary to the history of the Csáky family], ed. László Bártfai Szabó (Budapest: Stephaneum, 1919), vol. 1. 135–148.(with wrong dating) |
| 15 | May 10, 1382 | MNL OL DL 52 420. | <i>A nagykállói Kállay– család levéltára</i> , 2 vols [Cartulary of the Kállay family of Nagykálló] (Budapest: [N. p.], 1943), 219 no. 1917. | Frigyes Pesthy, <i>Krassó vármegye története</i> , vol. 3 [History of Krassó County] (Budapest: Athenaeum, 1882), 159 no. 103. |
| 16 | June 11, 1382 | MNL OL DL 91 893. | Degré, <i>Magyar halászati jog</i> , 139, and MNL OL database | <i>Zala vármegye története. Oklevéltár</i> , 2 vols [History of Zala County. Cartulary]. Eds. Imre Nagy, Dezső Véghely, and Gyula Nagy (Budapest: [N. p.], 1886), vol. 2. 186 no. 61. |
| 17 | July 6, 1387 | MNL OL DF 207 457. | ZsO, vol. 1. 15 no. 138. | Dreska, “A pannonhalmi konvent hiteleshelyének,” 13 no. 1. |
| 18 | November 27, 1393 | MNL OL DF 237 891. | ZsO, vol. 1. 357–358 no 3227.Kiss, <i>Floods</i> , 628. | — |
| 19 | March 25, 1401 | MNL OL DL 65 287. | MNL OL database | — |
| 20 | March 17, 1405 | MNL OL DL 92 239. | ZsO, vol. 2/1. 446 no. 3726. | App. no. 2. |
| 21 | November 5, 1406 | MNL OL DL 68 950. | ZsO, vol. 2/1. 641 no. 5091. sz. | App. no. 3. |
| 22 | January 16, 1407 | MNL OL DL 34 054. | ZsO, vol. 2/2. 5 no. 5239. | — |
| 23 | May 31, 1408 | MNL OL DL 9410. | ZsO, vol. II/2. 138 no. 6118. | — |

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|----|---------------------|--------------------------------|--|--|
| 24 | June 3, 1408 | MNL OL DL 42 946. | ZsO, vol. 2/2. 139 no. 6125. | – |
| 25 | January 18, 1411 | MNL OL DL 92 385. | ZsO, vol. 3. 84 no. 53. | – |
| 26 | February 21, 1411 | MNL OL DF 279 140. | ZsO, vol. 3. 106–108 no. 173. | – |
| 27 | February 23, 1415 | MNL OL DL 53822 and 53 823. | ZsO, vol. 5. 113 no. 218. | <i>Oklevelek Temesvármegye, vol. 1. 508–509 no. 310.</i> |
| 28 | May 1, 1415 | MNL OL DL 53 871. | ZsO, vol. 5. 191 no. 571. | <i>Oklevelek Temesvármegye, vol. 1. 511–512 no. 312.</i> |
| 29 | May 14, 1416 | MNL OL DL 10 465. | ZsO, vol. , vol. 5. 509–510 no. 1889. | – |
| 30 | January 15, 1418 | MNL OL DL 53 984. | ZsO, vol. 6. 380 no. 1377. | <i>Oklevelek Temesvármegye, vol. 1. 543–544 no. 343 (with wrong dating).</i> |
| 31 | February 15, 1418 | MNL OL DL 53 990. | ZsO, vol. 6. 405 no. 1499. | <i>Oklevelek Temesvármegye, vol. 1. 546–547 no. 346.</i> |
| 32 | April 3, 1419 | MNL OL DL 43 628. | ZsO, vol. 7. 99 no. 265. | – |
| 33 | February 11, 1420 | MNL OL DL 54 110. | ZsO, vol. 7. 314 no. 1345. | <i>Oklevelek Temesvármegye, vol. 1. 558–559 no. 361.</i> |
| 34 | June 21 to 25, 1420 | MNL OL DL 86 495. | ZsO, vol. 7. 432–433 no. 1871. | – |
| 35 | August 10, 1421 | MNL OL DL 98 381. | ZsO, vol. 8. 251–252 no. 859. See: Kiss, <i>Floods</i> , 453. | – |
| 36 | March 31, 1425 | MNL OL DL 43 628. | ZsO, vol. 12. 160–161 no. 381. | – |
| 37 | July 20, 1433 | MNL OL DL 106 963. | MNL OL database | – |
| 38 | April 12, 1454 | MNL OL DL 66 938. | MNL OL database | – |
| 39 | March 13, 1467 | MNL OL DL 16 498. | MNL OL database | – |
| 40 | April 12, 1469 | MNL OL DL 39 456. | Fekete Nagy, “A Petróczy levéltár,” 261–262 no. 202. | – |
| 41 | June 1, 1471 | MNL OL DL 36 393. 87–88, no 2. | Jakó, <i>A kolozsmonostori konvent</i> , vol. 1. 717–718 no. 2022. | – |
| 42 | September 18, 1472 | MNL OL DL 17 372. | Olexik, “Középkori levéltártörténeti adatok,” 270–271 no. 9. | – |

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|----|-----------------------|---------------------------------------|---|---|
| 43 | December 4, 1479 | MNL OL DL 65 632. | MNL OL database | — |
| 44 | February 24, 1487 | MNL OL DL 83 932. | MNL OL database | — |
| 45 | May 3, 1496 | MNL OL DL 95 726. | MNL OL database | — |
| 46 | February 7, 1515 | MNL OL DL 106 744. | MNL OL database, K. Németh, “Vizek és vízgazdálkodás, III.,” 9. (with wrong dating) | — |
| 47 | March 6, 1520 | MNL OL DL 30 554. | MNL OL database | — |
| 48 | September 26, 1520 | MNL OL DL 67 529. | MNL OL database | — |
| 49 | December 23, 1520 | MNL OL DL 29 981. | MNL OL database | |
| 50 | September 1, 1524 | MNL OL DL 36 400. 257– 259, no. 1. | Jakó, <i>A kolozsmonostori konvent</i> , vol. 2. 444 no. 4041. | — |
| 51 | February 17, 1525 | MNL OL DL 63 037. | MNL OL database | — |

4. List of the Kings of Medieval Hungary

Árpáadian dynasty

Stephen I (Saint) 1000–1038
 Peter Orseolo 1038–1041 and 1044–1046
 Samuel Aba 1041–1044
 Andrew I 1046–1060
 Béla I 1060–1063
 Salamon 1063–1074
 Géza I 1074–1077
 Ladislas I (Saint) 1077–1095
 Coloman (the Learned) 1095–1116
 Stephen II 1116–1131
 Béla II (the Blind) 1131–1141
 Géza II 1141–1162
 Stephen III 1162–1172
 Béla III 1172–1196
 Emeric 1196–1204
 Ladislas III 1204–1205
 Andrew II 1205–1235
 Béla IV 1235–1270
 Stephen V 1270–1272
 Ladislas IV (the Cuman) 1272–1290
 Andrew III 1290–1301

Přemysl dynasty

Wenceslas 1301–1305

Wittelsbach dynasty

Otto 1305–1307

Angevin dynasty

Charles I (Robert) 1301–1342
 Louis I (the Great) 1342–1382
 Mary 1382–1395
 Charles II (the Short) 1385–1386

Luxemburg dynasty

Sigismund 1387–1437

Habsburg dynasty

Albert 1437–1439
 Ladislas V (Postumus) 1440–1457

Jagiellonian dynasty

Wladislas I (Warneczyk) 1440–1444

Hunyadi dynasty

Matthias Corvinus 1458–1490

Jagiellonian dynasty

Wladislas II 1490–1516

Louis II 1516–1526

Szapolyai dynasty

John I 1526–1540

John II Sigismund 1540–1551 and 1556–70; Prince of Transylvania, 1570–1571

Habsburg dynasty

Ferdinand I 1526–1564

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 Fond Primăria orașului Baia Mare [Archive of the town of Baia Mare]
 Seria 2 – Documente privilegiale [Privilegial documents]
- Budapesti Történeti Múzeum [Budapest History Museum]
 Metszettár [Collection of prints]
- Hessisches Staatsarchiv Marburg
 Wilhelmshöher Kriegskarten
- Magyar Nemzeti Levéltár [Hungarian National Archive]
 Győr-Moson-Sopron Megyei Levéltár Soproni Levéltára, Sopron [Sopron City
 Archive of the Archive of Győr-Moson-Sopron County]
 IV. 6. Sopron Város Kamarási Hivatalának iratai [Files of the chamberlain of
 the town of Sopron]
 Kamarási számadások [Account books]
- Országos Levéltár, Budapest [State Archive]
 E Magyar Kamara Archívuma [Archive of the Hungarian Chamber]
 41 Litterae ad cameram exaratae
 156 Magyar Kamara Archívuma. Urbaria et Conscriptiones
- N Regnicolaris Levéltár [Regnicolaris archive]
 80 Limitanea Hungarico-Styriaca 1753–1756
- P Családi levéltárak [Family Archives]
 507 Nádasdy család nádasdlányi levéltára [Nádasdlány archive of
 the Nádasdy family]
 Levelezés [Letters]
 1314 A herceg Batthyány család levéltára. Missiles [Archive of the
 Batthyány family. Letters]
 1322 A herceg Batthyány család levéltára. Instrukciók [Archive of the
 Batthyány family. Instructions]
- Q Diplomatikai Levéltár Mohács előtti gyűjtemény [Archive of diplomatics.
Collection Ante-Mohácsiana]
 DL Diplomatikai Levéltár [Archive of Diplomatics]
- S Térképtár [Map collection]
 11 Kamarai térképek (1747–1882) [Maps of the Hungarian
 Chamber (1747–1882)]

73 Új szerzeményű térképek (1701–1940) [Newly acquired maps (1701–1940)]

X Másolatok gyűjteménye [Collection of copies]

DF Diplomatikai Fényképgyűjtemény [Archive of photo copies of diplomatics]

Országos Széchényi Könyvtár, Budapest [National Széchényi Library]

Kézirattár [Manuscript collection]

Cod. Lat.

Fol. Lat.

TK Térképtár [Map collection]

Österreichische Nationalbibliothek, Vienna

Handschriftensammlung

Codex 8609

Prímási Levéltár Esztergom [Archiepiscopal Archive, Esztergom]

Acta Radicalia

Štátny archív v Prešov [Town Archive of Prešov]

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Codex 1092

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