

# *„Nam per saepissimas inundationes Danubii maior pars periiit.’*

## *16th-century Danube floods in documentary evidence I*

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### *Danube floods: 16th-century sources and further potentials*

The medieval and early modern documentary evidence, related to the Carpathian Basin (hereafter CB) flood events, are usually not included in the European historical flood or weather data compilations. Even in the extensive source compilation series of Curt Weikinn<sup>1</sup> CB flood events are included only in very exceptional cases. Thus, publishing flood-related evidence, especially concerning such a key period of major flood events as the 16th century, plays a primarily important role in any further investigations. Moreover, up to recent times systematic datasets on medieval<sup>2</sup> and early modern floods of the Danube had occurred in the CB have not been published so far, despite the fact that 16th century is one of the most important periods in the flood history of European rivers.<sup>3</sup>

This paper (together with a further publication)<sup>4</sup> acts as an introductory work – providing a documentary database background – towards a larger-scale, more systematic-multidisciplinary investigation of 16th-century Danube flood events in

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<sup>1</sup> C. Weikinn, *Quellentexte zur Witterungsgeschichte Europas von der Zeitwende bis zum Jahr 1850: Hydrographie*. Vol. 1/2. Berlin 1960. 485 p.

<sup>2</sup> For a recently-published dataset of medieval Danube floods in the Carpathian Basin, see: A. Kiss, "Dunai árvizek Magyarországon a középkori írott források tükrében: 1000-1500. Esettanulmányok, forráskritika és elemzési problémák," [Danube floods in Hungary in medieval documentary evidence: 1000-1500. Case studies, source critics and analysis problems] In: A. P. Kiss, F. Piti and Gy. Szabados, *Középkortörténeti tanulmányok 7*. [Research in medieval studies 7] Szeged 2012. 339-355. (online available: Academia.edu)

<sup>3</sup> See, for example, R. Brázdil, R. Glaser, Ch. Pfister, P. Dobrovolný, J.-M. Antione, J.-M. Barriendos, D. Camuffo, M. Deutsch, S. Enzi, E. Guidoboni, O. Kotyza and F.S. Rodrigo, Flood events of selected European rivers in the sixteenth century, " *Climatic Change* 43/1 (1999), 239-285.

<sup>4</sup> The present publication is planned to be followed by another publication of similar style ("16th-century Danube floods in the Carpathian Basin II") providing further 16th-century Danube flood evidence.

the CB,<sup>5</sup> based on documentary, archaeological and natural scientific/sedimentary evidence. Some data and references were already included in the compilation of Antal Réthly,<sup>6</sup> which references were first checked (e.g. reliability, source reference or literature entry), unreliable references removed, and then sources were collected from the published or original source documentation. Moreover, further investigations in other 16th-century sources, not applied by Réthly, provided increased amount of evidence on more 16th-century Danube floods, and opened up possibilities for further investigations.

The present dataset is clearly not yet a complete one: further investigations will follow the present work, for example, in Vienna, Bratislava (and other local) archival materials, which might modify (and extend) our present knowledge on the quantity and magnitude of 16th-century Danube flood events. In the present overview of documentary materials the entire CB was involved, despite the fact that after 1541 the Hungarian kingdom was divided into three parts and from this time the CB Danube sections were divided between the remaining Hungarian kingdom and the Ottoman Empire. This fact clearly had an impact on the spatial distribution of known 16th-century Danube flood reports and available documentation: most of the known floods at present are known from the upper and upper-middle sections of the river, while data concerning floods on the sections south to the Danube Bend and the Budapest area is at the moment rarely known.

16th-century flood reports in the CB were preserved in narratives (chronicles, diaries: both Hungarian and Turkish), economic evidence such as accounts (e.g. manorial, tithe), urbaria and conscriptions, private and official correspondence (letters), legal documentation (e.g. permissions) and the legal court decisions of county (noble) meetings. Furthermore, the acts and parliament decisions over flood protection issues (after great flood events) also form a small but very important part of the database. Regarding the types of sources in which flood events were documented, the 16th century means a very interesting, transitional period between the Middle Ages and the early modern period. Flood events, even major ones, can be sometimes traced only in their impacts and consequences: namely that destruction, long-term economic impacts (e.g. tax release, land deterioration) or even flood protection/control orders, works are reported, while in many cases no direct information is (yet) available on the (great) flood event itself. Additionally, the significance of narrative documentation and the regulations of the central governmental bodies (e.g. prevention, control), in general, is also more an early modern characteristics – especially in the remaining parts of the Hungarian kingdom (western and northern parts of the CB).

Concerning individual floods, at present we clearly cannot provide a full list of 16th-century events. Nevertheless, most of the great flood events and some of the less significant ones are included and available for analysis. Among the main

<sup>5</sup> A. Kiss and J. Laszlovszky, *Ex eo tempore, quo Danubii inundatio frequens esse coepit' – 16th-century flood series on the Danube and their long-term consequences in Hungary: The testimony of documentary and archaeological-natural scientific evidence* (2012; in progress).

<sup>6</sup> A. Réthly, *Időjárási események és elemi csapások Magyarországon 1700-ig*. [Weather events and natural disasters in Hungary up to 1700] Budapest 1962. 450 p.

reasons of missing documentation on the first place one has to refer to the wars (partly civil war, but mainly the Turkish wars) which dominated in the mid- and late 16th century. On the one hand wars caused the mass destruction of documentary evidence and political changes were partly followed by the changes of administrative and documentation practices. On the other hand, the importance and destruction of wars dominated while the importance of natural hazards such as flood gained somewhat less interest, for example, in narrative evidence. And although Austrian and Turkish archives possess a great amount of Hungary-related materials, only a small part of these files and documentation has been investigated and utilised in flood research.

The Bratislava (-Sk; historical Pozsony/Pressburg) bridgemasters' account, which is a source of basic importance in the mid- and late 15th century, ceased to provide regular (direct) information on flood events presumably due to the fact that no standing bridge over the entire Danube functioned after the late 1490s.<sup>7</sup> In spite of all destruction and discontinuity in source types, 16th-century documentation can provide us with more Danube-related flood evidence in the near future. Beyond the yet (partly) "hidden treasures" of Turkish (and also Vienna and some German/Austrian) archives, for example, a source of further potential can be the official and private correspondence: at present some private and official letters with reference on Danube flood events were included, but a systematic investigation in Hungarian and Vienna archival materials means a necessary continuation of research. This is also true for regional and supra-regional legal-administrative documentation: a systematic overview of 16th-century county meeting protocols as well as investigations in the archives of royal state administration can reveal further documentary evidence concerning Danube floods.

In the following section of the paper the presently-known contemporary (and rarely almost-contemporary, but accepted by historiography as reliable) sources referring to 16th-century flood events are presented. In addition, the possible immediate Austrian parallel flood events, when available, are also provided, which may help in the better understanding of Danube flood waves on a larger geographic scale.

## *16th-century Danube floods in documentary evidence: a first year-by-year overview*

*The mega-flood" of 1501 – not (yet?) available in Hungary?*

Although clearly a most important, catastrophic flood event occurred in August 1501 on the Danube in Austria,<sup>8</sup> up to now no clear evidence is available in

<sup>7</sup> For more information and literature reference, see T. Ortway, *Magyarország régi vízrajza a XIII-ik század végéig*. [Early hydrography of Hungary until the end of the 13th century] Concerning the medieval bridge(s) of the Danube, rather detailed information can be found, written by Ortway (1889 Vol. 2/2, pp. 399-408). To this question, see also Kiss, "Dunai árvizek", 339-355.

<sup>8</sup> See, for example, Ch. Rohr, *Extreme Naturereignisse im Ostalpenraum. Naturerfahrung im Spätmittelalter und am Beginn der Neuzeit*. Köln-Weimar-Wien 2007. 235-237.

contemporary (or later) documentation for the appearance and destruction of this major Danube flood event in the Carpathian Basin.<sup>9</sup>

*Flood in December 1506 at Buda*

Long-lasting great frosts were probably responsible for the (ice jam?) flood occurred in December 1506, in the Buda (and Pest) area. Already on 11 December the Danube was covered by very much ice ("*cum maximis glaciebus*") which reflects on cold late November-early December weather conditions, followed by mild interruption and rapid melting.<sup>10</sup> The flood ("*propter inundationem aquarum*") was reported short after 15 December.<sup>11</sup>

*Summer floods of 1508: where (not)?*

Despite the rich documentation of the great 1508 flood on the Austrian Danube sections, where due to the rainy summer two significant flood waves developed (10 July, 10 August – lower than in 1501),<sup>12</sup> at present no direct contemporary data is available concerning this Danube flood in Hungary. Nevertheless, the year itself was probably a flood year of many rivers in the area: as a 17th-century Transylvanian chronicle suggested, in 1508 "there was great flood in entire Hungary and Moldova" ("*1508. Ingens aquarum inundatio per totam Hungariam et Moldaviam fuit.*")<sup>13</sup> Other, 18th- and 19th-century sources, early reference collections and literature entries can be found concerning this Danube flood event; yet without any traceable reference in the contemporary evidence.<sup>14</sup>

The most useful known information is available in the newspaper called "Magyar Hirmondó", where an article was published on 27 March 1784 about the maximum height of the Danube flood in the year of 1509 [1508?]. Mentioned in the article under the year 1509, still in 1784 a flood mark could be found in Győr on the wall of a tower (belonging to the bishop's castle) near the Vienna gate. According to the newspaper report, "*Ennek az áradásnak magassága felylyebb ért amannál, melyly 1769 esztendőkbenn vólt. De még sem érte fel az 1509 esztendőbéit, melylynek jele*

<sup>9</sup> In his compilation, Antal Réthly does not refer to any (contemporary, non-contemporary) source or literature reference to this flood event either (see Réthly "Időjárási események", 59.).

<sup>10</sup> P. E. Kovács, *Estei Hippolit püspök egri számadáskönyvei 1500-1508*. [The Eger account books of bishop Hippolit of Este] Eger 1992. 330, 119r.

<sup>11</sup> E. Kovács, "Estei Hippolit püspök" 330-331, 119v.

<sup>12</sup> Rohr, "Extreme Naturereignisse" 241-243.

<sup>13</sup> J. Trausch, *Chronicon Fuchsio-Lupino-Oltardinum sive Annales Hungarici et Transilvanici*. Vol. 1. 990-1630. Brassó 1847. 43.

<sup>14</sup> See Magyar Hirmondó 1784, No. 24, 27 March (p. 197-198.). Antal Réthly also counted this reference under the year 1508.

Réthly ("Időjárási események" Vol. 2. 1970. 156.) refers to F. X. Linzbauer, *Codex sanitario-medicinalis Hungariae*. Budae [Budapest] 1852. Vol. 1. 133., Vol. 2. 724.; and A. Zawadowski, *Magyarország vizeinek statisztikája*. [Statistics of Hungarian water bodies] Vol. 1. Budapest 1891. 36. Although the earlier source collection provide some reference entries, no any information is available concerning sources in the second work. Another Danube flood, might have occurred in 1516, is mentioned by such authors as A. Zawadowski ("*Magyarország vizeinek*" Vol. 1. 36) or I. Tóry (*A Duna és szabályozása*. Budapest 1952. 127.), referred in the Réthly-compilation (Réthly, "Időjárási események" 61.), without source reference.

*belől vagy on a vár' bástya falán nem meszsze a' Bétsi kaputól.*"<sup>15</sup> Thus, the maximum flood level of the 1784 flood was higher than the one occurred in 1769 (in reality, it should be the 1768 Danube flood event), but was lower than the maximum water level of the flood of 1509 (1508). Despite the "systematic one-year mistyping" of flood years in the newspaper, maybe we can give some credit to the contemporary observation of a floodmark which was still in its original position in 1784. According to this information, the 1508 flood level would have been higher than the floods occurred in 1768 and 1784, which two 18th-century floods were otherwise significant in Pest-Pilis-Solt county or in the south, in the Baja area, but were not considered as major events in Pest-Buda.<sup>16</sup> Thus, based on this newspaper report, one can conclude that at least one major flood event most probably occurred at the town of Győr in the first decade of the 16th century, presumably in 1508.

*Bones of Margit moved from its original place due to increased flood risk: 1523*

On 5 September 1523, Cardinal Thomas, the pope's legate gave permission to the convent in the Rabbit Island to move the bones of Margit the Blessed, daughter of king Béla IV, from its contemporary flood-endangered place to another, more suitable location ("*Cum nuper apud monasterium uestrum diuiteremur ostensa nobis per uos fuerunt ossa beatae Margaretae uirginis monialis uestre filiae ... in loco ut asserebatis exposito aquarum inundationibus, et quoniam illam uitae sanctimonia non minus quia prosapia claruisse asserebatis nobis humiliter supplicastis ut illam inde transferri et in loco decentiori in quo inundationes homini non officerent poni permitteremus.*").<sup>17</sup> Concerning this evidence and the flood waves, more detailed investigation, being written by the same authors, is currently under preparation.<sup>18</sup>

*Danube flood in late August, 1526*

According to the late 16th-early 17th-century author, Miklós Istvánffy (1538-1615), due to prevailing rainy weather conditions not only the Csele stream, but also the Danube was flooding in the time of the battle of Mohács (thus, flood was

<sup>15</sup> Magyar Hirmondó 1784, No. 24, 27 March (p. 198).

<sup>16</sup> For a description on late 18th-century flood events (including the ones occurred in 1768 and 1784) at Pest-Buda, see A. Kiss, "*Suburbia autem maxima in parte videntur esse deleta - Danube ice floods and the pitfalls of urban planning: Pest and its suburbs in 1768-1799*" In: Cs. Kovács (ed.), *From Villages to Cyberspace*. Szeged 2007. 271-282. (online available: Academia.edu) More detailed information on the 1783-1784 flood events in Hungary was included in a European overview paper of this extreme winter-spring flood series. See: R. Brázdil, G.R. Demarée, M. Deutsch, E. Garnier, A. Kiss, J. Luterbacher, N. Macdonald, Ch. Rohr, P. Dobrovolný, P. Kolář and K. Chromá. "European floods of the winter 1783/84: scenarios of an extreme event during the Little Ice Age" *Theoretical and Applied Climatology* 100/1-2 (2010), 163-189.

<sup>17</sup> HNA, Medieval Collection of Diplomats: DL 25312.

<sup>18</sup> A. Kiss and J. Laszlovszky, "Sorozatós árvíz hullámok a Dunán? Egy 16. század eleji árvíz sorozat hatása a Duna-kanyar településeire és épületeire" [Series of flood waves on the Danube? The impact of early 16th-century flood series on the settlements and buildings of the Danube Bend] (in prep.). To be submitted to: *Korall* (2013 No. 3: thematic issue on Environmental history).

reported concerning the Mohács area), on 29 August.<sup>19</sup> Even if Istvánffy was not a contemporary eye-witness of the event, since he is known to be a reliable history writer of the period and his work broadly applied in historical investigations, probably we can give some credit to his report.

#### *Flood of the Danube in 1529*

As it was impossible to make a bridge due to the great flood of the Drava and Danube rivers, around 6 August in 1529 the Turkish army could not cross the Drava river at Eszék (Osijek-Hr).<sup>20</sup> In this case the contemporary Turkish author, the sultan (Soliman the Great), mentioned that not only the Drava but also the Danube was in flood at that time.

#### *Flood of autumn 1530*

Caused and accompanied by constant rains, flood of the Danube obstructed the army's fights in November 1530. The event was mentioned by the early 17th-century author, Istvánffy concerning the Buda area.<sup>21</sup>

#### *Flood in the Lower-Drava area in late October 1541 – high water level of the Danube?*

The army of Soliman the Great, coming back from Buda, had to cross (again) the Drava river in October 1541. At Eszék, however, the Drava river flooded so much that the water spread over the meadows and floodplains, which made crossing on bridges very difficult for the army. Since Eszék town is located ca. 20 km from the Danube inflow, the influence of Danube high water level should be as well considered. Especially, because the swamps of the Karasica (between the Drava and the Danube) were supplied by both rivers, the flood of the Drava (even without mentioning it separate) means at least contemporary high water-level conditions of the Danube itself.<sup>22</sup> Unlike in 1529, however, no direct reference was included on any Danube flood in the Turkish narratives.<sup>23</sup>

#### *Great Danube floods prior to 1549*

Prior to June 1549 great, destructive flood events occurred on the Danube at Pozsony.<sup>24</sup> Flood or floods damaged the town moat, the town walls and several buildings nearby. Due to these circumstances and the low income of town citizens, the Locotenential Council applied to the king for a full tax release for Pozsony citizens

19 N. Ishtvanfi, *Historiarum de rebus Ungaricis libri XXXIV. Nunc primum in lucem editi. Coloniae Agrippinae* [Köln] 1622. 130.

20 "Szulejmán naplói" [Diaries of Suleiman] In: J. Thúry, *Török történetírók*. [Turkish history writers] Vol. 2. Budapest 1893. 329.

21 Ishtvanfi, "Historiarum de rebus" 171.

22 Gy. Lovász, *A Dráva-Mura vízrendszer vízjárási és lefolyási viszonyai*. [Water course and discharge of the Drava-Mura system] Budapest 1972. 158 p

23 "Lufti pasa: Az Oszmán ház története" and "Ferdi: A törvényhozó Szulejmán szultán története" [The history of sultan Suleiman] In: J. Thúry, *Török történetírók*. [Turkish history writers] Vol. 2. Budapest 1896. 30, 109-110.

24 I. R. Kiss, *A Magyar Helytartótanács I. Ferdinánd korában és 1549-1551. évi leveles könyve*. [The Hungarian Locotenential Archives in the period of Ferdinand I and the letter book of the years 1549-1551] Budapest 1908. p. 116-117. letter 99, written on 13 June 1549.

for some years, in order to be able to make necessary preparation works. This data may have connection to a 1548 Danube flood, occurred in Vienna.<sup>25</sup>

#### *Damaging flood prior to 1555?*

In his detailed analysis on the registry of the Komárom castle (Komarno-Sk) concerning the year of 1555, Sándor Takáts found reference on full tax release (for the years 1554-1558), which was provided by the king to numerous villages in the Komárom domain due to a destructive flood event and the damages caused by the Turkish.<sup>26</sup> Based on these information, at least one damaging flood event occurred either in 1554 or 1555 (there were also Turkish attacks in both years). In the same work, Takáts also mentioned damages caused by ice in the royal sturgeon fishing place, in Aszód (22 January 1555; and similarly in 1559 and 1660). The reference was inserted into the present list of flood events with question mark (similar to the later Takáts references), until the original text could be traced from the contemporary manuscript.

#### *Great (ice)flood in early 1557*

On 14 January Ádám Dory wrote a letter to his lord Tamás Nádasdy, describing that it was not possible to cross the Danube at the ford (and/or ferry) of Pozsony, because of the great flood ("*ob magnam inundationem aque*"). Describing the circumstances, later in the letter, the text ("*danubius ab utraque parte congelate glatie dura*") leads us to the conclusion that the flood could be an ice flood.<sup>27</sup> According to Takáts, the "the great ice flow" occurred on the Danube on 1 January.<sup>28</sup> An ice jam (flood0) is also mentioned on the Danube in the Vienna area, in the hospital accounts.<sup>29</sup>

#### *Summer flood of the Danube in 1558*

Similarly, in their private correspondence Dory informed Nádasdy about the fact that he could not cross the Danube (possibly in the Pozsony area) at first due to the flood of the Danube ("*ob danuby inundationem*"). Since Dory wrote the letter on 23 June 1558 in Pozsony, and wrote about a current event, flood of the Danu-

<sup>25</sup> See e.g. Wiener Stadt- und Landesarchiv, MA 8. 1.7.1.1. B11 - Spitalmeisterrechnung; Spitalmeisteramtsrechnung 1386-1780. (hereafter WStLA, MA 8. 1.7.1.1. B11) Vol. 26, 52v.

<sup>26</sup> S. Takáts, "A komáromi vizahalászat a XVI. században. Második befejező közlemény" [Great sturgeon fishery of Komárom in the 16th century. Second, ending study] *Magyar Gazdaságtörténelmi Szemle* 4/10 (1897), 485-509. Unfortunately, Takáts did not provide any reference on the exact title and location (archives) of the manuscript he used and analysed in a detailed way, and up to now I could not find the original manuscript or its transcriptions. Thus, the flood-related analysis is still the task of the near future.

<sup>27</sup> Hungarian National Archives (hereafter HNA), E 185 (Archivum familiae Nádasdy) Missiles: Ádám Dory NT (101.) 14 January 1557.

<sup>28</sup> S. Takáts, "A dunai hajózás a XVI. és a XVII. században. Első közlemény" [Danube shipping in the 16th and 17th centuries. First essay] (hereafter Vol. 1.) *Magyar Gazdaságtörténelmi Szemle* 7/2 (1900), 97-122 (p. 106).

<sup>29</sup> WStLA, MA 8. 1.7.1.1. B11, 1557: Vol. 34, 60v ("*Eiß guß*").

be could be an early summer flood.<sup>30</sup> Probably also another, indirect evidence for high water levels of the summer is that, according to Takáts, unusually the great sturgeon fishery (with success) continued over the mid-summer in the Danube.<sup>31</sup>

#### *Summer high waters in 1563?*

In a letter written on 26 June 1563, Hanns Gitzgern in Komárom was apologising for not being able to send Danube fish, due to high waters ("*wegen des hohen Wassers*").<sup>32</sup> In the Vienna hospital accounts a larger flood event ("*ain gross(e)n güß*") was mentioned after 8 June.<sup>33</sup>

#### *Frequent floods prior to 1568 in the Csallóköz*

Related to the Danube flood(s) of (1567 and) 1568, as suggested by Zimányi, the tithe records of 1568 show very low grain harvest results in several villages of the Csallóköz, which were possibly caused by the reason described in the tithe rolls of Istál (Dolný Štal-Sk) village: frequent Danube floods ("*nam per saepissimas inundationes Danubii maior pars perit*"). The author generally mentioned climate change and precipitation (and flood) increase as a possible reason for the decreasing harvest results in the Csallóköz area.<sup>34</sup>

In Austria, prior to 1568 Danube floods were recorded in 1566 and 1567; the latter one was extraordinary in magnitude.<sup>35</sup>

#### *Consequences of extraordinary floods in (1567-)1568-1569: parliament act and regulations*

Related to the information on great flood events on the one hand, and concerning mid-16th-century (and preceding) flood defence and control on the other hand, very significant is the decision made by the Hungarian parliament in 1569 (Articulus 21). In the text of the decisions the great damages of the frequent

<sup>30</sup> HNA E 185 Missiles: Ádám Dory NT (110.). 23 June 1558.

<sup>31</sup> Takáts, "A komáromi vizahalászat" 495. Even if at the moment no flood evidence is available from 1559, it is interesting to mention that the ice again destroyed the wooden structures of the great sturgeon fishery in early 1559 (and also in early 1560). Moreover, the water level of the Danube was so unusually low in the autumn of 1559 that no fish was caught around Komárom, in this main sturgeon fishing season. See: Takáts, "A komáromi vizahalászat" 496-497.

<sup>32</sup> Österreichisches Staatsarchiv, Finanz- Hofkammerarchiv, Ungarische Akten, Regesta: F 1563.VI.26.

<sup>33</sup> WStLA, MA 8. 1.7.1.1. B11, 1563: Vol. 37, 74r-75r ("*ain grossn güß zuworffen*").

<sup>34</sup> Archival evidence: HNA E159 (Regesta decimarum), No 116, Pozsony c. (Csallóköz), 1568/22. For more reference and analysis, see: V. Zimányi, "Gabona- és terméseredmények a Csallóköz egyes falvaiban, tizedjegyzékek alapján" [Cereal and harvest results in some villages of the Csallóköz (Žitný ostrov-Sk) based on tithe registers] *Agrártörténeti Szemle* 26/3-4 (1984), 458-506 (p. 461).

<sup>35</sup> In the Vienna hospital accounts (WStLA, MA 8. 1.7.1.1. B11), after 1 June 1566 a "Güß" was mentioned (Vol. 30, 73r-74r); then a great flood ("*groß Summergüß*") appeared in the wood transport accounts after 31 July 1567 (Vol. 40. 74r-76r). For published references on the great flood of 1567 in Austria, see: Rohr, "Extreme Naturereignisse" 243-246. No flood is mentioned concerning 1568 in the Vienna hospital accounts, concerning wood transportation (74r-76v) - Vol. 41. Moreover, already in 1565 "*Wassergüß*" was mentioned after 8 April in the Vienna hospital accounts (Vol. 38. 77v), which might as well mean a flood event.



floods of extraordinary magnitude ("*crebrae, et ingentes Danubii inundationes*") were mentioned referring to the actual and previous year(s). The most damages were mentioned concerning the whole island of Csallóköz ("*gravissima damna toti insulae Csallóköz*").<sup>36</sup>

Because of all these serious problems occurred in the Csallóköz, half (6 days out of 12) of all obligatory works of serfs ("*robot*") in Pozsony and Komárom counties, living in the island of Csallóköz, were ordered to be done in the island area. Their work was to renew and repair the formerly damaged dams and dykes (embankment), which had been responsible for defending and preventing Csallóköz from floods of the Danube. Based on the 1569 act (Articulus 21) one can conclude that a (regular or irregular) system of dams, thus spatially extensive flood prevention existed in the 16th-century Csallóköz area. Rather similar acts are known from 1426,<sup>37</sup> and from 1659 (Articulus 74: renewing the act of 1569).<sup>38</sup> The only but significant difference concerning the order of king Sigismund in 1426 is that at that time no "reparation", but rather building order (making ditches and dams for protection in the Somorja (Šamorín-Sk) area) was mentioned. Thus, whereas no information in 1426 is available concerning any (systematic or long-term) previous flood control works (and/or objects), the 1569 act clearly refers to an already-existing flood prevention/control system (dams) which "only" had to be repaired and renewed.<sup>39</sup>

In 1569 there were great (summer) floods in Austria. In the Vienna hospital accounts some reference is available on the great(est) water of the Danube around 26 June, which shows good agreement with the first flood wave of the Traun in mid-June.<sup>40</sup>

#### *Flood with ice in January 1573: between Magyaróvár and Komárom*

Reported in an official letter written in Magyaróvár on 18 January 1573, because of the great flood and ice (ice jam flood?), Jacob von Bezeckh Hofdiener

<sup>36</sup> L. Tóth, S. Kolosvári, K. Óvári and D. Márkus (eds.), *Corpus Iuris Hungarici/Magyar Törvénytár. 1526-1608. évi törvénycikkek*. Budapest 1899. Miksa 1569. évi decretuma (III). Articulus 21 (p. 598). According to Takáts, the new "German" mill, brought to Komárom in 1569, was taken by the flood (since it was reported in December 1570, the flood event could both happen in 1569 or 1570, but due to the dating of the report, it is somewhat more likely that the mentioned flood occurred in 1570). See: Takáts, "A dunai hajózás a XVI. és XVII. században. Negyedik Közlemény" [Danube shipping in the 16th and 17th centuries. Fourth essay] (hereafter Vol. 4.) *Magyar Gazdaságtörténelmi Szemle* 7/2 (1900), 241-273 (p. 253.).

<sup>37</sup> See Kiss, "Dunai árvizek" 339-355; A. Kiss and Ch. Rohr, "Late medieval Danube floods and their detectable impacts in Central Europe: The Eastern Alpine Region and the Carpathian Basin" (2012; in prep.)

<sup>38</sup> This act, in fact, is more than just renewing Articulus 21, 1569. Whereas in 1569 only the Danube floods are mentioned, in 1659 already the floods of the Danube and the Vág are referred in the act: L. Tóth, S. Kolosvári, K. Óvári and D. Márkus (eds.), *Corpus Iuris Hungarici/Magyar Törvénytár. 1657-1740. évi törvénycikkek*. Budapest 1900. Articulus 74 (p. 178).

<sup>39</sup> It is an interesting fact that the 1567 flood event was not mentioned or referred separate (despite its importance in Austria) in the parliament decisions (only the th eyear of 1569 and the preceding one).

<sup>40</sup> WStLA, MA 8. 1.7.1.1. B11. 1569: Vol. 42, 79 v ("*Als die Thunaw ster groß gewest*"). Rohr, "Extreme Naturereignisse" 246-247, 327-332.

and Hans Trautson, could not continue their travel towards Komárom. To avoid problems, the suggested further route for the travel was Szetmártonhegy-Veszprém-Fehérvár-Buda.<sup>41</sup> Similarly, great flood event was reported in Austria, in January 1573 when a great ice jam flood occurred in Krems and Stein.<sup>42</sup> According to Takáts, the water caused much damage in this year in the villages of the Komárom domain and the Danube ice destroyed ships.<sup>43</sup>

#### *Floods or Turks? Impacts of great floods prior to 1574*

In the western Csallóköz area, not only the late 1560s but also the early 1570s seem to be especially unfavourable concerning Danube floods. On 22 September in 1574, the inhabitants of Püspöki (Podunajské Biskupice; today part of Bratislava), Szunyogd and Csölle (Rovinka-Sk) turned to the Hungarian Chamber in Pozsony asking for tax release and protection against local authorities who – despite the fact that they had no harvests due to flood of the Danube in the previous years – the vice-count expected them to provide food for maintaining the army in the (border) war zone.<sup>44</sup> Flood events mainly of great magnitude were reported on the Danube in Austria (with special emphasis on Vienna, from the mid-1560s onwards in every other year, but practically in every year between 1569 and 1573.<sup>45</sup>

#### *Major ford loosing its regular incomes? Impacts of great floods prior to 1574*

Long-term consequences of great floods (and presumably also of changed hydromorphological activity of the Danube) were detected, and documented in the Pozsony urbarium, for example, in the area of Somorja market town (Oppidum Samaria), at the crossing place (ford, ferry) of Püspöki. A very important information is provided in the urbarium at this passage: namely that since a certain time floods of the Danube started to become frequent (*"Ex eo tempore, quo Danubii inundatio frequens esse coepit"*), and because of them the incomes of the ferry significantly decreased (*"multum diminutos esse proventus vadi"*). Even if the exact year is not provided, the wording (*"ab annis compluribus"*) suggests that this problem did not start in the preceding one or two years. In the lands of Somorja, for many years there were no buildings in Maierhoff *predium*, because of Danube floods (*"quod a multis annis nullum aedificium propter inundationes Danubii habuit"*).<sup>46</sup>

#### *Long-term impacts of great floods on land use, prior to 1574*

<sup>41</sup> Österreichische Statsarchiv, HHStA Türkei I. Karton 29. Konv. 2. 1573. I-IV. fol. 11-12. (18.01.1573, Magyaróvár).

<sup>42</sup> Rohr, "Extreme Naturereignisse" 250-256, 332-336.

<sup>43</sup> Takáts, "A komáromi vizahalászat" 505. Takáts, "A dunai hajózás" Vol. 1. 106.

<sup>44</sup> HNA Chamber Archives, E 150. Acta Eccl. Irreg. Fasc. 84/2. Misc. L. fol. 40.

<sup>45</sup> Beyond the flood events referred before, great Danube floods in every year can be detected in the timber and wood transportation accounts of the Vienna town hospital accounts: 1570 (Vol. 43, 79r): "groß güß" - mentioned after 25 February; 1571 (Vol. 44, 66v): "grosse güß" - mentioned after 1 April, and before the entry of 7 April; 1572 (Vol. 45, 74v): "groß gwß" - after the entry of 17 August, and then again between the entries 22 Aug and 7 Sep. ("groß güß"). For the great floods of 1572 and 1573 in Austria, see also Rohr 2007. 247-256., 332-336.

<sup>46</sup> F. Maksay (ed.), *Urbáriumok, XVI-XVII. század*. Budapest 1959. 179-181.: Oppidium Samaria.

Other important long-term consequences of preceding great Danube flood events were also reported for other settlements of the Pozsony domain, located in the Csallóköz or close to the Little Danube. In Benke Paton (Benkova Potôň-Sk) 21 *jugerum* arable lands were mainly destroyed by the flood of the Danube, although the serf who possessed it served from this land ahead for 2 years before. In Heg(y) Sur (Hrubý Šúr-Sk; along the Little-Danube) meadow was taken away by the frequent floods of the Danube; similar problems occurred in Pentek Sur (Malý Šúr-Sk), Bodak (Bodíky-Sk, today in the Žitný ostrov) and Födémes (Úfany-Sk, north to the Little-Danube).<sup>47</sup>

#### *Winter flood in 1576*

On 7 August András Kalamar or Gozthony, a Pozsony citizen, asked for permission to take 58 bulls through the country border without paying the border taxes (one-thirtieth), since the same number of bulls, for which he had already paid the border taxes, had died in the winter flood of the Danube at the meadows of Köpcsény (Kittsee-A).<sup>48</sup>

#### *Ice jam flood in early 1581*

During the county meeting acting as a court of justice, held on 11 June, the authorities of Győr county accepted the oath of certain persons about the fact that András Badych, the lawyer of György Paxy – as he had not been able to cross the Danube because of an ice jam flood event –, was ordered to come to the county meeting, to be held on 9 September.<sup>49</sup> According to Takáts, in 1581 belonging to the royal great surgeon fishery in the Danube at Aszód (Asód-Sk; today part of Okoč) was destroyed by the ice (flow of the Danube).<sup>50</sup>

#### *Flood in 1593: "the entire Transylvania and Hungary" - was it also a Danube flood?*

In the South-Transylvanian Fuchsio-Oltardinum chronicle (non-contemporary, with contemporary elements), a great flood (caused by rains) of rivers was mentioned (late summer), which flood affected the waterflows both in Transylvania and in the entire Hungary. Although the Danube was not mentioned in the text, there is a chance that the Danube was also in flood.<sup>51</sup> Concerning the winter of 1593, Takáts mentioned that the strong ice flow of the Danube caused great damages in the great royal ship in Komárom.<sup>52</sup>

<sup>47</sup> Maksay, "Urbáriumok," 184.: Benke Paton; p. 187: Heg(y) Sur, Pentek Sur; p. 189: Bodak, Födémes.

<sup>48</sup> HNA E41, 1576/No. 236.

<sup>49</sup> L. Gecsényi, *Győr vármegye nemesi közgyűlési és törvénykezési jegyzőkönyveinek regesztái*. [Regestae from the protocols of the Győr county noble congregations] Vol. 1, 1580-1616. Győr 1990. 27, 55., IV. 1/a-89., Gy. M. közgy./törv. Jz. (Győr, 1581).

<sup>50</sup> Takáts, "A komáromi vizahalászat," 508.

<sup>51</sup> Trausch, "Chronicon Fuchsio" 104. Antal Réthly ("Időjárás események" 106.), based scientific literature entries (e.g. Zawadowski, "Magyarország vizeinek" Vol. 1. 36 or Tóry, "A Duna" 197.) without any reference on the possible sources, refers to a flood event presumably occurred in 1595.

<sup>52</sup> S. Takáts, "A dunai hajózás a XVI. és a XVII. században. Ötödik közlemény" [Danube shipping in the 16th and 17th centuries. Fifth essay] *Magyar Gazdaságtörténelmi Szemle* 7/2 (1900), 289-319. (p. 316.).

*Flood in 1598*

Much rainfall, flood of the Danube and that of smaller rivers (caused by rain) in mid- or late autumn were blamed by Istvánffy for the fact that the army had to stay for a month in the Csallóköz.<sup>53</sup> The same event was also reported by the Transylvanian Márton Sepsi Laczkó: archduke Matthias had to leave the Buda area because of the continuous rainfall and the following Danube flood.<sup>54</sup> As a comparison, great floods were reported in Austria concerning August 1598. Another flood wave was documented in October, in Salzburg (Salzach river), and a great flood event occurred in Steyr on the Enns river, in the Eastern Alpine catchment area of the Danube.<sup>55</sup>

*Conclusions and outlook*

The present paper, together with a planned next one, is an introductory work whose aim is to provide a documentary database as a background to a developing complex survey over 16th-century floods occurred in the Carpathian Basin. Although based merely on the available documentary evidence we cannot yet provide a systematic overview of all 16th-century flood events, already most of the great flood waves, occurred on the Austrian Danube sections, can be also detected on the (upper) CB sections.

Information is available either in the form of reports on individual flood events or reports on the damages as well as long-term consequences of preceding great floods or series of flood events. Already at this stage it is possible to detect such important floods as the ones occurred, for example, in (summer 1508), winter 1557, summer 1558, the winter floods of 1573 and 1581. The damages caused by the great floods of 1568 and 1569 even resulted parliament decisions. The most important periods, subsequent years with (great) flood events clearly seem to be the ones prior to 1523, 1549 (and 1555?), 1568, 1569, 1574; but especially the late 1560s-early and mid-1570s seem to have many long-term impacts documented.

As a next important step, the Hungarian Danube flood references in Austrian archives (with special emphasis on the archives of the central, royal administration) is a subject of analysis. Further systematic investigations are also carried out in Hungarian administrative-institutional collections. The results of recent archaeological-natural scientific investigations are also to be applied in the 16th-century Danube flood analysis.

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<sup>53</sup> Ishtvanfi, "Historiarum de rebus" 732.

<sup>54</sup> I. Mikó, "Sepsi Laczkó Máté krónikája (1619)" [Chronicle of Máté Sepsi Laczkó] *Erdélyi Történelmi Adatok*. [Transylvanian Historical Data] Vol. 3. Kolozsvár [Cluj Napoca] 1857. 35-36. For further reference, see Réthly, "Időjárás események" 109.

<sup>55</sup> Rohr, "Extreme Naturereignisse" 257-262, 271-272.