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Environments of War

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Contextualizing the Mongol Invasion of Hungary in 1241–42: Short- and Long-Term Perspectives*

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The Mongol invasion in 1241–42 was a major disruption in the Kingdom of Hungary's history that brought serious changes to many facets of its political, demographic, and military development. It became a long-lasting element of collective memory that influenced modern historical discourse. Nonetheless, questions remain about the level and distribution of destruction and population loss, the role that environmental factors played in the invasion, the reasons for the Mongol withdrawal, and how this episode can be used for interpreting later thirteenth and fourteenth-century phenomena. The present article aims to discuss these four issues, employing a combined analysis of the wide-ranging textual material and the newer archaeological and settlement data in their regional context. We contend that new data supports the idea that destruction was unevenly distributed and concentrated in the Great Hungarian Plain. Furthermore, we express skepticism that environmental and climatic factors played the decisive role in the Mongol withdrawal in 1242, while we acknowledge the evidence that long-term climate change had substantial effects on Hungary's settlement patterns and economy as early as the mid-thirteenth century. We conclude that a nuanced multi-causal explanation for the Mongol withdrawal is necessary, taking greater consideration of local resistance and the military failures of the Mongol army than has previously been represented in international literature. Lastly, we uphold a viewpoint that the Mongol invasion brought many catalysts to Hungary's rapid development in the late thirteenth and early fourteenth centuries.

Keywords: Mongol Empire, Kingdom of Hungary, Mongol invasion of Europe, Mongol invasion of Hungary, environmental history, medieval archaeology

Introduction

The Mongol invasion of 1241–42 is among the key formative episodes in Hungarian history and has long been considered a threshold dividing periods in the Kingdom of Hungary's development. Academic research has been

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consistently engaged with the topic since the mid-nineteenth century, discussing not only the events themselves, but the reasons for them and their greater historical consequences. Certain contemporaries of the events recorded that the country was destroyed or that it submitted to the Mongols, and some researchers have since assumed that it may have lost a significant part of its population.[1] During the last two decades, a large quantity of new data has emerged from the field of archaeology. The first significant archaeological excavations were connected to motorway construction, but later these discoveries were followed up by targeted investigations.[2] The new archaeological data has been intensively discussed in Central and Eastern European scholarly circles, but it has not been very much represented in the recent wider discussions on the history of the Mongol Empire. At the same time, more than four decades after Denis Sinor first suggested ecological drivers behind the Mongol departure from Europe,[3] a new environmental theory is being put forward concerning why the Mongols broke off their campaign, opting not to occupy Hungary after many military successes. Ulf Büntgen and Nicola Di Cosmo offered a viewpoint that the Mongol withdrawal in 1242 was largely driven by short-term climatic fluctuation and environmental concerns, i.e., the Mongols' inability to properly provision their troops and animals.[4] Their theory attracted mainstream global media attention in many high-profile popular publications.[5] The authors of the present article responded to this new explanation in a previous article; however, we limited our arguments to the viewpoint that short-term climate was likely not behind the withdrawal without attempting to provide an alternative explanation for the

1 For an overview of the scholarly debates on population losses, see: Berend, *At the Gates*, 36–37. As Berend points out, two schools of historiography emerged in the debate on the scale of destruction. On the basis of empty villages in charters, György Györffy suggested 50 percent of the population died in the invasion and its aftermath. Fügedi and others suggested the quick, dramatic recovery and economic prosperity contradicts such an image and Pál Engel felt a considerably lower estimate of around 15–20 percent of the population was more likely. See: Fügedi, "A tatárjárás demográfiai következményei," 498–99.

2 Laszlovszky, "Material Remains," 1–3; Laszlovszky, "Tatárjárás és régészet," 455; Wolf, "Régészeti adatok."

3 Sinor, "Horse and Pasture," 181–83.

4 Büntgen and Di Cosmo, "Climatic and Environmental Aspects," 1–9.

5 For instance, see the following online articles on the issue: Gearin, "Mongol Hordes Gave up on Conquering Europe Due to Wet Weather," *New Scientist*, May 26, 2016; Kramer, "Scientists Finally Know What Stopped Mongol Hordes from conquering Europe," *Business Insider*, May 27, 2016; Paul Rogers, "Why The Mongol Hordes Retreated from Europe," *Forbes*, May 28, 2016.

mysterious event.[6] This current article will move in the direction of offering an alternative explanation.

Theoretical and Methodological Issues

Our endeavor here is to seek multi-causal interpretations to the events of the invasion and aftermath, using the range of related data that is emerging. This means employing short- as well as long-term perspectives with a nuanced contextualization of textual, archaeological, climatic, and environmental data. The discussion of the events and their consequences takes into account settlement patterns, the evolving church and monastic network, material culture, building projects, etc. as indicators of ongoing economic and social processes which also shed light on the invasion and recovery. We intend to take a wider perspective, focusing not only on the short invasion itself but the whole period from 1220s until the mid-fourteenth century. This long-term perspective is crucial because of the large climatic shift that can be detected between the early thirteenth and the mid-fourteenth century.[7] The long-term perspective is also essential because the crisis and recovery connected to the Mongol invasion unfolded for a long time after the withdrawal in 1242. In this respect, we pursue the path laid about by Jenő Szűcs by analyzing the economic and social transformation processes up to the mid-fourteenth century.[8] While this long-term perspective has existed in previous scholarship, relevant data was unavailable. Thus, earlier viewpoints remained hypothetical and pertinent issues were only discussed in a limited way.[9] Now with a new set of available data, several lingering questions should be revisited.

Discussion

In the following discussion, we will explore four broad topics related to the Mongol invasion and subsequent recovery, with the aim of incorporating data that has emerged from strengthening interdisciplinary approaches:

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6 Pinke et al., "Climate of Doubt," 1–6; see also Büntgen and di Cosmo's responses to the refutation: Büntgen and Di Cosmo, "Reply to," 1–2.

7 Holzhauser et al., "Glacier and Lake-Level Variations," 1107–17; Pinke et al., "Settlement Pattern as Indicators," 212; Pinke et al., "Zonal Assessment," 110.

8 Szűcs, *Az utolsó Árpádok*.

9 Laszlovszky, "'Per tot discrimina rerum'."

1. The level and distribution of destruction caused by the Mongol invasion in Hungary.
2. The impact of short- and long-term environmental and climatic changes on the Mongol invasion and Hungary's subsequent recovery.
3. The reasons behind the Mongol withdrawal from Hungary in 1242.
4. The aftermath of 1242 and subsequent recovery of Hungary in the long-term perspective.

The Level and Distribution of Destruction in the Mongol Invasion of 1241–42

The topic of the scope of the destruction inflicted by the first Mongol invasion of Hungary has long been debated, and it carries important implications for how we conceptualize the event and its consequences. Estimates of the total population losses could range as high as 50 percent to conservative numbers of perhaps 10–15 percent.[10] While this is still a very large segment of the population, one could imagine such losses being replaced by immigration and natural population growth in the long term. However, we must emphasize that there is not enough data from which to determine population losses in 1241–42, or even the population size of thirteenth-century Hungary. There quite simply exists no precise information with which to reconstruct either. Historians can use indirect evidence to glean some idea on population size and loss. Data we can use are, for example, the proportion of deserted villages, and the transformation of the monastic network. A better insight into the demographic situation of the 1330s is offered by the papal tithe list, even though some uncertainties remain.[11] Also, recent research on the monastic network and parish system seems to supply better indicators of population loss than abandoned villages.[12] Taking into account the small number of written sources related to one settlement or the character and dating value of archaeological finds coming from excavated deserted villages from the thirteenth century, it is not clear which villages were deserted as a result of their destruction by the Mongol army, the short-term consequences of the invasion, or the long-term social and economic changes. Only a significantly smaller part of settlements with direct written sources about their destruction or excavated sites with traces of particular destruction features and strong dating evidence (e.g., coins dated to the invasion period) can

10 Kubinyi and Laszlovszky, "Demographic Issues," 54.

11 F. Romhányi, "Gondolatok" (in print).

12 Kubinyi and Laszlovszky, "Demographic Issues," 50–52.

be connected to the event itself.[13] Nonetheless, the endless debates about what percentage of the population died in the invasion remain purely hypothetical and thus are essentially a futile exercise. Spatial patterns of destruction, however, can give us a better idea of which areas were most heavily affected, and which areas were lightly affected.

While the exact number of victims must remain a mystery, the surviving contemporary sources clearly describe a cataclysm of unprecedented character—essentially, a wholesale destruction of the people of Hungary. Moreover, the reconstruction of the event has up to recent decades relied almost exclusively on these textual sources, mainly narratives and charters. An exceptional source, the *Carmen miserabile* of Master Rogerius,[14] written shortly after the events, has long played a crucial role in reconstructing the story of the invasion. This work, written in Latin by a high-ranking churchman taken prisoner by the Mongols, describes a litany of atrocities committed by the invaders, violating contemporary European notions of what was permissible in war,[15] with the authenticity of an eyewitness perspective. This and the other contemporary sources, including those written in other European states,[16] and even far outside of Europe,[17] suggested that the Hungarian Kingdom almost collapsed in 1241–42 amidst an orgy of slaughter. For instance, Rogerius wrote, "Behold, during that summer [1241] they destroyed everything all the way to the borders of Austria, Bohemia, Moravia, Poland, Silesia, and Cumania as far as the Danube."[18] After the Mongols managed to cross the Danube the following winter, the destruction on the other side of the river was similarly extensive if we judge solely by the account of Rogerius, which states that when the Mongols suddenly withdrew, only the citadel

13 Ibid., 53.

14 For the critical edition and translation, see: Bak and Rady, *Master Roger's Epistle*.

15 Ibid., 168–69. Rogerius often remarked with horror that the Mongols "did not pardon sex or age" in their massacres, and he was not alone in this observation. As Johannes Gießauf notes, the Mongols may well have employed unprecedented cruelty as a tactic to demoralize their enemies and stifle resistance. Wholesale massacres of prisoners and the use of prisoners as essentially "arrow fodder" in attacks on enemy defenses were some of the ways that Mongols sought to disseminate a fearsome reputation. See: Gießauf, "A Programme of Terror and Cruelty," 89–96.

16 Engel, *The Realm*, 100.

17 Boyle, *Genghis Khan*, 270–71. Juvaini writes that none of the Hungarian force escaped the Battle of Muhi and that Hungary was subjugated; Song, *Yuan Shi*, 2978. See also: Pow and Liao, "Subutai," 37–76. This article on the famed general provides the first complete, annotated translation of both biographies of Subutai [Sübe'etei] in the *Yuan Shi*. These record that Hungary was defeated, and its city was conquered, before the Mongols withdrew.

18 Bak and Rady, *Master Roger's Epistle*, 214–15.

of Esztergom, the city of Székesfehérvár, and the monastery of Pannonhalma were still holding out: "Only these three places remained unconquered in that region."[19] Describing what he saw as a prisoner, taking part in the march back across Transylvania during the withdrawal, he wrote, "With the exception of a few castles, they occupied the whole country and as they passed through they left the country desolate and empty."[20] The image of a formerly populated and prosperous country reduced to a desert appears repeatedly, and Rogerius was not alone in offering this picture of catastrophic defeat and depopulation. Thomas of Split, another contemporary churchman, described how the invaders "wasted the whole realm of Hungary with their raging sword" and how "bodies lay scattered over the fields, and the corpses of the common people lined the roads in countless numbers" in the ensuing famine.[21] Nor were the authors of the major narrative accounts solely responsible for the portrayal of the total destruction of the country and its population. Chroniclers sometimes noted in their brief entries for the year that the Kingdom of Hungary had been "destroyed" in the sense of being obliterated from continued existence. Béla IV, writing to the pope several years after the Mongol withdrawal, reported that his kingdom had been "reduced to a desert by the scourge of the Tartars."[22]

The image of thorough and evenly spread destruction throughout the Kingdom of Hungary is quite pervasive in the textual records. However, new findings paint a rather different picture of a very uneven distribution of destruction throughout the kingdom, which requires us to ask why medieval authors were so keen to portray the devastation as uniform and *total*. It is important to remember that the authors had motivations and were often in a loose sense confined by the rules of *genre*. Put another way, a clergyman or king, bewailing the suffering to which he and the people of Hungary were subjected, might not take a nuanced approach in determining the exact scope of destruction afflicted on the country on a region-by-region basis. Thus, it is essential for historians to use the sources cautiously, not rejecting the textual material with the sort of hyper-skepticism that causes researchers to divest themselves of useful information for reconstructing past scenarios, but rather to use them in connection with findings from archaeological sites with destruction features, hoards, and settlement archaeology, broadening our picture of the events.

19 Ibid., 218–19.

20 Ibid., 220–21.

21 Karbić et al., *History of the Bishops*, 302–3.

22 Rosenwein, *Reading the Middle Ages*, 419.

A vast number of new sites and excavated features are being discussed, with interdisciplinary approaches increasingly being used to better resolve lingering questions surrounding the process of the invasion,[23] and helping to document the real evidence of its brutality.[24] Recent finds show villagers seeking shelter in the oven of a house,[25] unburied corpses in ditches,[26] casualties of battle,[27] people slaughtered regardless of age or sex, corpses buried haphazardly in the ruins of a burned house, and corpses of those who might have died of epidemics and starvation.[28] Very recent finds detail the concentrated massacre of young females and evidence of cannibalism.[29] The shocking brutality of indiscriminate slaughter and the resultant trauma likely drove contemporary authors to emphasize the totality of the destruction. Besides the evidence of mass-killing, many coin and treasure hoards that were discovered during the last century have been connected to the Mongol invasion.[30] Moreover, research revealed another important aspect of the events, namely, that burned settlements with features of destruction and desertion processes can be connected to the hoard sites, and the spatial distribution of these areas can be interpreted in the context of the invasion because the areas in which they are concentrated are quite well-defined. (Map.1)

The discovery of coin hoards connected to the invasion is revealing about the areas most affected by Mongol attacks. Hoards are related to destruction in the sense that they were buried as a response to the invaders, but there are different kinds of hoards in the period (coin hoards, jewelry, mixed hoards, iron objects) and they represent a complex relationship to the military events. The spatial distribution of coin hoards is also a result of the scale of a money economy in an

23 Laszlovszky et al., "Reconstructing the Battle of Muhi," 29–38.

24 In discussing archaeological results, special emphasis should be on the Great Hungarian Plain, and for the important works on that, see: Rosta, "Pétermonostora pusztulása;" Gyucha and Rózsa, "'Egyesek darabokra vágva';" Tóth, "A tatárjárás korának pénzzel keltezett;" Wolf, "Régészeti adatok." For how settlement patterns and spatial data can be used to shed light on the issues of destruction and recovery, see: Romhányi, "Kolostorhálózat;" and Romhányi, "Gondolatok," (in print) on the papal tithe list; and Romhányi, "Changes of the Spatial Organisation," for a discussion regarding the Carpathian Basin.

25 Gulyás, "Egy elpusztult tatárjáráskori ház," 31, 52–53; Laszlovszky, "Material Remains," 1–3.

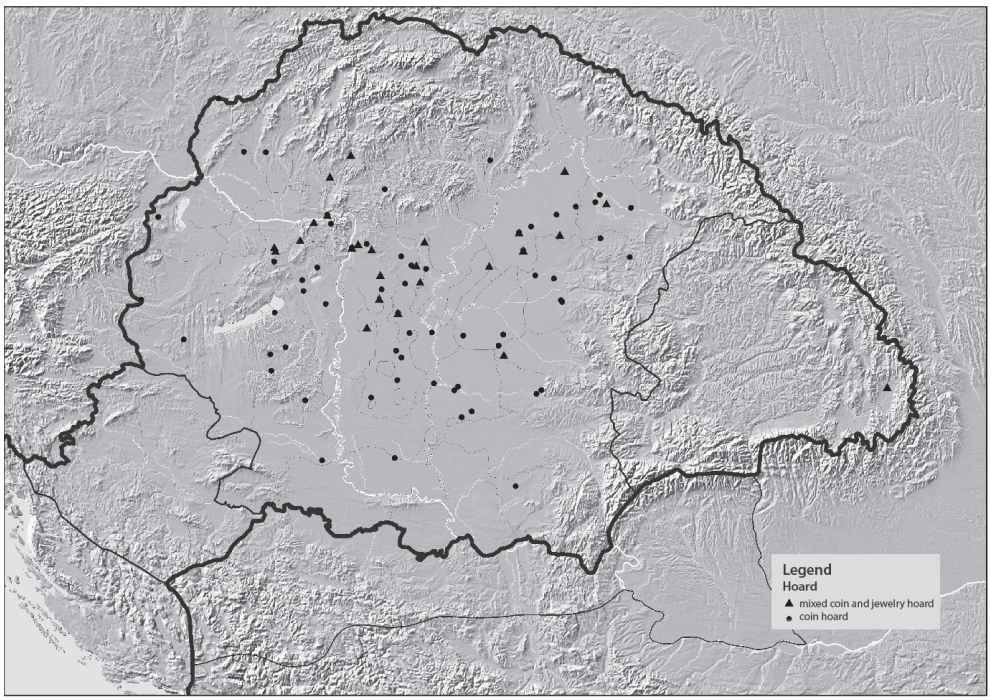
26 Gulyás, "Egy elpusztult tatárjáráskori ház," 43.

27 Laszlovszky et al., "Reconstructing the Battle of Muhi," 33–34.

28 Wilhelm, "'Akiket nem akartak karddal elpusztítani,'" 92, 93; Rosta, "Pétermonostora pusztulása," 208.

29 Yet unpublished findings came to light in 2016 on excavations done by Szabolcs Rosta and Gábor Sz. Wilhelm (Katona József Múzeum, Kecskemét). Kind information of the researchers. On the topic of reports of cannibalism, see: Guzman, "Reports of Mongol Cannibalism;" Schmieder, "Menschenfresser."

30 Tóth, "A tatárjárás korának pénzekkel keltezett," 79–90.



Map 1. Distribution of hoards found in Hungary connected to the invasion
(Image courtesy of the Hungarian National Museum)

area, while other types may represent different economic and social contexts.[31] Mapping the sites where they have been discovered reveals, however, that most of the hoard finds were concentrated in the Great Hungarian Plain, namely, in its northeast and central parts. The corpses that show signs of being connected to the invasion—unburied, buried offhand in hasty fashion, or victims of what appears to be mass murder[32]—are also concentrated in the same region. The only site in Transdanubia (the western side of the Danube) showing this type of violence that has so far been connected to the Mongol invasion, a one-time farm or manor located near Dunaföldvár,[33] is also related to the concentration of other mass murder sites. It is on the right-bank part of a heavily used ford on the Danube, so the destruction there is like related to a successful Mongol attempt to cross the river. The locations where Cumans subsequently settled, as previous research has clearly demonstrated, is also connected to the most devastated areas, and beside the central part of the Great Hungarian Plain, the

31 Vargha, *Hoards*, 27–29.

32 Pusztai, "Buzogánnyal, tarsollyal és késtok-merevítővel," 141.

33 Szilágyi and Serlegi, "Nád közé bújtak," 127–40.

small eastern region of Transdanubia, where the find was made, also became a Cuman settlement.[34]

Regarding the spatial distribution of destruction and its concentration in certain areas of the Kingdom of Hungary, the build-up of evidence and lack of finds in certain areas continues to reinforce conclusions about an uneven pattern of destruction, concentrated heavily on the Great Hungarian Plain. Many rescue excavations were made in the last two decades in various sites, among them a large number in areas that had never been investigated previously. Thus, the lack of finds in specific regions cannot be explained any longer by a lack of research. In fact, the contemporary textual evidence supports this picture of the Mongol army mainly plundering and devastating the Great Hungarian Plain. Their details concerning the nature of the Mongol occupation, at least the account of Rogerius and a letter of Béla IV to the pope dated to January 1242,[35] corroborate this version of events.[36] The latter document emphasized that the Mongols had not yet crossed the Danube—mere months before their evacuation of the Carpathian Basin. This had much to do with the fact that Hungarians on the western side of the river were still capable of putting up resistance until the river froze, around the time the letter was written, enabling a crossing.

Archaeology supports another facet of the account of Rogerius. He detailed how peasants from 70 surrounding villages in the Great Hungarian Plain gathered at a "new village" called Pereg, evidently to bolster their ability to resist. The Mongols only took it after a week, having filled up the moat.[37] Recently, a number of sites with enormous ditches around churches have been found in the Great Hungarian Plain.[38] Evidently villagers were gathering at these sites for mutual defense, but in all cases, the settlements appear to have fallen to the invader. Sites in the open plain lacked natural defenses, and when combined with the length of the time the Mongols had to conduct their attacks on these points over the course of 1241, they proved unable to hold out. It seems that it was difficult for people in an open plain to escape. Simon of Saint Quentin, a Dominican emissary to the Mongols, detailed Mongol methods of

34 Hatházi, "A kunok régészeti."

35 Nagy, *Tatárjárás*, 176.

36 Both documents often use rhetorical terms of total destruction but demonstrate in their details that the Mongols did not cross the Danube until relatively shortly before their withdrawal.

37 Bak and Rady, *Master Roger's Epistle*, 210–13.

38 Recent results of the archaeological investigations were summarized by Szabolcs Rosta at the conference of young medieval archaeologists in 2017. Accessed October 6, 2018. https://mnm.hu/hu/esemenyek/fiatal-kozepkoros-regeszek-konferenciaja–2017.

carefully planting ambushes for fleeing refugees, blocking access to mountains and woodlands that might offer defensive hideouts.[39] They employed hunting tactics in war; Rashid al-Din reported that they advanced against Europe in *jerge* formation, a hunting circle or battue, when the campaign commenced.[40]

Based on the above points-of-view we can draw a conclusion that the central parts of the country were much more devastated than other regions of the kingdom. However, the Great Hungarian Plain was likely not the most densely populated part of the country.[41] Furthermore, the textual sources attest that only some of the victims of the Mongol invasion died in battle, sieges, or massacres. Many of them lost their lives while escaping or in the famine triggered by upheaval of the year-long occupation.

While population size and loss during the invasion must remain in doubt, the uneven regional distribution of both is evident. Reasons for this in part stem from the way the Mongols advanced as well as how they waged war. One viewpoint is that the Mongols confined themselves largely to advancing along the main roads of the Kingdom of Hungary, whereas another point of view contends that they did not follow roads but rather moved through the countryside.[42] Our impression is that on the Great Hungarian Plain they were systematically laying waste to the entire region, going off the main roads, and thus there were few local people in the area who could escape them. On the western side of the Danube, in Transdanubia, the situation seems to have been different, judging by textual, archaeological, and settlement data. The occupation was shorter—only a few months in early 1242. Moreover, it appears that in western Transdanubia, particularly in the southwestern areas such as Somogy, along with Zala and Vas counties, the destruction afflicted by the invasion was minimal.[43] In some of these areas, the dense network of local churches, particularly brick churches, is an indicator of the lower level of destruction. The majority of these buildings

39 Simon of Saint-Quentin, *Histoire des Tartares*, 43–44.

40 Thackston, *Rashiduddin*, 327. The term *jerge* or *nerge* was a term used in Mongolian of the imperial period for forming a row or column but implied the use of a hunting ring, or battue, as a strategy for hunting game. In the context of warfare, it meant an encircling movement. See: Allsen, *The Royal Hunt*, 26. For details on the military application of the *nerge* formation and the steppe tradition of hunting as military training, see: May, *The Mongol Art of War*, 46–47.

41 Selmeczi, "A 13. század második felének," 319.

42 Wolf, "Régészeti adatok," 22–26, specifically 23. Wolf recently contributed, along with many of the other scholars featured here, to a popular archaeology magazine with a heavily modified article related to her earlier work. That issue of the magazine reflects much of the latest research on the invasion.

43 Szilágyi and Serlegi, "Nád közé bújtak," 135.

can be firmly dated to the thirteenth century, so before or after the invasion.[44] This implies that they were either not destroyed during the invasion, or they were built afterwards, which also means that the village communities were not devastated, and they were able to build new churches or renovate wooden ones in brick. Evidently the dense woodlands in that region, which remained until the fourteenth century,[45] offered refuge for the populace. We see a similar situation in the heavily wooded parts of what is today's Slovakia—in the Spiš region, for instance. The Mongols did go into these areas, but it seems that they mainly passed through or confined their attacks to targets along the main roads, quite unlike the situation that unfolded over the Great Hungarian Plain throughout the occupation. In Transdanubia the textual sources support the findings of damage inflicted along the main road or on major targets like Pannonhalma.[46]

It is clear as well that southwestern Hungary was the last part to be attacked and so the damage there was, again, quite limited. One piece of evidence comes from the events that followed the Mongol withdrawal. The vigorous and effective action Béla IV took against Friedrich II Babenberg of Austria almost immediately to recover his western territories, as well as the Hungarian king's ongoing struggle to acquire the Babenberg heritage after Friedrich's death in 1244,[47] are surprising if we imagine that Hungary's entire military was destroyed only a few years beforehand. This suggests that Hungary still had a base of military power in the western part of the country—likely comprised of forces that had not taken part in the Battle of Muhi. Moreover, the southwest region of Hungary may have been, both before and after the Mongol invasion, the most populous part of the entire kingdom; that was certainly the case in the fourteenth century.[48] This is another clue that the area had not been heavily affected by the Mongols.

In general, the level of resistance appears to have been greater than what is suggested in the main narrative sources of Rogerius and Thomas of Split.

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44 Valter, *Árpád-kori téglatemplomok*, 87–88.

45 Szabó, "The Extent and Management of Woodland," 226.

46 About the situation in Transdanubia, shortly after the Mongols had crossed the Danube, we have three letters sent to the pope (not yet elected at that time). One of them was sent by prelates gathered in Székesfehérvár, while the others were written by Abbot Uros of Pannonhalma. See: Györffy, "Újabb adatok;" Thomas of Split compared the destructive but quick advance of the Mongols through Transdanubia to a summer hailstorm and noted that destruction was limited. See: Karbić et al., *History of the Bishops*, 290–91.

47 Szende, "Harc a Babenberg örökségért," 290–94.

48 Kubinyi and Laszlovszky, "Demographic Issues," 57; Szabó, "The Extent and Management of Woodland," 226.

The more effective resistance in Transdanubia was made possible in large part by the Danube. A few years after the invasion, in his letter to the pope, Béla IV emphasized the strategic value of the river, noting that during the invasion it had functioned as a strong fortified line, enabling the outmatched Hungarian defenders to repel the Mongols for ten months.[49] We should not think that the river by itself could have played this role since the sources from a wide range of societies attest that Mongols could cross even larger rivers without their presenting a serious problem—though, in fairness, they intentionally waited for them to freeze in their earlier campaign against the Russian principalities, as was attested by Friar Julian.[50] Evidently the entire Hungarian army was not annihilated at Muhi though the losses were great and comprised important royal and ecclesiastical contingents. Yet, even Rogerius stressed how several unwilling nobles ignored the call to muster in the lead-up to the battle or managed to escape. For instance, Count Ladislaus of Somogy, who was rushing to aid of the king, received the news of the defeat and fled with his men and the contingent of the Bishop of Pécs, who narrowly escaped from the Hungarian camp.[51] Bishop Benedict of Oradea also escaped with his troops across the Danube before the battle.[52] The strong resistance of the citadel of Esztergom, which held out, suggests that valuable military forces remained in the country.[53] Rogerius also acknowledges that the Mongols did not cross the Danube earlier than they did because the fords were vigorously defended on the other side with troops even breaking up the ice or fighting on it daily.[54]

The intensity of resistance and the number of fortified settlements caused problems for the Mongols even in the eastern parts of the country. Although Mongol armies are recorded to have had much experience besieging large fortifications (e.g. Kiev, Kaifeng, Baghdad), their forces in Hungary probably were not expecting a situation in which even villages, such as Pereg, were fortifying themselves and resisting. In the Great Hungarian Plain with its looser settlement network, the Mongols were forced to besiege at least five strongholds between Oradea (Nagyvárad) and Cenad (Csanád): besides the two bishopric

49 Rosenwein, *Reading the Middle Ages*, 421.

50 Göckenjan and Sweeney, *Mongolensturm*, 104–5. On the strategic problem of crossing rivers and the approaches employed by nomadic armies, see the most detailed study on this under-researched topic: Felföldi, "A nomád hadviselés," 75–91.

51 Bak and Rady, *Master Roger's Epistle*, 184–87.

52 Ibid., 180–81.

53 Ibid., 218–19.

54 Ibid., 214–15.

centers, there was Tămaşda (Tamáshida), an unnamed island in the Körös River,[55] and the Cistercian Abbey of Igriş (Egres). Once the Mongols crossed into Transdanubia in early 1242, the situation became considerably worse. A letter from the Hungarian defenders of many different castles, monasteries, and towns, written in 1242, asked for military aid from Rome. Nevertheless, the defenders described a well-planned defense in response to the Mongols crossing the river and voiced confidence in their ability to repel the invaders from their strategic positions.[56]

In general, the large narrative accounts of the invasion portray a different image of the effectiveness of resistance compared to the aforementioned letter or the charters of the king which often commemorated the heroic actions of various noblemen and the citizens of towns. Thomas of Split for instance referred to the "useless preparations" made by the citizens of Pest to defend their town against the Mongols.[57] Rogerius seemed ready to describe any defeat of Hungarian forces, no matter how insignificant. Currently the big narratives, and the lamentations of rulers and clergymen over what we today would call a humanitarian disaster, seem to take precedence in international literature over the charter evidence. Yet, it is a byword of Hungarian medievalists that the country's history is reconstructed from charters. It is our view that when these two types of documents are juxtaposed, we see a rather more balanced picture of the level of Hungarian resistance. If more emphasis is given especially to Béla IV's brief mentions of acts of resistance,[58] successful examples of people crossing the Danube to aid their countrymen,[59] and otherwise unrecorded victories over contingents of the invaders,[60] the image we have of the progress of Mongol invasion changes markedly.[61] Furthermore, in scholarship there is a tendency to connect any sign of devastation or decline to the Mongol invasion. Deserted

55 Rogerius mentioned briefly staying on this fortified island with other refugees from surrounding villages. See: Bak and Rady, *Master Roger's Epistle*, 200–3.

56 Göckenjan and Sweeney, *Mongolensturm*, 293–95.

57 Karbić et al., *History of the Bishops*, 274–75. On the sacking of Pest, see: B. Szabó, "The Mongol Invasion." Despite sensational descriptions of the destruction of the city and its population, the author notes that archaeology has not so far yielded evidence of these events.

58 Nagy, *Tatárjárás*, 180. Béla IV praised, for instance, the resistance of six castle officers of Trenčín for their successful repulsion of Mongol attackers in a charter dated to June 2, 1243.

59 Ibid., 193. Béla IV praised an official, Geregye Nembeli Pál, for hurrying across the Danube River to aid those on the other side soon after the Mongols departed.

60 Ibid., 185. In this particular letter, Béla IV praises three castle officers (*iobagiones*) for their successful resistance and saving many lives at a certain mountain fortress.

61 For an important selection of some of these letters and charters, see: Nagy, *Tatárjárás*, 180–96.

villages, building phases of churches, and the dating of liturgical objects from Limoges were connected directly to the devastation of Hungary.[62] More recently many of the proposed connections between the destruction of the invasion and certain archaeological features have been questioned.[63]

The Short- and Long-Term Impact of Environmental and Climatic Changes on the Mongol Invasion and Hungary's Recovery

The role of climate is increasingly recognized as having a major influence on historical events, and climate data is being used to offer new interpretations. Climatic connections to the development of the Mongol Empire are a topic of important recent studies.[64] Recently, Büntgen and Di Cosmo offered the viewpoint that a short-term climatic fluctuation in early 1242, characterized by cold and wet weather, was the primary driver behind the Mongols' decision to abruptly withdraw in 1242.[65] We do not disagree with their interpretation of the climatic trend, but we disagree about it being the main cause for the withdrawal. While the present article does continue to look in part at the role of environmental and climatic issues connected with the Mongol invasion, the aim here is not to perpetuate a debate focused solely on a single historical episode. The recognition of the importance of exploring environmental issues related to pasturage, raised by Sinor in 1972,[66] and the usage of climatic data in addressing the problem of the Mongol withdrawal, represent an intention to shed light on historical events of great significance for global history. Researchers seeking answers to complex questions (related to the level of destruction, the reasons

62 Kovács, *Limoges-i zománcok*.

63 Wehli, "A magyarországi művészet," 478–79. Previous literature argued that the Limoges objects arrived in Hungary after the destruction inflicted by the Mongols and were used to replace the missing or lost liturgical objects. See especially the work of Éva Kovács. More recently this dating of the Limoges objects has been questioned and some in Hungary are dated before the Mongol invasion. See: Biczó and Kiss, "Limoges-i tál Bátmonostorról," 75–76.

64 For a representative and important article on climate's role in the Mongol Empire's emergence, see: Putnam et al., "Little Ice Age Wetting."

65 Büntgen and Di Cosmo, "Climatic and Environmental Aspects," 1–9.

66 Sinor, "Horse and Pasture," 171–83. Sinor's view was that the Great Hungarian Plain simply could not support the number of horses and other livestock which the Mongols would need to occupy Hungary. His 1972 estimation, based on American horse-breeding statistics and the assumption that each Mongol soldier required an average of three horses, was that the Great Hungarian Plain could not support a Mongol force larger than 68,640 troops. Decades later, Sinor had revised his calculations, estimating that Hungary could support 83,027 Mongol occupiers. For a detailed comparison of his estimates, see: Pow, "Climatic and Environmental Limiting Factors."

for the withdrawal, the consequences of the invasion, etc.) obviously should use the full variety of tools and perspectives available to gain insight into the historical past.

A key issue in looking at the role of environmental influences on the events of the Mongol invasion pertains to the well-documented famine. Shortly in the aftermath of the Mongol invasion, severe famine affected the local Hungarian population and Büntgen and Di Cosmo view this as a result of the short-term wet and cold spell in 1242. As such, the issue affected the local population but also the Mongols who opted to withdraw, owing in part to the problem of feeding troops and animals alike. Taking a short-term perspective on this episode, the textual material stemming from contemporaries makes it very hard to accept that the famine was not a man-made phenomenon. Thomas of Split viewed it as the direct result of the displaced peasantry being forced to abandon their crop fields for two growing seasons—first they had been unable to harvest in 1241 and then they were unable to sow in 1242.[67] Rogerius, a prisoner in the Mongol camp, noted that some peasants had been allowed to harvest certain crops but only to supply them to the Mongols in 1241.[68] Jan Długosz, who wrote his chronicle much later but who recorded a number of valuable and unique pieces of information, noted that the draught animals had all been seized by the Mongols so that in the aftermath of the invasion, peasants desperately yoked themselves to ploughs in attempt to resume planting.[69] Naturally if the farmers were unable to cultivate crops because they could not stay on their fields owing to the disruption and danger of the invasion, and if their draught animals had been looted, serious famine was going to set in.

It should not surprise us that the sources testify to widespread starvation among the Hungarian population after the Mongols left if we take a broader view of the Mongol conquests beyond the borders of Hungary. Shortly after the invasion, a Dominican emissary, Simon of St. Quentin, was sent into the Mongol Empire to contact their leaders on behalf of Pope Innocent IV. He passed through many regions that had been affected recently by invasions and eventually met with the Mongols in Armenia. In his report, in a section detailing Mongol methods of waging war, he was emphatic: "In every country which the Tartars destroy, famine always follows."[70] What his report would suggest

67 Karbić et al., *History of the Bishops*, 302–3.

68 Bak and Rady, *Master Roger's Epistle*, 210–11.

69 Długosz, *Ioannis Dlugossi Annales*, vol. 4, 59.

70 Simon of Saint-Quentin, *Histoire des Tartares*, 44.

is that Mongol invasions consistently triggered famine in all the affected areas, far beyond Hungary. The famines the Mongols triggered were intentional—a sort of weapon to crush resistance. When we consider Simon's testimony, it is hard to entertain the notion that the starvation which affected Hungary's people in 1242 was the result of a short-term fluctuation in climate, or even a unique experience for populations that had experienced a Mongol invasion.[71]

Taking the long-term perspective on the impact of climate on the invasion and its aftermath, recent studies suggests that famine on such a scale was an extremely unusual phenomenon in Hungary in the period—in fact, even the Little Ice Age did not cause a countrywide famine.[72] Yet, climatic and environmental changes were having an impact. The years of the Mongol invasion (1241–42) belong to a substantial transformation period of the climate regime when we detect the first traces of what has been identified as an early phase of the coolest period in written history. Tree ring-based temperature reconstruction from the Eastern Carpathians shows that summers and winters became cooler in the mid-thirteenth century for a sustained period.[73] Using archaeobotanical remains, a hydroclimatic reconstruction suggests that the decades between 1241–1301 in the Great Hungarian Plain became significantly more humid than in the preceding two centuries, and this higher level of humidity was permanent during the fourteenth and fifteenth centuries.[74] Palaeoglaciological reconstructions from the heart of the Alps reveal a warming phase with a low tide of glaciers in the mid-thirteenth century, while a cooling phase with significantly growing glaciers around 1300 marks the onset of the Little Ice Age.[75] The extraordinarily cold winter of 1241–42 also speaks to the structural transformation of the climate regime in Central Europe. That a short deviation in temperatures became something of a decisive factor during the Mongol invasion in Hungary is clear. As mentioned, after the battle of Muhi, the Mongols had been blocked on the line of the Danube River for roughly nine months. Despite the efforts of the Hungarians, who defended the western part of the river and regularly broke the ice during the severe winter, the Mongols were at last able to cross the ice

71 Civilian populations resorting to cannibalism in China are documented in the biographies of Subutai. See: Pow and Liao, "Subutai," 62; The Hungarian population was also reduced to this, with Długosz noting that mothers ate their own children. See: Długosz, *Ioannis Dlugossi Annales*, vol. 4, 50. For the latest archaeological findings in Hungary that corroborate the accounts, see footnote 29.

72 Kiss et al., "Rossz termések;" Kiss, "Az 1507(–1508). évi ínség." See also: Fara, "Crisi e carestia."

73 Popa and Kern, "Long-Term Summer Temperature Reconstruction," 1107–17.

74 Pinke et al., "Zonal Assessment," 110.

75 Holzhauser et al., "Glacier and lake-level variations," 792.

on horseback and resume their conquests.[76] So climate is documented to have played a decisive role in the course of the invasion—it just seems to have worked to the strategic advantage of the Mongols rather than the Hungarians.

The effects of the climatic change can also be studied in a later period, which is much more characterized by economic recovery and population increase. In short critical episodes, e.g., in the 1310s[77] and the 1330s,[78] the evident medieval climatic change could have certainly presented serious challenges for the population, mainly related to higher floodwater levels.[79] Nonetheless, Hungary lies at the western border of the steppe belt with warm summers and a relative dearth of precipitation for crop production, so that the most powerful limiting factor for agricultural production was drought, even during the Little Ice Age.[80] Thus, in the long-term, the mid-thirteenth-century climatic shift provided more optimal cool and humid conditions for agriculture than earlier. This point identifies a bio-climatological factor behind the fourteenth and fifteenth century's period of prosperity for Hungary's agriculture and its agriculturally based economy.

The direction of the long-term transformation of climatic features in the Hungarian Kingdom had another substantial effect on social organization. Landscape historical research has demonstrated a significant rise in the altitude of settlements in various regions from the eleventh–thirteenth centuries to the fourteenth–sixteenth centuries, e.g., in the Trans-Tisza region,[81] in the Kalocsa-Sárköz,[82] and on the southern shore of Lake Balaton.[83] Árpádian-age settlements were generally built at a lower altitude above-sea level than late medieval ones, and the areas suitable for establishing settlements shrank by the fourteenth–fifteenth century. All these phenomena and some archaeological surveys of abandoned settlements suggest that the environment could have been a protagonist among drivers behind the transformation of the settlement network in the Great

76 Bak and Rady, *Master Roger's Epistle*, 201, 205, 222–25.

77 Kiss et al., "Rossz termések," 27.

78 Ibid., 49.

79 For a comprehensive overview, see: Vadas, *Weather Anomalies*; Kiss, *Floods and Long-Term Water-Level Changes*.

80 Kiss, "Droughts and Low Water Levels," 51–54. Losses of sheep, grain, and bees were particularly mentioned.

81 Pinke et al., "Zonal Assessment," 109.

82 Knipl, *A Duna-Tisza-közi Hátság*, 91–93.

83 Mészáros and Serlegi, "The Impact of Environmental Change," 205.

Hungarian Plain and the depopulation of certain regions of the landscape.[84] The massive desertion which is evident during the period could have begun as early as in the first half of the thirteenth century and the process did not end before the first half of the fourteenth century. Thus, the Mongols did not solely initiate the regional settlement changes, but they gave a very drastic impulse to what was in fact a longer transition. Otherwise, after the withdrawal of Batu Khan's army, the Hungarian king could have carried out reforms to bring about a resettlement of the depopulated region, besides coping with the population losses and destruction.

The Reasons Behind the Mongol Withdrawal in 1242

Greg S. Rogers, noting that it was still a topic of debate which had not yielded a single, satisfying explanation, offered a systematic look at theories for the Mongol withdrawal from Hungary. Writing over two decades ago, he organized the existing theories for the withdrawal into four broad categories. First was the long-standing "political theory" that a succession crisis, precipitated by the death of Ögödei Khan in December 1241, forced the withdrawal. This is mostly based on the explanation which Carpini provided in his report, a few years after the invasion.[85] Secondly, there was the "geographical theory" of Denis Sinor, which offered an explanation rooted in environmental determinism, namely, that the Mongols withdrew because the Great Hungarian Plain offered insufficient fodder for their herds, and they would have had to limit the size of their army to the point that an effective conquest was impossible.[86] Then there was the "military weakness" theory which suggested that stiff resistance during the entire western campaign through Kipchak and Russian territories, and subsequently in East-Central Europe, deterred the Mongols from continuing. Rogers noted there were aspects of the literature which supported it, but also pointed out the all-too obvious reasons why this theory might appeal to some modern scholars.[87] Lastly, there were ideas which can be grouped into a "gradual conquest" theory which holds that the invasion was intended as an exploratory raid rather than a

84 Pinke et al., "Zonal Assessment;" See also: Campbell, "Nature as Historical Protagonist." Concerning the Great Hungarian Plain, see: Vadas, "Late Medieval Environmental Changes."

85 Rogers, "Historians' Explanations," 9.

86 Ibid., 10–11.

87 Ibid., 12–14.

permanent occupation or conquest.[88] He then pointed out the criticisms levelled at each theory which showed that all had problems that prevented any uniform agreement among scholars.[89]

In the time since Greg S. Rogers wrote, novel theories have appeared, but they basically fall within the broad categories he established. Timothy May has suggested that in addition to the impetus to withdraw provided by the khan's death, the Mongols had a "tsunami" strategy of conquering in a series of invasions, rather than a single one, which suggests the "limited goals" theory was at play in the case of Hungary in 1241–42.[90] Büntgen and Di Cosmo's most recent "environmental hypothesis" seems grounded on the same principles as Sinor's theory, namely, that the environment of Hungary proved unsuitable to the Mongols for permanent occupation. The notable difference is that Büntgen and Di Cosmo suggested this resulted from short-term climate fluctuation which can be demonstrated through dendroclimatological methods, whereas Denis Sinor suggested long-term unsuitability based on a highly speculative calculation of the carrying capacity of Hungary—one that certainly is not supported by the livestock data of the Early Modern Period.[91]

In our view, taking a broad perspective relying on a wide range of data, any monocausal explanation appears to be insufficient to explain the withdrawal. However, what can be clearly observed is that there was more resistance to the invasion than has hitherto been acknowledged in scholarship, and a dichotomy exists between how surviving narrative sources and other textual sources, such as the rather overlooked charter evidence, present this resistance. Clearly, Mongol objectives were being foiled. Neither the king, nor even local conglomerations of peasants in many cases, submitted without fighting. By early 1242, the king had escaped to the sea and the Mongol prince, Qadan, was quite incapable of capturing him at Trogir, nor did the Mongols manage to reduce any other major strategic point in Dalmatia.[92] The failure to achieve important goals and possible perceptions of the growing set of strategic problems, for instance, when they advanced into Transdanubia, may have convinced the Mongol leaders that it was best to withdraw for the time being. The fact remains that source materials, originally composed in Mongolian and surviving in the Chinese *Yuan Shi*, detail

88 Ibid., 14–15.

89 For a longer analysis of all four theories and further criticisms, see: Pow "Deep Ditches," 12–45.

90 May, "The Mongol Art of War and the Tsunami," 35.

91 Pinke et al., "Climate of Doubt," 3.

92 Karbić et al., *History of the Bishops*, 298–301.

that the Mongols were rather fearful of the Hungarian army and their princes wished to flee from the country already during the Battle of Muhi in early 1241; they were only narrowly deterred from carrying out the plan.[93] This closely corroborates Carpini's account that the Mongols tried to flee during the battle, and were barely prevented from fleeing the country.[94] It is difficult to ignore a situation where Mongol and Latin sources corroborate one another. Thus, it is a very serious oversight if modern scholarship decides to discount *a priori* the possibility that local resistance could have played any role in the Mongol decision to withdraw in 1242. Of course, other factors such as rumors of the khan's illness in Mongolia and environmental factors could have played a role. Moreover, the withdrawal did not mark the end of the Mongols' interests in Europe and Hungary. Threats and ultimatums continued, and they returned in force to the kingdom in 1285.[95] The withdrawal may well have been a temporary measure initiated by a sense that the occupiers' strategic problems were worsening in early 1242, but it hardly marked the end of the Mongols' imperial ambitions in Europe and elsewhere. Indeed, many polities in the southeast of Europe submitted to the Mongols periodically during the second half of the thirteenth century.[96]

Recovery: Political, Social, and Economic Changes in the Long-Term Perspective

One of the most notable signs of recovery that began immediately and continued in the decades after the Mongol withdrawal occurred in the military sphere. Historian Erik Fügedi found many examples in the charter evidence that contained Béla's stated intention to strengthen the kingdom and better protect its remaining people by creating policies that fostered the quick building of castles on suitable sites. While this wave of castle-building was well-known in Hungarian scholarship for at least a hundred years, Fügedi's own work first provided specific numbers; between 147 and 172 new castles were built between 1242 and 1300, and 22 towns with privileges were established in the first three decades of this flurry of activity. Fügedi was also careful to make the distinction between the "enthusiasm" for this building activity experienced by nobles who were granted incentives, increasing their own power vis-à-vis the monarch, and the ordinary populace whose frustration at bearing the labor

93 Pow and Liao, "Subutai," 66–67; Song, *Yuan Shi*, 2978.

94 Dawson, *The Mongol Mission*, 30.

95 Jackson, *The Mongols and the West*, 201–6.

96 Vásáry, *Cumans and Tatars*, 69–94.

and tax burden sometimes comes through in the extant records.[97] Moreover, his analysis, especially when manifested visually in the form of maps, reveals a rather unexpected and paradoxical trend. The vast majority of the castles built in the second half of the thirteenth century were not situated in the eastern and central plains of the country, which had borne the brunt of the Mongol occupation in 1241–42, but rather close to the western and northern borders of fellow-European rivals such as Austria and Bohemia.[98] This raises questions about intentions for the castles since renewed Mongol invasions would come from the east; the Mongols had merely based themselves on the *Dasht-i-Qipchaq* from which they continued to issue ultimatums and threats of attack.

The puzzling phenomenon of the location of castles can be explained foremost by the phenomenon highlighted in the first point of this discussion. Destruction was severe in some areas and light in others, and the areas, i.e. the western regions, which retained a strong population and economy were the most likely to have the means and necessity to carry out the huge investment of castle building. The distribution of castles has a loose inverse relationship to the distribution of sites showing concentrated signs of Mongol destruction. A second issue relates to the strategic suitability of sites for castle-building. The lessons of the first invasion evidently informed the survivors as to which sites were defensible. For instance, Lapis Refugii in the Spiš region became the site of a later Carthusian monastery after it had proven to be a useful improvised *Fluchtburg* during the events of 1241–42.[99] The emergence of the fortified hilltop town of Buda, as well, is one of the best indicators of this new process.[100]

Béla IV's ability to wage war against his Austrian and Bohemian neighbors, and to interfere in Polish dynastic conflicts, in the immediate years after the Mongol withdrawal is not necessarily a sign that a significant depopulation did not occur during the invasion and subsequent famine, but he was still clearly capable of mobilizing sizeable military forces afterwards. A major factor in this was that he had recruited and settled large numbers of Cumans in his kingdom by 1246. The Prussian chronicler Nicolaus von Jeroschin, writing of Béla's defeat at the hands of Ottokar in 1260, claimed that Béla's army was composed of 40,000 knights—"mercenaries from many countries, according to what I

97 Fügedi, *Castle and Society*, 52–53.

98 Ibid., 57–59.

99 Homza and Sroka, 148–53, 413–17, 450–55.

100 Nagy et al., "Medieval Buda in Context."

have heard."[101] Cumans supplied a strong military presence in the kingdom in the second half of the thirteenth century. Rashid al-Din, writing under Mongol auspices, described Hungary as a massive kingdom stretching from Cumania to the domains of Aquila and that its king commanded an "innumerable army." Nonetheless, he contended that the Golden Horde's Noqai had managed to conquer Hungary after attacking it incessantly.[102] It is significant that Rashid al-Din's description of the Hungarians' innumerable army refers to his own context of the late thirteenth century and the Mongol invasion of 1285. While it exceeds the scope of this work to discuss that second invasion in detail, it should be mentioned that the Mongols encountered much more effective resistance which reveals that lessons from the first invasion had been learned.[103]

Beyond military trends, looking at the long-term developments taking place in Hungary for roughly a century after the Mongol invasion sheds light on the events and their impact. There is a basic dichotomy in the historical interpretation of the period from the mid-thirteenth to the mid-fourteenth century concerning major processes taking place in Europe, particularly regarding crisis periods and the recovery following them.[104] In the long-term context, significant changes took place in Hungary following the invasion. In the second half of the thirteenth century, it adopted the social and economic innovations which made possible the thirteenth-century expansion and development in Western Europe (agricultural production systems, peasant economy, urban development), and further innovations appeared in the first half of the fourteenth century (*hospes* population, free land, new areas for colonization, etc.), a period characterized by social and economic resilience, including in an urban context.[105] The challenges of climate change in the period after the Mongol invasion remained at the local or small-scale regional level, unless man-made problems, namely, the side effects of war, contributed to the environmental stressors.[106] Probably the first period of largescale animal export to southern German towns and to northern Italy (Venice) contributed to Hungary's favorable conditions; the

101 Fischer, *The Chronicle of Prussia*, 180.

102 Jahn, *Frankengeschichte*, 53. Jahn opined that Rashid al-Din's mention of his own contemporary in the Golden Horde, Noqai, having conquered Hungary, means that this is a reference to the major 1285 invasion. Noqai was the commander of Mongol forces in that abortive invasion.

103 No major studies exist in English, but two excellent studies on this episode exist in Hungarian. See: Székely, "Egy elfeledett rettegés;" Szőcs, "Egy második tatárjárás."

104 Laszlovszky, "'Per tot discrimina rerum'," 50–51.

105 Kubinyi and Laszlovszky, "Demographic Issues," 61–63.

106 Kiss et al., "Rossz termések;" Fara "Crisi e carestia."

growth and overpopulation of urban centers elsewhere worked as a positive factor in Hungary's development, as the relatively underpopulated kingdom started to become a major food exporter for these areas.[107] Other factors, such as intensification of silver and gold mining, contributed to Hungary's prosperity in a significant way.[108] The combined elements of a strong economy, such as its mines and animal husbandry-centered complex agrarian production, coupled with a stable political system and with regional cooperation of local kingdoms, resulted in a subsequent period of rapid development.

Conclusions

Based on the preceding discussion we can draw the following conclusions:

1. Regarding the destruction inflicted by the Mongol invasion, there is little reason to persist with the debate on whether it was a very low or very high percentage of the population that died as a result. There is no relevant source material which can be discussed in such precise terms, but the events following the withdrawal of the Mongols make us rather skeptical of higher estimates. New archaeological data combined with a wide range of sources can lead to very detailed spatial analyses pertaining to the level of destruction on a regional basis, as well as characteristic features of that destruction. The number of archaeological sites and data is continuously increasing, adding to our knowledge of the course of events. From the combination of data, we have to conclude that significant parts of the country were not heavily destroyed. Research on the hoards of the period and the medieval settlement, church, and urban network also support the conclusion that the destruction of people, settlements, and infrastructure was very unevenly distributed. Furthermore, the resistance of Hungarian forces, even after the defeat at Muhi, was significantly more sustained than has been suggested by previous scholarship, particularly in the western part of the kingdom.
2. In accordance with the preceding point, some of the destruction was connected to environmental issues, and the significant famine which appeared as the Mongols withdrew in 1242. That there was a unique environmental challenge is now clearly demonstrated not only by written

107 Laszlovszky, "Agriculture in Medieval Hungary," 90.

108 Laszlovszky et al., *The Economy of Medieval Hungary*, 29–30. The editors here discuss the range of scholarly theories on the drivers behind Hungary's late medieval recovery and prosperity.

evidence but also by climate reconstructions. Nonetheless, the balance of evidence suggests that it was basically a man-made famine, albeit one that could have been exacerbated by environmental changes that were taking place. This conclusion is especially plausible when we consider that the natural long-term changes were much more severe in the decades following the invasion, particularly the first decades of the fourteenth century, and still they did not create the issue of an enduring countrywide famine.

3. Regarding the reasons for the Mongol withdrawal in 1242, no monocausal explanation can be offered. There were a host of factors at play, but the basic issue seems to lie with the objectives of the Mongols. As the invasion progressed, they were unable to achieve key objectives like capturing the king or obtaining his submission. Sources from a Mongol perspective correspond with European accounts that they were already considering withdrawal at the Battle of Muhi, the numbers of the enemy were a problem, and they faced the real possibility of a coordinated counterattack from other hostile parties in the region. Stiff resistance is the one explanation with which we see these textual sources fully corroborate each other at points.
4. The long-term recovery of Hungary was a complex process, and facets of it were not so much initiated as catalyzed by the invasion. The 1285 invasion shows how much was learned from the initial experience, while Hungary proved capable of economic and military growth in the aftermath. The prosperity which Hungary and the surrounding region experienced in the following century, when many other parts of Europe were in deep crisis, suggests that the destruction of Hungary was partial and rather limited in many areas.

In the short-term context, the Mongol invasion of Hungary in 1241–42 was a brief historical episode, but one in which the nobility, clergy, and population of the country suffered an enormous shock. They encountered a little-known and poorly understood enemy—not a raiding band of steppe horsemen, but a well-organized and large army attacking the country with the intention to subjugate or destroy the population. Especially in the Great Hungarian Plain, their tactics inflicted profound destruction. Archaeological evidence now corroborates claims of mass murder affecting women and children.[109] Settlements were

109 This is based on recent archaeological work by Szabolcs Rosta which is underway. Kind information of the researcher.

burned, towns destroyed, and famine was intentionally caused which continued to claim casualties long after the Mongols left the country, having plundered its livestock. It is no wonder that the Mongol invasion imprinted such deep memories on the population.

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Landscape and Fortification of Vienna after the Ottoman Siege of 1529

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This contribution focuses on two issues: first, the land- and waterscape of Vienna in light of modernizations to its fortification; second, the challenges faced in fortifying the city during a period now known as the Little Ice Age. The Ottoman siege of Vienna in 1529 showed that new technology in warfare combined with certain topographic features represented a danger to the town. In reaction to the lasting Ottoman threat, Vienna was fortified with bastions, curtain walls, and a broad moat. The fortifications were surrounded by the glacis, which was cleared of buildings. The emperor's military advisers and Italian fortress architects planned and created an artificial landscape oriented towards military needs. Rivers running through this area, such as the Wienfluss and the Ottakringer Bach, posed strategic problems and had to be dealt with. The Danube floodplain to the northeast of the city was an especially difficult environment to control. Solutions for the waterscape, but also for the hilly terrain in the west had to be found. The city's Danube front was included in the fortifications. This construction took place during a severe phase of the Little Ice Age when heavy rainfall caused frequent inundation and ice jams. High water, unstable sediments, and the erosion of foundations forced planners and builders to find solutions adapted to this special environment. Highlighting these aspects of environment and war in sixteenth-century Vienna is the aim of the paper.

Keywords: Vienna, landscape, waterscape, fortification, bastionary system, early modern period, Ottoman wars, Little Ice Age, climate and history

Introduction

Since the second half of the fifteenth century, the Ottomans had been pushing ever further westward. A decisive victory over the Hungarian King Ludwig II took place at Mohács in 1526. The siege of Vienna in 1529 and the continuing threat from the Ottomans led to a transformation of the immediate surroundings of the city into a fortress and to a rearrangement of the suburbs. The medieval city wall could no longer withstand the new military technology. From 1531 to about 1564, massive fortifications with bastions, connecting ramparts, and a broad moat were built around the inner city (Fig. 1). Large areas of the former suburbs were to be cleared for these buildings, but also for the glacis, the exposed field of fire in front of the moat. In addition, large quantities of building materials and

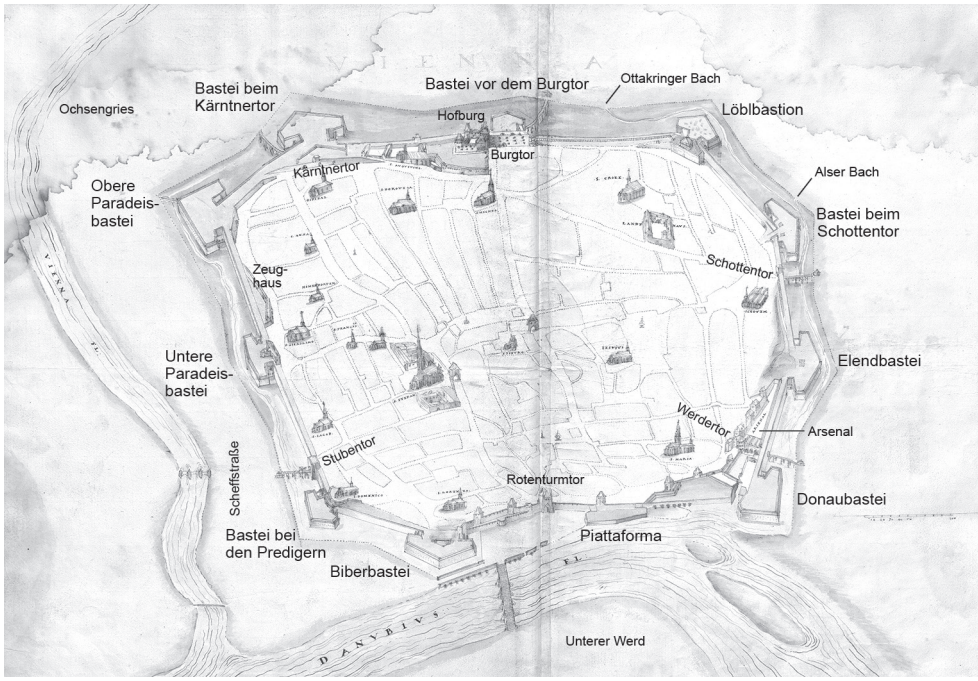

Figure 1. Nicolò Angielini (attributed): The Vienna Fortifications, c. 1570, with the objects mentioned in the text (Photo by Österreichische Nationalbibliothek Cod. 8609 Han, Nr. 7.)

raw materials had to be procured for the extensive construction project. These included timber, such as wooden piles for the foundations and brushwood for fascines, firewood and clay for the manufacture of bricks, and stone, sand, and lime. Stones came not only from the quarries in the vicinity, but also from the demolished houses and fortifications of the suburbs. Additionally, the earthen material excavated from the moat was used for the ramparts and bastions. All of these measures changed the landscape. They affected not only the immediate physical environment of Vienna, but also had an impact on more distant ecosystems. Another aspect was the awareness of geomorphological difficulties affecting the defense of the city. Thus, the hill in the west of Vienna opposite the *Hofburg* near St. Ulrich was perceived as a problem that demanded a defense solution. A great deal of discussions on defense were devoted to the waterscape of the city. The river bed of the *Wienfluss*/Wien River, flowing close to the city wall, offered protection to attackers and represented a strategic problem, which had to be considered. The Danube, with its barrier function, was the focal point of the defense concept. Tributary rivers flowing into the Danube, such as the *Wienfluss*, the *Ottakringer*, and the *Alser Bach*, which flowed into the moat, and the clay extraction in the western suburbs for brick production, had a landscape-

altering effect. Moreover, the Danube river bank, with its fluctuations in water level and floods, caused difficulties for the construction of the fortress. The climate of the Little Ice Age, a period of cooling in the early modern period, also had an impact. When the fortress construction of the 1550s led to a shortage of resources and provoked enormous costs, testing the budget limit, the solutions and improvements to the fortifications ultimately could not be tackled in the long term, despite numerous proposals and projects.[1]

Topography

When studying fortification activity in the sixteenth century, it should not be forgotten that there is a larger context to the small area being researched. Vienna was founded in a landscape that was and still is—even if it is not visible anymore—shaped by water. It is a town beside a large river: the Danube. Vienna was not located directly on the main stream but on top of an older and higher Pleistocene river terrace. The border between the so-called *Stadtterrasse* and the recent, post-glacial alluvium of the Danube, formed up to 12,000 years ago, coincides with the fortifications of the Roman legionary camp *Vindobona* and approximately with the medieval city walls. The *Ottakringer Bach*, a small stream flowing in from the west, passed the Roman camp directly on its western side. The deep former riverbed is still reflected in today's *Tiefer Graben*. The Danube's main course passed the Roman camp on the northern side. Lying on a terrace above the river, the drop to the Danube was immediate. In the third or fourth century the river eroded the northwestern corner of the camp, which afterwards no longer formed a square. The Danube has played an important role in Vienna's history, as did other water courses forming the Viennese waterscape. The upper reaches of the Danube must be taken into account, as must the centuries preceding the sixteenth century. Though Vienna is situated more than 900 kilometers downstream from the Danube's source, the river still showed a mountainous character with a highly variable flow regime, frequent flooding, and almost annual ice jams.[2]

The local floodplain between the different arms of the Danube consisted of morphologically different dynamic zones, relevant to diverse activities and user groups. On the one hand, there were comparatively stable islands like the

1 For the detailed story of the Viennese fortress in the 16th century, see Opll et al., *Wien als Festungsstadt*.

2 Liepolt, *Limnologie*. For detailed information on river morphology, see Hohensinner et al., "Changes in Water," 147.

central parts of the *Unterer Werd*, an island close to town, and separated from it by the Viennese arm of the Danube, today called the *Donaukanal*. On the other hand, great parts of the river landscape were characterized by large, more or less dynamic islands. The development of the highly sinuous main arm in the sixteenth century had already started by the early to mid-fifteenth century.[3] During the first siege by the Ottoman army in 1529, the evolution of the river bend was already at an advanced stage. First indications of a major rearrangement of the Danube channel network are provided by complaints in the 1550s, but there are also hints from the 1530s (Fig. 2).[4]

This shows that the Danube had already started to shift its course southwards within the gorge known as the *Wiener Pforte*, a short breakthrough section upstream from Vienna and Nußdorf (Fig. 1). From the mid-1560s onward, the main discharge of the river no longer flowed through the bend called the *Taborarm*, but instead found its way through the northern river arms, primarily through the *Wolfarm*.[5]

Apart from the Danube and its major changes of course in the third quarter of the sixteenth century, there are other smaller rivers, streams, and aspects of the terrain which were important for strategic considerations tied to fortification. Vienna is situated at the foothills of the eastern Alps formed by the hills of the Wienerwald. Several streams spring from these foothills to the west of the town and discharge into the Danube in the Vienna area, among them the *Ottakringer Bach* and the *Alser Bach*. Both streams flow to the direct vicinity of the center of town. One river in particular, flowing in from the west, attracted the interest of the fortification planners and engineers: the *Wienfluss*/Wien River. This river passes the town close to the walls on the southeastern side before discharging into the former Viennese branch of the Danube (today *Donaukanal*). Carved into the terrain, its river bed turned out to be a problem for the defense of the city. The same was true for the sloped terrain to the west of the walled town, with the monastery of St. Theobald sitting on top of the highest hill in the direct vicinity. We will return to morphology and strategic considerations later on.

3 WStLA, Hauptarchiv-Urkunden, Nr. 3631.

4 NÖHA W 61/C/87/A (875), fol. 2–59; see also the Hohenauer Steig at the Kahlenberg: NÖHA W 61/C/B7/B (876), fol. 423–604; NÖHA W 61/C/7/A (823), fol.; NÖHA W 61/C/3/A (818), January 22, 1537, fol. 229r.

5 NÖHA W 61/C/7/A (823), fol. 20r/v.; Sonnlechner et al., "Floods," 175–77.

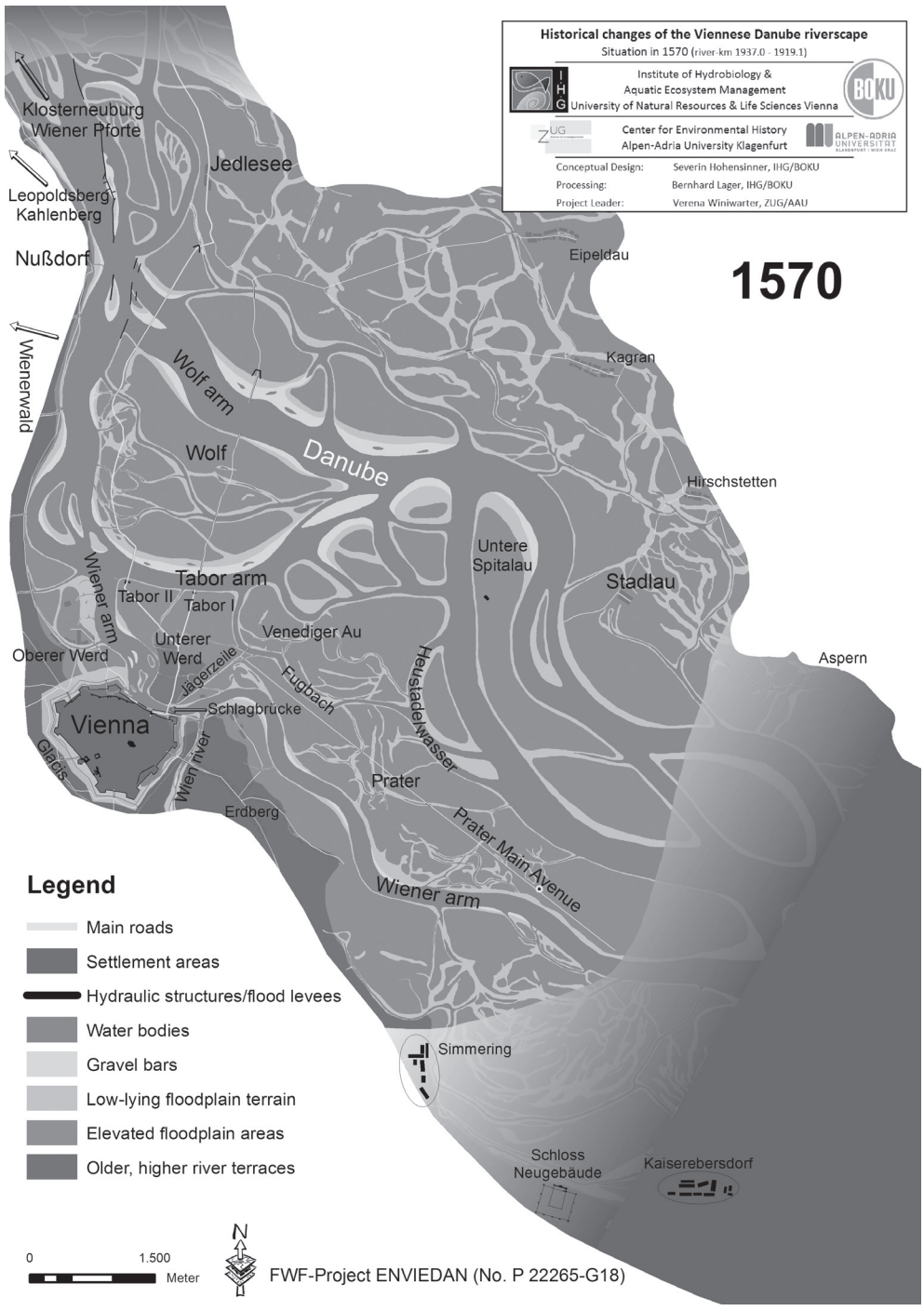

Figure 2. Reconstruction of the Viennese Danube c. 1570
(Reconstruction by Severin Hohensinner and Bernhard Lager)

Building the Fortress

The fifteenth century had brought drastic changes in the field of warfare. Cities were now bombarded by artillery in order to breach the walls. New military techniques required new tactics. The bastionary system developed in reaction to the new weapon, in Italy in particular. However, not only the necessary adjustments to fortress construction, but also the surroundings of the fortifications had to be considered. Open spaces were created, settlements demolished, and the area flattened to deny protection to the enemy. Rivers were diverted, or their barrier function was retained and strengthened.

The Establishment of a Military Landscape Surrounding Vienna—the Construction of the Fortifications[6]

Earliest construction measures (1531–1539)

A transformation in the conduct of war and in military technology took place in the fifteenth and sixteenth centuries. The increasing use of firearms and the development of large caliber artillery and mines, with which walls could be demolished, led to fundamental change in military architecture.[7] Until the Ottoman siege of 1529 the fortifications of Vienna were medieval in character. The city wall had been strengthened against artillery fire by earthen embankments, but with its vertical towers it remained the most important part of the fortifications and the main target of attackers.

In August 1529, immediately before the siege, Ferdinand I of Habsburg, Archduke of Austria and King of Bohemia, Hungary, and Croatia, renewed his call to bring wood for the defense of Vienna as quickly as possible, in order to equip the city with fences, bastions, and bulwarks for cannon.[8] The houses, churches, monasteries/nunneries, and hospitals of the suburbs were only evacuated, set alight or demolished when the Ottoman army was in their immediate vicinity. Wooden roofs in the town were dismantled in order to prevent fires spreading. Such measures were not enough, however. The strength

6 The basis of the following are two publications by the authors: Krause, "Erste Türkenbelagerung von Wien," Krause and Sonnlechner, "Wien wird Festungsstadt."

7 Burger, *Landesfestungen der Hohenzollern*, 14–18; Reichhalter, "Von der Ringmauer zum Festungswall," 149–53.

8 FHKA Gedenkbuch 33, fol. 42v.

of the attackers and their mining tactics meant that the city wall was no longer sufficient for defense. The city survived the attack only because the much more numerous enemy had supply problems and because of the very bad weather that autumn. The Ottoman retreat ruined the suburbs, and there were wide breaches in the city wall beside the *Kärntnertor* (Carinthian Gate), but above all the fear that it might not be possible to withstand a second attack remained. Ferdinand I and his advisors thus sought better defense solutions to combat fears about security. One year after the siege Ferdinand decided to develop the inner city as a fortress, excluding the suburbs, and to strengthen the city wall with *Bollwerke* (bulwarks).[9] According to Ludwig Eberle, nine bulwarks were planned.[10] In the first phase, several structures were to be placed against the outer side of the city wall, while in-between several elevated artillery platforms (cavaliers) would be raised inside the wall and the moat would be defended by flanking positions. The construction of the *Bastei vor dem Burgtor* (Bastion before the Castle Gate), the so-called *Spanier* (Spaniard), began at the beginning of March 1531. The demolition of walls from buildings of the medieval suburb during the excavation of the foundation trench led to higher costs than planned.[11] The erection of the *Bastei beim Schottentor* (Bastion beside the Scottish Gate) followed soon afterwards. The new bastions jutted far out from the medieval city wall and thus extended into the former suburban area. People who lost their houses and ground in the suburbs were resettled. Those whose occupations needed running water were to be settled in the *Scheffstraße* area on the city side of the Wien River between the *Stubentor* (Stuben Gate) and the Danube. Their new houses and workshops were in future to be built not too close to the fortifications and only of wood, so that they could be removed easily in case of siege. An exposed field of fire was to be created in front of the moat (the glacis), so that the area was easily observable and offered no cover to the besieging enemy. The sources show that the ban on erecting buildings within 50 fathoms of the moat was repeatedly violated well into the 1570s.[12] In October 1531, financial difficulties began and activity was on the verge of grinding to halt. The approaching winter cold was a further problem. The Viennese city council also faced high costs, caused by the demolition of (city) towers and the clearance of the moat at that time. It was making slow

9 NÖLA Ständische Akten A VIII 9, September 8, 1530, fol. 10r–11v.

10 Eberle, "Wien als Festung," 220.

11 NÖHA W 61/C/3/A, March 10, 1531, fol. 93r–95v; Camesina, *Urkundliche Beiträge*, no. II, 51 f.

12 Camesina, *Urkundliche Beiträge*, no. V, 55; KA HKR, 1558 February; Expedit 119, fol. 303r; other examples in Eberle, "Wien als Festung," 261 f.

progress in the construction of the *Bastei bei den Predigern* (Preachers' Bastion) because of a shortage of both personnel and money.[13] The appearance and construction details of these bastions remain unknown, with one exception—the *Bastei vor dem Burgtor*. This is thought to be the first angular bastion in the German-speaking area. It survived into the seventeenth century[14] and even after the new castle bastion was built to protect the *Burgtor*. The earliest structures of the new fortifications—called bastions, bulwarks, or "cats" (cavaliers)—appear to have been unstable and to have been rather provisional in nature. The sources imply that the activities were something of a damage limitation exercise and that a comprehensive masterplan, which took into account the strategic situation and included adequate solutions, resource management, and financing, was still absent.

The strengthening of the fortifications on the Wien River side of the city took place between 1536 and 1539.[15] Work is mentioned in the sources at the *Biberbastei*,[16] on an earthwork (*Wasenbastei*) beside *Stubentor*,[17] at the earthwork known as the *Heynersbastei*, and at a further small earthwork that lay between these last two[18] and which appears to have been a predecessor of the later *Untere Paradeisbastei* (Lower Paradise Bastion).[19] The use of the word *Wasen* (= *Rasen* = turf) indicates that the structures largely consisted of earth with a covering of turf. Nevertheless, stone from the abandoned suburban defenses and buildings was also salvaged and reused in the new fortifications.[20] In 1539 a ship—a so-called *Siebnerin*[21]—was bought for the purpose of sinking it in the Danube somewhere between two city towers, the *Salzturm* (Salt Tower) and the *Rotenturm* (Red Tower).[22] It was probably intended to help strengthen the river bank or as the foundation of a built structure. Between 1540 and 1543 there are no sources which tell us about any significant progress in the construction of the

13 NÖHA W 61/C/3/A, October 9, 1531, fol. 90r–91v; Camesina, *Urkundliche Beiträge*, no. VI, 56.

14 Jeitler, "Schriftquellen," 47; Jeitler, "Burgbastei," 176–83.

15 For this phase, see also Eberle, "Wien als Festung," 221.

16 WStLA, OKAR 1536, Ausgaben, fol. 18v, 1537/38, Ausgaben fol. 15r, fol. 17v, 18r/v, fol. 19r.

17 E.g. WStLA, OKAR 1536, Ausgaben fol. 17v–18r.

18 WStLA, OKAR, Ausgaben 1538, fol. 20r und 25v; WStLA, OKAR, Ausgaben 1539, fol. 24v–25v, 29r/v and 31v.

19 Perger, *Straßen*, 27 s. v. Braunbastei. Thus called from 1684 onwards (Camesina, *Urkundliche Beiträge*, no. XXXVI, 91).

20 WStLA, OKAR, Ausgaben 1536–1539, passim; for the medieval suburban defences, see: Opll, *Alte Grenzen*, 43–56.

21 Typical transport ship on the Danube, used for among other things to carry salt.

22 WStLA, OKAR, Ausgaben 1539, fol. 22r.

fortifications. Intensive enlargement work took place later after the appointment of Italian fortification specialists. Bastions were then built which were so strong and large that they remained in use into the nineteenth century.

The construction of five large bastions and the broadening of the moat (1544–1555)

This phase saw the planned extension of the bastion system in the Italian manner and is characterized by a new type of bastion: the bastions are clad in masonry, larger and stronger, and include open flankers (recessed artillery emplacements) for the better protection of the moat area. Between 1544 and 1555 five such bastions were erected, which flanked each other on the landward side of the town. The bastion between the *Burgtor* and the *Schottentor* (later known as the *Löblbastion*) was built between 1544 and 1548. In response to the hill beside St. Ulrich in front of the fortifications, thought to be a potential problem in the case of siege, the bastion was equipped with a particularly high artillery platform (cavalier). A crack in the masonry opened up at an early stage and necessitated repairs.[23] Similar problems developed at the bastion beside the *Schottentor*. The subsoil had not been sufficiently strengthened to support the large, heavy walls. At almost the same time another new bastion was being erected on the other side of the city beside the *Stubentor* in place of the earlier *Bastei bei den Predigern*. It is also referred to as the Town, Burghers', *Hollerstauden*, or Dominican bastion. The Italian fortifications engineer Dominico Illalio (Domenico dell'Allio, born c. 1515, died 1563) designed the bastion in 1544 and marked out its outline on site.[24] A cavalier behind the bastion was begun in 1545, which was raised up with earth from the city moat.[25] The stone bastion with recessed, open flankers, and including the cavalier, which appears to have been finished in 1546,[26] seems to have been something of a prototype for further bastions.

Nevertheless, the system of bastions in the Italian manner remained unfinished and in some places the fortifications would not have been secure if a new siege had taken place.[27] Finances were insufficient, leading to a delay in

23 Jeitler, "Schriftquellen," 51.
24 WStLA, OKAR 1544: Ausgaben, fol. 16r und 18r.
25 WStLA, OKAR 1545: Empfang, fol. 16r und 17r.
26 Camesina, *Urkundliche Beiträge*, no. X 59 f.
27 Eberle, "Wien als Festung," 223.

the completion of the section between *Stubentor* and the *Biberbastei*.[28] The new bastions extended far out into the approaches of the medieval city wall and thus occupied very much space, so much that the surrounding moat had to be broadened with a great deal of effort.[29] The material thus extracted was piled up to create the body of the bastions.

Francesco de Pozo was the responsible master builder for the *Bastei beim Kärntnertor* (Bastion beside the Carinthian Gate), which was erected 1548–1552. The excess earthen material from the foundation trenches was to be brought out of the city to the gardens and cemeteries and spread out there, while buildings on the construction site were to be demolished.[30] Subsidence in the area of the casemates of the bastion led to instability. Again, it would appear that the foundations and/or the subsoil below could not carry the weight demanded.

The so-called *Obere Paradeisbastei* (Upper Paradise Bastion)[31] stood on the other side of the *Kärntnertor* on the Wien River. This was Vienna's largest bastion. It was erected in this phase in place of the earlier *Heynersbastei*. The structure appears to have been built very quickly and to have been finished by 1551.[32] It took its later name *Wasserkunstbastei* (Waterworks Bastion) from a pumping station on top of the bastion that pumped water from the millstream into the city.[33] In this case the new fortifications served the needs not only of defense, but also of supply.

The *Kleine Wasenbastei*, which was built on the Wien River side of the city apparently in the place of the *Untere Paradeisbastei*, and which was also called *Jakoberbastei* (Jacobean Bastion) and later *Braunbastei*, was completed in 1555.[34]

Great numbers of bricks were needed for these projects, necessitating the construction of new brickworks in 1547.[35] Brick production relied on large amounts of firewood, which were to be brought in from the floodplain along

28 Camesina, *Urkundliche Beiträge*, no. XII.

29 FHKA VDA 580, 1545, fol. 258r–272v. For the moat, see also Krause, "Stadtgraben," 36f.

30 NÖHA W 61/3/A, January 13, 1548, [Abschrift], 331r-v; Camesina, Urkundliche Beiträge, no. XIII, 64f.

31 Perger, *Straßen*, 153 s.v. Wasserkunstbastei.

32 Camesina, *Urkundliche Beiträge*, no. XVII, 69 f.

33 Eberle, "Wien als Festung," 234.

34 Eberle, "Wien als Festung," 223 und 233. For these terms, see Perger, *Straßen*, 27, s.v. Braunbastei.

35 FHKA NÖK ER 1547-2, fol. 256v. FHKA NÖK ER 1549-1, fol. 207r: In 1549 the abbot of the Scottish (Benedictine) Abbey complained that the extension of the brickworks had led to the loss of a great deal of land subject to the monastery.

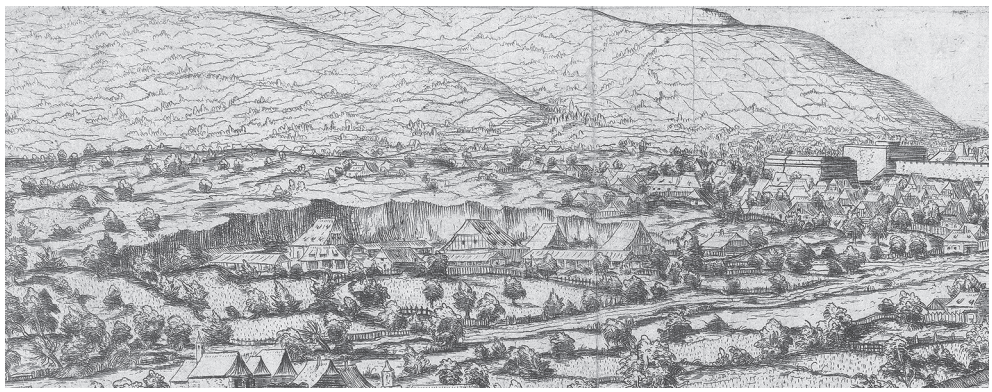

Figure 3. The extraction edge of the *Laimgrube* with the brickworks in the center of the picture. Detail from the Trial of the Assyrian King Sennacherib by Hans Sebald Lautensack, with a view of Vienna in the background, 1558/59
(Photo by © Wien Museum, Inv.-Nr. 31.041.)

the Danube.[36] In 1549 bricks from a total of ten kilns were available for the buildings alongside sufficient lime, sand, and stone.[37]

Most clay was extracted to the west of the city on a hillside called *Laimgrube* (Clay Pit) on the northern side of the Wien River. A view by Hans Sebald Lautensack, dated 1558/59, shows the drying sheds and the cut edge created by clay extraction (Fig. 3). In 1548, further north from the *Laimgrube*, the *Ottakringer Bach*—referred to as "a little stream from St. Ulrich"—flowed to the stone bridge at *Kärntnertor*. Flooding created at that point an undesirable, elevated *Gstätten*, by which is presumably meant a deposit of sediment and other material carried by the stream. In order to prevent the enemy entrenching themselves behind the cover that this deposit provided, it was to be removed and the water diverted into the city moat, as had previously been the case and from which point it could flow into the Danube.[38] These measures led to landscape changes in front of the city. The substantial, protruding fortifications also meant that houses, gardens, and outbuildings in the vicinity, both within and without the city, were adversely affected and sometimes had to be removed.[39]

The plans by Bonifaz Wolmuet and Augustin Hirschvogel, from 1547 and 1549, respectively, reflect developments towards an overall concept for the fortifications (Fig. 4). They show both those bastions that already existed, and

36 FHKA NÖK ER 1548-1, fol. 37r.

37 NÖHA W 61/C/3/A, 1549 June 9, fol. 363v–364r.

38 Camesina, *Urkundliche Beiträge*, no. XIII, 65.

39 Complaints from people affected, claiming compensation, have survived: NÖHA W 61/C/3/B (819), 1550, fol. 367r–389v; April 27, 1551, fol. 428r/v.

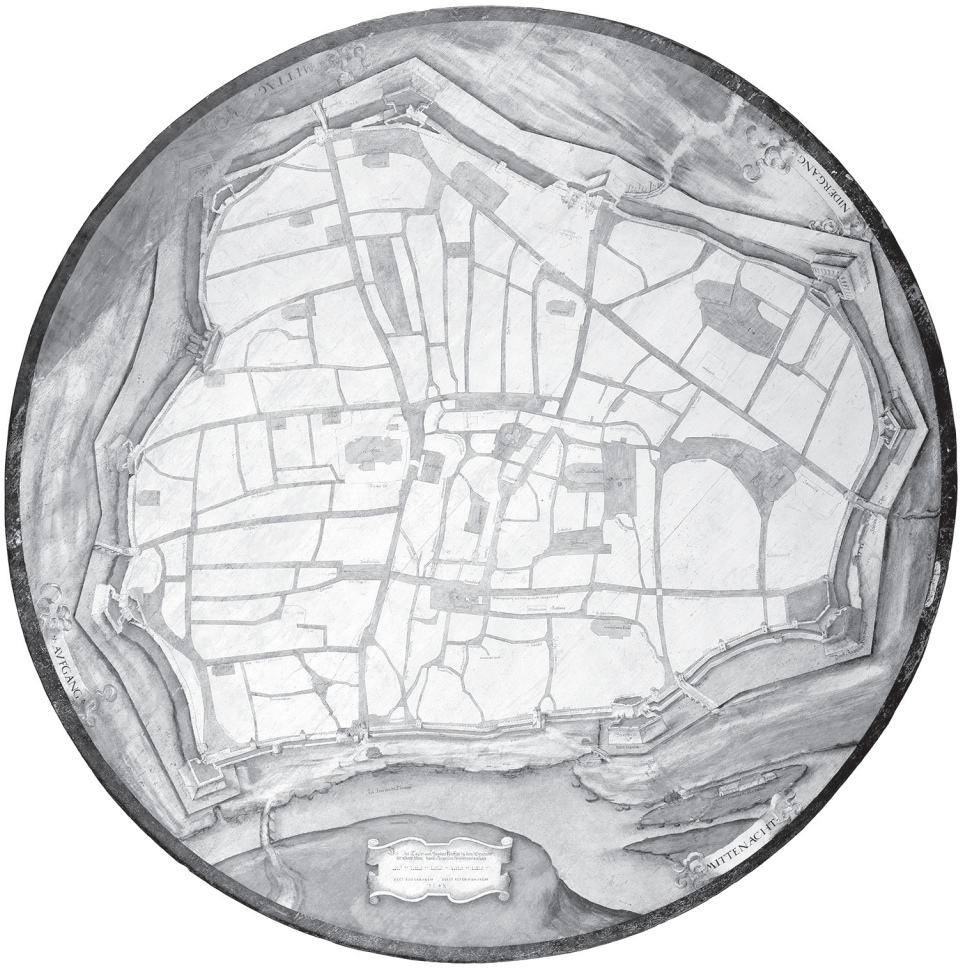

Figure 4. Augustin Hirschvogel: Plan of Vienna, painted on a table top, 1549
(Photo by © Wien Museum, Inv. Nr. 31.022.)

also those which were still in the planning phase. Initially, the course of the medieval city wall was maintained and the bastions were built against the wall. This was still a long way off from an ideal fortification, i.e., a regular, polygonal plan. The terrain, climate problems, the urban landscape, and fear of the likely high costs delayed or prevented the realization of more ambitious plans. The new bastions in this phase served to protect the city gates on the landward side. The integration of the Danube riverbank into the new fortifications and the necessary changes involved were to take place in the coming years.

Fortification of the Danube riverbank and erection of the curtain walls (1557–1563)

The last construction phase under Ferdinand I was marked by acute financial problems, but at the same time by professional planning and attempts to build long-lasting structures appropriate to "modern" military technology. The superintendent of works, Hermes Schallautzer, and following his death in 1561, Thoman Eiseler, as the highest-ranking engineer, were responsible for the construction work between 1557 and 1563. Concepts, estimates, reports, bills, and sketches have survived from this period. The section of the fortifications from *Schottentor* along the Danube to the *Biberbastei* was now to include "modern" bastions and an arsenal. The moat was widened in many places. From 1560 onwards curtain walls were built in front of, sometimes substantially before, the medieval city wall. They were broad ramparts clad in masonry, which connected the bastions. Masonry-clad curtain walls were not erected everywhere, however. Some stretches of the medieval city wall remained intact. New buildings, such as armories, foundries, an arsenal, and a storehouse, were designed directly behind the curtain walls, which served the supply and accommodation needs of the military, but also the storage and repair of military equipment. Work began on the later so-called Lower or Imperial Armory c. 1558.[40] This stood in the area east of the street *Seilerstätte* on the medieval city wall, which at this point followed the undercut former bank of the Wien River, which swung inwards toward the town in a great bow.[41] The new curtain wall between the *Untere* and *Obere Paradeisbastei* was built in a straight line well to the east of the old wall so that the area of the bow was absorbed into the fortifications. The bastion beside the *Schottentor*, which was still not in a satisfactory condition, was to be renewed. Two high cavaliers were being built behind it.[42] Buildings had to be demolished as part of the preparation of the building sites for the *Elendbastei* and the *Donaubastei* (Danube Bastion, also called the *Neutorbastei*) and for the arsenal between them.[43] The arsenal was to be erected outside the medieval city

40 KA HKR Registratur 634, 1558, September, fol. 1r. From c. 1572 onwards the two armouries were referred to as the "Lower" (between the two *Paradeisbasteien*, on the street Seilerstätte) or "Upper" (in the Salzburger Hof complex in the Renngasse) armouries (NÖHA W 61/C/90/B, 1572, fol. 853–857; FHKA Hoffinanzprotokolle E 1576 [W 321/W 322], fol. 157v; KA HKR Protokollbuch 162, 1576, fol. 218r; KA HKR Protokollbuch 158, 1574, fol. 178v); Perger, *Straßen*, 132 s. v. Seilerstätte.

41 Krause, "Stadtgraben," 33 and fig. 2.

42 KA HKR Registratur 634, September 1558, 1r.

43 NÖHA W 61/C/3/B, July 8, 1558, fol. 529r.

wall beneath the escarpment of the Danube,[44] connected by a canal to the river and to house shipyards, workshops, and a small fleet.[45]A new storehouse was to be erected on the site of newly demolished buildings to the south of the arsenal, close to the Salzburger Hof.[46] By 1561 building work on the two bastions and on the arsenal appears to have been largely completed.[47] An undated perspective sketch, which was copied by Albert Camesina in 1879, but is now lost, shows the progress of the building work on the house for the officers and the commander of the arsenal and also on a neighbouring wall, including the former area of those houses which had been demolished to make room for the fortifications.[48] The transformation of the Danube front began towards the end of this phase. A *piattaforma* (platform, Fig. 5) and a new bastion, on the site of the older *Biberbastei*, were to be built, although unstable subsoil, a high water table, and unfavorable weather made the implementation of the projects very difficult. Another negative factor was the precarious financial situation, which deteriorated from

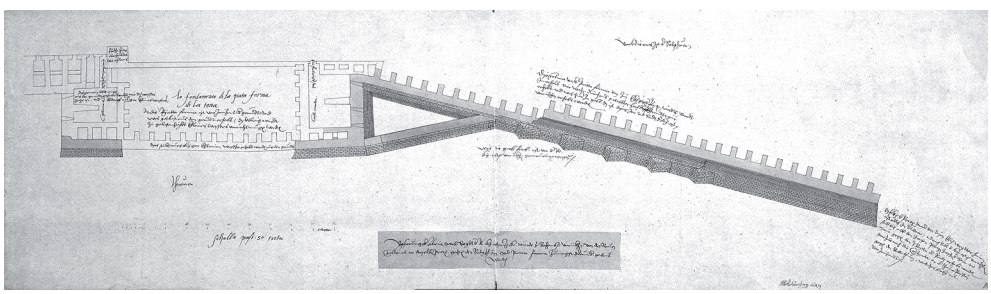

Figure 5. Plan of the building site of the *Piattaforma* (left) and the adjacent curtain wall with cutwaters, copy by Albert Camesina, 1879. (Photo by WStLA, Kartographische Sammlung, Allgemeine Reihe, Pläne und Karten: Sammelbestand, P1.220/4)

44 KA HKR Akten 2, Expedit 109, 1558, August, without folio.

45 Jeitler, "Historische Quellen zur Elendbastion," 216.

46 KA HKR Akten 3, Registratur 634, fol. 1v.; NÖHA W 61/C/90/A fol. 233 (copy of the 19th century) and fol. 396r/v (1547 September 8). See also Veltzé, "Kriegswesen," 208–11. A new Imperial Armoury was built in the Renngasse on the site of the Salzburger Hof 1568/1569: FHKA Hoffinanzprotokolle E 1569 (W 282/W283/W284), fol. 24r und 290v; FHKA Hoffinanzprotokolle E 1568 (W 277/W278/W279), fol. 407r; KA HKR Protokollbuch 150, Registratur, 1569, fol. 147v; NÖHA W 61/C/90/B, 1568 August 11, fol. 825–28.

47 In recent years the Stadtarchäologie Wien has had the opportunity of uncovering and recording the remains of bastions and curtain walls, which were demolished from 1858 onwards, in several places. Excavations at the *Elendbastei* and the *Neutorbastei* led to new results concerning the type of construction and the building materials used, and have been published in two monographs: Sylvia Sakl-Oberthaler et al., *Von der mittelalterlichen Stadtmauer*; Mader, *Die Residenzstadt Wien an der Donau*.

48 WStLA, Kartographische Sammlung, Allgemeine Reihe, Pläne und Karten: Sammelbestand, P1.220/1.

1561 onwards and led to the possibility that work on the fortifications and on other imperial buildings in and around Vienna would not be able to continue at a reasonable pace.[49] The reason for the financial crisis was the enormous costs, which the fortifications against the Ottomans, particularly in Hungary and Croatia involved.[50] In Vienna work came to a temporary halt more or less at the time of the death of Emperor Ferdinand I in 1564. In the following decades we know of suggested improvements by fortifications specialists such as Bartholomeo de Rocchi, Carlo Theti, and Daniel Specklin, but these were not realized.[51] Only in the seventeenth century, in particular under Leopold I (1640–1705), did a further enlargement of the fortifications take place through the addition of ravelins, a covered way, and places-of-arms on the counterscarp. Later still, in the eighteenth century, a system of countermines below the glacis was among the measures taken.[52]

Climate and seasonal construction works

As far as we can tell from the sources and from literature, the timespan between 1547/48 and 1572 in particular brought years of heavy flooding and regular ice jams, both of which caused severe damage. The years from 1565 to 1571 seem to have been the worst in this respect.[53] This period corresponds with the Grindelwald Fluctuation, the first extreme phase of the Little Ice Age lasting from the 1560s to the 1620s.[54]

Assessing the influence of climate change on the changes and dynamics of the Viennese Danube in the sixteenth century is difficult, but embedding the findings into the larger frame of a central European climate history helps interpret the dramatic changes taking place in the riverscape during those

49 KA HKR Protokollbuch 142, 1562, fol. 81v; fol. 82r; 1563 fol. 130v, 135v.

50 Pálffy, "Preis für die Verteidigung," 20–44, esp. 42 f.

51 Opll, Krause and Sonnlechner, *Wien als Festungsstadt*, 489 no. 19, no. 21. Württembergische Landesbibliothek Stuttgart, Handschriften, Cod. math. 4: Daniel Specklin, Codex Mathematicus (ca. 1575); Accessed April 17, 2018. http://www.deutschefotothek.de/gallery/freitext/Codex+mathematicus or http://digital.wlb-stuttgart.de/sammlungen/sammlungsliste/werksansicht/?no_cache=1&tx_dlf[id]=4364&tx_dlf[page]=1

52 Eberle, "Wien als Festung," 223 f; As Terminus ante quem: FHKA Hoffinanz Österreich Fasz. 638; 1702 Juni 1 [Konzept], without folio, with reference to damaged countermines.

53 See foremost NÖHA N 27/B/1-3 (460–62); W 61/C/7/A and B (823, 824); W 61/C/87/A and B (875, 876); also WStLA, Bürgerspital, Spitalmeisterrechnungen, Jg. 1548–1572.

54 Pfister, "Little Ice Age;" Pfister, *Wetternachhersage*; Pfister, "Climatic Extremes;" Glaser, *Klimageschichte;* Hohensinner et al., "Changes in water and land," 148–53.

years. The ice jam flood in 1565 and several severe winter and summer floods in 1566 can be seen as the turning point in the hydromorphological history of the Viennese Danube. At that time, the river definitively relocated its main current to the northern *Wolfarm*. Both sudden erosion processes and gradual channel shifting contributed to the overall instability of the Viennese floodplain and caused numerous disputes concerning land properties and problems with transport routes and infrastructure in the riverscape.

Weather and climate (change) were of great significance for the construction of the fortifications on the Danube front. As early as 1531 the Imperial Military Council emphasized that fortification work would go ahead despite the cold and temperatures below freezing point, thus revealing one of the problems facing the construction work: the rigors of the weather.[55] In 1537 and again in 1546 the mayor and the city council complained to Ferdinand I that the Danube bridges were damaged or had been torn away by the heavy rain and ice flooding.[56] The staff available for repairs was overworked. Apparently the flood had also damaged parts of the fortifications at the *Salztor* (Salt Gate) and *Rotenturmtor* (Red Tower Gate) near the Danube.[57]

The fortification works were obstructed in 1549 by a high water table, which rose steadily in heavy rains. In a desperate step, the builder planked the entire surface of the building and tried to expel all the water. The cost of this measure was considered too high.[58]

A letter dated December 20, 1561 from Thoman Eiseler to the Emperor gives us a glimpse of the seasonality of construction activity, which was only able to progress when the Danube's water level was low, as was normally the case in winter. Eiseler expressed his hope that the water would remain low for two months, which would allow him to complete the work. The Danube and its variability had to be considered in planning and determined the seasonal course of work.[59] It soon became clear that this hope had been in vain. On St. Thomas's Day, December 21, the water began to rise. On January 5, the groundwater level had dropped again, so that Eiseler tried to resume work on the *Piattaforma*. But on the night of the 10th of January and again on almost the entirety of the

55 Camesina, *Urkundliche Beiträge*, 57 no. VII.

56 NÖHA W 61/C/3/A (818), January 22, 1537, fol. 229r.

57 Camesina, *Urkundliche Beiträge*, 63 no. XII: *Item so haben die grossen jetzgewesen güssen die wuern unnd sennkh beim Saltz unnd* Rotenthurn *seer zerissen, allso das dieselben widerumben aufs paldist, sambt den wuern beim Täber gemacht werden muessen.*

58 Camesina, *Urkundliche Beiträge*, 67 no. XV.

59 Camesina, *Urkundliche Beiträge*, 75 no. XXII.

following day it again rained very heavily. Eiseler knew about the connection between rain in the upper reaches of the Danube and the swelling of the river and feared that it might have rained a lot in the catchment area of the Danube, provoking a renewed expansion of the river. In the spring of 1562 Eiseler urged the emperor to settle the outstanding claims of all contractors so that the workers would be able to take advantage of a potential low water period and proceed with the fortifications.[60] On May 26, he mentions in a letter to Maximilian II three times *klaihn wasser*, i.e., a low water table, as the framework for a reasonable deployment of personnel. A low groundwater level was obviously a prerequisite for good construction progress.[61]

The management of natural dynamics was carried out with appropriate precautionary measures. Construction had to be based on the water and not on the favorable season from the workers' point of view. They had to work in extreme summer heat and in icy winter cold, just as the river allowed.

Strategic challenges to the fortification work caused by topography

Fortifying the city was challenged by environmental prerequisites. As already mentioned, the hilly terrain to the west of the city and also the waterscape caused problems. Clearing the area immediately in front the fortifications from buildings and settlements was one thing. Coping with the terrain was another. The hill close to St. Ulrich in particular, where the monastery of *St. Theobald* was located (today in the 6th district of Vienna), formed a perfect location for the firing of artillery at the town. This can be found in considerations of the authorities.[62] The well-known fortification architect and engineer Carlo Theti (1529–1589) dealt with this subject. He seems to have offered the emperor and his military council a solution to the strategic problem. Two plan sketches by Carlo Theti were recently published.[63] The first includes the design of a citadel in exactly the

60 Camesina, *Urkundliche Beiträge*, 76 f. no. XXIV: May17, 1562. Camesina, *Urkundliche Beiträge*, 78 no. XXV.

61 Camesina, *Urkundliche Beiträge*, 81 no. XXVIII.

62 NÖHA W 61/C/3/A, August 29, 1538, fol. 237r: *So ist die stat an khainem ort dermassen uberhöhet als zu Sannd Tybold, und wo sich in khryegsleuffen der veind daselbst hin mit geschütz legern wurde, nit allain auf denen plätzen, unnd in denen gassen der stat, sonnder auch in der khunigclichen burgkh vor dem geschütz nyemannds sicher sein mugen.*; also NÖLA, Ständische Akten, A VIII, Nr. 9: Oktober 11, 1593, fol. 24r/v: *Zum andern ist aussen auf der Laimgrueben, vor dem purckhthor bey gmainer stat ziegelstadel ain sehr schedliche anhech fast wie ain perg, darauf leicht fünff oder sechs grosse stuckh [geschütz] khennen darauf der feindt gerechtß hinein in die purckh schiessen khönd*t.

63 Mollo, "Carlo Theti," fig. 17–18.

place described, west of the city near *St. Ulrich*, and also an additional fortress wall protecting the Imperial castle. The second reflects the state of the Vienna fortifications. These sketches accompanied Theti's elaborating manuscript from 1576, "Discorsi vari in materia di fortificazione per Vienna, con disegni," which has survived in the Biblioteca Ambrosiana in Milan[64] (Fig. 6). The citadel was never built.

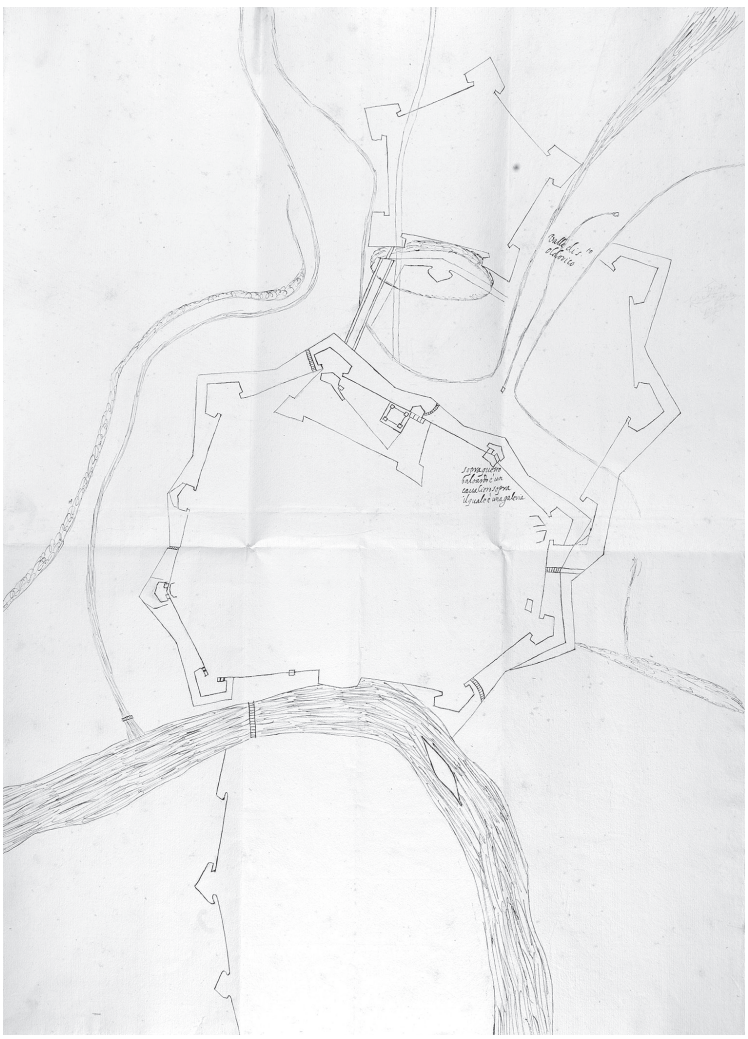

Figure 6. Carlo Theti: Sketch of the Viennese fortress with the project of a citadel on the hill near St. Theobald close to the valley of St. Ulrich (*valle die S.to Olderico*)
(Photo by Biblioteca Ambrosiana di Milano, D 183 inf., f. 9r)

64 Biblioteca Ambrosiana di Milano, D 183 inf., f. 9r.

The second major strategic problem was the Wien River/*Wienfluss*. The river itself flowed in from the west in a wide gravel bed, in some areas with several branches, and passed the walls southwest of the city. It took a winding route, especially with the bend called *Ochsengries*. From 1529 the Wien River was a frequent topic in the discussions of the military about the defense of the city.[65] Particularly noteworthy are the statements of the military councilors during the deliberations on the fortifications along the Hungarian, Italian, and Croatian borders in August and September 1576, which were presented to the emperor and his councilors from October to December 1576.[66] The military discussed the problem of the half-filled urban moat, which was not a proper barrier, and the broad river basin of the Wien River, which offered the enemy an opportunity to find shelter when attacking the town. A look at the two Angielini plans handed down in Karlsruhe and Dresden also shows the quite steep edge of the terrain, in particular from the *Ochsengries* in the south—that section of the *Wienfluss* where its course turns 90 degrees to the north—to the area of the *Stubentor* in the north.[67] A particular problem for the military were the settlements in the area between the *Wienfluss* and the moat and city wall. In particular, the millstream with its mills and stone weirs, which feature prominently in the Karlsruhe and Dresden "Angielini" plans, were to be removed and the technical installations destroyed. The entire area should be levelled as far as possible. Even the deviation of the Wien River into the town for cleaning purposes was considered.[68]

A third major obstacle for the fortification works were the waters of the Danube. As described earlier, the water level varied. The climatic extremes of the Little Ice Age made the work even more complicated. The foundations were the most difficult problem. In 1559 trees in the woods belonging to the Scottish Abbey were to be felled to create construction piles for the foundations of a building planned between the *Biberbastei* and the *Donaubastei*.[69] Whether this is a reference to the preparation of the ground for the construction of a curtain wall and/or for the so-called *Piattaforma* is not clear. A dispute among Imperial engineers about the composition of parts of the *Piattaforma*, which was built directly on the bank of the Vienna arm of the river, shows how systematically

65 Camesina, *Urkundliche Beiträge,* no. V (1531), no. XV (1549), no. XXXVI (1576/77).

66 KA AFA, 1576 13/2 (incorrect 1577 13/2 in the index) fol. 46r–51v; Camesina, *Urkundliche Beiträge*, no. XXXVI, 88–96.

67 Opll, Krause and Sonnlechner, *Wien als Festungsstadt*, 314 f. Tables 2 and 3.

68 Opll, Krause and Sonnlechner, *Wien als Festungsstadt*, 93.

69 Archiv des Schottenstiftes, Chronik des Stiftes Schotten, 2. Abteilung, Bd. 1, (copy), 223.

the appropriate construction methods were discussed. The construction of the masonry part of the *Piattaforma*, which following the opinion of master builder Francesco Theobaldi (died 1569) was to be built without Orillons (ear-shaped plan), was underway in 1561.[70] A drawing copied by Albert Camesina reveals the progress of the construction, including of what the mathematician and cartographer Tilemann Stella (1525–1589) called "corners" on the wall,[71] protruding parts which served as cutwaters (starlings) (Fig. 5). The high water table and problems to do with the foundations meant that water had to be

Figure 7. Wooden pile tipped with iron.
(Photo by © Wien Museum, Birgit und Peter Kainz, Inv. Nr. MV 36.442.)

70 Camesina, *Urkundliche Beiträge*, no. XXII, 75 f.

71 WStLA, Fotosammlung, Fotosammlung allgemein, A 463, without folio.

constantly bailed out and also that wood for ever more and longer wooden piles had to be felled. The piles beneath the curtain walls elsewhere could be driven in much deeper than was possible around the *Rotenturmtor*, where they had to tipped with iron. Wooden piles with iron tips were discovered during the construction of an underground car park at Morzinplatz, the former site of the *Piattaforma*, in 1972 (Fig. 7). The last datable tree ring from such a pile was dated to 1554, proving that the object did indeed originate in the period of construction mentioned in the sources.[72] We do not know when exactly the *Piattaforma* was completed, but by 1563 it was sufficiently finished to begin the construction of the flanking positions.[73] The structure was later replaced by the Great *Gonzagabastei*, completed in 1664.[74] The square platform known as the *Biberbastei*, which was built against the eastern corner of the city wall at the confluence of the Wien River with the Danube, was replaced by a large new structure with casemates and recessed flankers between 1561 and 1563. Work on the foundations ran into difficulties because of the high water levels in the immediate vicinity of the Danube then as well.[75] The site had to be bailed out constantly. The area around the *Biberbastei* was incorporated into the moat, while the river front was not equipped with such a ditch.

Surveying the Waterscape in Order to Resettle the Suburbs

In June 1569 we read of a military project to relocate the suburbs to the *Unterer Werd*. On 4 June of that year, the court military councilor Franz von Poppendorf wrote to tell the emperor that there was a great deal of "disorder" in the suburbs. The suburbs and gardens posed a danger. The inhabitants would have to be removed, but they should be offered replacement land on the island called *Unterer Werd* between *Schlagbruecke* and *Alter Tabor*. Areas had already been marked out. The inhabitants of the suburbs could be relocated within a two-year period.[76]

In December 1577 the emperor commissioned Poppendorf to make a draft plan. Poppendorf inspected the *Tabor* with the fortress architect and engineer

72 Wien Museum Inv.-Nr. MV 36442; dendrochronological sampling by Michael Grabner. It is likely that the outer rings were removed during the manufacture of the piles. Many thanks to Michaela Kronberger, Wien Museum, for this information.

73 Camesina, *Urkundliche Beiträge*, no. XXX, 83.

74 Perger, *Straßen*, 56 s. v. Große Gonzagabastei.

75 Eberle,"Wien als Festung," 230.

76 KA HKR, 1569 Juni Nr. 144 Expedit; 1576/89 Carlo Theti presented his suggestions for fortifying Vienna.

Ottavio Baldigara. Baldigara sketched the situation and surveyed the "island" in the Danube.[77] His conclusion was that part of the island would have to be raised to keep it dry and habitable. Any potential settlers who were concerned about the situation should look to the recently built house of Wolff Fischer as a model for all future houses. Fischer had built up the ground so high that the water was not a danger.

The emperor obviously had doubts about the safety of the new urban settlement between *Schlag-* and *Taborbrücke*. In particular, the emperor asked whether the "new town"[78] would not in fact serve the enemy, and thus be harmful to the city. Poppendorf outlined strategic considerations for the defense of cities and the specific problems of the case of Vienna: the main point of a fortress was that all places around it were cleared and that the enemy was thus deprived of the benefits of settled areas. He can therefore not approach the fortress and is not able to entrench his army or artillery. The enemy must, as far as possible, be stopped outside the city, fought and decimated. Another advantage of stopping him in front of the city was that it would then be possible to observe where he planned to attack the fortification. One must hold off the enemy for as long as possible, so that he would begin to run out of provisions and be forced into a war of attrition. Some drawbacks cannot be averted, he wrote, but the suburbs and gardens, which are detrimental to fortification, should be removed, trenches and cellars filled in, and a flat space established around the city. The suburbs were to be relocated to the island—the *Unterer Werd*.[79] The disadvantages of such a new town would not be comparable to those of the previous condition; there was no advantage for the enemy. Even if the island were not fortified, the enemy would have no advantage over the current situation. If the old city were lost, the new one could decide whether to defend itself or to withdraw the inhabitants across the Danube and destroy the bridges behind it.

The populated and fortified island also had the advantage that the enemy would have to split up his camp, with one part south and one part north of the Danube. He would have to divide his Janissaries—that is, the Ottoman elite troops, of which there were generally about 10,000— because he would be forced to attack two cities at once. He could only build his camp in the floodplains on

77 KA HKR, 1569 Juni Nr. 144 Expedit, Attachment entitled: *Die Insel zwischen Schlag- und altem Täber bruggen, abgewegen durch Otavio Waldegara 17. Decembris anno 1577*.

78 The sources use the term "*newe statt*."

79 KA AFA, 1577 (on the cover of the manuscript: "1576") 13/2; Camesina, *Urkundliche Beiträge*, no. XXXVI, 88–96.

flood-prone terrain, which would be to his disadvantage. In addition, he could not use cavalry in those areas, as they were swampy and crisscrossed by ditches.[80] The planned relocation of the suburban population into a fortified new town would, according to the military council, be the only sensible solution to the problems.[81] Nevertheless, this fortress was not realized in the way the military councilors had proposed.

The waters, especially the Danube as a barrier on the one hand, and the populated and unpopulated Danube floodplains on the other, played a significant role in the deliberations of the military council.

Conclusion

The Ottoman siege of 1529 changed the perception of the town. Its inhabitants had painfully experienced the opportunities inherent in new military technology and control of the Danube. The Viennese were lucky to have beaten back the aggressors. As a consequence a new type of fortification was built: the Italian bastion system. Building materials like wood, clay, or stone were taken from the surroundings of the city leading to further changes in the landscape. The immediate vicinity of the walls was totally cleared of settlement. Planners and engineers presented concepts dealing with fortifying floodplain areas and heights overlooking the city after having studied the strategic risks inherent in the land- and waterscape. The process of building the fortifications, which lasted for the entirety of the sixteenth century and beyond, was impeded by the terrain, especially on the side of the city exposed to the Danube. Structures were eroded and seasonal variation of water levels caused problems. The movement of the Danube away from the town in combination with heavy flooding in the years of the Little Ice Age was clearly observed by the engineers. Several measures were taken to convert the Viennese environment into a military landscape, including the strategic use of natural terrain.

80 Camesina, *Urkundliche Beiträge*, 90.

81 Camesina, *Urkundliche Beiträge*, 90 f.

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Not Seeing the Forest for the Trees? Ottoman-Hungarian Wars and Forest Resources*

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The present paper analyzes the relationship of the Ottoman wars to the loss of forests in the Carpathian Basin. An important thesis of twentieth-century scholarship was that the Ottomans were to be blamed for the crash of the so-called "traditional" landscape of the lowlands of the Carpathian Basin. The paper argues that this view needs serious reconsideration, especially in light of research into two interconnected aspects found in a Hungarian region, Transdanubia, that is the focus of the paper. First, we estimate the amount of woodland before and after the Ottoman occupation. Second, we quantify the role military fortifications may have played in wood consumption (and therefore potentially in deforestation). We focus on the central parts of the Transdanubian region. The counties to be examined in more detail (Vas, Veszprém, and Zala) were among those most significantly impacted by the continuous wars in the sixteenth and seventeenth centuries. This area arguably could be indicative of processes in other lowlands and hilly areas in the Carpathian Basin, though bearing in mind that forest regeneration may have been fundamentally different in the territories of lowlands, hilly areas, and mountain ranges.

Keywords: environmental history, Ottoman Hungary, forest cover, timber consumption, earth and wood fortifications

Introduction

The political changes of the sixteenth century significantly transformed the spatial and economic structure of the Carpathian Basin. The Ottomans' gradual occupation of the Great Hungarian Plain and the Transdanubian region (lands to the south and west of the Danube) in the aftermath of the battle of Mohács (1526) led to both settlement concentration and desertion. In this period, Hungarian humanist authors as well as folk songs and other literary sources frequently recall the time before, during the Middle Ages, when the land of

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Hungary was rich and fertile. It is juxtaposed to the recent devastation of the country.[1] This narrative has proven to be a lasting one. Research conducted in the interwar era perceived the Ottoman period (which lasted until the end of the seventeenth century) as one of complete devastation or at a minimum a deep crisis of the land. The most important thesis was that the Ottomans were to be blamed for the crash of the so-called "traditional" landscape of the lowlands of the Carpathian Basin. Two prominent historians of the interwar period, Bálint Hóman and Gyula Szekfű, echoed this view in their *Hungarian History*. In Szekfű's chapter on the seventeenth century, the Great Hungarian Plain was characterized in apocalyptic terms:

> The running wild of the Hungarian landscape (…) is the direct consequence of the desertion of the areas south of the Győr–Budapest–Debrecen line. (…) Villages were destroyed, people and livestock left the area; they fled or were taken into Ottoman captivity. As we shall see, instead of twenty-five or thirty villages, only one mid-sized market town was left, the inhabitants of which possessed 2–300,000 acres of uninhabited wasteland [*puszta*]. With people leaving, the reign of grasses started. Lands became covered in grass; here it became a sand dune, and there it turned into salt marsh. The whole plain became fallow, the remaining forest could no longer provide enough moisture, [and] with the loss of moisture the wasteland started to expand again, which the Hungarians of the previous centuries thought to have cast away for good from Hungarian soil. (…)[2]

The image of settlements being abandoned due to Ottoman plundering, and forests and plowlands becoming wastelands, was later criticized by ecologists, historians, and archeologists. Forestry experts were critical of this theory already in the interwar era.[3] In more recent literature, the period features not so much as one of crisis but more as a time of changes necessitated by the presence of the Ottomans. Nonetheless, because of the political situation and climatic processes (which included some of the harsher phases of the Little Ice Age), scholarship indirectly describes this period through a narrative of decline.[4] One of the cornerstones of this decline narrative is the loss of forests in the Great Hungarian Plain and Transdanubia and the expansion of marshes in the

1 See e.g. Oláh's *Hungaria*. Olahus, *Hungaria – Athila*. See also: Szilágyi, "Figures and Tropes." (in preparation).

2 Hóman and Szekfű, *Magyar történet*.

3 Vági, "Van-e hazánkban;" Weidlein, "A dűlőnévkutatás;" and Kaán, *Alföldi kérdések*, 11–43.

4 E.g., Rácz, *Steppe to Europe*, 137–40 and 174–77.

lowlands. Referring to the loss of forests is especially prevalent in the context of the frontier zones of Ottoman-Hungarian wars, where in many cases the literature assumed total deforestation.

The literature traditionally used two kinds of evidence. Medieval sources, especially foreign narratives, almost always referred to the richness of forests in the Carpathian Basin. Nonetheless, this richness has to be considered in context. Most chroniclers came from Western Europe, especially from the northern parts of present-day France, the Low Countries, and present-day Germany.[5] Compared to these areas, the Carpathian Basin was relatively rich in forests. By contrast, accounts from the Early Modern Period refer to huge wastelands, probably exaggerating the devastation by the Ottomans. The low proportion of the forests in the Great Hungarian Plain that is evident in all historical material from the eighteenth century onwards coupled with the traditional anti-Ottoman viewpoint resulted in the attribution of a major loss of woodland to the Ottoman presence. Changes in the function of woodlands in this area are clear from a number of sources,[6] but changes in the extent of woodlands are hard to demonstrate based on the archival sources available for either the pre- or the post-Ottoman period. As a result, a comprehensive reevaluation of landscape changes in the areas affected by the Ottomans either by their constant presence or through occasional plundering remains to be done.[7]

Within the limits of the present paper, we cannot attempt to offer a complete evaluation of the consequences of the Ottoman occupation for Hungarian landscapes or even for forests. Instead, we will focus on two interconnected aspects in a single, spatially limited area. First, we will try to estimate the amount of woodland before and after the Ottoman occupation. Second, we will quantify the role military fortifications may have played in wood consumption (and therefore potentially in deforestation). We will focus on the central parts of the Transdanubian region. The counties to be examined in greater detail (Vas, Veszprém, and Zala) were among those most significantly impacted by the continuous wars in the sixteenth and seventeenth centuries. This area arguably could be indicative of processes in other lowlands and hilly areas in the Carpathian Basin, but one should bear in mind that forest regeneration may have been fundamentally different in areas of lowlands, hills, and mountain ranges.

5 On the foreign travelers in medieval Hungary, see: Nagy, "The Towns."

6 Vadas, "A River Between Worlds," 242–58.

7 Criticisms against this view arose due to several different aspects: Szakály, *Magyar adóztatás*; Bartosiewicz and Gál, "Ottoman Period." Most recently: Sárosi, *Deserting Villages*, 57–94.

Changes in Woodland Cover in the Ottoman Period

The easiest way to assess the direct impact of the Ottoman occupation for woodland cover in the Carpathian Basin would be to compare solid quantitative data from the early sixteenth and the late seventeenth centuries. This, however, is not possible. Late medieval data, as we shall see, is highly fragmented and can be at most indicative of the general situation. At the other end, there are probably more data for the late seventeenth century, but these data remain unprocessed. The first reliable account of woodland cover in the Carpathian Basin is from the 1780s, almost a century after the Ottomans were driven out of the area.

For the Middle Ages, the best available sources to describe the proportions of different land-uses are the so-called estimations. An estimation was a legal procedure during which the lands of a noble landlord were appraised to establish their monetary value. Because different land-uses had different values, the resulting surveys included data on the amount of arable land, meadows, woods, pastures, vineyards, etc. within various administrative units. One of us compiled a database of late medieval estimations in the early 2000s.[8] This database contains material for approximately one percent of the territory of the Carpathian Basin. The database is undoubtedly in need of updating and with all medieval charters now available in a digital form (which was very much not the case when the database was originally compiled), probably significantly more estimations could be found. However, this additional work still remains to be done and for the present we have to make do with the existing database. At least some data are available for eight counties in Transdanubia (either partially or entirely): Veszprém, Zala, Vas, Esztergom, Baranya, Sopron, Komárom, and Tolna. There is no data for Somogy, Fejér, Pilis, Győr, or Moson counties. Taken as a whole, the data show that Transdanubia was 56% wooded before the Ottoman occupation (33,117 ha. of woodland out of a total of 59,573 ha. of land with data). And yet the actual woodland cover in the period and region likely has to be estimated downward because less wooded counties (e.g., Fejér, Győr, Komárom, Tolna) contributed little or no data to these high percentages. Most of the data comes from a handful of wooded counties, and the most wooded parts of those counties. Thus if we average the percentages recorded for separate counties, we end up with a figure of 39%.

8 Szabó, *Woodland and Forests.*

If we turn our attention to the counties of Veszprém, Zala, and Vas, we see high percentages: 82% for Vas (18 settlements with data), 58% for Veszprém (16 settlements with data), and 47% for Zala (8 settlements with data). Even in the case of these three counties, which are relatively well covered by estimations compared to the other counties in Transdanubia, data is available for less than 5% of their territories. Nonetheless, the estimations suggest that Vas County was the most wooded. The county in the eleventh and twelfth centuries was defined by the frontier protection system usually referred to in the scholarly literature as *gyepű*.[9] This area was settled somewhat later than most lowlands of the Carpathian Basin, which may explain why there were more woodlands here than for instance in Veszprém County. However, more than three-quarters woodland cover may be somewhat exaggerated. This may stem simply from the fact that the few villages described by the estimations lay in more forested areas. Veszprém County had fewer forests, but that still meant almost 60%. Most of the county lies in a hilly region dominated by the forested slopes of the Bakony Mountains. Bakony was among the Royal Forests dating back to the Árpádian period. Until the late medieval period the Forest was scarcely settled because of its use as a hunting ground. From the fourteenth century onwards the administrative structures of the Royal Forest gradually disappeared and woodland cover probably decreased.[10] Zala was the least wooded of the three counties as suggested by the estimations. Its still significant woodland cover may be partly explained by the fact that until the twentieth century the county included large parts of the Bakony Mountains. In sum, the data provided by estimations are anything but precise. They indicate that the three counties under study were well-wooded, but this really only means the Bakony Mountains for certain, where most of the available data come from. Overall, woodland cover in the counties was most probably lower than percentages shown the by estimations, but it would be difficult to say by how much.

As mentioned above, the first comprehensive dataset about woodland cover in the Carpathian Basin originated in the 1780s, when most of the territory of the Habsburg Empire (including Hungary) was mapped for military purposes. The research potential of the sheets of the First Military Survey was amply demonstrated for example in the Great Hungarian Plain.[11] As the present study

9 Herényi, *A nyugati gyepű*.

10 On the Bakony Forest, see: Szabó, *Woodland and Forests*, 119–27.

11 Molnár, "A Duna-Tisza köze;" Bíró and Molnár, "Az Alföld erdei," 169–206; and Pinke, "Alkalmazkodás és felemelkedés." Based most likely also on the First Military Survey, Bartha and Oroszi ("Magyar erdők,"

focuses on Transdanubia, which lacks a similar study, we chose to analyze forest cover in the region including the three counties of Vas, Veszprém, and Zala. Altogether 1,453 sheets were prepared for Hungary, Transylvania, and the Temes region.[12] From these sheets 235 cover the territory of Transdanubia. The method we chose to estimate woodland cover is relatively simple. Each sheet was divided into a grid of 6x4, after which each grid was further divided into 3x3 smaller cells, resulting in altogether 216 cells per sheet. Each cell represents approximately 1 km^2. We estimated whether forests or other land uses were dominant in each cell. The number of forested cells represented woodland cover for each map sheet. This is not the most sensitive or sophisticated method to estimate woodland cover, but the results can be considered reliable at the given resolution. The whole territory of Transdanubia consists of ca. 42,700 cells, of which approximately 15,000 cells comprised the counties of Vas, Veszprém, and Zala. Overall forest cover in Transdanubia in the 1780s appears to have been around 32%. The three counties analyzed here had somewhat more forests than the region as a whole (Vas 37%, Zala 38%, and Veszprém 39%). In general, lowland areas everywhere in the Carpathian Basin had fewer forests than uplands and mountain areas, hence the higher proportion of woodlands in these counties than for instance in the neighboring Somogy, Győr, or Moson counties.

When comparing late medieval and late eighteenth-century data, there is an apparent loss of woodland. For the whole of Transdanubia, late medieval estimations show ca. 56% woodland cover as opposed to 32% in the 1780s. For the three counties of Vas, Zala, and Veszprém, a similar decrease can be observed. It should also be noted that whatever differences existed between the three counties around 1500, they were gone three centuries later. It would be easy to interpret the above percentages at face value and ascribe the effect to the Ottoman occupation. However, there are good reasons to be cautious. As for Transdanubia as a whole, we have argued above that the ca. 56% woodland cover recorded in late medieval estimations was almost certainly too high, and a different interpretation of averages indicate a 39% woodland cover. This means that the actual difference in medieval and late eighteenth century woodland

221–31) published an estimate of the forest cover in the 1780s for the whole territory of present-day Hungary. According to them, at the time woodland cover was 29.7%. Unfortunately the authors did not refer to the method or sources they used. In any case, their result seems too high. Forest cover on the Great Hungarian Plain, which covers almost 50% of present-day Hungary, was ca. 3.5% in the late eighteenth century. An overall 29.7% woodland cover for the entire country would have meant more than 50% for Transdanubia, which is highly improbable in light of our own results.

12 For overall numbers for the Carpathian Basin, see Szabó, *Changes in Woodland Cover*, 112–13.

cover was in all probability considerably less than 24%, and much closer to 10%. This holds true for Vas, Veszprém, and Zala counties as well. The other reason for caution is that the First Military Survey did not record the situation right after the Ottoman occupation but an entire century later. This century was a time of large-scale rebuilding and recolonization. Between 1711 and 1790, Hungary's population increased more than twofold, from ca. 4 million to ca. 10 million, and in the case of these three counties more than threefold.[13]

The two main processes that concern us in this paper are settlement abandonment and (re)colonization. It is beyond doubt that many settlements were abandoned during the Ottoman occupation, especially in the frontier zone between Hungary and the Ottoman Empire, where continual warfare made settled agriculture highly risky. That said, it would be difficult to estimate the rate of settlement desertion partly because of the difficulties in comparing Hungarian and Ottoman sources and partly because 'desertion' itself is a complicated term and what was referred to by this word had been widespread in Hungary already before the Ottoman period.[14] Nonetheless, at least in Transdanubia, settlement abandonment implied reforestation. Any piece of land left by human inhabitants quickly turned into scrubland and then into forest. This is typical of the hilly areas where woodland regeneration can take place easily, especially compared to the lowlands such as the Danube–Tisza Interfluve. The other process was (re)colonization after the Ottoman period. This concerned areas of former settlements as well as areas without former inhabitation. In these territories, forests had to be cleared to make space for people and arable lands.[15] There were at least three different forms of forest clearance to which seventeenth- and eighteenth-century Transdanubian sources refer. In areas with larger trees, the most effective form of clearance was cutting the trees with axes and then getting rid of the stumps and the remaining scrub with grub axes. This has been identified by research to have been present in many areas in Transdanubia. Another common form of forest clearance was ring-barking (in Hungarian *kerengetés* or *aszalás*). Settlement and place names as well as other sources attest to the existence this form of clearing also in Transdanubia.[16] The process itself was rather slow. The bark, cambium, and sapwood of individual trees were damaged in a circle to the extent that the tree could no longer transport enough water

13 Cf. R. Várkonyi, "'a természet majd'," 32.

14 See most recently: Nógrády, "Az elakadt;" and Sárosi, *Deserting Villages*.

15 Takács, *Egy irtásfalu*; idem, *Irtásgazdálkodásunk*.

16 Takács, "A régi gazdálkodás."

and nutrients in its tissues. This resulted in the drying out and eventual death of the trees. The quality of these trees was usually good, because the timber did not warp. The third and fundamentally different form used in Transdanubia for woodland clearance was burning.[17] This may have been used in a rather limited area as less income could be generated by the burning of the standing trees than by harvesting and selling them.

As an example of the resettling process, we will briefly discuss the above-mentioned Bakony Mountains. The area was very much affected by the Ottoman wars in the sixteenth and seventeenth centuries. After Székesfehérvár, in the center of Transdanubia, fell to the Ottomans in 1543, there were repeated Ottoman military campaigns and raids in and around the Bakony. Many of the settlements either shrank in size or were abandoned in the course of the sixteenth century. Unlike other regions that were under permanent Ottoman control, the area north of Lake Balaton experienced fewer military campaigns and raids in the seventeenth century. This resulted in an earlier resettling of the area. Resettlement was also more gradual than in areas that were under Ottoman control for one-and-a-half centuries. This is visible in the forms of forest clearance as well. The sources here do not mention clearance by burning, but often refer to ring-barking.[18] A number of new settlements emerged from the mid-seventeenth century onwards.[19] This was not unique to this area: similar processes may be identified, of course with some chronological differences, in other areas of the middle mountain range of Transdanubia. As has recently been shown, in the areas under permanent control by the Ottomans, i.e., the southern half of Transdanubia, the resettlement process started only after the Ottomans were expelled or only after the end of Rákóczi's War of Independence (1703–1711).[20] The examples from this region very clearly point to a loss of forests in the eighteenth century via systematic clearances.[21] The transformation of forests into arable land was a rather slow process. This was shown in the most detailed manner through the example of Várong, a small village in the hills of Tolna

17 On the forms of forest clearance from the turn of the eighteenth century used in southern Transdanubia, see: Hofer, "Déldunántúl," 151–52; Máté, "A Mecsek-vidék," 153–55; and Máté, "Landscape." For Somogy County, see: T. Mérey, "Az erdőgazdálkodás," 133–34.

18 Hegyi, *A népi erdőkiélés*.

19 For the Bakony Mountains and the Bakony Forest, see above: note 9.

20 Máté, "A Mecsek-vidék," and "Landscape Reconstruction," with reference to the existing literature.

21 Weidlein, "A dűlőnévkutatás;" Reuter "Földrajzinév-gyűjtések;" Takács, *Egy irtásfalu*; K. Németh and Máté, "Vázlat a pusztafalvak;" and Máté, "Landscape Reconstruction," esp. 117–19.

County in the southeastern part of the Transdanubia.[22] It took almost a century for the people who settled here to reintroduce the two- and three-field systems that had been widespread by the late medieval period. It took also surprisingly long for the settlement itself to settle on a fixed location. In addition to forest clearance through settlement, the rebuilding of the country's infrastructure—roads, bridges, embankments, water regulation works, etc.—required massive amounts of timber.[23] Nonetheless, and in spite of complaints to the contrary, until the end of the eighteenth century, wood was probably not a scarce resource in the areas that the Ottomans wars had previously affected.[24]

Military Defense and Timber Consumption in the Sixteenth and Seventeenth Centuries in Central Transdanubia

One of the most prevalent motifs in discussions about the effects of the Ottoman occupation on Hungarian woodland is timber consumption for military purposes, especially for palisade fortifications. A number of works suggested that the construction of hundreds of new fortifications from the 1540s onwards as well as their maintenance for one-and-a-half centuries represented significant pressure on forests and was one, if not the most important, cause of deforestation. Other scholars voiced more cautious opinions.[25] Our main goal is to reconsider how much timber was used for the building and maintenance of the numerous fortifications and fortified watchtowers (also referred to in the literature as palisades, earth and wood fortifications, and *palanka*s) that stood in the three analyzed counties of Transdanubia in the Ottoman period. We will attempt to achieve this goal by quantifying and comparing consumption (the number of fortifications and the amount of timber needed to build and maintain them) and production (the woodland area necessary to produce the given amount of timber).

Two basic types of sources are available to study timber consumption: written and archeological. As to the first type, Sándor Takáts published dozens of works on the history of the Ottoman period based on archival research he carried out

22 Takács, *Egy irtásfalu*, 19–44.

23 For spheres of timber consumption at the time, see: R. Várkonyi, "'a természet majd'," 37–43.

24 Cf. Magyar, "Az 1715–1720-as összeírások," 232. Unlike Magyar, R. Várkonyi suggests that this resulted is a major environmental crisis: R. Várkonyi, "'a természet majd.'"

25 Rácz, *From Steppe*; Ágoston, "Where Environmental;" Ágoston and Oborni, *A tizenhetedik század*, 88–92; Szabó, "Erdők a kora újkorban;" and most recently, Sárosi, *Deserting Villages*, 35, 41, and esp. 55.

in Vienna at the end of the nineteenth and beginning of the twentieth century. In the absence of later systematic research on this issue, scholars ever since have used his data to demonstrate large-scale timber and fuel wood consumption during the Ottoman period in the fortifications of the border defense systems.[26] In addition to being highly scattered both geographically and temporally, the numbers provided by Takáts are difficult to use as they always describe wood consumption for one single fortification in a single year, which tells nothing about the details or breakdown of consumption. István Sugár followed a different approach in the 1990s. He studied the timber acquisitions of the castle of Eger, one of the most significant border castles on the northern edge of the Great Hungarian Plain, in the mid-sixteenth century. He looked at the supply zones for different types of wood. He showed that timber was usually brought to the castle from the neighboring forests, but the data also show the acquisition of wood from as far away as Maramureş, some 300 kilometers east of Eger. This latter piece of information cannot be taken as a sign of the lack of wood in the neighborhood as in most cases the castle was supplied from within a radius of a dozen kilometers.[27] Regarding archeological data, archeologist Gyöngyi Kovács and paleoecologist Pál Sümegi recently published a short but important study.[28] By examining the physical remains of palisades, they attempted to calculate the amount of timber needed to build such fortifications. In our view, the best approach to understanding the impact of the military constructions on forest cover is a combination of such archeological data with a reasonably comprehensive view on the number and types of fortifications.

Relatively little attention has been paid to palisade fortifications until recently, because they were believed to have been quite simple architecture,[29] and only a few of them had been properly excavated.[30] From the point of view of our goal, the most important question is the structure of the walls. When trying to estimate the amount of timber used to build and maintain various fortifications, one of the basic features is the number of logs used per meter of wall.

26 R. Várkonyi, "Környezet és végvár," 17–19; Ágoston, and Oborni, *A tizenhetedik század*, 90–91; Ágoston, "Where Environmental," 74.

27 Sugár, "Az egri vár," 177–78.

28 Kovács and Sümegi, "Palánkvárak, fák, erdők."

29 See the influential work of Pataki, "A XVI. századi várépítés." A partly different view is reflected in: Takáts, "A magyar vár," and Takáts, *Rajzok*, II, 1–132. For a more recent discussion of wooden fortification, see most importantly the works of György Domokos. See also: Tolnai, *Palánkvárak*.

30 For a short overview, see: Mordovin, "The Post-Medieval Fortifications."

Before giving a brief overview of the fortification types it is important to note that there was no major difference between the building techniques used by the Ottomans and the Hungarians (Habsburgs).[31] The scholarly literature usually refers to three major types of fortifications. The first, the so-called *latorkert*, may have been the simplest solution to provide a building with at least some protection. It was basically a palisade created by logs driven in next to each other at small intervals and had a wattling to connect these logs. This did not require much technological knowledge from the builders and was used frequently to provide protection to watchtowers (the *górés*), manor houses, late medieval palace buildings, or churches. It was also used as an exterior defense line for more elaborate earth and wood fortifications. The amount of timber needed for these fences was relatively high compared to their limited defensive role, as the logs were driven in at narrow intervals.[32]

More elaborate types of wooden fortifications had logs driven into the ground in two parallel lines. The two lines were formed by logs at somewhat greater intervals than in the case of simple palisades. In order to strengthen the structure, the logs were joined by branches. The best type of wood for connecting the logs was probably willow, but it seems that all kinds of branches were used to strengthen the structure of the walls.[33] Earth was filled in between the two lines of logs, which gave considerable thickness and strength to the walls and provided much better protection than simple wooden palisades. The amount of earth likely required was a huge quantity, as in some cases the two lines of logs were relatively distant from each other, sometimes well over a meter. In some cases, as it has been recently demonstrated by the example of the fortifications of the town of Szécsény in the northern Hungary, besides the two lines of logs, there was a thick embankment erected that was also strengthened with logs.[34] The third type of fortification that has been identified in the scholarship is similar to the previous one, except that the logs in these fortifications were joined not only by branches but also by iron bands, making the fortification even more difficult to besiege.[35]

31 See: Takáts, *Rajzok*, II, 1–132 (for the Hungarian side) and Stein, *Guarding the Frontier*, 53 (for the Ottoman side).

32 For an overview of the types of fortification, see: Takáts, "A magyar vár," and Tolnai, *Palánkvárak*.

33 Imre Szántó, "A végvári rendszer," 6–7. See also: Bende, "A törökkori magyar," 514.

34 Mordovin, "The Post-Medieval Fortifications," 280. Similarly thick walls were identified by archeological excavations at Bajcsa and other sites as well.

35 See e.g. the building works of Kanizsa using iron bonds in 1558: Takáts, *Rajzok*, II, 21.

As a starting point in providing an estimate of the wood consumption of Ottoman-period fortifications in Vas, Veszprém, and Zala counties, a database of all the defensive structures had to be created. At least a few parameters had to be defined in order to calculate the timber needed for a specific fortification: first, its size and shape; second, its structure. It is to be noted here that the calculations provided below could not include the timber consumption related to buildings inside the various fortifications. These buildings inside the walls were also significant consumers of wood. However, partly because we lack comprehensive research on these buildings, any estimates would well exceed the uncertainties connected to calculating the fortification walls themselves. In any case, probably the most important consumers were the fortification walls, and these had to be maintained more regularly than the timber used in buildings. It should also be noted that in a number of cases, combinations of palisades and stone fortification existed: there was a palisade that encircled a large area, inside this perimeter there was an earth and wood defensive wall to protect the inner stone or brick castle. For instance, in the case of the castle of Kanizsa, one of the most significant fortifications in western Transdanubia, there were at least three parallel walls protecting the stronghold.[36]

Different numbers of logs were needed for a castle that stood for a decade compared to one that was in use for the more than 150 years of Ottoman presence in Transdanubia. Fortifications also had to be reconstructed on a regular basis because of the natural deterioration of the materials as well as damage from sieges, fires, and so on. It is challenging to estimate how long logs could last on average, how often the branches had to be repositioned, and how frequently minor earth filling works were conducted.

Some of these problems are easier to deal with than others. There is little chance of knowing what type of fortifications stood in different places. In some cases written evidence gives detailed insights into the structure and size of fortifications, such as in Körmend, Kanizsa, Győr, Pápa, Bajcsavár, and about a dozen others. However, there were many more small watchtowers and minor castles about which little is known apart from their approximate location. Similarly, the length of time fortifications were in operation is difficult to ascertain. In some cases there are precise data on the beginnings of the fortification in a certain place, on extensions during the wars, etc. In other cases, either because of the lack of research into a fortification, the loss of sources,

36 Takáts, *Rajzok*, II, 21. See in more details: Méri, *A kanizsai várásatás*.

or simply because of its short existence, there are only a few references, or just single one, to a fortification. This is especially true for small fortifications similar to *górés* or small watchtowers surrounded by a wooden fence.

These points set a number of barriers to a reliable calculation of the timber consumption of the fortifications in Transdanubia, but our goal is to achieve a rough understanding of the scale of timber consumption in order to evaluate how important the Ottoman period and the military activities may have been in the change of forest cover in Transdanubia.

We had to make a number of methodological decisions and restrictions in order to arrive at some conclusions. We had to accept that it is impossible to collect all archeological and historical data on each of the fortifications as part of the present research. We had to find a way to make some generalizations. Three major tasks had to be accomplished to achieve this. First, we had to estimate the average perimeter of fortifications at different levels of importance; second, we had to decide whether to assume a single palisade or a more complex earth and wood fortification wall; and third, we had to estimate how long the timber of the fortifications lasted, i.e., approximately how often logs had to be replaced by new logs.

Thanks to the meticulous research of the past few decades, one can attain a relatively precise view of the size and perimeter of a number of fortifications and also the size of the garrisons that were ordered by the Ottoman and the Habsburg–Hungarian military administrations to man them.[37] In cases where scholarly literature referred to the size of the fortifications, our task was relatively easy. However, in the majority of the cases, only the size of the garrisons ordered in different years was available. In order to estimate the number of logs used for fortifications of unknown size, we looked at data on garrisons to gauge an average size for the fortifications. Our assumption is that the number of men in a garrison had some correlation with the size, but of course this was not always straightforward. Another problem, discussed below, was the fact that the same fortification had garrisons of very different size in different periods of the Ottoman wars, even though according to the present state of scholarship many of these fortifications themselves did not change much in size. Despite these not negligible shortcomings, our solution still appears best suited to estimate the scale of the perimeter of these fortifications.

37 For the Hungarian fortifications, see most importantly: Pálffy, "A magyarországi és délvidéki végvárrendszer," Pálffy, "A török elleni védelmi rendszer," and Hegyi, *A török hódoltság*.

We also had to estimate the wood consumption of the three different basic types of fortifications. One meter of the wall in different earth and wood fortifications required different amounts of wood. We tried to estimate both the average consumption of simple fences and of the fortification that had logs palisaded in two parallel lines.

The former is relatively easy. The post holes at the different fortifications suggest that 20- to 30-centimeter diameter logs were prevalent in these constructions. Estimating using the smaller version and relatively limited, ca. 10-centimeter gaps between logs, a meter of these walls consumed ca. 3 logs. The log consumption of more complex fortifications is somewhat less evident. The logs used here were basically the same size, but their intervals varied more. Recent research has produced important results in identifying the number of logs used for building these earth and wood fortifications. Based on the examples of the fortifications of Barcs, Bajcsavár, and Szécsény, the interval between two logs may have varied between 40 and 60 centimeters.[38] Estimating similarly with the smaller, 20-centimeter logs, set at 40 centimeter intervals to identify the greatest possible consumption, each meter of earth and wood fortification needed 3.2 logs for the more complex fortifications that had the logs in two parallel lines (1.6 for both line of logs). Because of the fairly close results in the case of the log demand of fences and earth and wood fortifications, we chose to calculate with three logs per meter for all types of structures. Some fortifications had inner and outer walls, or at least an outer palisade in addition to an earth and wood wall, but this only modified the calculation in a few individual cases.

As noted above, the size of the garrisons stationed in the fortifications varied significantly in different years on both sides of the frontier. When data are available, we used numbers based on the sixteenth-century garrisons from the earliest sources published by Klára Hegyi on the Ottoman side of the frontier and the sources published mostly by Géza Pálffy, László Vándor, and József Kelenik on the Hungarian side. We tried to avoid the most important biases, the large garrisons during the Fifteen Years' War, as well as the slightly lower mid-seventeenth century numbers. We used the earliest possible data. Based on the garrisons of the fortifications, we identified three categories. The smallest fortifications had fewer than 50 men. The size of fortifications with a small but continuous presence of troops could, of course, differ significantly in wood consumption from a mere watchtower. Based on the size of well-

38 Kovács and Sümegi, "Palánkvárak, fák, erdők," and Mordovin, "The Post-Medieval Fortifications," 278.

studied fortifications in Transdanubia (Csány, Főnyed, Szentgyörgy, Szenyér, and Tótfalu[39]), and assuming two logs from a single tree,[40] ca. 300 trees might have been enough to build the fortifications of a castle or watchtower of this scale. Castles with between 50 and 199 troops must have been larger based on the fortifications held by the Ottomans (Vál, Paks, Újpalánk, and Dombó[41]) and the Hungarians (Babócsa, Lenti, Fonyód, and Csákány[42]). The average number of trees required for these fortifications may have been ca. 600 trees. It has to be noted, however, that the numbers are not always straightforward; just to note one problem, some of the fortifications in the largest category, forts with more than 200 troops, were no larger or only slightly so than those with sometimes significantly smaller garrisons. The category with the most troops (200 and above) is more problematic than the smaller ones. They often housed not only troops but had significant civil populations as well. This makes the estimates less accurate, but because most fortifications in Transdanubia fell into the first and second categories, i.e., housed less than 200 troops, this problem does not significantly affect our calculations. Based on the size of some of the fortifications that fell into the third category, Berzence, and Paks[43] on the Ottoman side, and Körmend, Egerszeg, Kiskomár, and Bajcsavár[44] on the Hungarian side, we estimated that ca. 1,000 trees were required for their construction.

If precise data are available for individual fortifications, we of course used these data rather than the standardized sizes. In some cases the two are clearly different; one example is the town Keszthely, which had a relatively small

39 On Csány: Pálffy, "A magyarországi és délvidéki végvárrendszer," 170, Sági, "A zalacsányi török," 131–135, on Főnyed: Magyar and Nováki, *Somogy megye*, 48, on Szenyér: Vándor, "A zalai végvárrendszer," 95, on Szentgyörgy: Szatlóczki, "Szentgyörgyvár," 33–48, and on Tótfalu: Végh, *Egerszeg*, 156 and Baráth, "A Rába," 45.

40 Based on: Kovács and Sümegi, "Palánkvárak, fák erdők," 115.

41 On Vál: Hegyi, *A török hódoltság*, II, 614–26, and Terei et al., *Fejér megye*, 101–102, and 222, on Paks: Hegyi, *A török hódoltság*, II, 1153–61 and Miklós, *Tolna megye*, 293–94, on Újpalánk: Hegyi, *A török hódoltság*, II, 1162–66 and Gaál, "Turkish Palisades," 105–108, and on Dombó: Hegyi, *A török hódoltság*, II, 1216–24, Miklós, *Tolna megye várai*, 171–80 and Szabó, and Csányi, "Werbőczy."

42 On Babócsa: Pálffy, *A császárváros*, passim, Marosi, *XVI. századi*, 9 and Magyar, and Nováki, *Somogy megye*, 23–24, and later under Ottoman authority: Hegyi, *A török hódoltság*, II, 1312–19 and III, 1578–83, on Lenti: Marosi, *XVI. századi*, 16 and Végh, *Egerszeg*, 156, on Fonyód: Magyar, and Nováki, *Somogy megye*, 46–47, and on Csákány: Vadas, "Vízgazdálkodás," 220–21, and Baráth, "A Rába," 52.

43 On Berzence: Hegyi, *A török hódoltság*, II, 1320–26 and III, 1583–1589, and Magyar, and Nováki, *Somogy megye*, 38–39, and Paks, see above note 39.

44 On Körmend, see: Vadas, *Körmend*. See also: Kelenik, "A nemzetiségi megoszlás," 108, on Egerszeg: Végh, *Egerszeg*, 30, on Kiskomár: Pálffy "A magyarországi és délvidéki," 149, and Róbert József Szvitek, "Kiskomárom," 45, and on Bajcsavár: Toifl, "Bajcsavár," 28.

garrison, around 100 people, but as the fortification surrounded the town's houses, it required significant amounts of wood. The area that the earth and wood fortification surrounded was ca. 400x500 meters.[45] The structure in this case was more elaborate than of just a wooden palisade: it had two parallel lines of logs with earth filled in-between them. Building this fortification probably required ca. 5,400 logs, i.e., 2,700 felled trees. There are examples of the opposite situation as well, when a large military population was ordered to defend a rather small fortification. This was possible because many of the troops did not actually live inside the encircled areas except during war conditions. A good example of this is the well-studied fortification of Bajcsavár. The fortification's size and shape is well documented. The pentagonal fortification, partly brick, partly earth and wood, required less than 800 trees or 1600 logs but housed as many as 550 men.[46]

A follow-up problem is to find out how often logs had to be replaced in fortifications. There are a number of sources on reconstructions, for instance, in the case of the fortifications at Körmend and Csákány. The reconstructions in lucky cases even refer to the number of logs used to replace the decomposing ones, but the data in the sources are usually not precise enough to create a clear picture of the speed of the decomposition process. The data available are also controversial. In the case of Körmend and Csákány, the reconstruction works probably were not very frequent, but when the fortifications were rebuilt and its logs were replaced, the sources refer to major quantities of material.[47] At Bajcsa the picture is somewhat different. Here, probably due to the unstable foundations, continuous re-building activities are suggested by the sources with sometimes huge quantities of logs.[48] At Kecskemét, a town in the central part of present-day Hungary, the local judge or his representative had to check the ditches and the earth and wood fortification four times every year by perambulating the town.[49] This probably is a good indication of how fast the material of wood fortifications could deteriorate. This does not mean, however, that almost all of the material of fortifications was replaced every once in a while. For Körmend and Csákány, sources also refer to works when only a few logs were replaced.[50]

45 Végh, *Birodalmak*, 56, and 124–25. See also: Pálffy, *A császárváros*, passim.

46 Kovács, and Sümegi, "Palánkvárak, fák, erdők."

47 In one case as much as 2,600 new logs are mentioned: MNL OL P 1314 No 19 237 (13 March 1641). For Körmend, see: Vadas, *Körmend* and Baráth, "A Rába," 35.

48 Toifl, "Bajcsavár," 28–34. See also: Kovács and Sümegi, "Palánkvárak, fák, erdők," 119–20.

49 *Kecskeméti*, 75–76 (no. 83). See also: Sárosi, *Deserting Villages*, 178.

50 See e.g. MNL OL P 1314 24 356. (7 March 1641). The source is also quoted by: Baráth, "A Rába," 45 note 120.

The sources suggest that generally such work was necessary on a regular basis not in order to replace the logs but to bring in new branches and an earth filling to strengthen the braid. Major rebuilding works at these fortifications probably took place only a few times during the Ottoman period. Similar conclusions were drawn by archeological observations and written sources at one of the most important fortifications in the frontier zone east of the Danube, in Szécsény. Here the excavations show that some of the logs were never replaced in the fortification during the entirety of the Ottoman wars, but there were a number of smaller maintenance works. One rebuilding is worth noting. The castle changed hands three times during the Ottoman period; it was in Ottoman hands for a short period during the Fifteen Years' War and then after 1663 and 1683.[51] After the second occupation the walls had to be rebuilt because the fortifications had been set on fire by the fleeing Hungarians. The data are somewhat controversial because some sources suggest that the rebuilding only required smaller works, but an Ottoman source suggests something entirely different. According to an order sent to the beylerbeyi of Eger on the materials needed for the reconstruction of Szécsény, quantities almost unheard of were mentioned, and these numbers are of interest even if the fortification itself is not in the geographical focus of the present work.[52] According to the estimate of the Ottoman janissaries, the beylerbeyi should have sent 10,000 logs for the inner and outer tower, a further 5,000 for the four sides, as well as 4,000 deck-planks for the foundations. In addition, for the rebuilding of a bridge that led to the castle, they required 1,000 special planks, along with 4,000 further bridge deck-planks. Although probably the quantities were intentionally over-exaggerated, they are nonetheless huge. This is difficult to reconcile with the data from Csákány or Körmend, for instance.

In the end we decided to calculate a 10-year cycle of reconstruction, which means that during the Ottoman period each log was replaced by a new one every ten years. Some logs probably lasted much longer than 10 years, but those affected by water had to be replaced almost annually.[53] This calculation probably overestimates the speed of replacement of logs in earth and wood fortifications, but as the aim is to understand the possible scale, it is better to use a relatively higher frequency than to underestimate the amount required.

51 Mordovin, "The Post-Medieval Fortifications."

52 Fekete, *A hódoltság*, 290 (no. 252).

53 See e.g. the problems at Bajcsavár: Toifl, "Bajcsavár," 28–34.

The next step in the reconstruction was to find out how long the different fortifications were in operation in the Ottoman period. Some of them changed hands between the Hungarians and the Ottomans a number of times and were used by both parties. Some had short occupations and were probably in operation no more than a few years or a decade. Where we found references to the length of their operation, we obviously used that. In every other case we estimated that the fortification was in existence throughout the entire period discussed here. This leads to numbers higher than the reality, which nonetheless allows for the calculation of the upper limit of timber consumption, and can possibly compensate for fortifications for which no written or archeological data exist. We included each fortification in the list only once (either as Hungarian or Ottoman), even if it changed hands several times.

Based on this methodology, the approximate demand for timber in the different fortifications can be reconstructed with a large margin of error. Our aim, however, was to identify the scale of the use of forest resources rather than the precise number of trees or square kilometers of woodland that had to be managed for this purpose. The calculation offered here is by no means precise enough to argue for or against a change in the extent of woods in Transdanubia as a consequence of the Ottoman period, but it can be a step in identifying whether building a significant number of new fortifications could have consumed large quantities of woodland resources.

The database gathered in the three Transdanubian counties of Vas, Zala, and Veszprém includes 138 fortifications, castles, watchtowers, and fortified palaces on the Hungarian side and only about 8 on the Ottoman side (of which, with the exception of Kanizsa, none were in Ottoman hands for more than a few years; see Fig. 1). Because of the difference in numbers and the nature of Ottoman sources, the list may be more complete for Ottoman fortifications than it is for Hungarian ones. We did not systematically include fortified—walled—towns in the three counties. Some of the towns had stone walls dating back to the Middle Ages. These in some cases were also augmented by new outworks of timber, and the foundations of stone fortifications also used major amounts of wood.

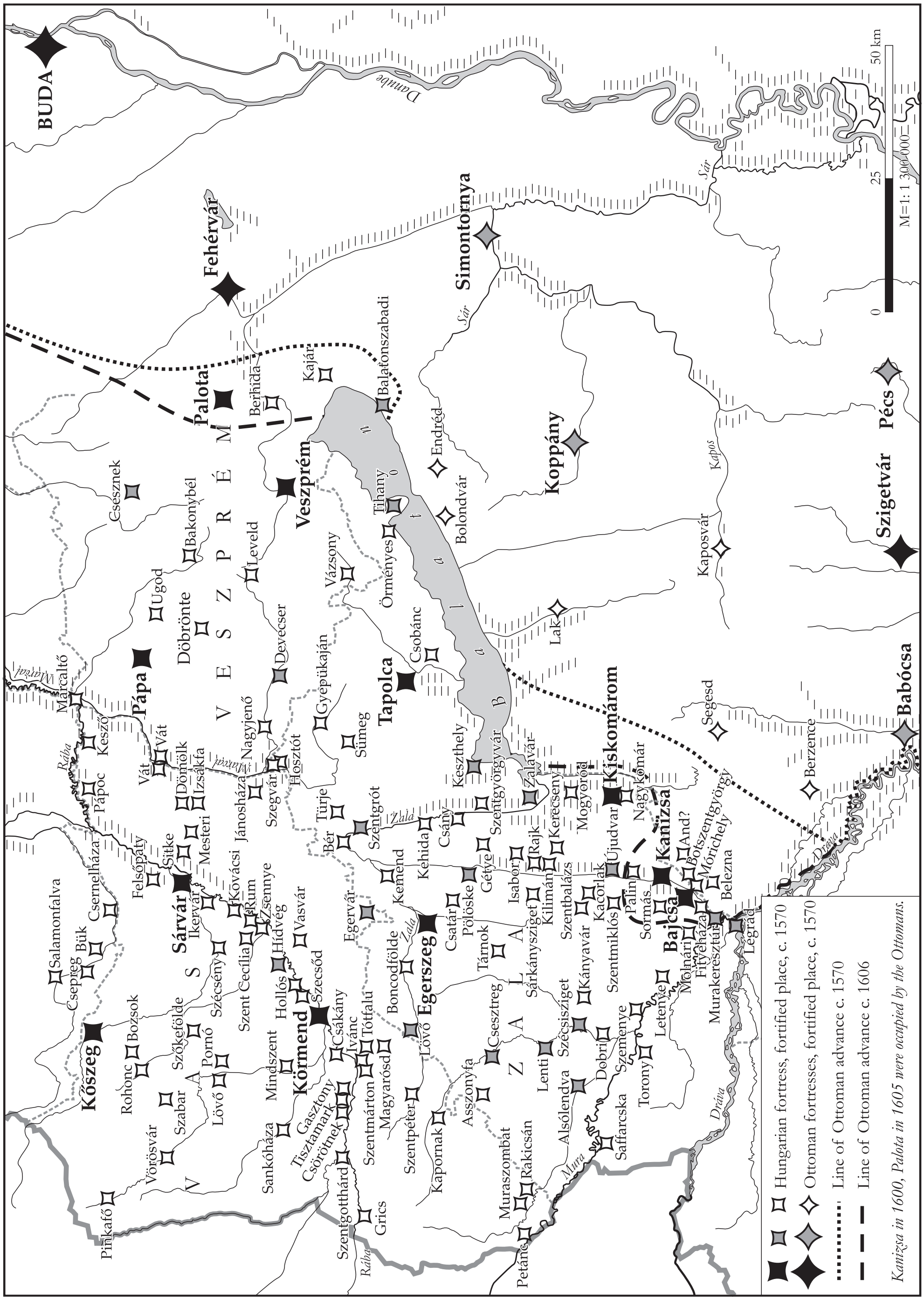

Figure 1. Ottoman-period fortifications in Vas, Veszprém, and Zala counties
(drawn by Béla Nagy)

According to our calculations, the roughly 150 fortifications in Vas, Veszprém, and Zala counties needed yearly on average a few hundred trees for the Ottoman side and ca. 5,000 trees for the Hungarian/Habsburg side. In other words, fewer than two or three hundred and 10,000 logs, respectively, were needed in each year during the 150 years between 1541 and 1690. This adds up to ca. 25,000 and 750,000 trees, respectively, altogether. It is important to emphasize two things. First, these numbers represent only the amount consumed for constructing the walls of the earth and wood fortifications themselves; they do not include the amount used in castle buildings, fortified palaces, and various other buildings, such as stables, barns, storage houses, etc. Second, fortification works were not distributed evenly throughout the period of Ottoman presence in the area. The 1540s and especially the 1550s certainly brought a major rise in the demand for wood, and wood was probably consumed less cautiously in these periods than from the 1560s and 1570s onwards, when a more refined defense strategy came into effect. In the early years, probably many more than 5,000 trees were felled yearly to build fortifications in Transdanubia, while in the 1670s, for instance, there may have been a significantly smaller demand for timber.[54]

The most important question has yet to be answered: How much area was required to provide 5,000 trees annually? There is limited information on the yields of medieval forests, but there are many studies on nineteenth- and twentieth-century forest management that, of course with some restrictions, can be used for comparison. Nowadays, in intensive timber-oriented forests thousands of saplings are planted on every hectare. Most of these young trees perish through competition and targeted cuttings that leave only the most promising individuals. How many trees grow up into full-sized individuals depends on the species and location. For the purposes of this paper, we calculate using a relatively open stand where trees are spaced out 5 meters from each other. One hectare of such high forest provides 400 trees. This means that on an annual basis, 12.5 hectares of forest had to be clear cut to provide timber for the walls of fortifications in Vas, Veszprém, and Zala counties. Considering that the trees in these palisades were relatively young (20–30 centimeters in diameter, ca. 50 years old), the same woodlot could have gone through approximately 3 cycles during the 150 years of Ottoman wars. In sum, ca. 625 ([12.5*150]/3) hectares or 6.25 km^2 of woodland had to be managed in order to build and maintain all the fences and outworks of the fortifications in the region. We can also consider coppice-

54 Pálffy, "A török elleni," 192–99, and Pálffy, "The Origins."

with-standard management rather than high forests. In this management system, timber was combined with firewood. Average numbers of timbers are hard to calculate because of the high variability recorded in historical sources.[55] For the present, we can use 35 standards per hectare. This adds up to ca. 7,100 hectares of managed coppice woodland to provide 5,000 logs annually. These forests would have been organized primarily for firewood production with timber trees as a by-product.

These numbers are remarkably low. Even if the results are greatly underestimated—and because of a number of factors listed above they may be—and in reality ten times more woodland had to be managed to produce the trees necessary for the earth and wood fortifications, which we believe is unlikely, the forest area needed to supply the construction of palisades would have still been a relatively limited area compared to the territory of the three counties. This is surprising in view of existing scholarship, which in many cases refers to the newly built fortifications as one of the most important reasons for deforestation in the Ottoman period both on a regional scale and at individual sites as well.[56]

Although a systematic collection of the written evidence on the problem has yet to be carried out, we will mention some general observations which can strengthen our assessment of wood consumption. Source material originating from western Transdanubia—mostly Vas County—makes hundreds of references to the problem of water;[57] only a handful of sources refer in any way to the problem of forest resources. Although there is scattered evidence of bringing supplies of wood and timber from longer distances, both Hungarians and Ottomans in the frontier zone brought wood to the fortifications from short distances.[58] Ottoman and Hungarian sources refer frequently to the need for rebuilding the palisades and fortifications, but there is seldom a reference in these sources to a lack of timber.[59] Although data are limited, timber does not seem to have been an expensive material at the time. An example is the Ottoman fortification of Gradişka on the Sava River, even though its distance

55 Szabó, "Driving forces."

56 See e.g. on the suggested deforestations related to castle building in the Dráva valley: Kovács and Sümegi, "Palánkvárak, fák, erdők."

57 Vadas, *Körmend és a vizek*.

58 On Ottoman provisioning, see: Fodor, "Bauarbeiten."

59 See e.g. the numerous references to the reconstruction of earth and wood fortifications in Ottoman sources: Fekete, *A hódoltság,* 228 (no. 38), 231 (no. 50), 261 (no. 154), 282 (no. 226), 290 (no. 252), 296 (nos. 274 and 275), 386 (no. 159), 398 (no. 194) 404 (no. 211).

from Transdanubia limits its relevance as a comparison. Nevertheless, during the construction of this fortification, almost four times as much was spent on the ropes that held the logs together than on the logs themselves.[60] All this, however, does not mean that there was never an occasional local shortage of timber in Transdanubia in the Early Modern Period. Such cases may have been connected to a specific species of wood or to timber suited to a certain use. Changes in the waterscape should equally be considered in the context of the Ottoman wars. The landscape in the surroundings of fortifications may not have been affected only by the use of trees close-by, but was also by the flooding of areas that surrounded these buildings.[61]

Limitation of the Results and Perspectives

The data discussed here focused on Transdanubia. The validity of the results outside this region is an important issue. Central Transdanubia in the Ottoman period was probably the area with the densest network of fortifications. The forest cover at the beginning of the Ottoman period in Transdanubia was probably several times greater than that in the Great Hungarian Plain. In addition, ecological conditions are rather different in the two regions. Much of the Great Hungarian Plain belongs to the forest-steppe region where forest regeneration is a complicated process, which was certainly influenced by the significant upswing in extensive animal pasturing that was, at least partly, a consequence of socioeconomic changes brought about by the Ottoman occupation. This means that the validity of our data for the Great Hungarian Plain is far from self-evident. One should also keep in mind that pressure on forest resources needs to be interpreted within the context of availability. In areas with highly limited woodland resources, such as the central plain areas of the Carpathian Basin, spatiotemporally intense pressure could easily have created local wood shortages.

Furthermore, in evaluating the pressure the Ottoman presence in the Carpathian Basin exercised on woodlands, one should consider all fields of consumption. This of course would require a set of studies dedicated to other spheres of military consumption, such as roads, bridges, temporary camps, siege machines, mines, cannon founding, saltpeter production, etc. However, these issues are beyond the scope of this paper and quantifying them at this point

60 Stein, *Guarding*, 53. See also: Fodor, "Bauarbeiten."

61 Cf. Vadas, "A River Between Worlds."

would be even more speculative than what has been presented above. The same holds true for the proportion of the wood consumption of the fortifications compared to other spheres of military and civic activities.

There is one sphere of consumption where we may offer brief quantitative data that can be compared to the timber consumption of fortresses: the general firewood consumption of the population. Three basic kinds of data are required to do so: population numbers, per capita consumption, and wood production. In the first case, there are relatively reliable data for the late medieval period (1494/1495), the late sixteenth century (1598), and the period of the reign of Joseph II (1780–1790).[62] Per capita annual consumption and per hectare wood production are of course less exact, but there is considerable literature that addressed the issue.[63] Applying an average of 1.5 m^3/person of annual firewood consumption and 3 m^3 of firewood produced by one hectare of coppice forest

Year	Indicators	Vas	Veszprém	Zala	Sum	% of area to be coppiced
	area in km^2	4482.99	4080.91	5881.64	14,445.54	
1494/5	population	49,675	33,818	87,938	171,431	
	firewood consumption in m^3	74,512.5	50,727	131,907	257,146,5	
	woodland needed in ha	24,837,5	16,909	43,969	85,715,5	5.9
1598	population	84,000	30,000	78,000	192,000	
	firewood consumption in m^3	126,000	45,000	117,000	288,000	
	woodland needed in ha	42,000	15,000	39,000	96,000	6.6
1787	population	227,174	140,789	228,415	596,378	
	firewood consumption in m^3	340,761	211,183.5	342,622.5	894,567	
	woodland needed in ha	113,587	70,394.5	114,207.5	298,189	20.6

Figure 2. Estimated population and firewood consumption in relation to production in the three counties in 1494/1495, 1598, and 1787

62 For the late medieval period, see: Kubinyi, "A magyar királyság népessége;" for 1598, see: Szakály, "Tolna megye;" and Faragó and Őri, *Az 1784–1787 évi népszámlálás*, for the census during the reign of Joseph II.

63 Szabó et al., "Intensive woodland," for Moravia (with references to further literature), Galloway, Keene, and Murphy, "Fuelling," for London.

annually, in 1494/1495 less than 6%, in 1598 less than 7%, and in 1787 less than 21% of the territory of the three counties had to be managed as coppice forests (Fig. 2). These numbers need to be interpreted in relation to woodland cover. The first two suggests that only a small proportion of the woodlands had to be managed to provide firewood, but by the late eighteenth century the majority of forests were probably used for providing the population with firewood. When compared to the woodland needed to provide timber for fortifications, the differences are great: for example in 1598, 96,000 hectares were needed to provide firewood to the three counties, which is some 150 times greater than the average amount we estimated for provisioning fortresses with timber.

Conclusions and Outlook

In the first half of this paper we have shown that woodland cover in Transdanubia was relatively high both in the Late Middle Ages and at the end of the eighteenth century. Overall, our results suggest that woodland cover decreased during the three centuries that separate the two datasets. However, this decrease cannot simply be attributed to the Ottoman wars. The decrease itself has been exaggerated because medieval percentages were biased in favor woodland and also because the post-Ottoman data are not from the immediate aftermath but includes the entire eighteenth century, which was a time of recolonization, significant population growth, and therefore woodland clearance too. This woodland clearance went on well into the nineteenth century. In order to test the prevalent assumption that the Ottoman period brought a decrease in forest cover in the frontier zone between the Ottoman Empire and the Kingdom of Hungary (and thus the entirety of Transdanubia), we examined the sphere of consumption. The construction of earth and wood fortifications is usually associated with the largest woodland loss. Our results show that these may have had a less significant impact on forests and forest cover than has been hitherto suggested. When arguing for the loss of woodlands due to the construction of these fortifications, Hungarian research has usually drawn attention to decrees and other documents that concerned the protection of forests from the Early Modern Period onwards, and attributed the appearance of these mandates to the scarcity of forest resources.[64] However, most of these documents, for instance, those published in the most important related source collection, the

64 *Magyar erdészeti*, I, passim.

Magyar erdészeti oklevéltár (Cartulary of Hungarian Forestry), do not mention a lack of woodland, neither do they refer to a scarcity of firewood or timber.[65] Such documents were usually meant to regulate the use of local forests and should not be regarded as proof of resource scarcity. They rather documented an increasingly diverse forest administration.[66] The brief comparison of the timber consumption of fortresses with general firewood consumption by the population also suggests that military activities did not present an overly significant pressure on woodland resources. Nevertheless, it is clear that future research will need to discuss further aspects of wood consumption in Early Modern Transdanubia. Considering all the possible woodland uses connected to military activities may raise consumption in this sphere to much higher levels. One must take into account, however, that the many spheres of military as well as civic consumption are rather difficult to quantify. Previously neglected sources may shed more light on woodland consumption and the land-use patterns in Early Modern Transdanubia.[67] Though a precise quantitative reconstruction of woodland cover and consumption for the sixteenth and seventeenth centuries is still far from being complete, our study has uncovered a general trend in Transdanubia that rebuts the idea of forest scarcity and which might even have reverberations in other parts of Hungary.

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66 See, e.g., the decree of Sopron from 1541: Házi, *Sopron,* II/2, 280. See also on this: Csapody, "Sopron város."

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How to "Ravage" a Country: Destruction, Conservation, and Assessment of Natural Environments in Early Modern Military Thought

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This article examines the practice of "ravaging" the countryside as a part of Early Modern military thought. It analyses the arguments for destroying or conserving cultivated natural environments and how they were integrated into the emerging theoretical framework on war in the seventeenth and eighteenth centuries. I argue that depriving the enemy of local natural resources by consuming or destroying them was an extreme form of exercising control over an area which was used to exert control over both the supplies for an enemy army and the use of land by the local population. To legitimize this practice, specific arguments were used: destruction was meant to "shorten" a war, and gradually use of this tactic was confined to the home country and defense against enemy invasions. In addition, it was important which resources were targeted: while the destruction of forage and harvests was seen as a form of short-term damage, cutting down trees counted as a form of lasting damage that was undesirable. Some authors of works on military strategy started to argue that devastating the land in the enemy's country was unpractical, and that (forced) contributions from locals were far more useful. Thus, while authors of works on military strategy did make arguments against "scorched earth" warfare and the "ravaging" of the countryside, they did so purely out of practical considerations which rested on notions of utility, rather than out of any humanitarian considerations.

Keywords: early modern period, environment, warfare, military thought, wartime destruction

During the winter months of 1688 and 1689, much of the land in the territory of the Electoral Palatinate was in flames. After the devastation of the Thirty Years' War and the Dutch War earlier in the century, the border region along the Rhine again had become a major gateway for French troops traveling towards the German Empire at the outbreak of the Nine Years' War. The roots of this conflict lay not only in the events leading to the Glorious Revolution in 1688, but also in King Louis XIV's fear that a strong Habsburg Empire might be able to contest the territorial gains that he had achieved during the Reunions.[1]

1 Lynn, *Wars of Louis XIV*, 191–193; Wilson, *German armies*, 88–89.

As the bulk of the German armies was still fighting the Ottoman Empire in the Great Turkish War, Louis XIV's forces met with little resistance when occupying a large part of the Palatinate. Important cities and fortresses of the area, like Heidelberg (the seat of the Elector of the Palatinate), Mannheim, Worms, Kaiserslautern, and Speyer, surrendered within weeks.[2] But the French did not enjoy a quick and decisive victory. German princes continued to put up resistance. They soon opposed the French troops, together with the forces of the Habsburg Emperor Leopold I. After the Glorious Revolution, the Generalstaaten and England under William of Orange also joined the conflict. In the autumn of 1688, the Minister of War François Michel Le Tellier, Marquis de Louvois, and the king's consultant Jules-Louis Bolé, Marquis de Chamlay suggested to put the Palatinate and other occupied areas to the torch after having collected large amounts of contributions. By demolishing major cities and strongholds in the region, Louvois hoped to slow down any progress of German forces against French borders.[3] At its core, this was a defensive strategy. The act became known as the infamous "devastation of the Palatinate," as it was characterized in various pamphlets which were intended to foment a sense of scandal. The destruction of the Palatinate became a media event.[4]

The French army was not the first and not the last to use this tactic.[5] Nevertheless, the "burning of the Palatinate" was a prominent example of a tactic put to use in the seventeenth and eighteenth centuries that has been called "scorched earth warfare."[6] Both major cities but the surrounding countryside suffered as a consequence of efforts to transform the region into a "logistic obstacle."[7] In this article, my intention is to demonstrate that this devastation was not simply an act of desperation, but rather was a tactic which drew on an element of Early Modern military thought.

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2 Lynn, *Wars of Louis XIV*, 193–194; Dotzauer, *Rheinland-Pfalz,* 164–66.

3 Lynn, *Wars of Louis XIV*, 194–95; Dotzauer, *Rheinland-Pfalz,* 167–68; Lynn, "A Brutal Necessity," 79–83.

4 On this see Dosquet, "Die Verwüstung der Pfalz," 333–69; Wrede, *Reich und seine Feinde*, 400–3; Bothe, "Von Mordbrennern," 11–47.

5 In addition to the references to warfare in Antiquity used by Early Modern authors (for instance the scorched earth warfare that Caesar attributes to Vercingetorix in his "Commentarii de bello Gallico"), there are numerous mentions of other instances of such conduct. Frank Tallett, for example, listed the deliberate destruction wrought by Maurice of Nassau or the Elizabethan generals in Ireland in the 1590s as scorched earth warfare and a practice of warfare that targeted the economic resources of an enemy. Tallett, *War and Society,* 58–59.

6 As described by Lynn, *Wars of Louis XIV*, 195.

7 Ibid.

Most handbooks and memoirs concerning the art of war included examples of when and how to "ravage" a country. These reflections also underline that this type of "scorched earth warfare" not only targeted towns and villages by burning down buildings and driving off or killing their inhabitants, but also targeted the cultivated nature of the countryside. By consuming or destroying forage and crop yields, this tactic of attrition was used, as Lisa Brady has noted in the case of the American Civil War, to sever the connection between the rural civilian population, the enemy army and the land on which both depended for sustenance on the other.[8] It was thought to be possible to starve out an enemy and to exercise control over the enemy's use of land in a radical way: by destroying it.

Examining this aspect of Early Modern military tactics and its consequences for the natural environment as a part of military knowledge, I aim to contribute to fields of research for environmental historians and historians of warfare. As a synthesis, this environmental history of warfare focuses not only on the environmental impact of war, but also, as Richard Tucker has pointed out, on the ecological settings of war through history.[9] As J. R. McNeill has observed in a study on the history of woods and warfare, scorched earth tactics like destroying natural resources are "as old as war itself," and Emmanuel Kreike underlined the importance of environmental warfare as a colonial war practice in the nineteenth and twentieth centuries.[10] An examination of this form of warfare as a part of the emerging theoretical framework on war in the seventeenth and eighteenth centuries furthers an understanding of environmental warfare as a special field of military knowledge.

The article consists of three sections. Initially, I sketch an episode of the devastation of the Palatinate with a focus on the local consequences of this type of warfare to highlight its impact on civilian use of land. The efforts of the French armies were intended to ensure not only the demolition of fortifications and towns, but also the consumption of as much forage as possible. This deprived enemy troops and the local population of a vital natural resource. I then analyze the idea of "ravaging" a region in Early Modern military thought as a legitimate

8 Brady, "The Wilderness of War," 172–79; Brady, "Devouring the Land," 49–52.

9 Tucker, "The Impact of Warfare," 15–16; Tucker, "War and the Environment," 319–20.

10 McNeill, "Woods and Warfare," 401. In an extreme form, Emmanuel Kreike called this environmental warfare a form of "ecocide," citing the example of Dutch colonial warfare in the nineteenth century. However, while Early Modern environmental warfare targeted civilians, it was never comparable to an effort systematically to eradicate an entire population or people. See Kreike, "Genocide," 297–300.

modus operandi that was addressed in certain contexts. Finally, I briefly examine the idea of protecting the countryside during wartime, as violence against the rural population and their local resources was also connected to ideas of "just war" and legitimate versus illegitimate conduct of warfare. This protection, as I will argue, was meant to ensure the effectiveness of one's own army and did not entail the idea of a humanization of warfare; rather, in the discourse of military thought and theory, utilitarian arguments prevailed.

The Hunger for Forage: The Case of Baden-Baden 1689

Fernand Braudel once called the times before the nineteenth century and the beginning of the consumption of large amounts of fossil fuels the "Old Biological Regime."[11] One key implication of this term is its focus on energy production: Before large amounts of energy began to be drawn from the use of fossil fuels (an "underground forest," as Rolf-Peter Sieferle has put it),[12] the "Old Biological Regime" was mainly bound to organic sources of energy. Wood for fires and food for both man and animals alike were subject to the biological laws of fertility and plant growth. John Landers has described this configuration as an "organic economy," its limitations having a direct impact on the military logistics of pre-industrial Western societies. As Landers suggests, the dependence of this "organic economy" on large rural areas meant that military forces could only advance if armies and military administrations were able to make use of local agricultural resources. Depriving an enemy of this resource, thus, was often the only way to win a war.[13]

This perspective proves exceptionally interesting if one considers the ways in which Early Modern armies ensured their mobility. Often, it has been noted that winter campaigns were uncommon in Early Modern Europe and that warfare was typically bound to the seasons, just like agriculture. If military operations dragged on into the harsh winter months,[14] this was considered especially

11 Braudel, *Civilization and Capitalism*, 70–72. On the use of this concept, see Marks, "The (Modern) World since 1500," 58.

12 Sieferle, *Der unterirdische Wald.*

13 Landers, *The Field and the Forge*, 70–71; 202–3; 225–26.

14 It should be noted that Early Modern Warfare took place in a special phase of climate history, the Little Ice Age. Especially low temperatures and wet and unstable summers further contributed to the famines during wartime. As John Lynn has noted, during the Nine Years' War, France suffered one of the worst agricultural disasters on record in 1694 and 1695, and this dramatically slowed the French war efforts, see Lynn, *Wars of Louis XIV*, 241–53. For a concise summary of the concept of the Little Ice Age and

problematic. One of the main reasons for this limitation was the dependency on forage. Grass growth determined the point of time armies could leave their winter quarters. Without this "fuel," no army could be expected to move anywhere. The cavalry needed a daily portion of forage to feed their horses, as did all the other animals used in convoys for supplies or to transport baggage and heavy and expensive siege weapons, which were very important in an age of fortress warfare.[15]

As John Lynn has argued, drawing on the example of the French Army, a force of about 60,000 soldiers could easily muster about 40,000 horses, 20,000 for the cavalry and another 20,000 used for logistical tasks. As the amount of forage for troops in winter quarters was quantified in *Réglements,* it is possible to estimate at least the amounts of dry forage that a body of troops like this would consume on a daily basis. The *Réglement* of the French Army in November 1665, for example, prescribed a ration of 20 pounds of hay for each horse. For the cavalry alone this would have meant that about 200 tons of dry forage were needed to sustain about 20,000 horses, if these estimates are accurate.[16] The problem with forage was that it effectively could not be procured from distant regions via carts, as this again would require the use of horses, which would also need to be fed. Dried forage was vital for troops in their winter quarters, but the same problems arose as in the case of fresh forage. Furthermore, it proved complicated to dry fresh forage in the field, as it rotted very quickly. Thus, the *subsistance militaire* was divided into food for soldiers and food for animals.

This tactic sheds some light on the core problem of logistics that was connected to military tactics in the Early Modern era. Military strategy and military organization changed between the Thirty Years' War and the French Revolution. This can only be briefly covered here: out of the mercenary armies of the early seventeenth century emerged more or less permanent forces with an aristocratic officer class more closely bound to the military hierarchy and the authority of the sovereign; soldiers were gradually subjected to harsher forms of drills, as the ideal tactic of linear warfare of the early eighteenth century to maximize firepower demanded even greater discipline; the ever-present army

the research of leading climate historians Christian Pfister, Hubert Horace Lamb and Rüdiger Glaser, see Behringer, *Kulturgeschichte des Klimas*, 119–22.

15 Tallett, *War and Society,* 32–33 and 54.

16 See Lynn, *Giant,* 127–28. Lynn also estimates a total sum of 400 tons of dry forage for 40,000 horses or even 1,000 tons of green forage, see Lynn, "Food, Funds, and Fortresses," 141. However, it is important to note that not all animals used for supply runs belonged to the armies. Rather, animals for carting food and other supplies were often requisitioned from the local rural population.

"tails," still known in the early seventeenth century, consisting of the women and children of mercenaries who occasionally even outnumbered the armed forces, declined in the late seventeenth century as the supply of soldiers increasingly became a matter of a military administration. At the same time, European armies experienced a dramatic growth, fostered by changes in recruiting and supply practices.[17]

The supply of troops underwent a major transformation since the end of the Thirty Years' War.[18] As for the French example, the growth of the army was to a large part only possible because of reforms under Le Tellier and his son Louvois. These reforms were reactions to the increasing problem of providing adequate supplies for a large force without actually having the funds to purchase food for the troops directly. By institutionalizing the establishment of magazines using private contractors, the French administration tried to improve army supply and reduce damage dealt to the home country. In theory, food could then be carted from the magazines towards the field of operations.[19]

In contrast to these obvious changes, however, there remained certain key problems of Early Modern warfare. Often, forage had to be obtained in the field as a local resource, either by requisition or by purchase.[20] "Foraging" was the most basic daily routine for armies.[21] However, concentrating large quantities of dried forage in magazines could also become a major advantage, as this would allow an army to take to the fields early. Under Le Tellier and his son Louvois, this became one of the key factors in the quick successes of the French army during the Dutch War, as the troops could draw on substantial stocks of hay and

17 For a concise overview of military tactics from the seventeenth to the eighteenth centuries see, for instance, Lynn, *Women, Armies, and Warfare,* 2–14; Tallett, *War and Society*; Wilson, "Warfare in the Old Regime;" Duffy, *Military Experience*.

18 On the French case see Lynn, *Giant*, 108–14. On the connection between warfare and the emerging state during the Early Modern period, see for example Tilly, "War Making and State Making," 181–86; for a critical view of the notion of a dominant "fiscal military state," see Parrott, *The Business of War*, 310–27. Parrott emphasizes the role of private contractors as suppliers of European armies.

19 See Parrott, *Business*, 310; Creveld, *Supplying War*, 17–22. However, Crefeld is very critical concerning the actual use of magazines, arguing that most of the time they actually were used to supply troops in garrison, not operating armies. John Lynn argues against this thesis, and he points out that supply for soldiers indeed was normally procured via the magazine system, whereas fodder was mostly requisitioned locally. Lynn, "Logistics," 15–21.

20 On this difference, see Lynn, "Logistics," 19–20.

21 On the importance and complexities of foraging, see Lund, *War for the Every Day*, 65–69.

straw that had been established at major fortresses along the Rhine. The river was used to transport the enormous quantities of forage.[22]

This shows two main factors that also played a key role during the devastation of the Palatinate. First, forage was one of the main resources that an army needed to keep itself mobile, and it was also a resource of which one could deprive one's enemy only by consuming or destroying it. As it was a local resource, the availability of which was bound to its own growth time, keeping an enemy away from forage could potentially slow down his operations. Also, a considerable advantage was to be obtained if one could concentrate large amounts of dried forage in magazines. This concentration of forage could be achieved by drawing on contributions from the enemy territory, which were to be paid both in money and "*in natura.*"[23] It became common practice to obtain these "contributions" as a mixture of taxes and extortion not only for the French, but for all European armies after the Thirty Years' War, and this remained common practice until the end of the eighteenth century. This method of sustaining an army in enemy territory was a vital part of financing warfare, and levying contributions was legitimate in terms of military law. The collection of this "war tax" was relatively orderly most of the time, as commanders even worked together with the civil administration of occupied regions to raise the required sums or the required amounts of foodstuffs and fodder. So-called contributions were often seen, in comparison to pillaging and looting, as a lesser evil. If a town or region failed to pay, however, armies could burn villages and towns as a form of rightful punishment.[24]

Yet, the burning of the Palatinate in the winter months of 1688 and 1689 was not done as punishment for failure to pay the increasing sums demanded by French intendants. Instead, this common practice provided the pretext for a plan that had been designed very early on.

The example of the fate of Baden-Baden, a small county south of the Electoral Palatinate which also was partly occupied by French forces and compelled to make contributions (as were most territories on the Upper Rhine),

22 Lynn, "Food, Funds, and Fortresses," 148.

23 Lynn, "Logistics," 143–46.

24 Redlich, *De Praeda Militari*, 44–46 and 66–71. Redlich, however, draws a sharp line between the seventeenth and the eighteenth centuries, describing the former as a century of pillaging and the latter as the century of a rather orderly system of contributions. On the cooperation of local elites with enemy forces in collecting contributions to mitigate possible negative consequences for the territory, see Carl, "Restricted Violence," 122–25.

sheds light on what this practice meant for civilian populations.[25] Demands were being made not only for considerable sums of money, but also for forage to supply French troops in their winter quarters. For the territory of Baden-Baden, these demands were sent by Jacques La Grange, who had been the intendant of Alsace since 1674 and had served in the Nine Years' War as the intendant of Alsace, Brisgau, and the French army in Germany.[26]

In a letter to the Baden-Baden officials written on February 7, 1689, he elaborated on the consequences the county would face if his demands were not met. "I have heard that of the 20,000 rations of forage, which have been imposed on you for our part of the contribution, you have only paid 600 so far."[27] If this did not change quickly, he threatened to "burn without consideration."[28] Eleven days later, La Grange issued yet another official letter to levy new contributions, demanding 1,500 sacks of oats for the cavalry.[29]

While it was a common practice to draw upon enemy resources to sustain one's own army, especially during winter, the motive in early 1689 was not only subsistence. As John Lynn has pointed out, there had been plans to demolish not only fortifications, but also towns on the Upper Rhine as early as the end of October 1688. In a letter to Louvois, Chamlay suggested completely destroying the town of Mannheim. In a letter from Louvois to the Lieutenant General Joseph de Montclar written on December 18, the Minister of War ordered Montclar to destroy all settlements along the Neckar completely so that German troops would find neither food nor forage.[30] This included consuming or destroying forage before retreating to the left side of the Rhine, as Montclar wrote in an order concerning the French officer Peyssonel in 1688: his troops should consume all forage if possible and burn the rest.[31] It is not unlikely that this is the context in which the repeated demands for new deliveries of substantial amounts of forage from the county of Baden-Baden to Strasbourg is to be seen: as an attempt to consume the fuel available and establish a logistical obstacle for the German forces.

25 Wunder, "Zerstörungswut oder militärische Logik," 25–26.

26 See Vetter, "Anhang," in *Das Schloß gesprengt, die Stadt verbrannt,"* 158.

27 Generallandesarchiv Karlsruhe (GLAK), 48/3384, letter from La Grange to the Baden-Baden councilors, February 7, 1689.

28 Ibid.

29 GLAK 48/3384, letter from La Grange to all officials of the county of Baden-Baden, February 18, 1689.

30 Lynn, *Wars of Louis XIV*, 196.

31 Lynn, *Giant*, 129.

This tactic seemed to work, as reports by Baden-Baden councilors to Count Hermann of Baden-Baden in Regensburg suggest.[32] In a report dated to January 24, 1689, an official wrote about destruction around the town of Pforzheim, but also about raiding parties that took forage and grains. The "conservation of the country" was at risk, as many of the subjects had already fled the surrounding countryside.[33] To ease the burden of contributions, especially that of providing forage, a letter directly addressed to La Grange himself[34] tried to dissuade the French official from demanding copious amounts of hay and straw: "The supply of grains and forages is absolutely impossible, as it is completely consumed by the billeting and continued passages of the royal troops."[35] According to the letter, the financial and ecological limits of the small territory had been reached, and during winter it was simply not possible to grow more forage.

One could contend that these sources are not entirely reliable, since the councilors and officials may have exaggerated the situation in Baden-Baden to persuade the French to relieve the burdens of war or to persuade Hermann of Baden-Baden to force the Reichstag in Regensburg to respond to the French more quickly. However, another document supports the conclusion that the description of the situation given by the councilors in their reports was accurate. In a record dated March 24, 1689, several Baden-Baden officials discussed the next response to the growing French threat.[36] Even though the governor of Strasbourg Count Chamily had given an order allowing the contribution in forage to be paid in money, the councilors found this obligation impossible to meet. In addition, the document illustrates the growing sufferings endured by the civilian population and the damage done to their methods of land use. Again, they wrote that "a large share of fruits and forage" had already been consumed "*in natura*," and soon there would be nothing left. Many subjects, they contended, had fled the territory because of famine, and the lack of forage had

32 Hermann of Baden-Baden was the Uncle of the well-known General and ruling Count of Baden-Baden Ludwig Wilhelm of Baden-Baden. Hermann of Baden-Baden was Principalcommissarius at the Reichstag in Regensburg as of 1688. In this position, he seems to have been interested in the development of the new war against Louis XIV, and he received continuous reports about the developments in the county. See Kleinschmidt, "Hermann, Markgraf von Baden," 120–22.

33 GLAK 48/3384, report of officials of the County Baden-Baden to Count Hermann of Baden-Baden, January 24, 1689.

34 This letter is only preserved as a copy without signature; in his answers, La Grange addressed a "madame."

35 GLAK 48/3384, copy of a letter to La Grange.

36 GLAK 48/3384, concept of several officials and councilors of the County of Baden-Baden, March 24, 1689.

led to the slaughter of a large part of the remaining cattle.[37] As the subjects had neither grain nor forage left, they could hardly sell them to meet the demands in money.

While this kind of shortage was common if an enemy army was present in a territory, the authors linked it to the tactic of consuming everything so that German commanders would find nothing with which to feed their troops and mounts, even though this hardly made any sense to them. As they wrote, the French insisted on their demands "even though the German troops quartered in this county do not get their supplies from our land…"[38] Thus, the shortage was to some degree artificial and intentional, a tool of war meant to constrain German forces.

This brief example shows the importance of a local resource like forage in keeping an army supplied, a resource that was "natural" because it followed its own biological mechanisms and rhythms.[39] While military organization and tactics gradually changed during the seventeenth and eighteenth centuries, this factor remained a critical logistical problem that was examined writings on military theory. If all dried forage had been consumed in a region during winter, there was simply no other solution than to wait for fresh grass to grow again or to engage in large-scale logistics operation, procuring large quantities of hay and straw via rivers. Also, this understand of the importance of forage and the shortage of it in a given territory clarifies the meaning of the term "logistic obstacle." By consuming (or destroying) this necessary fuel, the army directly impacted the use of local land, the inhabitants of which needed forage, for example, to keep cattle. This shortage, together with the burning of villages and all sorts of violence against the civilian population, drove the subjects from the territory. This in turn meant that in some areas, there was nobody left to cultivate the land so it would again yield grains or forage, thus making it difficult to supply an army in the region.[40] This impact on land use by a large military force was not always accidental, nor was it always a result of faulty organization. Rather, sometimes it was used as a way of depriving an enemy of supplies. This warfare

37 Ibid.

38 Ibid.

39 For a theoretical approach on defining nature as a problematic notion in historical research see Schatzki, "Nature and Technology in History," 85–86.

40 The idea of the population as a work force that ensured the "fertility" of the land and thus provided the essentials for supplying an army was common in Early Modern military theory. See for example Santa Cruz de Marcenado, *Reflexions*, vol. 12, 7.

of attrition, which has been seen as characteristic of the wars under Louis XIV,[41] was widely discussed in contemporary military thought, both before and after the reign of the sun king.

"Ravaging" a Country as a Part of Military Thought

The devastation of the Palatinate also became a topic in Early Modern military theory. One example is Hanns Friedrich von Flemings "Der vollkommene Teutsche Soldat," an encyclopedic effort to summarize the state of the art of war in the early eighteenth century. The author placed particular emphasis on the wars of Louis XIV and the destruction wreaked in the course of these wars. This included burning down houses, poisoning wells, and desecrating graves, actions that were seen as a violation of the "divine law or the law of nations."[42] Flemings' accusations repeat claims found in leaflets in which the French conduct of war was presented as scandalous. However, it is telling that he used this example in a chapter in which he discussed the theory of a "just war" and laws during wartime in general. In this context (of course from a German perspective), French actions served as an example of misconduct.

Flemings' compilation also shows the specific nature of military discourse of the period. In the appendix, he included a list of examples of "soldiers who distinguished themselves both by sword and scholarship."[43] The list was meant to illustrate one of Flemings' key points, which he made clear on various occasions in his work: officers should educate themselves to master the art of war.

This points towards an emerging new ideal of educated officers and the idea that war itself could be controlled and systematized by reducing it to certain basic principles. As Azar Gat and other scholars of the "military enlightenment" wrote, military thought did not remain untouched by processes and currents in the general spirit of the age, which has been dubbed (at least by its European heirs) the "Enlightenment" and the "Age of Reason."[44] The doctrine of natural law combined with a general search for rules and principles in the arts, together with the "gospel of Newtonian science,"[45] created a particular intellectual atmosphere.

41 Lynn, "Food, Funds, and Fortresses," 137–38.

42 Fleming, *Teutsche Soldat*, 95.

43 Ibid., 698.

44 In general, see Cassirer, *Die Philosophie der Aufklärung*; Hazard, *Die Herrschaft der Vernunft*; Koselleck, *Kritik und Krise*; Gay, *The Enlightenment.*

45 Gat, *Origins*, 26.

However, many modern scholars of the Enlightenment argue that this cannot be summed up as a "revolution" or the personal project of few "enlightened" thinkers, but rather as a large-scale process of losing and questioning traditional orders and thus a resulting concentration of communication.[46]

The study of these general principles of warfare and sharing them with young officers and interested amateurs alike were key factors in the establishment of "military science" and a "military enlightenment."[47] Ever since Niccolò Machiavelli's "Dell'Arte della Guerra" (1521), a new genre of printed texts emerged that focused on how to wage war, primarily drawing on examples borrowed from Ancient authors like Vegetius, Caesar, and Onasander.[48] It has been argued that the influence of Antiquity on military treaties remained very high until the end of the eighteenth century, with most authors following technically outdated formations and ideals of warfare, with only few exceptions.[49] While it is indeed true that Ancient authors, primarily Vegetius but also Caesar's "De Bello Gallico," were frequently referenced in nearly all works on the art of war of the period, it is also important to consider the changes to the discourse on military theory during the late seventeenth and eighteenth centuries. Gradually, writings about European warfare came to adopt a more skeptical perspective that emphasized the experiences of the authors and made references to recent events, especially after the Seven Years' War, while occasionally drawing on the authorities of Antiquity.[50] As a genre, writings on the Art of War tried to give the reader examples of the best practices in nearly every field of military life, making the knowledge of the Ancients and the knowledge of great commanders available, but also commenting on it in an increasingly reflective manner.

Despite Flemings' harsh judgment concerning the destruction wreaked by the French, there indeed was a place in this discourse for the planned devastation of a country by an army through the destruction of forage and harvests. Thus, the French officials drew on an idea that was already present in military thought and remained part of it even after the Nine Years' War. A French example that was written before the outbreak of the Nine Years' War and was broadly published and read illustrates this.

46 Fulda, "Gab es 'die Aufklärung,'" 22–25; Bödecker, "Aufklärung als Kommunikationsprozess," 91–92; Füssel, "Aufklärung," 280; Pečar and Tricoire, *Falsche Freunde*, 11–27.

47 Gat, *Origins*, 25–27; Hohrath, "Spätbarocke Kriegspraxis," 28–29; Hohrath, "Die Beherrschung des Krieges," 373–79.

48 Gat, *Origins*, 1–9.

49 Beatrice Heuser, *Den Krieg denken*, 99–107; Creveld, *The Art of War*, 73.

50 Neill, "Ancestral Voices," 516–20.

Henri II, the duke of Rohan, was one of the most reputable French authors on military theory of the seventeenth century. Born in 1579 to an old and powerful protestant family, de Rohan served in campaigns against Spanish forces in Flanders under King Henry IV. Due to his close relationship to the king, Rohan could hope to rise rapidly into the highest circles of power. However, the assassination of Henry IV in 1610 shattered his hopes, and soon he found himself the leader of protestant resistance in France and in opposition to the ruling Marie de' Medici and Louis XIII. In the following uprising of the Huguenots, Henri de Rohan played a key role in repeatedly defeating larger royalist forces until the peace of Alès in 1629. He was then ordered by Louis XIII to become his ambassador in the Swiss *Eidgenossenschaft*. There, he fought a campaign in Valtellina in an offshoot of the Thirty Years' War. He was mortally wounded at the siege of Rheinfelden in 1638, were he had fought in the army of Bernhard of Saxe-Weimar.[51]

In 1636, Henri de Rohan published a translated extract from Julius Caesar's "De Bello Gallico," "Le Parfaict Capitaine." Combined with this however, Rohan published his own "Traité particulier de la Guerre" in which he sought to adjust the "good maxims" of the Ancients to the new art of war.[52] In his treatise, he wrote that he wanted to show that "despite the difference in our arms to those of the Ancients, we should not ignore their orders."[53] The reference to Antiquity was his main source on which he drew for illustrations.

However, Henri de Rohan was also a practitioner of warfare in the early seventeenth century, which bore witness to the rising importance of siege warfare. In the chapter dedicated to defending a country against enemies, he addressed the question of the proportion of fortresses to an army in the field to defend a territory. At this point, he also wrote about the tactic of wearing out an enemy by entrenching large garrisons in strong fortresses. He warned that this would threaten the land itself, as it would be desolated by the besieging armies. Without a force to counter the besiegers, "you put the means to keep an army in the field at risk; and the damage to two or three harvests will put your neck in the noose."[54]

Nonetheless, a few pages later, Henri de Rohan explicitly suggests laying waste to the lands. If a territory is attacked by a larger force, there is only one

51 See Hubler, "Rohan, Henri de."

52 This part was also copied and translated into German. See Rohan, *Erfahrner Capitain*.

53 Rohan, *Parfaict Capitaine*, preface.

54 Ibid., 357.

option: "consume the enemy *[consommer l'enemy]*"[55] and cut off his food supply: "In this case, it is necessary to leave the country and burn all sustenance which you cannot contain in your fortresses, and also all towns and villages that you cannot defend: because it is better to defend oneself in a ruined land than to conserve it for the enemy."[56] According to his reasoning as a practitioner of warfare during the Thirty Years' War, destroying forage and harvests and displacing the local population (even if it were one's "own" population) were legitimate means of starving out an enemy, justified by the reference to the common good.

Henri de Rohan's works were widely published and translated, and many authors of the later seventeenth and eighteenth century alluded to his "Le Parfaict Capitaine" as an influential treaty on warfare, mainly a work which offered a better understanding of warfare in Antiquity.[57] This does not mean, however, that Rohan was the inventor of this tactic, nor was he the only author suggesting its use. In fact, other contemporary authors had similar views. Many quoted the famous Roman author Vegetius as the main Antique authority on warfare:[58] in his general rules of war he wrote that "everything that is of use for you harms your enemy; everything that is of use for him is harmful to you."[59] According to this logic, it was "a great deed to fight your enemy with hunger rather than with the sword."[60] This, together with Henri de Rohan's work, shows that laying waste to a region and destroying or consuming forage and food were well-established elements of military strategy before the Nine Years' War.

Perhaps more surprising is the fact that many authors still supported this tactic after the Nine Years' War, partly drawing on their experiences in that conflict. Even though the reputation of Louis XIV suffered because of the burning of the Palatinate, which also failed to bring the war to a quick end, the approach of devastating a region which should be defended remained part of various treatises.

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55 Ibid., 360.

56 Ibid., 361.

57 Even in 1773, the German officer and influential military writer Ferdinand Friedrich von Nicolai mentioned de Rohan's work and recommended it because it offered a more nuanced understanding of Caesar's approach to warfare. Nicolai, *Grundriss*, 263.

58 Heuser, *Krieg denken,* 98–107. Heuser, however, sees the references to Ancient authors like Vegetius as nearly absolute until the end of the eighteenth century. For a critical perspective, see Neill, "Ancestral Voices," 516–20.

59 Vegetius, *Abriß des Militärwesens*, 175.

60 Ibid., 179.

One telling example is that of the French nobleman and officer Antoine de Pas, Marquis de Feuquières. Born in 1648, Feuquières served in nearly all the wars of Louis XIV. During the Nine Years' War, he commanded a regiment and contributed to the French victory at Neerwinden in 1693.[61] He was also one of the French officers who led raids deep into German territory, demanding large sums of contributions. After the Nine Years' War, Feuquières fell from Louis' grace, and the War of Spanish Succession was launched without him as a member of the king's army.[62] During this time, he wrote his memoirs, in which he commented (often in a harshly critical manner) on many operations that had been led by French and German officers.

His work was published in 1711, the year of his death, and it instantly became a popular lecture as the various reprints and translations into English and German suggest. Again, in his chapter dealing with defensive wars, Feuquières concerned himself with the possibilities of waging war against an enemy that had invaded a territory by surprise. It was "very difficult to prescribe, by general maxims, how to wage this war."[63] But as a general maxim, Feuquières again suggested that the countryside should not be spared: "The rural countryside should not be conserved. It is imperative that one take everything possible into the best fortresses and consume, even by fire, all grains and forage which one cannot take to a safe place, as to diminish the subsistence of the enemy army."[64] Local resources that were not controlled by one's own troops were a threat to the region and to one's own army. Thus, if necessary, they were to be destroyed. The phrase "even by fire" suggests that simply burning everything was a matter of last resort, however. Preferably, forage and grains were to be consumed.

Even after considerable time, this rationale of disrupting land use to deplete local natural resources was an element in the discourse of military theory. The time of the great encyclopedias, which were meant to gather and systematize all forms of knowledge for the use of mankind (most prominently, the "Encyclopédie" of Denis Diderot and Jean-Baptiste le Rond d'Alembert) also saw a fair share of efforts to put together encyclopedias and dictionaries specializing in military knowledge.[65] One of the best-known examples is the "Dictionnaire Militaire"

61 "Feuquières, Antoine de Pas, marquis de," 662.

62 Ibid.

63 Feuquières, *Memoires*, 2.

64 Ibid., 3.

65 Hohrath, "Die Beherrschung des Krieges," 373; on encyclopedias in general, see Schneider and Zedelmaier, "Wissensapparate," 349–50.

by German officer and engineer Jacob von Eggers. Eggers was born in 1708 and was active in the Swedish service, where he received an education in military engineering and the building of fortifications. In 1737, he joined the army of Saxony. During the War of the Austrian Succession, Eggers fought on the side of the Saxon army, securing river crossings by building field fortifications. After the war, Eggers was promoted to the serve as the head of the Saxon corps of engineers. He became the educator of the princes of Saxony and was admitted to the Swedish Academy of Sciences. In 1751, he published his "Dictionnaire Militaire." Until his death in 1773, Eggers was mainly the commanding officer of the city of Gdańsk (Danzig), where he built up an impressive library specializing in military science.[66]

Eggers was the prototype of the "enlightened" officer: well-educated (partly due to his specialization in military engineering) but also with experience in the field. His efforts as a military writer and collector of books on military science make him one "of the educated officers of the eighteenth century who laid the foundation for the rationalization of warfare," as Daniel Hohrath puts it.[67] Still, in his dictionary there is an entry for "to ravage [*ravagiren*]": "ravage, is the act of troops ravaging a province or region where they cannot hold out against an enemy by burning and pillaging and taking everything with them if possible."[68] In his entry concerning the "le plat pais" (the rural countryside), Eggers noted that it was common to lay waste to most of these kinds of lands due to problems with discipline or due to enemy raids.[69] It is striking that for Eggers, the option of "ravaging" a country was not bound to war on friendly territory, but yet was a defensive measure that deserved to be mentioned in his dictionary, thus making this tactic a codified part of military knowledge. However, the idea of desolating an area to gain advantages remained an element of military knowledge that was repeatedly mentioned in writings on the subject until the end of the eighteenth century.[70]

The destruction of the countryside was justified as a defensive measure that was meant to ultimately protect the "common good," even though nearly all of the authors in question mentioned this tactic in reference to friendly territory. If an enemy army would otherwise use a resource to its own benefit, it was better

66 Hohrath, "Jacob von Eggers," 99–101.

67 Ibid.

68 von Eggers, *Ritter-Lexicon*, vol. 2, 559.

69 Ibid, 23.

70 See for instance Bessel, *Entwurf*, 9.

to destroy it and to deprive him of this opportunity. Thus, exercising control over the use of local resources was the main motive. What is important in the case of each of these examples is the way in which military land use and civilian land use were related to each other. To all military writers, the primary focus lay on the use of the rural countryside for the armies. Food and especially forage were broadly mentioned as targets along villages, resources that could be of direct use to anyone controlling a territory. By consuming or destroying as much as possible, one could at least keep the enemy at a safe distance while harming him indirectly due to the lack of supplies. Also, the use of fortresses as key factors of resource mobilization becomes clear. This tactic was related to the fact that campaigns were fought following the seasons. Depriving an enemy of sustenance was confined locally and possibly lasted until the following spring, but this meant that it lasted until the next campaign. Thus, it could be used to exert at least some degree of control over the movement of the enemy army and its use of local resources. If a region simply could not sustain an army any longer, it was unlikely that the region would be the next theatre of operations. The displacement of the local population could worsen the situation, as locals were needed to cultivate the land and to harvest grains and forage.[71] However, there also were instances of authors arguing against the idea of devastating the land. Their arguments reveal the utilitarian point of view that was prevalent in military theory regarding the destruction of the rural countryside and natural resources.

Conserving Local Resources as Military Rationality

In fact, there was a prominent reference in one of the most important texts on international law to both the destruction and the conservation of local, natural resources. The Dutch jurist Hugo Grotius, who is often considered one of the founders of international law and the law of war, also dealt with the damage done to the countryside during conflicts. In his "De Iure Belli ac Pacis" from 1625, Grotius made a considerable contribution to the discussion of the theory of a "just war" and "just warfare," drawing on scholastic and humanist traditions. Devised by St. Augustine of Hippo in the fifth century and St. Thomas Aquinas in the thirteenth century, the theory of "just" war

71 On this contemporary emphasis on the local population as an important element in the provision of resources for armies operating in an area, see for instance Santa Cruz, *Reflexions*, vol. 12, 7.

played a vital role as a background for international laws of war for the whole Early Modern period. While the area of the *jus ad bellum* addressed the causes to declare war, the category of *jus in bellum* regulated the conduct of warfare. The theory of just causes for war, however, outlawed wars of aggression or out of motives like greed, expansion, and the like and emphasized that war was to be used as a means of reestablishing order against a perpetrator.

While this setting of laws and rules worked well as legitimization for campaigns against non-Christian enemies and "outlaws" (like bands of criminals or marauders),[72] this focus on just causes was subjected to scrutiny by Gentili and Grotius. The question of what was, precisely, a "just" cause for war had become problematic. The notion of sovereignty proposed by Hobbes and Bodin meant that the emerging state was regarded as the only legitimate actor that could rightfully set rules and use force to establish them. Thus, conflict between two states posed a problem, as both parties claimed to have "just" causes for their military actions. In this problematic setting, Gentili and later Grotius emphasized the *ius in bellum* as regulation of the conduct of warfare; while war was accepted as a way of settling disputes between two sovereigns, the notion of *ius in bellum* at least offered some hope of mitigating its worst effects.[73]

In this context, Grotius addressed the question of damage done to cultivated natural resources.[74] In the twelfth chapter of the third book in "De Iure Belli ac Pacis," he explicitly wrote about the importance of moderation when it came to efforts to "desolate or ravage the enemy country."[75] Firstly, Grotius noted that the destruction of the "fruits of the land" was not necessarily an illegitimate tactic. As he explained, destroying land and the goods of an enemy was not unjust if the destruction was necessary. Alluding to Ancient authorities like Polybius and Onasander, he stated: "A general will remember to desolate an enemy's land and to burn it to devastate it; because if the enemy is lacking the fruits of the land and money, the war will be halted […] So desolation is permitted if it can force the enemy to make peace quickly."[76] But as he mentioned, this kind of desolation happened "commonly out of wrath and resentment or out of the desire for bounty"[77] rather than for strategic reasons.

72 Bennett, "Legality and legitimacy," 265–70; Tuck, *The Rights of War and Peace*, 78–79.

73 Schröder, "Sine fide nulla pax," 37–38; Schröder, "Natural Law," 204–18; Pröve, "Vom ius ad bellum zum ius in bello," 264–68.

74 See also the remarks of Stone, "The Environment in Wartime," 16–18.

75 Grotius, *Drey Bücher von Kriegs= und Friedens=Rechten*, 168.

76 Ibid., 169–70.

77 Ibid., 170.

However, Grotius also explicitly stated that there were indeed limits on the justifications for attacking natural resources. Referring again to writers of Antiquity like Plato, he illustrated that devastating a country was not necessary in most cases. If an army had already occupied an enemy territory so that the enemy "cannot use the fruits of it,"[78] this was a reason for sparing the countryside. Furthermore, Grotius mentioned "divine law," which compelled armies attacking cities to use only the "wild trees" for earthworks and to spare the "fertile trees," because "the trees cannot rise up against us and give battle."[79] Quoting the Jewish philosopher Philo of Alexandria, Grotius wanted to spare "fertile fields" for the same reasons: "Why do you want to vent your anger on inanimate things, which are themselves gentle by nature, and bear fruits?"[80]

The example of Grotius shows two important arguments that provide some theoretical context for the deliberate destruction of the countryside as part of military campaigns and strategy in the seventeenth and eighteenth centuries. On the one hand, Grotius argued that special necessities could arise in warfare that made destroying forage or harvests a viable tactical option. On the other, however, this argument of necessity meant that any act of destruction that was "unnecessary and useless" was illegitimate. If the enemy could not reasonably be expected to gain any use from the resources because he had no control over them, then there was no legitimate reason to destroy them. Interesting is the specific mention of fruit-bearing trees, which are used as an example. With this reference to Ancient authors, Grotius condemned the useless destruction of resources that needed a lot of time to regrow, meaning that destroying them was not simply a matter of gaining an advantage during a war, but was also a means of inflicting damage that was out of proportion.

Several military writers brought up this argument of utility, especially since the beginning of the eighteenth century. One example is the well-known French military writer Jean Charles, Chevalier de Folard. Born in 1669 to a clerical noble family in Avignon, Folard received his education at a Jesuit college. His first experience of the military was under the command of Duras in the fall campaign of 1688, precisely in the context of the Nine Years' War and the destruction of the Palatinate. Later, he fought under the Swedish king Charles XII, where he started to develop his own system of military thought during his time at Stockholm. As an expert on classical Roman and Greek warfare, Folard

78 Ibid.

79 Ibid.

80 Ibid., 171.

tried to draw on Antiquity while at the same time presenting a new system of military theory derived from Classical sources. In his "Nouvelles Découvertes sur la guerre, dans une dissertation sur Polybe" and his "Histoire de Polybe," he made contributions to many spheres of Early Modern military thought, one of the most controversial being the idea of using the formation of columns as a form of attack.[81]

Despite his sometimes seemingly eccentric ideas, he was not an "armchair general." He had served in the French and Swedish armies and had participated in several campaigns. In his "Histoire de Polybe," Folard commented on contemporary examples of warfare. In fact, other authors repeatedly quote him not for his disputed ideas concerning column tactics but for his original thoughts on war in mountains, the "coup d'oeil" in warfare, and for his critical approach, which emphasized the search for general principals in war.[82] He also wrote on the question of destroying forage and harvests.

While he at one point explicitly quoted Vegetius with reference to his maxim of starving an enemy by burning forage as "admirable,"[83] he later criticized this practice. While devastating one's own territory seemed like a necessary evil, Folard deemed destroying enemy territory as unnecessary and ineffective. Here, he quoted Raimondo Montecuccoli, one of the most important Habsburg generals of the seventeenth century:[84] "The raids of armies or a large part of troops into enemy territory do not yield any advantage if they are not part of a considerable operation: because nothing is better suited to ruin an army. This kind of enterprise, which consists solely in ravaging and doing damage far away from a border, is hardly useful […] If we have no other intent than to destroy a certain portion of land, one deprives oneself of contributions one could collect. […] These kinds of invasions are not useful except for during the time of the harvest, and this is precisely the time which should be chosen […]."[85]

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81 Gat, *Origins*, 28; Chagniot, *Chevalier de Folard*, 13–29.

82 See for example Töllner, *Bildung*, 118; Zanthier, *Versuch über die Märsche*, 110; Pirscher, *Coup d'oeil*, 18. Frederic the Great and Maurice de Saxe both took interest in Folards writings as well, see Starkey, *War*, 36–37.

83 Folard, *Histoire*, vol. 4, 148.

84 Montecuccoli, *Kriegs-Nachrichten*, 214. Montecuccoli played a major role in the Imperial army of the seventeenth century and fought in the Thirty Years' War, the Nordic War, and the Dutch War; also, he was one of the most important generals to fight in the wars against the Ottoman Empire. His treatise on warfare became a reference work in the eighteenth century. On Montecuccoli, see Gat, *Origins*, 13–24.

85 Folard, *Histoire*, vol. 5, 237.

These remarks show that the decision to burn forage and harvests or at least to consume them to gain an advantage implicitly included civil land use, as his suggestion concerning the proper season for an attack suggests. However, two factors made this tactic unfavorable. First, the advantage gained by destroying forage only lasted for a short while, and it furthermore only worked at the expense of the rural population. It was not necessarily compassion for the fate of displaced and impoverished peasants that made Folard disdain this tactic; rather, he argued from an utilitarian perspective. Exploiting the population by demanding contributions (which, as pointed out before, were also paid *in natura*) promised far greater incomes in the end. Remarks that went into detail concerning compassion for the local population or, simply, addressed humanitarian concerns were not decisive. Rather, this emphasis on the importance of conserving natural resources and sparing the local population originated in a military rationality that emphasized the role of the enemy countryside as an economic factor.

This economic argument, which rested on the idea of necessity and the proportionality of force, was raised in works by other authors.[86] The idea that enemy territory should be conserved not only as a possible territorial gain after the war but also as a possible theatre of operations for future campaigns is echoed in several writings, but it was always part of the effort to ensure military effectiveness. As such, it can be seen as analogous to the shift from irregular looting to the rather orderly process of collecting contributions and the efforts to outlaw looting in general in order to avoid driving off the local population, which proved vital as a workforce for any army in a region.

However, it is important to note that the authors of works on military theory saw looting and ravaging the lands as concepts that were related but not essentially the same. Ravaging the land meant targeting the enemy's rural infrastructure and local resources in a planned and orderly fashion, while looting was the outright loss of all discipline. In practice, of course, the two could not be so clearly or easily separated. As John Lynn has put it, it was scarcely possible to order a soldier to burn down a farm and at the same time prevent him from simply taking everything that was inside or abusing the inhabitants.[87] The option of destroying a region that could not be protected against an enemy remained a discussed and viable option until the end of the eighteenth century,[88] but it

86 For instance, see Santa Cruz, *Reflexions*, vol. 4, 164 and 173, and vol. 12, 7.

87 As noted by Lynn, *Wars of Louis XIV*, 198.

88 For instance, see Bessel, *Entwurf*, 9 or Burtenbach, *Betrachtungen*, 14, although von Burtenbach is critical of the burning of the Palatinate.

slowly came under scrutiny after the Seven Years' War, as two final examples illustrate.

When the English officer and engineer Henry Lloyd issued his "Military Memoirs" in 1781, he also touched on the subject of conserving enemy territory. Lloyd, who has come to be known as one of the most important military theorists of the second half of the eighteenth century alongside the French officer Guibert, had a long history of military service. Born presumably in 1720, Lloyd got his education at the Oxford Jesus College, where he acquired a high degree of skill in geometry and cartography.[89] Having left England in 1741, Lloyd served with the French during the War of the Austrian Succession. After having caught the attention of Maurice de Saxe during the battle of Fontenoy (1745), Lloyd was recommended to different generals as a skilled engineer and officer, and he served in Prussian, French, Austrian, and Russian armies before returning to England.

His "The History of the Late War in Germany," in which he described his experiences and the general setting of the Seven Years' War, became widely known and read. In his "Military Memoirs," this experienced and educated soldier also wrote about the habit of detaching forces from the main army to raid a country: "To force the enemy to battle, or to the clearing of the land, one naturally has to put the whole force to use together, and one may not occupy oneself with detachments, raids, or similar: because this weakens the army; the detachments risk being cut off, and they devastate the country that one has to preserve if one wants to stay there."[90] In this rather general remark, which made no direct mention of the old practice of burning forage, Lloyd emphasized the later use of a region by one's own army as an argument against devastating an area by detaching too many troops. However, his formulation "if you want to stay there" suggests that this was generally bound to strategic plans rather than to moral imperatives. Few authors identified the "ravaging" of a countryside as something that was generally unwanted and morally deplorable.

One of the authors who commented on this practice in a critical manner was the French lieutenant-colonel Paul-Gédéon Joly de Maizeroy. He was a recognized student of warfare in Antiquity and due to this was admitted to the French Royal Academy of *belles-lettres*. But he also became known as a military writer himself, having published his "Cours de tactique" in 1766, which was reprinted twice

89 Speelman, *Henry Lloyd*, 5–7; Starkey, *War*, 56–63.

90 Henry Lloyd, *Abhandlung über die allgemeinen Grundsätze*, 120.

and translated into German in 1767. In 1777, he completed his work on tactics with his "Théorie de la Guerre."[91] In this, he scorned the light cavalry and troops of the "small war," such as Hussars, Croats, and Pandures, who were employed excessively during the Seven Years' War by both the Austrian and the Prussian armies. His disdain for these kinds of troops was prompted in part by the fact that the "small war" waged by raiding parties of light troops basically consisted of forays in the course of which these troops "ravaged" the areas.[92] For Paul-Gédéon Joly de Maizeroy, though, this constituted a considerable disadvantage for both armies and was a feature of a "barbaric" way of war: "and this apparent advantage can even turn against him, if one abandons the devastated land. In general, this barbaric manner of waging war is detrimental to both parties."[93] He had moral disdain for the practice of "ravaging" a country as barbaric, and this sentiment explains in part his criticism of the widespread use of light troops.

The practice of laying waste to the countryside was often summed up with the term "ravaging" or "ravager," but the explicit mentioning of burning forage or harvests gradually declined in the writings by military theorists until the end of the eighteenth century, which could be interpreted as a form of marginalization in the discourse. Still, even if the tactic of destroying villages and local resources and the pillaging and displacement of the population gradually became something the authors were more inclined to discourage, the reasons for this were almost always utilitarian. In their writings, they rarely expressed pity for suffering peasants. Rather, it was important to point out that one's own army might suffer dire consequences if lands were made "sterile" and "unfertile" by war.

Conclusion

The tactic of depriving an enemy of local natural resources by consuming or destroying them was part of Early Modern military thought. This tactic was intended not simply to reduce or eliminate supplies for the enemy army. Rather, it also targeted local populations and their use of land as a way of creating artificial shortages of food and forage. When and how to "ravage" a country was discussed in various texts that dealt with the theory of how to wage war in the

91 Gat, *Origins*, 39.

92 Carl, "Restricted Violence," 125–28; Martin Rink, "Die noch ungezähmte Bellona," 168–87.

93 Maizeroy, *Théorie*, 291.

seventeenth and eighteenth centuries. In this discourse, four factors stand out as main motives and categories of thought.

First, in order for efforts to destroy forage and harvests and "ruin" a country to be seen as legitimate, they had to be presented as necessary. This notion of necessity was often based on Ancient axioms of warfare or arguments in favor of "shortening" a war. Second, however, it seems to have been extremely important where this tactic was used. Military thinkers explicitly wrote about this tactic of "scorched earth warfare" in the context of enemy invasions that were unforeseen or simply overwhelming. In these cases, desolating one's own country was discussed as a defensive method to starve out an enemy. Paradoxically, these same thinkers tended to suggest that enemy territory should be treated carefully, as it was more practical to extort contributions, a perspective that somewhat economized military land use. Third, to some degree the authors explicitly assessed which resources should be targeted and why. "Devastating" the countryside meant that not only villages were burned, but also forage and harvests, which were seen as directly useful for the enemy troops. However, as Grotius suggested, there were limits to this logic. Trees, for example, were never mentioned in the context of "ravaging" a country and starving out an enemy. Forage could be grown again for subsequent campaigns, but cutting down useful trees was seen as a form of lasting damage.[94] Fourth, the factors of duration and effectiveness played a role in the reflections of the authors. Some of them considered the usefulness of "devastation" by raiding parties as minimal and something that did not last long enough to be worthwhile. In addition, again the practice of extorting contributions promised a more effective source of income in the end. These arguments of utility were used to criticize the tactic of "scorched earth warfare" and the "ravaging" of the countryside, while the authors on military theory seldom touched on humanitarian concerns.

While I have focused in this article on ideas and categories prevalent in military thought, it is also important to consider that the practical side of warfare often followed its own rationalities. Often, the devastation of the countryside was not the effect of a conscious decision by generals or officers, but a consequence of mismanagement and logistical shortages. Even in the middle of the eighteenth century, these kinds of problems could lead to armies doing substantial damage to the countryside, as the aftermath of the Battle of Warburg

94 It is important to note, however, that this sentiment explicitly was bound to the notion of "fertile" and "useful" trees. If trees and forests could constitute a tactical disadvantage, many authors did not hesitate to recommend that they be destroyed. For example, see Folard, *Histoire,* vol. 3, 287.

on July 31, 1760 illustrates. There, the British army remained in the area for nearly three months, and it used anything and everything that could be burnt as fuel, including fruit-bearing trees, hedges, and even wooden statues of saints.[95] In order to explore further the effects of Early Modern armies on the natural environment in wartime, case studies for regions that frequently became the theatre of war could prove exceptionally fruitful.

In the end, this poses the critical question of the place of military theory in relation to military practice and, on a larger scale, in relation to warfare and the environment as a whole. While military theory certainly provided a framework for discussion of scorched earth tactics, an explicit reference to theoretical texts is hard to grasp in military practice itself: French officials did not quote de Rohan every time they ordered the destruction of villages and forage. However, even if works on military theory presented idealized versions of how their authors thought war should be waged, they often included examples of contemporary warfare. While military theory certainly does not reflect military practice itself, it forms a special discourse in which these practices are described and situated in an argumentative context. Thus, the treatises make it possible to analyze the special discourse on war and the systems and categories in which military knowledge was conceived and presented. As far as the relationship between warfare and the environment is concerned, this means that violence against the natural environment was a defining part of Early Modern military knowledge, and even at the end of the eighteenth century it had not vanished from the discussions. Rather, it remained embedded in contemporary conceptions of "just" war and the "right" and "rational" conduct of operations.

When Carl von Clausewitz, sometimes regarded as the "prophet" of modern warfare, worked on his influential opus magnum "On War," he drew on a vast body of works by military theorists like Feuquières, authors whose writings were available to him in the Prussian royal library.[96] It would certainly be an exaggeration to draw a clear line from Clausewitz to Agent Orange. But the Early Modern military theory on which Clausewitz at least partially relied reminds us just how deeply embedded environmental warfare was in military thought well before the of armies of the post-industrial age developed their now infamous capabilities of mass destruction.

95 Petersen, "Feuer und Eis," 72–74.

96 Heuser, *Strategy before Clausewitz*, 186–87.

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Peacetime Changes to the Landscape in Eighteenth-Century Transylvania: Attempts to Regulate the Mureş River and to Eliminate Its Meanders in the Josephine Period

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The article focuses on the attempts of Habsburg authorities in eighteenth-century Transylvania to regulate the Mureş River and eliminate its meanders in order to improve salt and timber transport to Hungary and the Banat region. These attempts ultimately led to changes in the landscape of the province by reshaping riverbanks and removing their vegetation. These changes were prompted by the need to change the type of transport vessel as a result of the timber crisis. To this end, specialists from Upper Austria were brought to build the new softwood vessels that were cheaper and corresponded with the characteristics of the Mureş River. The engineer Mathias Fischer was appointed project leader. He also initiated and planned cleaning operations on the river. The article also presents the work methods and machines employed during these operations and discusses the failed operation to eliminate the meander at Ciugud. In addition, the efforts of the Transylvanian *Gubernium* and Salt Office led to the accelerated development of towns such as Alba Iulia and Topliţa.

Keywords: environmental history, river regulation, landscape changes, early modern era, timber trade, salt trade

In the eighteenth-century, many West European states initiated canal building and river regulation projects. They were promoted and carried out in order to increase agricultural output as well as to protect agricultural land and human settlements from floods. In addition, they played a significant role in preventing and reducing the spread of epidemic diseases among humans and animals alike.[1]

Navigable rivers played an important role in transportation. The expansion of internal waterways was an essential requirement for the economic development of pre-industrial societies. Before the planned expansion of the road network and the emergence of railways, rivers and canals had been the

1 Szücs, "Auenbewirtschaftungsformen an der Theiß," 243; Scholl, *Ingenieure in der Frühindustrialisierung*, 118.

main transportation routes for natural products and resources. Transportation costs over water were cheaper than over land, especially given that the poor state of roads was a serious hindrance to traffic.

River regulation and river bank stabilization greatly contributed to the expansion of internal waterways. Thus, many river sections were straightened by eliminating meanders and deepened by removing sediment through dredging, and river banks were stabilized, which not only made the passage of ships smoother, faster, and safer, but also reduced the risk of floods.

The main focus of this study is how the landscape of the Mureş River changed in the context of the eighteenth-century timber crisis and the efforts made by the Habsburg state—central and local authorities alike—to achieve this change, and how it impacted economic growth and human settlements.

In the second half of the eighteenth century, Transylvania went through a timber crisis. Due to the reduction of wood resources and an increase in their price, the Transylvanian *Gubernium* decreed that, instead of hardwood, softwood should be used in shipbuilding. The new task of shipbuilding was given to Upper Austrian masters.[2] One of the most critical measures that the *Gubernium* took was to regulate the Mureş River based on the model of the Traun River in Upper Austria. Austrian specialists viewed this river as a model for Transylvania because its course and discharge were similar to those of the Mureş River.[3] Their aim was to accommodate the new salt ships made of softwood timber. As a result, significant material efforts were made to eliminate all potential obstacles and meanders on the river, which could damage the salt ships and implicitly their precious cargo, as well as hinder the transportation of other resources from Transylvania to Hungary, such as timber and military matériel.

The first part of the article deals with the technologies used in the cleaning of the Mureş River in 1779, discussing the issues that emerged during this operation and its environmental impact. In parallel with this dredging operation, they also attempted to improve the waterway by stabilizing the riverbanks and removing obstacles, such as rocks, trees, mills, and bridge ruins. The navigable section of the Mureş River extended from Mirislău (Miriszló in Hungarian) to Zam (Sameschdorf in German, Zám in Hungarian) where it left Transylvania, flowing into the region of Banat. This operation involved the local town halls from the provinces adjoining the Mureş River, such as Transylvania, the Banat,

2 Österreichisches Staatsarchiv, Neue Hofkammer, Siebenbürgische Kammerale, Salzwesen, 198, Year 1779: 531.

3 Ibid., 172.

and Hungary, as well as engineers, a local workforce, and representatives from Vienna.

The final part discusses the operation to eliminate meanders, which mainly targeted the area around Ciugud (Schenkendorf in German, Csügöd in Hungarian), close to the Alba Iulia fortress, in 1786. The so-called "Limba" (Tongue) meander was the first to be eliminated. However, because there was no hydrotechnician to run the operation, it was carried out inexpertly and in an improvised manner, which ultimately made it unsuccessful. In the end they were forced to move the village instead. These operations, apart from their primary target of eliminating meanders, also focused on the removal of vegetation from the river banks, more precisely brush and smaller wooded areas that could potentially hinder work and transportation.

State of the Art

This topic on the changes to the landscape that occurred following attempts to regulate the Mureş River has not yet been tackled either by Romanian historiography or Hungarian historiography. Works dealing with transportation on the Mureş River tend to focus on the history of salt mining. Given the interdisciplinary character of this topic, which brings together knowledge and perspectives from the fields of history and geography, one should take a brief look at the scholarly works that have touched upon it.

The subject was briefly approached in a recently published monograph on forests in eighteenth-century Transylvania, more precisely in the chapter dealing with knowledge transfer from Austria to Transylvania and the search for solutions to the timber crisis that affected inland navigation in this province.[4] Given that a detailed approach to the issue of forestry would go beyond the limits this paper, only one of its aspects will be analyzed in this article.

in the eighteenth century, Transylvania and Europe witnessed an acute timber crisis, principally caused by overharvesting. At the time, wood was the main energy source in industry. The increase in the price of timber strongly impacted each economic sector. As for the military, the oak timber crisis affected the construction of fortifications, transport vessels, and bridges. As a result, Transylvanian town halls regulated the access of individuals as well as goats and cattle to forests and the harvesting of certain tree species, restricted construction,

4 Rus, *Wald- und Ressourcenpolitik*, 218–23.

replaced timber with brick, stone, and roof tiles as primary building materials, and introduced fast-growing tree species.

Konrad Müller[5] was the first to approach the subject from the perspective of the history of transportation in his work on the Habsburg economic policy before and during the reign of empress Maria Theresa. Müller discusses, among others, the efforts of the Salt Office, Treasury and *Gubernium* to modernize transportation by land and by water alike. His work, largely based on documents from the State Archives in Vienna, provides an overview of the aforementioned modernization efforts. Mercantilist policies in Transylvania were principally focused on the exploitation of natural resources. Maria Theresa's reforms offered the province the much-needed opportunity to develop its economy. However, their implementation was hindered both by underpopulation and resistance from the aristocracy and landed nobility.

In the category of works on the history of transportation one should also mention the authors who approach the history of salt mining and timber rafting. Thus, authors such as Beniamin Bossa,[6] Ioan Dordea,[7] Volker Wollmann,[8] Harald Heppner,[9] Viorica Suciu and Gheorghe Anghel,[10] Dorin-Ioan Rus,[11] and Dorel Marc[12] discuss ethnographic and historical aspects of transport by water without approaching the issue of the regulation of the Mureş River.

One should also mention the most recent approaches concerning the regulation of the Tisa (Tisza) River and the Danube. For the first case, Linda Szücs's study[13] focusing on the impact that the regulation of the Tisa River had on the agriculture in the surrounding areas is notable. Edit Király's work,[14] despite mainly focusing on the regulation of the Danube and its perception in the nineteenth century, provides many pieces of relevant information on the eighteenth century as well.

5 Müller, *Siebenbürgische Wirtschaftspolitik*.

6 Bossa, "Transportul sării pe Mureş," 141–49.

7 Dordea, "Un proiect din anul 1790 privind reorganizarea economiei sării," 441–57; Dordea, "Aspecte ale transportului sării pe Mureş," 165–93.

8 Wollmann and Dordea, "Transportul şi comercializarea sării," 135–71.

9 Heppner, "Die Wasserstraßen und ihre Bedeutung," 91–106.

10 Suciu and Anghel, "Mărturii ale practicării plutăritului," 376–87.

11 Rus, "Din istoricul societăţii de plutărit din Reghinul-Săsesc (1852–1908)," 91–95.

12 Marc, "Sisteme de transport şi de comercializare tradiţională a sării," 152–57.

13 Szücs, "Auenbewirtschaftungsformen," 237–50.

14 Király, *"Die Donau ist die Form."*

Transylvania's Rivers and Their Role in Salt Transportation

Transylvania's navigable waterways (Mieresch/Maros/Mureş, Samosch/Samos/Someş, Alt/Olt, partially Arieş/Aranyos and Körös/Criş) had been used for salt transportation since the Roman period. The earliest plans to render navigation easier, which were included into larger projects for the reorganization of salt mines, can be dated back to the time when the province was an autonomous Principality (1541–1688).[15]

River projects in Transylvania trace their origin to the issue of efficient salt transport. In 1699, shortly after Transylvania came under Habsburg rule, the Aulic Chamber reorganized the salt monopoly as well as the main warehouse located at Partoş (Alba Iulia) where a dockyard for the building of ships, ferries, rafts, and other types of vessels needed for the transportation of salt and other goods on the Mureş River operated in the eighteenth century. The main task of the Salt Office, whose headquarters were located in Alba Iulia, was to organize the transportation of salt and other goods on the Mureş River, which required the hiring of an ever-growing number of rafters and crews for ships.[16] Ordinarily, the Office carried out the transport of salt, but it also often carried out the transport of various other goods, such as grain, foods, wine, iron, lead, copper, lumber, boards, and building stones, to the western areas of Transylvania, the Banat, and Hungary. In 1788, following the outbreak of the Austro-Russo-Turkish War (1787–91), the Office became involved in the transport of war matériel too. On 28 January 1788, the Transylvania Gubernium requested the Salt Office to put at the Army's disposal 25–30 pontoons needed by troops to build bridges for crossing rivers and streams.[17]

In 1786, the Austrian hydrologist François Joseph Maire describes in his work the empire's great waterways and the economic advantages that their navigability could bring. Regarding raw materials and goods that could be more cheaply transported by water from Transylvania, Maire mentions salt, antimony, grain, tobacco, hemp, wine, horses, sheep, leather, wax, and honey. Salt played a crucial role within trade. Hungary, Slavonia, and Croatia were supplied with Transylvanian salt, the quantity delivered annually reaching 600,000 quintals.

15 Strider, "Ein Bericht," 260–61; Rus, "Böhmische und slowakische Berichte," 93.

16 Suciu and Anghel, "Mărturii," 373.

17 Suciu and Anghel, "Mărturii," 374.

As for goods that could be transported to Transylvania by water, he mentions manufactured products, sugar, coffee, and luxury items.[18]

In 1772, the Office at Partoş owned 262 vessels, but the transport to Szeged (Seghedin) of the necessary 600,000 quintals of salt (30,000 tons) required at least 400 vessels. In 1778, 92 vessels were brought back from Arad to Partoş for reuse, while in 1780 the number of vessels included in the Office's inventory reached 300.[19]

Measures for the Navigability of Transylvanian Rivers in the Eighteenth Century

After Habsburg authorities took control of Transylvania, they started to draft plans to render the rivers navigable again, given that they had been used for salt transport in Roman times (106–275 AD). In 1700, Count Johann Friedrich von Seeau submitted such a plan for the Someş and Olt rivers,[20] but it failed for same reason as later plans, because of a lack of qualified personnel and technology. For example, a 1771 project aimed to bring ship crews from the German states and regulate the Mureş and Arieş rivers with the help of modern machinery brought from the German states. Although the plan was approved, it was ultimately abandoned[21] likely because of the devastation caused by floods that year,[22] which prompted the Financial Directorate to reallocate the funds to flood relief efforts.

Throughout Maria Theresa's reign, new river regulation projects were submitted in order to improve navigation on the Monarchy's main rivers.[23] One of them was Maire's ambitious project to create a waterway connecting Sibiu and Trieste. The first step was to link up the Olt and Mureş rivers at Sibiu, thus creating easier access to the Danube. Then, this waterway was to be unified with another one that linked Szeged to Pest, thus allowing Austria access to West European markets by water. In Maire's vision, a logical consequence was to link up the Mureş and Someş rivers as well, which would hasten Transylvania's

18 Maire, *Bemerkungen,* 147.
19 Suciu and Anghel, "Mărturii," 373.
20 Wollmann, "Der siebenbürgische Bergbau," 42.
21 Müller, *Wirtschaftspolitik*, 57.
22 Rus, "Die Überschwemmungen," 43–62.
23 von Hietzinger, *Statistik der Militärgränze,* 82–102.

economic progress.[24] Colonel Jean-Baptiste Brequin de Demenge's 1766 plan,[25] which aimed at linking the provinces of Croatia, Transylvania, Hungary, and the Banat to the Drava River in order to facilitate trade by water, was ultimately abandoned.[26]

According to a mercantilist-inspired transport system in Europe, navigation on internal waterways was seen as the best quality means of transportation. Certainly, transport by land was not neglected either. The developmental potential of navigation on internal waterways was especially significant in this time period. Wherever opportunities for economic development arose, the use of waterways was always taken into account. However, this development was somewhat slowed down due to the limited territory of many states, and their separation by trade barriers and customs.[27]

Under the influence of mercantilist theories, absolutist rulers improved transport conditions by promoting navigation on internal waterways in order to increase the economic power of their states, and started the systematic reorganization by connecting the various fluvial transport systems. Thus, in Western Europe numerous plans to regulate rivers and to build canals between the main navigable rivers were drawn up. In 1770, the Austrian government issued a navigation ordinance for the Danube (Donau-Schifffahrtsordnung) and initiated the systematic regulation of navigable rivers.[28] Although certain mercantilist states also expanded their road infrastructure, in most states transport was moved on internal waterways. For instance, during the Russo-Austro-Turkish conflict, war matériel was mostly transported by water. The era of mercantilism witnessed a wave of canal building in Central Europe too. Absolute monarchs perceived transport policies, which included the planning and construction of canal networks, as a means to further unify their state. Canals were also supposed to stimulate trade and bring together economic zones. Canal building also contributed to the transformation of the landscape with the aim of achieving economic unity.[29]

In 1773 Count Auersperg, who was at the time Governor of Transylvania, claimed that the regulation of the three rivers would be very costly, which is

24 Maire, *Bemerkungen*, 80–81.
25 Schönburg-Hartenstein and Zedinger, "Jean-Baptiste Brequin," 69–71.
26 Maire, *Bemerkungen*, 21.
27 Voigt, *Verkehr*, 240.
28 Ibid., 238.
29 Ibid., 312.

why the Diet ultimately rejected the project.[30] Navigation on the Mureş River was hindered by numerous obstacles that caused material and human losses. For example, in 1771 several vessels sank, and total material losses were estimated at 1,165 florins. In 1774, a tower located in the village of Folt collapsed into the river and prevented navigation. Vessel owners and inhabitants of surrounding villages were ordered to clear the riverbed of stones and fallen trees, and remove sunken vessels and rafts.[31]

The value of canals was recognized from the early eighteenth century when numerous plans were drawn up. Their implementation, however, generally failed due to financial constraints. In Transylvania, several military and civil engineers, such as Fischer, Croner, Mraz, and other scientists participated in the mapping of the province initiated during the reign of Joseph II. Their river measuring and mapping endeavors laid the foundations for the 1779 Mureş River regulation project.

Canal building targeted the removal of all obstacles and the creation of a safe environment for the transport of timber and salt with the new types of vessels on the Mureş River. The documents sent by Viennese Court to the Treasury and the War Council in June 1781 reveal a plan for the comprehensive regulation of the Mureş River.[32] According to a 1775 report and its annexed map, which has since been lost, there were 96 meanders along this river, 87 of them quite large, which had to be partially straightened. In addition, all the points of entry and exit from the old riverbed had to be sealed off. Given that the total length of the meanders measured 3,532 lines,[33] the Financial Directorate in Vienna proposed shortening it to 1,620 lines (calculated in Viennese feet[34]), which would cut the distance by 1,912 lines. Thus, many dangerous obstacles would be eliminated and the duration of the trip would be reduced by half. By increasing transport speed, they would be able to reduce the size of the vessels and consequently keep the amount of "material losses to a minimum, which would increase the yearly revenues of the Imperial Treasury" ("auch das Schwenden selbst des Materials auf geringerer Prozent heruntersetzt, damit dem königlichen Ärarium jährlich großen Nutzen zuwenden würde").[35]

30 Müller, *Wirtschaftspolitik*, 57.

31 Bossa, "Transportul," 143–44.

32 Österreichisches Staatsarchiv, Neue Hofkammer, Siebenbürgische Kammerale, Salzwesen, No. 200, Year 1781: 281.

33 The Line is a unit of length equal to 1/10 or 1/12 of an Inch.

34 In the eighteenth century, a "Viennese foot" was equal to 32,032 cm (Trapp, 1998: 229).

35 ÖStA, NH, SK, Salzwesen, 200, 1781: 289–90.

In 1786, the engineers Fischer, Mraz, and Croner were entrusted with planning the regulation of the Mureş, Someş, and Olt rivers, respectively. The greatest technical challenge that the engineers faced during the regulation of these rivers was the elimination of the numerous rocks and meanders that required many machines and specialists.[36] They had to report on the obstacles that hindered navigation on the aforementioned rivers, on how they could be eliminated, and on the number of specialists that would be required to carry out the task.[37]

The 1779 Regulation Plan

The 1779 plan drawn up by the Salt Office envisaged the regulation of the Mureş River and the introduction of new types of softwood vessels. It was arguably one of the most ambitious landscape transformation projects in eighteenth-century Transylvania. It required the dredging and cleaning of the Mureş River, and its regulation through the elimination of its meanders, with the aim of making navigation easier. Carrying out this project would require the transfer of experts and technology and the professional training of local specialists, which counted as something new for Transylvania. The greatest hurdle, however, was technical. The main reason for commencing this project was the rising price of oak timber needed in shipbuilding due to the aforementioned over-harvesting crisis starting in the mid-eighteenth century.[38] The previous source for hardwood timber had been the Hungarian state forests in the area of Arad, more precisely in Vărădia de Mureş (Waradia or Totvărădia / Tótvárad), (*Fig.* 1) from where it was brought to Partoş.[39] The price of softwood for vessels was considerably less, and varied according to dimensions and furnishing. A softwood vessel without a roof cost 83 florins and 13½ kreutzer, while the price of one with a roof could reach 101 florins and 16¾ kreutzer. The cost price of an oak ship reached 125–140 florins.[40]

36 Müller, *Wirtschaftspolitik*, 57.

37 Magyar Nemzeti Levéltár Országos Levéltára, Erdélyi Országos Kormányhatósági Levéltárak, Gubernium transylvanicum levéltára, Gubernium transylvanicum in politicis, Ügyiratok F 46, 1786, No. 3997: 1–8.

38 Österreichisches Staatsarchiv, Neue Hofkammer, Siebenbürgische Kammerale, Salzwesen, 198, Jahr 1779: 169–217.

39 ÖStA, NH, SK, Salzwesen, 198, 1779: 172.

40 Ibid., 211.

In December 1778, the navigation engineer Fischer, head of the Mureş River project, sent the Treasury a proposal for the building of softwood vessels. According to Fisher, the length, width, and depth of these ships would make them more efficient. They could also sail on rivers with lower water levels. The test ship measured 10 klafter in length,[41] 15–16 Austrian ft. in width, 2 ½ Austrian ft. in height. Soon after it was built, the Treasury approved a pilot trip on the Mureş River between Maros-Portu and Szeged.[42] The minutes of the discussions following the test reveal that the engineers Fischer and Hubert were satisfied with the outcome. They argued that the vessel's slight bent forward was no reason for concern, but still recommended that the vessels be covered with canvas instead of wood.[43]

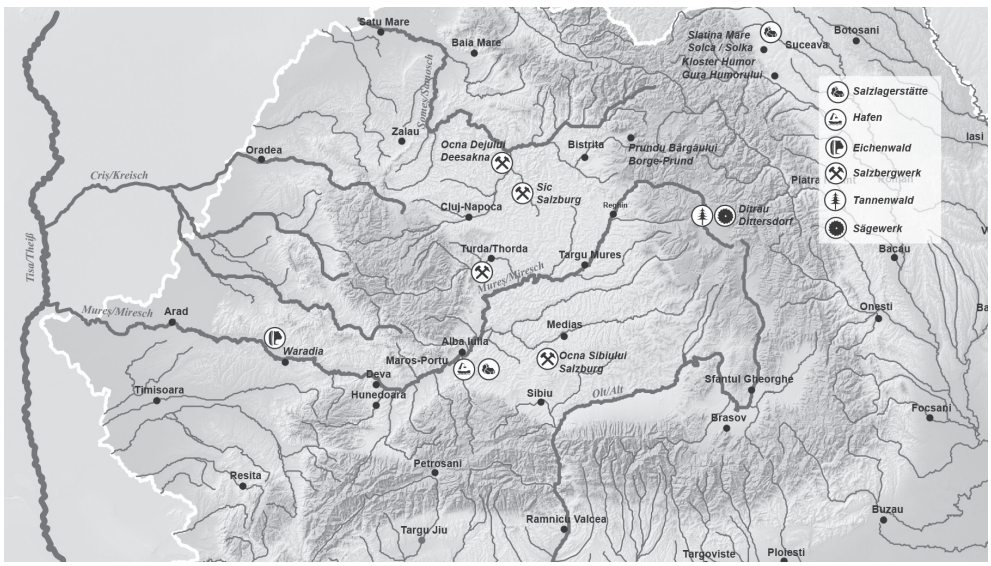

Figure 1. Salt mines and waterways in Transylvania (made by Bianca Tămăşan)

Because the new vessels built from softwood were less resistant to accidents than those built from hardwood oak, the Treasury ordered at its meeting held in Lugoj on 13 February 1778 a new cleaning operation of the Mureş River, the demolition of floating mills, and the removal of logs, broken bridge pillars, and other elements that could potentially jeopardize navigation. At the same meeting, the Treasury also decided on what type of machinery was necessary and set the

41 As a unit of length, 1 klafter is equal to about 1.80 m.

42 Ibid., 24–27.

43 Ibid., 59.

summer of 1778 as starting date of the operation so that the new ships would be serviceable by the spring of 1780.[44] The engineers Samuel Nazdroviczky and Fischer, upon testing each machine, comparing prices, and evaluating maintenance costs, gave a professional opinion in favor of the windlass (*Erdwinde* in German) for the Transylvanian sectors of the river. According to the two engineers, this machine was used the following way: (1) if placed on a ship, it could easily be attached to any part of a log; (2) in order to better attach the logs to the machine, Wallachian workers would be hired due to their ability to stay longer underwater; (3) once the log was taken to the riverbank and attached to it, it could be conveniently redirected and easier unattached; (4) the machine's force could be increased with the help of a tackle; (5) if the riverbank was uneven, the logs could be removed with various lifting machines, which, required more work; and (6) experience showed that with the help of the windlass even larger tree trunks with branches could be removed. Both Commissions representing the regions of the Banat and Hungary, respectively, agreed with the two engineers' technical proposal. The wooden debris removal operation started on 11 August and ended on 1 October 1778 with the removal of 117 logs and tree branches of various sizes.[45]

On 27 February 1779,[46] the Financial Committee in Vienna (Wiener Finanzkommission) approved the plan drawn up in Sibiu (Nagyszeben/Hermannstadt) and tasked the engineer Hubert with building the new ships projected to be 100 feet long, 15–16 feet wide, and with a total depth of 2½ feet (= 28.35/4.5–5/0.75 m.). As for the width of the Mureş River, it reached 150 paces at Alba Iulia (Gyulafehérvár), 200 paces at Deva (Déva), Şoimuş (Marossolymos), and Ilia (Marosillye), while in the flatland, as it slowed down, it reached up to 300 paces. As for its average depth in the navigable sector that started at Alba Iulia, it reached at least 1 fathom or even more.[47]

On 27 March 1779, the Viennese Financial Directorate set the production cost for each new ship at 83 florins and 13½ kreutzer. The timber would be brought from the Giurgeu Mountains in the Eastern Carpathians.[48] The engineer Karl Loidl was tasked with building a sawmill in the mountains to mill

44 Ibid., 28–56.

45 Ibid., 58–69.

46 ÖStA, NH, SK, Salzwesen, 198, 1779: 47.

47 Militärische Beschreibung von Hungarn / Anhang zu der Kriegs-Charte des Gross Fürstenthums Siebenbürgen.

48 ÖStA, NH, SK, Salzwesen, 198, 1779: 169; 211.

planks and beams for shipbuilding.[49] As for the building technique, the Viennese Aulic Chamber proposed the use of the same methods as navigators in Upper Austria because the Traun River had a similar course and flow speed to the Mureşin Transylvania. In addition, they recommended the adoption of Austrian shipbuilding methods and ordered the relocation of several masters from Upper Austria to Alba Iulia in order to create a shipyard.[50] Finally, the Commission sanctioned the building of a road that ran parallel to the Mureş River in order to facilitate the traction of ships with the help of oxen and horses. The road was to be built with the help of peasants from villages along the river.[51] With the new ships, the Transylvanian Treasury was aiming for higher revenues, given that they were more spacious, required only a small crew, and their maintenance costs were low in comparison to the older hardwood ships.

The navigation engineer Fischer was tasked with organizing the transport of logs in the river, beginning in December 1778, for the building of the new vessels. Upon conducting field research, Fischer reported first in February and then in May to the Financial Directorate that it was necessary to build a canal at the confluence between the Topliţa stream and the Mureş River. In his opinion, it would be an easy task because it merely required the removal of a few rocks that hindered transport. In addition, he also considered that in order to facilitate transport up to the sawmill at Ditrău (Ditró/Dittersdorf) (Fig. 1), it would be necessary to build a road that would cost an estimated 100 florins.[52] On 23 May 1781, the Transylvanian Treasury submitted to Vienna a protocol on the cost of building the waterway on the Topliţa stream, which amounted to 633 florins. According to the same document, the logs moved on this waterway would be used to mill planks.[53]

This politically directed transformation of salt transport by changing the type of ships required not only the regulation of rivers, but also the dredging of riverbeds. Thus, in December 1779,[54] the General Staff in Sibiu considered the possibility that the 2nd Wallachian Border Guard Regiment could take over this task on the Someş and Tisa rivers where the new ships would operate. The experience of the cleaning operation on the Mureş River from the summer and

49 Ibid., 171.
50 Ibid., 174.
51 Ibid., 194–211.
52 Ibid., 321–22.
53 ÖStA, NH, SK, Salzwesen, 200, 1781: 63–68.
54 ÖStA, NH, SK, Salzwesen, 198, 1779: 758–63.

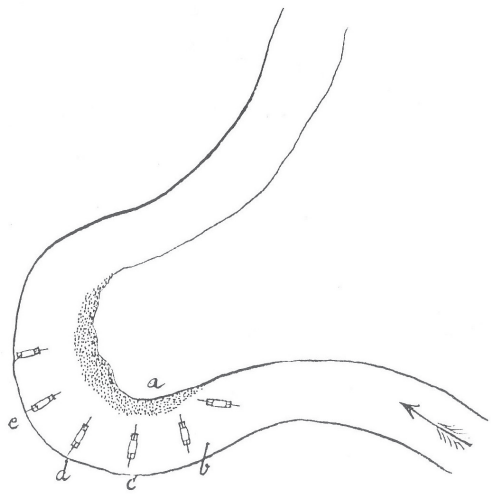

Figure 2. The meanders on the Mureş River
(ÖStA, NH, SK, Salzwesen, 199, no. 8, 2 December 1780.)

autumn of 1778,[55] when an insufficient workforce was recruited from among local peasants, provided the Financial Directorate with the opportunity to make the above decision. In February 1780, they informed Colonel Enzenberg, commander of this regiment in Năsăud, that border guards could now use larger ships for salt transport on the Someş River.[56]

On 5 August 1780, the Financial Commission in Vienna sent their approval to the Gubernium in Sibiu of the sum of 8,760 florins for the shipyard at Maros-Portu, of which 4,261 florins were allocated for the building of 31 ships (each cost 137 florins and 47½ kreutzer). The remaining sum was allotted to auxiliary buildings.[57] In addition, on 2 December 1780, the Commission allotted an extra 1,873 florins and 20 kreutzer for the construction of 10 wintering places for ships.[58] According to Fischer's plan, these places were to be built beyond the river, in an area protected from floods (Fig. 2).[59]

The plan followed the design of wintering places for salt transport vessels at Salzkammergut (on the Traun River, especially at Wels) conceived by the imperial

55 Ibid., 28–56.
56 ÖStA, NH, SK, Salzwesen, 199, 1780: 42–51.
57 Ibid., 442–553.
58 Ibid., 1094–98.
59 Ibid., 1097.

and royal cameral engineer Hubert in 1776.[60] Hubert had already provided technical instructions regarding these places as well as other similar designs for the region of Banat.[61]

The aim of this measure was to reduce travel time to Szeged by a third, which meant that each round-trip salt transport, which had required five weeks until then, would now require about three weeks without pause. This also meant that several shipments of salt could be moved by the newly-built ships over a short period of time. As a result, lower quantities of timber would be used, which would bring more revenues to the Imperial Treasury; however, the quantity of timber to be used depended on the ship's size and furnishing. In order to build the a along the river, arable lands had to be reduced, brush and forest surplus on riverbanks had to be cut. In addition, the construction work required timber, stone, as well as skilled and manual laborers, carts, and various tools. In order to carry out the first set of requirements, the engineer Fischer made the following proposal:[62] (1) landowners had to build levees and embankments wherever banks were sunken or uneven in order to protect villages and lands from floods; (2) cavities located next to riverbanks had to be filled up or crossed by a bridge; (3) brush and trees along riverbanks had to be cut; (4) garden fences along riverbanks had to be torn down so that ships could be hauled upstream; (5) mill owners had to erect tall and strong protection bars around mills, which were obstacles to navigation of rivers. In 1771, the Mureş River alone numbered 186 mills that had to be bypassed. The projected demolition of these mills caused an uproar among owners.[63]

Unfortunately, Fischer's plan to render the Mureş River navigable with softwood vessels, which can be considered very ambitious for the prevailing technical conditions in Transylvania, was ultimately abandoned for lack of qualified personnel.

According to the 1779 plan to regulate the Mureş River, wherever the river had two branches, one of them had to be closed off. For this they adopted a holistic approach, meaning that every angle and aspect was taken into account, from the width, length, and depth of the waterway to safety measures for ships as well as the adjoining roads, agricultural lands, and human settlements.

60 Ibid., 1095.

61 Ibid., 1095–96.

62 ÖStA, NH, SK, Salzwesen, 200, 1781: 281–318.

63 Müller, *Wirtschaftspolitik*, 57.

While choosing the trajectory and outlining the scope of the regulation work, Fischer started from certain principles that reflected the necessity to maintain a stable riverbed: (1) respect for the natural evolution tendency of the riverbed and creation of favorable water-flow conditions; (2) preservation of floodwater flow direction and water transport capacity by avoiding flow blockages; and (3) regulation works carried out in stages by following the evolution in time and space of morphological phenomena and by avoiding unwanted effects.

As we indicated above, the works to protect the banks of the Mureş River had to be conducted according to the particularities of its flow, the necessity of these works being closely connected to the regulation solutions. Because riverbank protection works were costly as they absorbed a significant amount of building materials, the Viennese Financial Directorate wanted them reduced to the required minimum. In any case, cutting through the meander neck required at least two consolidation points (upstream and downstream). However, there was the risk that calibration works could destroy natural consolidations (Fig. 3). It was

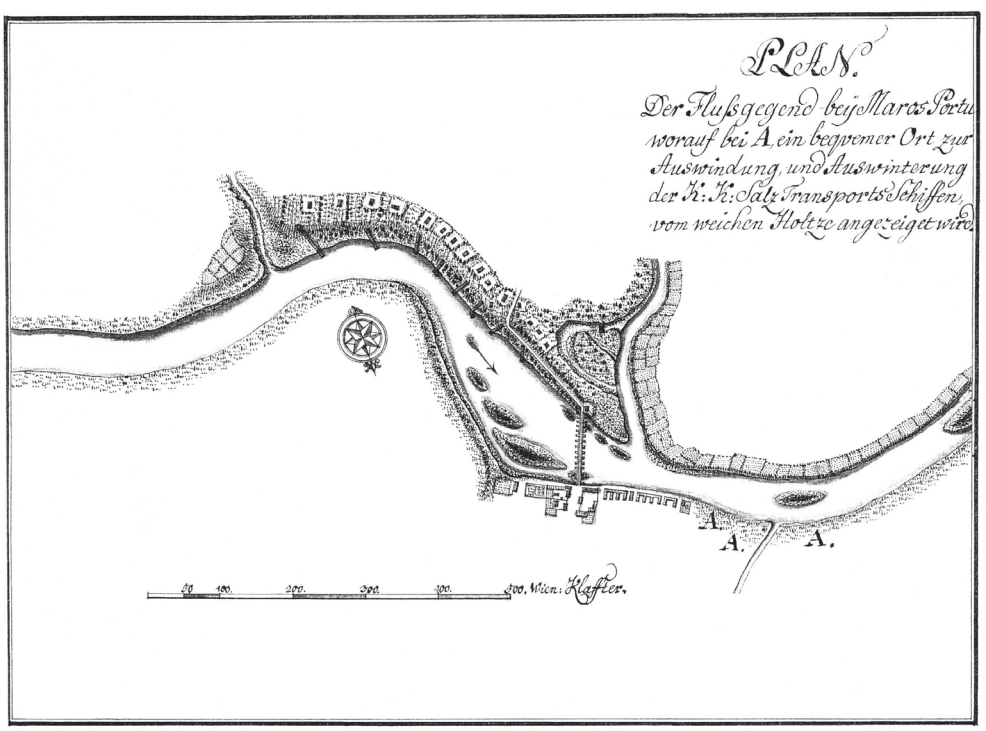

Figure 3. Wintering places for ships
(ÖStA, NH, SK, Salzwesen, 199, no. 8, 2 December 1780)

also stipulated that levees should be built in certain sections near the riverbanks for their protection.

This planned transformation of the landscape could also appear as an attempt by the Financial Directorate to improve transportation by water and riverside living conditions alike.[64] In this time period, the custom of regulating internal waterways within ample projects in order to facilitate transport, to ensure protection against floods, and to prevent the outbreak of epidemic diseases was always linked to centralizing interests of state power.[65] This implies the existence of a political-economic will, as well as a group of advisers and specialists that perceived the transformation of the landscape as an impetus for agriculture and for economic progress in general.

The new transformation of the landscape was based on the use of techniques and work methods theretofore unknown in Transylvania. They represented the best premise for carrying out projects on river regulations, canal building, and draining operations. The great technical projects were not carried out simply by bringing or importing know-how, but also by connecting them with institutions, scientific ideas, and technical procedures.[66] A novel element of this project was that it placed the landscape within the general context of its use, thus serving economic interests, such as the promotion of transport. Secondly, it relied on extensive mapping and surveys, which helped engineers eliminate risk factors. The technical plan was accompanied by mission statements, financial proposals, as well as revenue and expenditure estimates.

Impact on Human Settlements

By building new transport routes in the era of mercantilism, the transport reorganization plan created the premise for the economic development of regions rich in raw materials or located in the proximity of waterways, also giving an impetus for the structural transformation of human settlements and landscapes alike. The fact that transportation by water played a substantial role is also demonstrated by the presence of human settlements along the rivers. Among them, those situated at each end of a route or at the intersection of major waterways and roads acquired greater significance. Because waterways were used only for a short period in a year, travelers and traders had to stop over

64 Király, "*Die Donau,*" 30.

65 Király, "*Die Donau,*" 41.

66 Ibid., 43.

in these settlements for a longer time and then continue their journey by land. This had a positive impact on the local economic and cultural life.

This is also how the settlement of Partoş developed. The local Naval Office contracted annually administrative personnel and ship crews, who lived in the neighborhood close to the port. Moreover, this area of town hosted many shipbuilders. There three plans for the fortress and town of Alba Iulia from this time period that describe the main salt warehouse and the shipyard, both located on the right bank of the Mureş River between the bridge over the river and the mouth of the Mureş Canal, known as the "sanitary canal" in the nineteenth century. The plans were drawn up by the Fortress's Corps of Engineers.

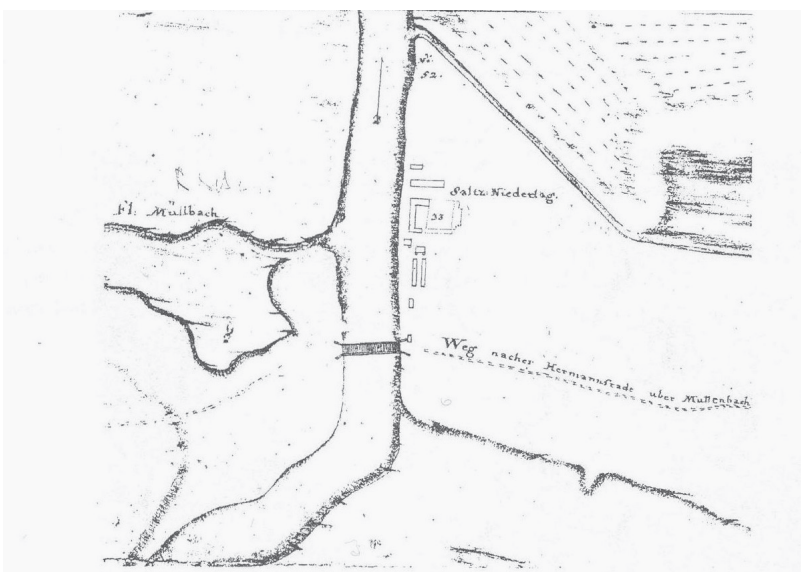

Figure 4. Maros-Portu in the year 1740
(Suciu and Anghel, "Mărturii," 367–87.)

The first plan was drawn up in 1740 and entitled "Situation Plan for the Alba Iulia Fortress in Transylvania" ("Situations Plan der Festung Carlsburg in Siebenbürgen"). On the south side, one can distinguish the course of the Mureş River, the bridge with the customs office, and the road that links Alba Iulia to Sibiu via Sebeş. On the same bank is also located the mouth of the Mureş Canal and the salt warehouse (Salzniederlag). The latter, comprising a total of nine buildings, stretched along the right bank of the Mureş River for around 300 meters. The buildings of the salt warehouse were placed on the western side of a rectangle (Fig. 4).

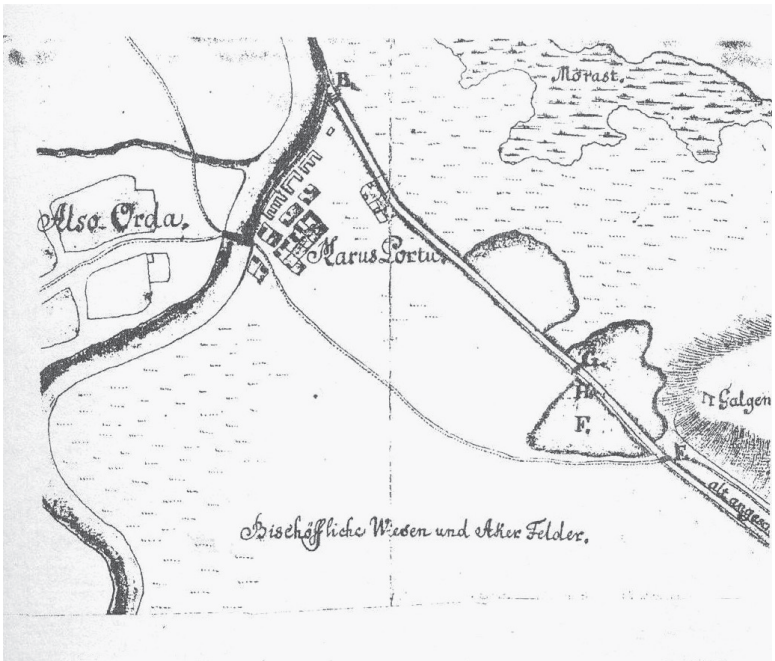

Figure 5 Maros-Portu in the year 1771
(Muzeul Naţional al Unirii Alba Iulia, fond "Colecţia de documente," no. 7409.)

The second plan was drawn up in 1771 and illustrates only the town's main elements: streets, canals, churches, as well as the salt warehouse at Partoş. They also marked the locality Maros-Portu on the right bank of the Mureş River. Apart from the 20 houses, one can also notice that the location of the buildings of the salt warehouse is identical to that from the previous plan (Fig. 5).[67]

The Mureş River project was also the source of demographic growth in Topliţa. In 1750 it counted 50 households,[68] and by 1785 their number reached 227, with a population of 1,470 inhabitants.[69] Work at the Austrian sawmill and in timber rafting increased the town's population as more individuals found employment there (Figs. 6 and 7).[70]

67 Suciu and Anghel, "Mărturii," 375–76.
68 Marc, *Evoluţia habitatului,* 55.
69 Prodan, *Din istoria Transilvaniei*, 288.
70 Marc, "Izvoare etnografice surprinse, " 479.

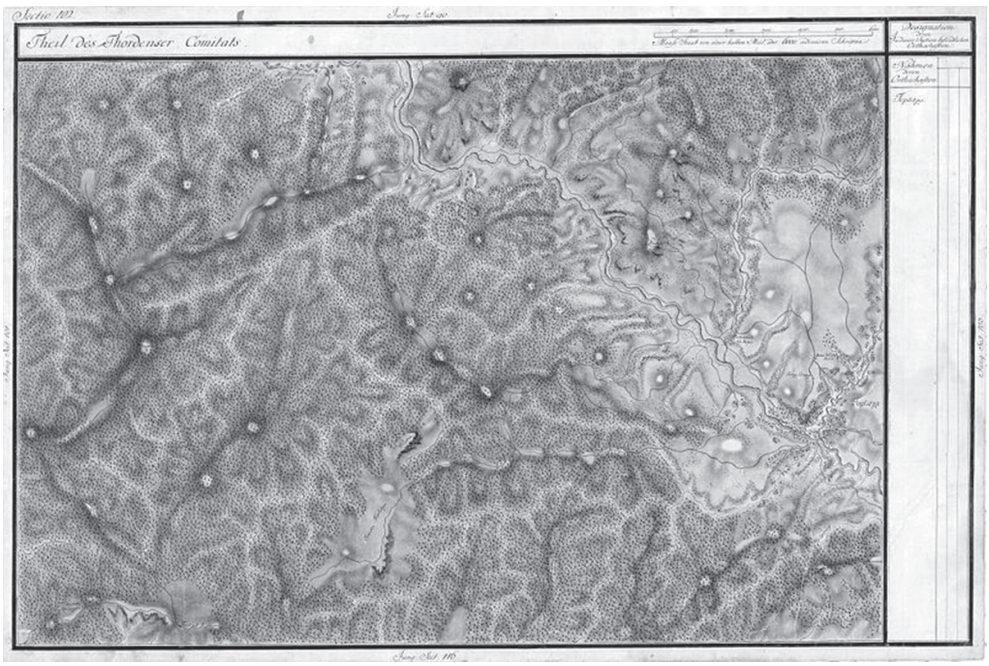

Figure 6. Topliţa during the Josephine land survey
(Dorel Marc, *Evoluţia habitatului tradiţional în zona Topliţei Mureşului Superior (sec. XVII–XX)*. Tg. Mureş: Ardealul, 2009.)

The River Regulation Attempt at Limba

The 1786 operation to eliminate meanders on the Mureş River started with the so-called "Limba" (The Tongue) meander, close to Alba Iulia. This operation included technical measures that Transylvanian Treasury were ultimately unable to implement properly due to lack of experience and inadequate equipment. The flawed intervention combined with eroding riverbanks resulted in the flooding of Ciugud. As a result, its population had to be evacuated and moved elsewhere.

The navigation engineer Fischer submitted to the *Magistrat* in Alba Iulia a formal request for the relocation of the inhabitants of Ciugud and for 300 laborers needed for the hydro-technical works.[71] On June 14, 1786, during the preparation stage for this operation, Fischer was asked the following questions: "where and how was the sector of the Mureş River, that was assigned to him,

71 MNL OL F 46, 1786, No. 4544: 1–2.

Figure 7. Topliţa during the Franciscan-Josephine land survey
(Personal collection)

navigable, if meanders prevented safe navigation, […] and whether circumstances required the employment of personnel."[72]

Fischer explained that the Mureş River was navigable from Mirislău, a locality upstream from Aiud (Enyed/Strassburg am Mieresch), where navigation was surely possible in springtime, even with a 5–600 quintal cargo on a type of vessel built straight and wide in order to be useful on lower-depth waterways. On deeper waterways, such as the Danube, larger and heavier cargo ships could navigate, which was important to the economy of the province as local produce could be moved easier, safer, and in larger quantities. On the lower course of the Mureş River up to Arad or to the Tisa River, navigation was possible until June.

In relation to the numerous meanders, small islands, and other obstacles hindering easier and safer navigation, Fisher maintained that the greatest issue was the dispersal of the current. This dispersal meant that the river, at higher current velocity, rather eroded the riverbank, which consisted mostly of soft earth, than deepened the rocky riverbed. He then proposed several measures to

72 MNL OL F 46, 1786, No. 5443: 3.

improve the course of the Mureş River, such as the improvement of the riverbed, the building of roads with effective drainage along the riverbanks, the protection of side valleys from floods, the regulation of mills and weirs, the construction of bridges over dangerous places, and the installation of water conveyance systems or similar objects that could be useful for the local population.

For the elimination of the meander he proposed: (1) building adequate machinery for the river; (2) the prior cleaning of the riverbanks and of the river sector; (3) cutting through the neck of the meander; (4) securing the lower part of the riverbanks; (5) sealing off the free branch; and (6) eliminating the possibility of floods.

They intended to cut through the neck of the meander at the point opposite Ciugud, namely, at the village of Drâmbar (Drombár), which meant building a canal between the two points. Then, Fischer argued, the population of Ciugud had to be relocated (Fig. 8).[73]

Figure 8. "Limba" and Ciugud in the year 1741. Military map of Alba Iulia, 1741. (*Plan der Hauptvestung Carlsburg in Furstenthum Siebenburgen, I. M. Eisele*, Catalogue of Count Ferenc Széchényi´s Maps and Atlases, no. 89.)

73 MNL OL F 46, 1786, No. 4544:1.

In a report dated 5 April 1786, Fischer asked the Transylvanian Treasury when it could finance the improvement of navigation and hydraulic issues. He explained that, similarly to Hungary, each county should employ an engineer specialized in hydraulic issues so that several works could be executed at the same time. In addition to this, he suggested that it would be very useful if they also conducted research and drew up future improvement plans with the help of a hydro-technician who was able to implement them and who was familiar the country's particularities as well as its problems.[74] Following this request, Transylvania's Gubernium approved on 2 July 1787 the payment of 1,397 florins and 20½ kreutzer to the Transportation Office at Partos for the execution of hydro-technical works at Ciugud.[75]

The resolution of these issues required the employment of experienced personnel, especially laborers who had previously worked on similar building projects, such as the improvement of road infrastructure, the renovation of public buildings, etc. These projects were ultimately abandoned, either for technical or financial reasons. The year 1786 was especially difficult for Transylvania due to a devastating earthquake,[76] numerous floods, and an epizootic outbreak,[77] which compelled the *Gubernium* in Sibiu to redirect financing towards the affected areas and to postpone the planned regulation of the Mureş River.

Three-quarters of a century later, on 6 May 1850, another project for the regulation of the Mureş River was submitted by the deputy Military Commissar of the Alba District, Dimitrie Moldovan, to the General Staff in Sibiu. The plan targeted rendering this river navigable for steamboats, but it was ultimately rejected.[78] The idea of regulating the Mureş River would be reexamined almost a century later, during the communist period.

The following question arises: How did the regulatory works influence the lowland downstream settlements? As we have seen, the policies to improve transportation on the Mureş River, which included its regulation, led to the further development of the town of Alba Iulia, the prime example of this study. Similar developments can be noticed in other towns, such as Deva and Arad, while the operation near the village of Ciugud, which ended in failure, caused the relocation of its entire population. It is certain, however, that river

74 MNL OL F 46, 1786, No. 5443: 4–7.

75 MNL OL F 46, 1787, No. 6149: 1–7.

76 von Hoff, *Chronik der Erdbeben,* 74.

77 Armbruster, *Dacoromana-Saxonica*, 401.

78 Suciu and Anghel, "Mărturii," 380.

regulation operations reduced the risk of flooding generally. Another example is the successful operation on the Târnava Mare River at Dumbrăveni (Ebesfalva in Hungarian/Elisabethstadt in German), which took place in 1771.[79]

Conclusions

The plans to regulate navigable rivers can be considered a novel element within the evolution of navigation on internal waterways in the early stages of Transylvania's industrialization in late eighteenth century. Industrial growth was a decisive factor in waterway regulation and the reorganization of timber and salt transport. This induced numerous changes in the natural environment and prompted the development of human settlements.

The Mureş River plan consisted of: (1) rethinking the timber and salt transport system on the internal waterways, which was determined by the acute shortage of oak timber needed in shipbuilding; (2) building softwood vessels according to the design of those used in Upper Austria; (3) regulating the channel of the Mureş River by straightening and reinforcing its banks as well as by eliminating menders; and (4) building canals for moving timber to the specially constructed sawmills.

The following changes were made to the landscape: (1) reinforcement of riverbanks; (2) building of a road which ran parallel with the Mureş River for the traction of vessels upstream; (3) building of the sawmill at Ditrău; (4) construction of the canal at Topliţa; (5) rearrangement of the shipyard at Partoş; and (6) growth of towns and villages in the proximity of logging sites (for example Topliţa) and of the sailors' neighborhood in Alba Iulia.

These projects aimed at reshaping the landscape and subordinating it to the economic imperatives of the Viennese Court. The centrally planned regulation of the Mureş River in Transylvania was meant to make the downstream transportation of goods (primarily salt) easier and more cost-efficient. In addition, this project was beneficial not only for the local labor market, given that the dredging, cleaning, and building works required a considerable number of skilled workers and manual laborers, but also for local industry and commerce as more goods could be moved.

Moreover, these operations had an environmental impact as they reduced ground water levels and the average discharge of the Mureş River. One should

79 Rus, "Die Überschwemmungen," 43–63.

also add, however, that constant and long-lasting tree harvesting in the area and climate change, as well as increasing demand for water in the fast-growing towns and in agriculture, may have very well contributed to this.

The poor state of roads meant that the expansion of internal waterways (regulation of rivers and construction of canals) became a necessity. In comparison to roads, which became unusable in bad weather, waterways were much more reliable and cost-efficient. The latter were better suited for moving heavier cargo, especially salt. Around ports located alongside waterways, several towns grew and thrived as a result of commercial and shipping activities.

Novel for Transylvania was the dissemination of technical innovations as well as the rethinking of the shipbuilding system that was achieved by bringing specialists from Austria. There were, however, several obstacles that had to be overcome, such as cost, safety issues, and lower water depths. Revolutionary for the province was also the progress of institutional structures and infrastructure. Further improvements to infrastructure involved the facilitation of water transport through the building of a new type of vessel, adopting a new navigation system, and expanding the Maros-Portu port.

The geographic distribution of salt and timber resources required the design and promotion of new cargo vessels. Topographic difficulties and landscape particularities propelled the improvement of these means of transportation and of the infrastructure. The development of the "salt industry" led, on the other hand, to the creation of new economic centers in areas where timber was used in construction.

Towards the mid-eighteenth century, transport over waterways had become a major revenue source for the state. During this century, states were willing to invest heavily in the expansion of internal waterways and to encourage the creation of transregional waterway networks in order to move larger quantities of goods and to increase their revenues. As for Transylvania, the measures that central authorities took were revolutionary for the time since they transformed the landscape by expanding and improving transport routes and by rethinking transport over water and ways to conserve timber. According to a 1791 report, approximately 500,000 quintals of salt produced from the mines at Turda, Cojocna, and Ocna Sibiului were transported on the Mureş River annually.[80]

80 ANR-Cluj, collection: Tezaurariatul Minier, No. 49/1791, 23.

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"Fighting Where Nature Joins Forces with the Enemy:" Nature, Living Conditions, and their Representation in the War in the Alps 1915–1918[1]

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First World War propaganda, but also popular movies like Luis Trenker's *Berge in Flammen*, for a long time presented the image of the war in alpine territory as a place, where solitary heroes fought a war in a magnificent natural scenery that was so different from the carnage of the western front. Based on recent research that has shown that the latter was not true, the following contribution focuses on the perception and representation of nature and natural phenomena in contemporary publications, diaries, and letters from Austria, Italy, and Switzerland. It analyzes the relationship between soldiers from many countries on the one hand, and nature as well as natural phenomena such as avalanches, fog, or rain on the other. The contribution discusses the reactions of officers and soldiers to nature and the respective natural phenomena and offers new insights on everyday living conditions of officers and soldiers in a landscape with harsh conditions that had never before been a battlefield for such a prolonged period of time.

Keywords: First World War, environmental history, nature, weather conditions, Alpine territory

Slightly above the Passo dello Stelvio, close to Rifugio Garibaldi and Piz Trais Linguas, the following inscription in German as well as Hungarian can be found:

> Faithful unto death to its Emperor and Apostolic King, fatherland, and home […] the IV Reserve Battalion of the 29th Hungarian Infantry Regiment under the command of Captain Kalal and Lt.-Col. Edler von Kunze gloriously and without giving way even one step defended […] the Stilfserjoch [Passo dello Stelvio] as well as the snow-covered, barren, and icy heights between the Piz Trais Linguas, the Scorluzzo, the Naglerspitze, and the Krystallkamm in the war years 1915, 1916, 1917, and 1918.[2]

1 I thank Oswald Überegger and the two anonymous reviewers for their comments on an earlier draft of this article. They have helped me to improve this contribution.

2 Cf. Image 1: All translations from German and Italian are by the author.

Still today, many people passing the Passo dello Stelvio come up to this commemorative plaque, which has been moved a few meters onto Swiss territory, and lay down wreaths to honor the memory of those for whom it was erected in 1918 by the commanding officer Freiherr Moritz von Lempruch.[3]

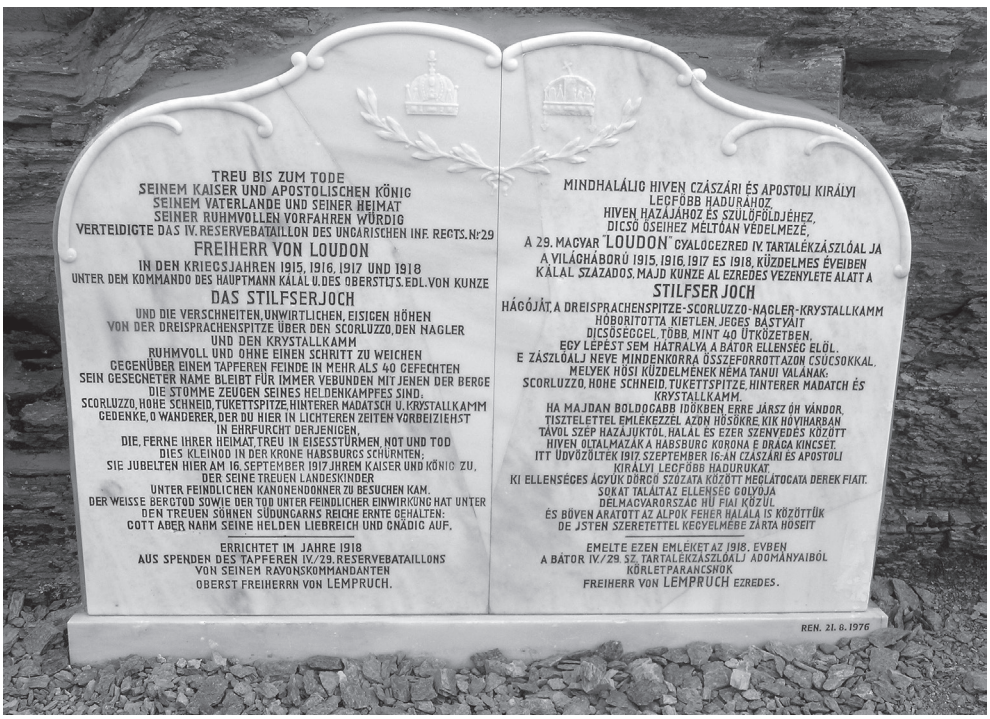

Photo 1: Commemorative plaque for officers and soldiers of the IV Reserve Battalion of the 29th Hungarian Infantry Regiment on Piz Trais Linguas

(Photograph by the author, August 2017.)

Dangerous, Barren, Awesome, and Beautiful: An Introduction to Nature's Role and Natural Phenomena in the War in the Alps 1915–18

All of this is part of an ongoing fascination amongst a large numbers of visitors to the former war zone between the Umbrail pass in the west and Mt. Krn in the east with a war that for a long time has been portrayed as an unconventional battlefield, so different from the many other fronts of the war.[4] Although historians like Isabelle Brandauer, Christa Hämmerle, Marco Mondini, or Markus Wurzer

3 Accola, *Der militärhistorische Wanderweg Stelvio-Umbrail*, 57–58.

4 Überegger, *Erinnerungskriege*, 235. Cf. recently Reis Schweizer, "Ein Krieg in Eis und Schnee," 6–7.

have shown that life and fighting on the alpine front was not so much different from the brutal reality of other fronts,[5] the majority of the literature dealing with this part of the war—published mainly by non-professional historians[6]—offers interpretations that stress either the heroic character of the men involved, the sacrifice they made, or the perseverance they showed. In similar ways efforts of today's regional tourist offices present the former battlefield in several outdoor museums as an awesome experience of nature, but in which the reality of war is no longer present.[7]

In this context nature is usually presented simultaneously as dangerous and barren as well as awesome and beautiful, not least because it was the essential prerequisite for the existence of the mountaineer warrior, who fought out this war individually rather than as part of an indiscernible mass. The impressive natural scenery formed the aesthetic aura for a war fought out personally, with death coming suddenly and in the sight of one's homeland's highest summits rather than in the mud of the frontline in the west or the east. And yet, the mountainous landscape was represented as even more dangerous than the enemy. Officers and soldiers not only had to fight the enemy's armed forces, but also the forces of nature which were even viewed as the ultimate conquest to be made in some sort of sportsmanlike alpine competition.[8] In a manner similar to the description of the mountaineer warrior, who is at the same time archaic and modern, nature too is likewise described as active as well as indulgent, as both destructive and majestic and as a force, which "joins forces with the enemy."[9]

This was also the way that nature was presented in wartime propaganda as well as in interwar era movies, novels, and publications. In contrast to many places on the eastern and western front as well as in the Balkans, many of the alpine areas were rather well known to the general public as a consequence of pre- and postwar tourism promotion. In contrast to other places where winter battles took place, such as the Carpathians or the Caucasus,[10] it was fairly easy to get stories

5 Brandauer, "Kriegserfahrungen: Soldaten im Gebirgskrieg," 385–400; Hämmerle, "Opferhelden? Zur Geschichte der k.u.k. Soldaten an der Südwestfront," 155–80; Mondini, "Kriegführung," 367–84; Wurzer, "Der Dolomitenkämpfer Sepp Innerkofler," 371–85.

6 On the co-operation of historians on all levels cf. Segesser, "Wellen der Erinnerung und der Analyse," 46.

7 Überegger, *Erinnerungskriege*, 235–36; Rapp, "The Last Frontiers," 231–47.

8 Überegger, *Erinnerungskriege*, 248–49; Günther, *Alpine Quergänge*, 258–62.

9 "Italy's Heroic Campaign: Fighting where nature joins forces with the enemy," *The New York Herald* (European Edition), March 12, 1916, 3.

10 Cf. Tunstall, *Blood on the Snow* and Ford, *Eden to Armageddon*, 121–37.

about this part of the war out to the public early on, a fact that has shaped the memory of the war in alpine territory up to the present. In their publications, people like Walter Schmidkunz and Luis Trenker,[11] Fritz Weber,[12] Gunter Langes,[13] and Heinz von Lichem,[14] following views common among the Deutscher und Österreichischer Alpenverein, presented a picture of the war in which the enemy on the one hand was a traitor, while on the other his mountaineering achievements had to be acknowledged.[15] It is probably in this context that Lichem also claimed that according to the testimony of the surviving commanding officers, as well as of accounts of soldiers from all sides, about two-thirds of the 150,000 to 180,000 war victims of the alpine front died because of the rigors of the high altitude (including disease), with 60,000 deaths on the alpine front being attributable to avalanches alone.[16] Looking at figures given by Heinrich Menger in 1919, who speaks of 2,840 dead officers and soldiers for the winter of 1916/17 for the Tyrolean and Carnic front,[17] and at the official data in the official history of the Austro-Hungarian army, stating 880 dead for November and December 1916,[18] this figure seems to be too high[19] and may probably be attributed to the fact that—apart from statistical problems[20]—the impact of the environment was amplified to fit with the argument that men on the frontline were not just fighting the enemy, but an enemy far bigger, that is, nature.

It is in light of this latter question of perceptions that this contribution explores what officers and soldiers of the time wrote about nature as well as natural phenomena, such as avalanches, fog, or rain, and how they coped with weather and climate in locations where no one before had ever tried to stay for the entire year. It will not be possible to present the entirety of perceptions of

11 Trenker, *Kampf in den Bergen*. As he made it clear in his preface Trenker published the book in collaboration with Walter Schmidkunz, whose wartime publications will be discussed below. This work formed the basis of Trenker's movie, which bears the same title. Cf. Alexander, "Der Dolomitenkrieg im 'Tiroler' Film," 228–37.

12 Weber, *Feuer auf den Gipfeln*.

13 Langes, *Die Front in Fels und Eis*. The first edition was published in 1932.

14 His major work is Lichem, *Krieg in den Alpen 1915–1918*.

15 Rotte, "Politische Ideologie und alpinistische Ideale," 130–40.

16 Lichem, *Krieg in den Alpen 1915–1918*, vol. 2, 142 and vol. 3, 109–10. For figures on victims on the alpine front in general cf. Rotte, "Politische Ideologie und alpinistische Ideale," 138.

17 Menger, "Alpenverein und Weltkrieg," 185.

18 Glaise-Horstenau, *Das Kriegsjahr 1916: Zweiter Teil*, 700.

19 Cf. Brugnara et al., *December 1916*, 1–2.

20 Mortara, *La Salute Pubblica in Italia*, 20–26; Isnenghi and Rochat, *La Grande Guerra*, 165–71; Leoni, *La guerra verticale*, 468 (footnote 22).

nature and natural phenomena, but in exploring rarely used and partially only recently published diaries as well as letters and contemporary publications from Austria, Italy, and Switzerland that disclose natural phenomena in wartime, this contribution will attempt to give a transnational picture—and thereby try to overcome the criticism of Hans Heiss that Austria and Italy have remained in a state of friendly ignorance of each other, working back to back.[21] In diaries officers and soldiers recorded their own impressions of nature over time and in real time. Either as manuscripts or in some cases as published versions diaries survived, but many were also lost.[22] What is clear is that not all officers or soldiers kept diaries. Therefore only a specific extract of experiences is left to us, which often stems from people who had an affinity for writing. This latter aspect is also true in regard to the second type of source, letters written to relatives at home; although, as Mondini has shown for the Italian side, many illiterate soldiers turned to writing during the war with the help of their literate comrades.[23] Contemporary publications, often written by people closely attached to official bodies such as the Austro-Hungarian Kriegspressequartier, can therefore be considered to represent the official or semi-official discourse on nature in alpine territory. In some cases—mainly in publications in newspapers—they were, however, also written to keep the home front informed and reassured. The first part of this contribution will give a quick overview on the war in alpine territory in the years 1915 to 1918 before looking at the three types of sources, in order to map out the existing presuppositions and stereotypes. A short conclusion will complete this article.

The War in the Alps, its Historiography, and its Development

So far Marco Armerio, Tait Keller, Selena Daly, Diego Leoni, and Mario Podzorski have been among the few professional historians who specifically discussed the perception of nature in their studies. Armiero and Keller claimed that as a

21 Heiss, "Rücken an Rücken," 101. Kos, Review of *Krieg in den Alpen*, 261–62 also wonders to what extent the contributors from Austria and Italy really took notice of each other's research.

22 Such was the case of Moritz Freiherr von Lempruch, whose diaries, as probably many others, were lost in the last and chaotic days of the war. Lempruch, *Der König der Deutschen Alpen*, 2. In other and probably the majority of cases the reason, why the diaries were lost is unknown. Some are also still privately held and therefore not easily accessible. Cf. Wisthaler, *Karl Ausserhofer*, 8 and Grote, "'Mir geht es gut und ich hoffe dasselbe von dir sagen zu können'," 20.

23 Mondini, "Papierhelden," 186–88. Letters were, however, less often preserved than diaries. Cf. Wisthaler, *Karl Ausserhofer*, 16.

consequence of the Great War, the "Alps were celebrated as the natural bastion of the nation, the ultimate borders of the Italian community,"[24] or "a bastion for Germany and Austria […,] a national sanctuary and a 'Volkssanatorium' […,] where martial and mountaineering ethos [fused]."[25] While Armiero mainly concentrated on the memory of the war and only included a few testimonies mainly of veterans,[26] Keller's studies contain an analysis of several contemporary sources from the war years. However, he mingles information from such sources with accounts of the interwar period, which weakens his conclusion that "soldiers on the Alpine Front felt their spirits rise when they saw the mountains" and that those "on the home front believed that the mountains aided the war effort […giving] strength and courage."[27] In her article Daly looks at the experiences of mountain combat by Futurist Filippo Tommaso Marinetti, thereby concentrating on one specific experience.[28] Leoni gives an impressive account of the daily lives of soldiers in the war in alpine territory. He makes great use of diaries and letters, but when relating to nature his focus is more on its impact than on perception.[29] Podzorski analyses daily lives of Swiss soldiers in Val Müstair and on the border triangle between Austria-Hungary, Italy, and Switzerland in the region between the Punta di Rims and Piz Cotschen. He gives an impressive overview about the daily routine, sentry and patrols, construction work, cutting wood, repairing roads, accommodation, food and drink, leisure time, health issues and hygiene, contacts with soldiers from the belligerents, and last but not least, nature (as weather and landscape). His study is, however, limited to Switzerland, which was neutral and whose military therefore only had a limited experience of the war itself in the form of border violations and the watching of operations of the belligerents.[30]

The war in the Alps formally began on May 23, 1915 with Italy's declaration of war against Austria-Hungary. The largest part of the frontline between the Passo dello Stelvio in the West and Tolmin in the East consisted of mountainous terrain with heights mainly between 1,000 and 2,000 meters above sea level, but sometimes reaching almost 4,000 meters in the Ortles region and 3,000 meters

24 Armiero, *A Rugged Nation*, 87

25 Keller, "The Mountains Roar," 268. and 270.

26 One exception was a quote from Cesare Battisti that will be discussed below. Cf. Armiero, *A Rugged Nation*, 98.

27 Keller, "The Mountains Roar," 268; Keller, *Apostles of the Alps*, 89–118.

28 Selena Daly, "'The Futurist mountains'," 323–38.

29 Leoni, *La Guerra Verticale*, 126–211.

30 Podzorski, "Kriegsalltag und Kriegserfahrungen von Schweizer Soldaten," 87–124.

in the Dolomites.[31] Operations along the alpine border did not, however, begin immediately, although some of the troops had been deployed to their positions before the war began.[32] The Italian High Command had decided to proceed cautiously on this part of the front and rather concentrate on offensives in the lower Isonzo/Soça region, where it believed the chances for a breakthrough were best.[33] For sure, this was largely due to the fact that up to the 1880s the military high command had not considered alpine territory a possible battleground, and consequently fighting in high altitude was to a large extent a novelty to modern warfare.[34] Already long before the war the Austrian military high command had decided to build fortresses at strategic positions blocking the entry into the main valleys of Trentino, Tyrol, and Carinthia, even if this meant giving up some parts of its territory, such as Cortina d'Ampezzo.[35] Although two major offensives—the so-called Austro-Hungarian "Strafexpedition" in 1916[36] and the battle of the Ortigara in 1917[37]—were mounted, for two years in its eastern part and three years in its western part the frontline did not change much until the end of the war. Soldiers were compelled to fight and survive year-round in an environment in which human beings usually only lived and came into contact for a very short part of the year.[38] At the beginning of the war the terrain was mostly unknown to the soldiers deployed into these areas and there had been almost no military training for fighting and surviving in high altitude before 1914. On either side, the number of troops who even to a small extent had been trained for mountain warfare was small. Troops therefore at first had to adapt to this new way of warfare, a fact that offered opportunities for the mythologizing of figures like mountain guide Sepp Innerkofler. Over time, however, technology took over also in high altitude and officers as well as soldiers adapted to a way of warfare previously unknown, but no less brutal than on the western front.[39]

31 Jordan, *Krieg um die Alpen*, 87–98.

32 Schmidkunz, *Der Kampf über den Gletschern*, 7–10.

33 Isnenghi and Rochat, *La Grande Guerra*, 147–57.

34 Isnenghi and Rochat, *La Grande Guerra*, 159–60; Leoni, *La Guerra Verticale*, 39–51.

35 Jordan, *Krieg um die Alpen*, 130–41; Schmidl, "Kriegführung," 357.

36 Artl, *Die "Strafexpedition."*

37 Pieropan, *Ortigara 1917*.

38 The extended period of time spent in these harsh conditions made the experience on the Alpine front different from that of other mountainous theatres of war mentioned above in Tunstall, *Blood on the Snow* or Ford, *Eden to Armageddon*, 121–37.

39 Hämmerle, "'Es ist immer der Mann, der den Kampf entscheidet und nicht die Waffe …'," 42–43; Leoni, *La Guerra Verticale*, 131–44; Menger, "Alpenverein und Weltkrieg," 171–72; Überegger, *Erinnerungskriege*, 243–45; Wurzer, "Dolomitenkämpfer," 371–85.

Making Sense of the War and its Natural Environment in Official and Semi-official Publications

Not least in view of the growing number of victims caused by the war, but mainly because by the end of 1914 it became clear that this global war was not going to be short, governments of all the major belligerents actively began to make sense of the war. In the case of Italy the Habsburg authorities used the image of the traitor, who had to be fought on the heights of one's native mountains, while for Italy the war against the Danube monarchy was presented as one of freeing Trento and Trieste from the yoke of the tyrant in Vienna.[40] This propagandistic effort did not remain without effect on the officers and soldiers in the frontline, although not all of them were responsive in the same manner. Amongst those using demeaning terms for the enemy was Karl Ausserhofer, who spoke of "Bölz" or "Katzelmacher" in his diary when referring to Italians.[41] Even more explicit was Franz Josef Krug, who specifically called the Italians "traitors" and "greedy for booty." They would, however, never be able to tear down this mountain rampart that was well defended against the "archenemy."[42] Karl Hane,[43] Walter Schmidkunz,[44] Emilio Campi,[45] and Nicola Ragucci[46] on the other hand avoided demeaning terms and only spoke of the enemy, the "Italians" or the "Austrians," respectively. Ragucci went a little further, eulogizing his own soldiers as "soldiers that the world ignores […]! Unknown heroes! Worthy descendants of ancient Rome!"[47]

In contrast to many others, writers and artists were often able to avoid being recruited as frontline troops. Instead they served as official and semi-official war

40 Procacci, "L'Italia nella Grande Guerra," 8; Überegger, *Erinnerungskriege*, 237–38.

41 Ausserhofer Diary, e.g. June 23, 29 and 30, July, 6 to 9, August 16, or September 3, 1915 for "Bölz" and July 10, 19 and 20, August 5, or September 4, 1915 for "Katzelmacher;" Wisthaler, *Karl Ausserhofer*, 112–41. Cf. ibid., 45 for an explanation of the two terms.

42 Krug, *Alpenkrieg*, 5, 14, 15, 17–18, 21 and 28.

43 Hane Diary, e.g. May 1, 15, 16, 22, 23, 26 and 28, June 1, 4, 7, 10, 13, 15, 25, 28 and 29, July 3, 5 and 9, 1916. On May 24 and 30 as well as on June 8 and 9, Hane used the term "Welsche," which for some was demeaning, but probably not to Hane. Only Battisti is called a traitor on July 9, 1916. Tschaikner, "Kriegstagebuch," 51–52 and 63–78.

44 In Schmidkunz, *Der Kampf über den Gletschern* the enemy is almost absent except for a mention on 14.

45 Campi Diary, e.g. June 7, 9 and 16, July 7, 11 and 22, and August 4, 6, 18, 22, 26, 27 and 31, 1915. Magrin and Fiorin, *Il cappellano del Cadore*, 93–113.

46 Ragucci Diary, e.g. August 29, September 12, 19, 24 and 25, and November 2, 1916. Ragucci, *Ospedale*, 16–44. It is not surprising that Ragucci mentions the enemy the least, because as a medical doctor in a military hospital he was not close to the frontline.

47 Ragucci Diary, October 20, 1916. Ragucci, *Ospedale*, 30.

correspondents, photographers, and painters and became part of the propaganda effort of the belligerents.[48] In this function they published realistic, fictitious, or semi-fictitious reports about the war, mainly with the aim to reassure the population at home that all was well and that, if men fell, they had given their lives for a good cause. Of course the primarily male reporters were not entirely free in what they were writing, but in regard to their representations of nature there was some leeway as the following analysis will show. The authors chosen all grew up in middle-class families and were officials, professional officers, teachers, or journalists. As such they were most certainly influenced by the positive and often nation-centric view of alpine nature that was dominant among the bourgeoisie of many European countries.[49]

It comes as no surprise that the mountaineer Walter Schmidkunz, who was an active member of the Deutsch-Österreichischer Alpenverein as well as the Wandervogel-Bewegung,[50] was amongst those whose description of nature and natural phenomena was most pronounced. Being a war correspondent of the Kriegspressequartier between August 1917 and October 1918, his book *Der Kampf über den Gletschern* was published in three editions between 1917 and 1918. He opened with romantic language, speaking of the "deserted wilderness made up of snow and granite," of the "icy heart of the Adamello," of a spuming stream, where bear and fox say goodnight to each other, or of the eternal mountains,[51] only to continue with the weeks of wet and cold, the night of a stormy foehn, fog, avalanches, hunger not quenched by a hunted chamois buck, or the difficulties of discerning an enemy attack from noises of natural phenomena, such as the falling of a rock, or the light of a star from that of an enemy lantern.[52] Schmidkunzen's presentation of living and fighting in high altitude was ambivalent, showing both nature's splendors as well as its dangers, but of course his chapters, which he wrote as if he had been present himself in the actions he described, always ended on a positive note such as a sunrise, which brought back warmth to freezing soldiers, whose cry of joy told nature as well as the enemy that they were still in control.[53]

48 For Austria cf. Reichel, *"Pressearbeit ist Propagandaarbeit,"* 67–74.

49 Cf. Mathieu, *Die Alpen*, 138–65.

50 Grimm, "Schmidkunz, Walter."

51 Schmidkunz, *Der Kampf über den Gletschern*, 8, 20.

52 Ibid., 9–10, 14, 17

53 Ibid., 20–22.

In a similar manner popular writer Franz Karl Ginzkey[54] spoke of the "romantic surging of valleys and heights, half flogged by rain, half kissed by the sun,"[55] the "brilliance of […] the hilly high plateau of Folgaria,"[56] or the beauty of mountains like the Rosengarten and the Latemar,[57] only to describe a "witches' cauldron full of uncertainty and lurking death"[58] as well as emplacements reclaimed by hard labor out of solid rock. In this latter case man and nature are combined by Ginzkey to create a bulwark that men never could have built themselves.[59] The bulwark or mountain rampart was also an important symbol that Franz Joseph Krug used. He was a former editor of the *Grazer Tagblatt* and an officer from the frontline in Carinthia. Supported by the command of the 10th Army and the *Karnisch-Julische Kriegszeitung*, he was very eager to tell the people at home about the so-called silent front in the Carnic Alps, where heroic soldiers stopped the enemy from entering the homeland, while at the same time fighting the forces of nature. In this "unique double war" against the enemy as well as against the "adverse forces of nature in high-altitude mountains," a large number of "maximum performances" were necessary not only to "wage war against the archenemy, but also against the tremendous forces of nature in winter."[60] Krug, however, not only pointed to the heroic deeds of soldiers and officers in difficult circumstances, but also mentioned the fact that every benefit had been drawn from engineering, in order to enable officers and soldiers to wage war.[61] Visiting Swiss Colonel Karl Müller,[62] the German director of the Alpine Museum in Munich Carl Müller, and Filippo Tommaso Marinetti were even more fascinated by the way modern (and urban) technology worked in the mountains and how infrastructure originally built for tourists could now be used for wartime purposes.[63] For Carl Müller the war and its technology was able to overcome problems that had seemed insurmountable in peacetime:

54 Cf. Atze, "Franz Carl Ginzkey reitet für Österreich," 194–207.
55 Ginzkey, *Die Front in Tirol*, 30.
56 Ibid., 37.
57 Ibid., 64.
58 Ibid., 62.
59 Ibid., 30–31.
60 Krug, *Alpenkrieg*, 5, 20–21.
61 Ibid., 19.
62 Cf. "Totenschau Schweizer Historiker," 209.
63 Müller, *An der Kampffront in Südtirol,* 21–22, 27 and 78–80; Müller, "Von den Wundern der Südfront," 150–56; Daly, "The Futurist mountains," 327–31.

> The war in alpine territory has become lord over [all the problems]; there are no constraints and there is no resistance. Using the most refined resources of technology, but also the help of the simple power of untiring human hands supported by ordinary tools, but animated by formidable energy [the war in alpine territory] has subdued steep pinnacles as well as rugged glaciers and made them subservient to man, without taking account of the casualties it takes and despite the fact that subjugated nature does not want to acquiesce to the yoke and again and again revolts against its conquerors, destroys their works often enough, and tries to take revenge on body and life of those who try to enslave it.[64]

To some extent Müller's words resembled those of Marinetti, who in a much more ideologically oriented language, also tried to "enslave the mountains to Futurist ideals [and] visions of industrialised modernity."[65]

Marinetti also tried to exploit the positive associations that were attributed to the Italian alpine soldiers, the so-called Alpini, equalizing the efforts of the Volunteer Cyclists, to whom he belonged, with those of the venerated Alpini, who were the protagonists of "a warrior myth" because they were "descendant[s] of mountain stock, which allows only the strongest, the most able and most determined to survive."[66] Amongst those praising the Alpini to the utmost was Cesare Battisti, a former deputy of the Cisleithanian Reichsrat, who fought on the Italian side, before being caught and executed in Trento in July 1916 for high treason. For him

> mountaineers and mountains form just one thing. The terrain merges with the people. You will find thousands of men from the plains, who have never paid any attention to the form of the terrain, who do not know six inches of earth without pavement; but the mountaineer has a feeling for the mountain, he has a geographic sense of the area he lives in. […] An Alpino from Valtellina, who explained to his comrades the reasons for war, said: "Let us go to liberate our waters." Do we really have to tolerate that the sources of our rivers are in the hands of the enemy?[67]

64 Müller, "Von den Wundern der Südfront," 150.

65 Daly, "The Futurist mountains," 328.

66 Daly, "The Futurist mountains," 332. quoting Mondini, *Alpini*, viii.

67 Battisti, *Gli Alpini*, 30–31. The translation of the author differs slightly from the translation made by Armiero, *A Rugged Nation*, 98 for some parts of the quotation.

Battisti's aim was to show that these soldiers, growing out of a different community, loved their country and their people, but nevertheless remained a harmonic family, in which the person was more important than his military function. It was the alpine environment that generated such a quality within the men of the Alpini battalions.[68] Battisti was not alone in this assessment. Between 1915 and 1917 the Italian high command almost tripled the number of Alpini battalions and also created a substantial number of new mountain artillery batteries to support them. Nevertheless it proved unable to use these valued special forces in a manner adapted to warfare in the mountains. Except for their success in taking Mt. Krn (Monte Nero) in June 1915, the Alpini failed as much as the infantry along the Isonzo/Soça Valley.[69] The myth nevertheless remained intact. Not least therefore the Futurist Marinetti stressed the fact that his unit survived the same conditions with less supplies than the Alpini, implying that he and his unit were able to overcome even greater hardships. Marinetti's major aim in this context was to escape from the perception of futurism as a preserve of the urban middle class and to align himself with the simplicity of the common soldier, with whom a majority of Italians seemed to sympathize. At the same time he tried to prove that "industrialised modernity" was still superior to nature.[70]

While Schmidkunz, Ginzkey, and both Müllers had been part of an orchestrated propaganda effort of the belligerents and Marinetti as well as Battisti tried to prove their irredentist credentials, Jakob Heer's texts were published out of a different motivation. He was a teacher and part of the Infantry Battalion 85 from Glarus, which was stationed in different parts of Switzerland to guard its mountainous border.[71] The publication of his texts in the local newspaper *Glarner Nachrichten* aimed to inform and put at ease relatives back home as to the fate of their loved ones, who had to serve in an unfamiliar environment.[72] Heer generally presented an ideal picture of nature, pointing to the echo of cowbells, the romantic mountain landscape, the picturesque and monumental

68 Battisti, *Gli Alpini*, 24–25.

69 Isnenghi and Rochat, *La Grande Guerra*, 160–61; Mondini, "Kriegführung," 369–70.

70 Daly, "The Futurist mountains," 333–34.

71 The battalion was stationed on the south-eastern border of Switzerland in the Engadin, the Splügen-San Bernhardino region and last but not least on the Umbrail close to the frontline at the Passo dello Stelvio.

72 Heer, *Das ist Deine Schweiz*, 3–4. The author died on 2 November from the Spanish Flu and his brother decided to put together all the texts that his brother had published during the war in the local newspaper Glarner Nachrichten. Cf. [Jakob Heer], "Die 85er." *Glarner Nachrichten* September, 25, 1915; Heer, *Das ist Deine Schweiz*, 67.

setting, magnificent air, skiing competitions, or even the great number of very old Swiss stone pines, left in place to protect the valley from falling rocks and avalanches.[73] Sometimes, however, Heer also considered real war, like when throwing stones down a slope, even though there were no enemy troops there;[74] when he grumbled about the weather, referred to historical figures like Jürg Jenatsch and writers like Conrad Ferdinand Meyer, or criticized the fact that the local population had used up natural resources such as wood to an extent that was detrimental to society.[75] When called upon not to write about positive aspects only, Heer stressed that Swiss soldiers had no reason to complain. They should not forget their privileged situation, living in peace in the midst of a terrible war.[76] In September 1916 Heer came close to the battlefield at the Passo dello Stelvio and was rather depressed when he pondered the fate and living conditions of Austrian and Italian soldiers. He therefore showed great sympathy for refugees and deserters, offering them bread and cheese.[77]

Joining Forces with the Enemy? Nature and Natural Phenomena in Wartime Diaries from Austria and Italy

In contrast to contemporary publications—whether government-inspired or otherwise—war diaries do not contain that many reflected accounts, but can be considered self-testimonies written shortly after events, forming a sequence of notes, thoughts, and moments summing up what happened. As a consequence mental leaps and gaps are often present in diaries, unless their authors edited or changed them after the war.[78] Five diaries, by Karl Ausserhofer, Emilio Campi,

73 [Heer], "Die 85er." *Glarner Nachrichten* July 3, 8 and 17, September 8 and November 27, 1915 as well as February 8, 1916; Heer, *Das ist Deine Schweiz*, 15, 21, 23, 40, 44 and 59–61.

74 In this context [Heer], "Die 85er." *Glarner Nachrichten* July 24, 1915 or Heer, *Das ist Deine Schweiz*, 25, refers to the Old Confederation's battle of Morgarten. Müller, *An der Kampffront in Südtirol*, 20 also refers to the use of stones to stop an enemy attack, but, although also Swiss, he does not refer to Morgarten, probably because his account was mainly written for a German audience.

75 [Heer], "Die 85er." *Glarner Nachrichten* July 24, August 7, September 8 and November 27, 1915; Heer, *Das ist Deine Schweiz*, 26, 28, 41–42. and 45.

76 [Heer], "Die 85er." *Glarner Nachrichten* December 18, 1915 and September 9, 1916; Heer, *Das ist Deine Schweiz*, 50–51 and 63 was glad that he had so far not had to kill an enemy and thereby make a wife a widow and child an orphan.

77 [Heer], "Die 85er." *Glarner Nachrichten* September 9 and 25, 1916; Heer, *Das ist Deine Schweiz*, 65–67.

78 Wisthaler, *Karl Ausserhofer*, 5–6, who calls those who were edited or changed "forged diaries" ("unechte Tagebücher"). Cf. Frommelt. "Vorarlberger Kriegstagebücher," who points out that it is not always easy to make out the difference between "true" and "forged" diaries.

Karl Hane, Joseph Mörwald and Nicola Ragucci, were chosen for this study.[79] Each has been edited by a professional historian and contains at least a short introduction about the authors as well as on the state of the diaries. This helps to understand the context in which the diaries came into existence and gives an idea about the way the authors approached nature and what interpretative patterns influenced them.

Three of the diaries are from Austria and two from Italy. Ausserhofer was a farmer from South Tyrol born in 1880. Due to his age and his being a Landsturmmann, he was not sent to the eastern front in 1914, but remained on duty close to his hometown, before being assigned to the Dolomite front (Fanes Valley, Son Pouses, Lagazuoi, Asiago) for the remainder of the war (1915–18).[80] Campi was a military chaplain with the battalion *Pieve di Cadore*, a local unit from the alpine zone in Italy, which formed part of the 7th Alpini Regiment. Campi had been born in 1888, consecrated as a priest in 1911 and sent from his parish in the region of Verona to his new position in the Cadore, where he often stayed with his troops close to the frontline.[81] Hane was a teacher from Vorarlberg, born in 1892, who served as a cadet and non-commissioned officer in the area between Rovereto and Lavarone.[82] Mörwald was a gardener from Upper Austria born in 1894, recruited into the artillery and on his way to the eastern front, when his unit was redeployed to the region around the Plöckenpass in the Carnic Alps, where he served until the armies of the central powers broke through at Caporetto/Kobarid in October/November 1917.[83] Ragucci was a medical doctor and pharmacist from Naples. He was the oldest of the diarists, born in 1863. In 1915 he was called up again and served as a major in the Italian medical corps, first in Aversa and Naples, before being sent to the Field Hospital 040 in Cortina d'Ampezzo in August 1916. While neither Ausserhofer nor Mörwald had any intellectual background,[84] Ragucci was friends with some writers and painters like Edmondo de Amicis and Luigi de Luca, a fact that very probably influenced the writing of his diary, which is more deliberative than those of Ausserhofer

79 The author is aware that there are many more diaries, as e.g. Leoni, *La Guerra Verticale* shows. As this study focuses on the perception it seems, however, better, to concentrate on less examples, about whose authors more is known.

80 Wisthaler, *Karl Ausserhofer*, 32–38.

81 Fiorin, "Il diario di don Emilio Campi," 24 and 31–52.

82 Tschaikner, "Kriegstagebuch," 50–51.

83 Schubert, "Das Kriegstagebuch des Josef Mörwald," 9–26.

84 Schubert, "Das Kriegstagebuch des Josef Mörwald," 9–11; Wisthaler, *Karl Ausserhofer*, 21–37.

and Mörwald.[85] As a priest and a teacher respectively, Campi and Hane had some intellectual background, which may explain their reflection, though neither of them at the time had connections beyond local intellectuals.[86]

In contrast to wartime publications, diaries were much less coherent and there was a considerable fluctuation in length as well as in the numbers of entries. Using the example of Karl Ausserhofer's diary, Sigrid Wisthaler has shown that the fluctuation in entries on the one hand depended on the conditions at the front. In October and November 1916, Ausserhofer was confronted with an extremely cold autumn and early winter, a fact that explains why his entries for that period were very short. Similarly and probably because of lack of supplies in April and May 1918, Ausserhofer stopped making daily notes and often summarized events for several days in one entry.[87] Wisthaler also tried to assign Ausserhofer's entries to different categories such as weather, military service, food and leisure time, perception of the enemy, self-perception, clothing, hygiene and accommodation, emotions, sickness and death, family and civilian population, depiction of landscape, hope for the future, comrades, and religion. According to her calculation, the first two ranked highest for the period that Ausserhofer spent in the frontline, while food and leisure time, emotions, sickness and death, family and civilian population, and hope for the future were aspects that Ausserhofer mainly discussed in his diary when away from the front in military hospitals, during rehabilitation, or while on leave. For Wisthaler, it is clear that the particular context was an essential prerequisite to explain the topics that Ausserhofer wrote about. Weather phenomena were essential, while he was in the frontline, as they were a precondition for surviving in high altitude.[88]

With the exception of the case of Karl Hane, where some information is available,[89] no such detailed analysis exists for the other diaries, but the tendency is the same. Fog, rain, hail, and (for those who were in the mountains during winter) snow were among the natural phenomena that Hane most often mentioned, not least because several times he had to sleep in wet clothes or could not sleep at all.[90] Campi and Mörwald also complained about bad and especially cold weather when it kept on going like this for over a month up

85 Ragucci, *Ospedale*, 9–12.

86 Magrin and Forin, *Il cappellano del Cadore*, 24–29; Tschaikner, "Kriegstagebuch," 47.

87 Wisthaler, *Karl Ausserhofer*, 11–12. and 167.

88 Wisthaler, *Karl Ausserhofer*, 12–15.

89 Frommelt. "Vorarlberger Kriegstagebücher," 127–44 and 150–51.

90 Hane Diary, May 26 and 29, as well as June 4, 1916; Tschaikner, "Kriegstagebuch," 68–69. and 70.

in the mountains.[91] Hane, Mörwald, and Campi were therefore very glad when "eventually good weather"[92] eased the situation and hoped it would stay that way for at least some time.[93] In such situations they also spoke of (a most) splendid weather.[94] Because of his serving in a field hospital, Ragucci's notes tend to be a little more deliberative. Nevertheless, apart from talking about the wounded—sometimes at length, especially when he felt very much with a specific person[95]—the weather also took up a large share of his entries. As he was serving through the harsh winter of 1916–17,[96] Ragucci's emphasis was most often on the massive snowfall in and around Cortina d'Ampezzo. This was especially the case in November and December 1916, when Ragucci was not only preoccupied with the communications of Cortina, but when he also wondered about the height of snow that had amassed on the barracks of the Alpini close to the peaks of the Tofane.[97] While in such contexts Mörwald mainly referred to the shoveling of the snow,[98] Ragucci found time to reflect on it, calling it "awesome and impressive," when he found that 1.25 meters of snow had accumulated on his terrace overnight.[99] He also spoke of the silver slopes of the valley and the sea of snow that covered the area around his hospital.[100]

In such circumstances of heavy snowfall, numerous avalanches came crashing down. Such was the case in February and March as well as November and December 1916. Mörwald called this a "terrible snow weather," or the "terror of winter," and described the "thundering and rolling" of avalanches.[101] Ausserhofer, whose diary for February–March 1916 is lost and who was on leave from 12 November 1916 onwards,[102] nevertheless already spoke of the "lasting

91 Campi Diary, June 22 and 23, 1915 looking back at the weather between May 27 and June 23, 1915. Magrin and Forin, *Il cappellano del Cadore*, 95; Mörwald Diary October 15–17, 19, 23 and 25–27, and November 13, 1915 as well as February 2 and 11, 1916; Mörwald, *Feuerbereit*, 56–57, 59 and 72–73.

92 Hane Diary, June 5, 1916; Tschaikner, "Kriegstagebuch," 70.

93 Mörwald Diary, 8 November 1915; Mörwald, *Feuerbereit*, 58.

94 Campi Diary, July 4 and 6, 1915 and February 6,1916; Magrin and Forin, *Il cappellano del Cadore*, 99–100 and 125; Mörwald Diary, February 5 and 6, as well as March 14, 1916; Mörwald, *Feuerbereit*, 72 and 83.

95 This was the case especially in the two cases of lieutenant Zoli and second lieutenant Abate, whose agony as well as ups and downs Ragguci describes at great length. Ragucci Diary, January 19–27, and March 17–28, 1917; Ragucci, *Ospedale*, 70–74 and 80–86.

96 Brugnara et al., *December 1916*, 1–3 and 6–7.

97 Ragucci Diary, November 9, 1916; Ragucci, *Ospedale*, 34–35.

98 Mörwald Diary, e.g. February 9, 16 and 17, 1916; Mörwald, *Feuerbereit*, 72–75.

99 Ragucci Diary, December 11, 1916; Ragucci, *Ospedale*, 50.

100 Ragucci Diary, November 10–11, and December 2, 1916; Ragucci, *Ospedale*, 35–36 and 45.

101 Mörwald Diary, February 14, and December 11 to 13, 1916; Mörwald, *Feuerbereit*, 76 and 155–57.

102 Wisthaler, *Karl Ausserhofer*, 8 and 167.

bad weather" and "a terrible mass of snow," with avalanches that killed 6 people of his company and many more in other places during that early period.[103] Campi also commented on snowfall, specifically in September, October, and December 1915 as well as February and March 1916, which caused frostbite and made paths difficult,[104] but also offered a lovely panorama.[105] Although he was hampered by heavy winds, dense snowfall, and barren paths, Campi decided to spend Christmas 1915 amongst his troops and in the proximity of the Zygismondi cabin. He recorded that in spite of the difficult conditions, he was glad to have shared this moment with men on the frontline rather than staying in his comfortable hotel room.[106] In February and March 1916 Campi's desire to be close to his soldiers made life very difficult. At first he had to bury a number of soldiers that had been killed by the avalanches that had overwhelmed a number of barracks and emplacements.[107] Finally he contracted a cough, a headache, and high fever in the same area where he had spent Christmas.[108] He could not be evacuated, as neither the paths were open nor was the cable car operating: "we are blocked by snow, without food, without wood, the mail has neither reached us nor departed. […] Our situation becomes more critical and more dangerous as time goes by."[109] Only on 16 March could he finally leave the mountains.[110]

Campi was not the only one affected so closely by avalanches. Mörwald had similar experiences in February–March as well as December 1916, suffering from frostbite that could not be treated, as snowfall and avalanches blocked his unit for almost 10 days.[111] In December 1916 Mörwald just returned from his leave when he was again caught in heavy snowfall, avalanches having destroyed some barracks and the unit's two kitchens.[112] The next day Mörwald and his comrades unsuccessfully tried to dig out their gun that had been buried in snow. The day after an avalanche hit part of their camp, and Mörwald and his comrades succeeded in saving 24 soldiers and their NCOs. They could not,

103 Ausserhofer Diary, November 5 to 9, 1916; Wisthaler, *Karl Ausserhofer*, 167.

104 Campi Diary, September 2, 13–27, October 1 and 23, 1915 as well as December 24–25, 1915; Magrin and Forin, *Il cappellano del Cadore*, 113–15, 118 and 122–23.

105 Campi Diary, October 18, 1915; Magrin and Forin, *Il cappellano del Cadore*, 116.

106 Campi Diary, December 24–25, 1915; Magrin and Forin, *Il cappellano del Cadore*, 122–23.

107 Campi Diary, February 24–28, 1916; Magrin and Forin, *Il cappellano del Cadore*, 125–30.

108 Campi Diary, February 28 – March 5, 1916; Magrin and Forin, *Il cappellano del Cadore*, 130–31.

109 Campi Diary, March 6, 1916; Magrin and Forin, *Il cappellano del Cadore*, 131.

110 Campi Diary, March 16, 1916; Magrin and Forin, *Il cappellano del Cadore*, 133.

111 Mörwald Diary February 17–27, 1916; Mörwald, *Feuerbereit*, 74–78.

112 Mörwald Diary December 10–11, 1916; Mörwald, *Feuerbereit*, 155–56.

however, save another man who was stuck on a slope on the other part of the valley. It was extremely difficult for Mörwald and his comrades to hear the cries for help and not be able to do anything for that man, who finally died during the following night.[113] Avalanches did of course not come down as far as Cortina, but nevertheless Ragucci was also affected by their outcome, as many of the wounded were transported to his hospital. Without knowing what had already happened, on 13 December 1916 Ragucci commented in his diary on the "great proof of courage and readiness to make sacrifices that the marvelous young men have to submit to in this horrible period. Today it is not the ordinary enemy that you are fighting, but today you are fighting the snow; you don't seize the gun, but the best weapon currently is the shovel."[114] Late that night Ragucci was informed by the divisional command that a high number of wounded would be transported to his hospital, the first reaching it the following day with ventral bruises and bone fractures. Transport proved difficult, however, especially as the snowfall continued. Ragucci was therefore very pleased that the snowfall stopped during the evening of 15 December, and for the following day he spoke of "splendid weather," which was a great respite for him.[115]

Snowfall and rain, however, were not the only weather that distressed officers and soldiers. They also had to be on their guard against fog, or more specifically what the fog could hide. In Ausserhofer's dairy we read of the opportunities afforded to the enemy to approach the emplacements without being seen.[116] For Mörwald, bad weather such as fog could, however, also be a protection in a difficult situation such as after the fall of the summit of the Cellon just above his emplacement at the end of June 1916.[117] Ragucci's description of nature—such as in the case of the defiant and solemn peaks of the Cinque Torri[118]—was closer to that of the published sources discussed above. On the other hand he was much closer to death in his hospital and his descriptions of dying soldiers are much longer than those of either Ausserhofer, Hane, or Mörwald.[119] As a priest Campi also had to cope with dead officers and soldiers fairly often, but he

113 Mörwald Diary December 12–15, 1916; Mörwald, *Feuerbereit*, 157–59.

114 Ragucci Diary, December 13, 1916; Ragucci, *Ospedale*, 51–52.

115 Ragucci Diary, December 13–16, 1916; Ragucci, *Ospedale*, 52–53.

116 Ausserhofer Diary, July 5–9, 1916; Wisthaler, *Karl Ausserhofer*, 157.

117 Mörwald Diary, June 27 to 30, 1916; Mörwald, *Feuerbereit*, 114–17.

118 Ragucci Diary, October 13, 1916; Ragucci, *Ospedale*, 28.

119 Ragucci Diary, October 12, 20 and 25 to 28, 1916; Ragucci, *Ospedale*, 26–27 and 30–31. Most of the time Mörwald just spoke of dead soldiers – Mörwald Diary, June 23, 27, July 15, August 5–6 or December 15, 1916 – avoiding to mention names such as on May 23, 1917; Mörwald, *Feuerbereit*, 112, 115, 121, 130,

usually referred to them in a religious manner, because this was as much his job as his vocation.[120]

There were, however, experiences of nature that were also quite exceptional. Amongst them there is Campi's climbing of the Cima Undici on 13 May 1916 and his celebrating mass on the Terza Tofana on 17 September of the same year.[121] Hane's exceptional experience with nature was quite unique, and none of the others analyzed here seem to have experienced anything like it. He was struck by a lightning and gave a very detailed description of what happened. Although Hane's record of the event was written down in hindsight, when he was in hospital, his account is very detailed, which is rather unusual for his entries. As a rule Ausserhofer, Campi, and Mörwald only gave short accounts of storms or heavy rain, mentioning at most the severity of the storm or the fact that they got wet.[122] The same was true of Hane, at least up to 11 July 1916.[123] That day was very hot and for Hane very dull, that is, until he saw a storm coming from Monte Zugna. He tried to turn his tent canvas into a raincoat. While calling on his officer cadet to turn off the telephone, he was struck by lightning, which he experienced as:

> a loud noise, a strong shock onto my knee, and a feeling as if someone had been cruising on the skin of my feet with a red-hot iron. From the pain I cried out loudly. The foot was lame, but soon recovered some strength. The grass around us was on fire. The officer cadet dead. […]. Horrible! I am saved! What fortune! But pain! […]. The officer cadet held the shell of the telephone in his hand when the lightning went through his head. He cried: "Extinguish the fire, I am burning!" Then he turned pale and was dead! I remained conscious. The lightning went through my loaded gun, but it did not go off, as Dobmayer [a good friend of Hane] later found out, looking at the surface quality you could just see where the lighting had gone down, and then passed onto my knee. […] My coat and jacket have a small hole, just as big as a

159 and 187–88. Similarly Ausserhofer Diary July 6 and 9, September 25 or November 9, 1916; Wisthaler, *Karl Ausserhofer*, 157 and 166–67.

120 Campi Diary, e.g. August 5, 8 and 19, 1915; Magrin and Forin, *Il cappellano del Cadore*, 108–09 and 111.

121 Campi Diary, May 13, and September 17, 1916; Magrin and Forin, *Il cappellano del Cadore*, 135 and 147.

122 Ausserhofer Diary, July 8, 9 and 14, 1915, June 21, July 27, and September 21, 1916; Wisthaler, *Karl Ausserhofer*, 115–16, 118–125, 154–160 and 166; Campi Diary, July 7, 1915; Magrin and Forin, *Il cappellano del Cadore*, 101; Mörwald Diary, July 14, and August 13,1915, June 4, July 1 snd 15, 1916; Mörwald, *Feuerbereit*, 42, 46, 109, 117 and 121.

123 Hane Diary June 10, 11 and July 5, 1916; Tschaikner, "Kriegstagebuch," 71–72 and 77.

> Heller coin. Trousers, underpants, shirt, and leggings were in tatters, charred and burnt from knee to hip.[124]

Hane was finally evacuated to hospital, where he had to undergo a long treatment, because large parts of his skin had been burnt. He therefore never returned to the front line, and like Ausserhofer did not talk about the natural conditions or natural phenomena while in hospital or in rehabilitation.[125]

The Dwindling of the Image of the Magnificent Alps: Wartime Natural Phenomena in Exemplary Letters from the Frontline

Like diaries, letters are also a form of self-testimony, but in contrast to the former they have a specific addressee, are not for the writer alone, and usually reflect on what he (or she) can tell the recipient.[126] As letters were less often preserved than diaries,[127] this contribution will only focus on a few of them written by German artillery captain Carl Franz Rose to his wife and children.[128] Rose was sent in 1915 to the Italian front as part of the German Alpenkorps to support the weak Austro-Hungarian artillery units, first on the plateau of Lavarone, then in Sesto, and finally until January 1916 in Corvara. Like Schmidkunz, Rose was also a mountaineer and therefore showed a strong love of nature.[129] This became very clear already in his first letter of 2 June 1915, where he commented on the "magnificent alps [… with] fine cows […] luscious meadows [and a] splendor of flowers."[130] Nature was glorious, all the rest—especially food and the Austrian comrades—lukewarm.[131] In letters to his wife and his son Heinz, he spoke of the "superb Dolomites" that the two would have to come to see after the war. Rose, however, also mentioned how dangerous as well as difficult fighting in high altitude was, and how well the horses and mules served the troops.[132]

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124 Hane Diary July 11,1916; Tschaikner, "Kriegstagebuch," 78.

125 Hane Diary July 13, 1916 to May 3, 1917; Tschaikner, "Kriegstagebuch," 80–85. Cf. Ausserhofer Diary, July 12 to September 13, 1916; Wisthaler, *Karl Ausserhofer*, 158–66.

126 Wisthaler, *Karl Ausserhofer*, 6.

127 Wisthaler, *Karl Ausserhofer*, 16.

128 Rose, *In Schussweite*.

129 Rose, *Schussweite*, 13–24.

130 Letter of Franz Carl Rose to his wife Claire June 2, 1916; Rose, *In Schussweite*, 39. In a similar manner Ragucci wrote to his wife in the only surviving letter of August 20, 1916, shortly after his arrival in Cortina. Ragucci, *Ospedale*, 11.

131 Letter of Franz Carl Rose to his wife Claire June 2, 1916; Rose, *In Schussweite*, 40–41.

132 Letters of Franz Carl Rose to his wife Claire June 2 and 7, August 13, September 15 and 26, 1915; letter of Franz Carl Rose to his son Heinz August 7, 1915; Rose, *In Schussweite*, 40, 44, 94–95, 101,

Nevertheless the constant climbing was tiring and Rose especially disliked the cold nights and bad weather. He was therefore glad that as an officer he did not have to stay outside most nights,[133] and not very happy when he learnt that he would have to stay in the mountains in winter. Rose's conviction that the war was a good thing waned more and more: "[It is] dreadful being so alone, almost impossible to bear. And now it looks as if this is going to continue for a long time! It seems that things do not go according to the will of the High Council [the German government], as I was told in Berlin back then. This is a misery and I will not take part in this for much longer."[134]

He nevertheless accepted it and asked his wife to send him the necessary clothing.[135] With some irony he commented that "men from the flat country became alpine mountaineers, learning to ski," only to complain about the large quantities of snow as well as the problems with heating the provisional dwellings that had been set up.[136]

Conclusion

In conclusion, you can state that the experience of nature and everyday life in the war in alpine territory was very complex and diverse, but also to a considerable extent influenced by presuppositions and stereotypes. Publicly—and this later became the master narrative—many stressed the splendor of the mountains and the way in which mountains, though dangerous, became symbols of national defense that could in some cases even tangibly support those fighting in high altitude. Carl Franz Rose is a good example of a man who came to the mountains with a romantic view and told his family about the monumentality of the alpine scenery. In his case it took some time to realize and describe also the negative aspects of a life at high altitude, in the cold, with fog, rain, and snow. Ragucci's testimony was quite similar, and as he was always able to return to his hospital, a former grand hotel, his experience of nature and weather conditions was less

116, 125 and 134. Rose and his wife really visited the war-zone after 1918, as a photograph in Rose, *In Schussweite*, 27 shows.

133 Letters of Franz Carl Rose to his wife Claire 18, 26 June, 1, 3, 13 August, 8, 26 September, 2, 18 October and 21 December 1915; Rose, *In Schussweite*, 53, 65, 81, 83, 85, 97, 102, 112, 121–22, 127, 149.

134 Letter of Franz Carl Rose to his wife Claire 12 December 1915; Rose, *In Schussweite*, 146.

135 Letters of Franz Carl Rose to his wife Claire 22 August, 8, 26 September and 2 October 1915; Rose, *In Schussweite*, 105–6, 113, 122, 128.

136 Letters of Franz Carl Rose to his wife Claire 26 September, 21, 23 December 1915; Rose, *In Schussweite*, 125, 148–52.

negative over the long term than that of Rose. Men like Ausserhofer, Hane, and Mörwald were less deliberative. They almost never talked about the splendor of the mountains. Their eyes were fixed on everyday fighting and the weather—good weather giving respite, bad weather making life even more miserable. There are several essential factors that explain their ambivalent representations of nature: class, intellectual connections, upbringing, education, and personal attitudes; the daily changing conditions; and the various contexts behind why all these men wrote. Further research is necessary to verify the findings of this exemplary study. By analyzing a more important number of contemporary documents and linking them more closely to the existing master narrative in the current historiography, it will then be possible to gain a more sophisticated understanding of a theatre of war that was as much different as it was similar to the other fronts in this global war. In this context it is important to be more aware of the diverse perceptions and understandings of nature in a war where nature itself seemed to have joined forces with the enemy.

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Was There a Socialist Type of Anthropocene During the Cold War? Science, Economy, and the History of the Poplar Species in Hungary, 1945–1975[1]

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The paper argues that exploring the content and sites of transnational entanglements is a more adequate way to study the relationship between the Cold War and the Great Acceleration phase of Anthropocene than looking at the so-called East vs. West in isolation. By focusing on how scientific ideas, economic concepts, industrial projects, and data production emerged and intertwined in the case of activities related to poplar trees in Hungary, it becomes clear that anthropogenic landscape change during the state socialist period was embedded into the global circulation of ideas about forests, materials and ecology. The paper also points out that forestry is a relevant area of knowledge for studying the reasons behind anthropogenic change leading to the Anthropocene because of continuities it provides across World Wars and regions, and because the profession engages with biological knowledge production, business interests, political demands regarding long-term economic growth, and notions of ecological crisis in its everyday practice.

Keywords: anthropocene, science studies, history of forestry, state socialism, paper production

Anthropocene, Cold War and Poplar from the Perspective of Hungary

Trees can become symbols of historical change. In early 2018, a group of Australian scientists proposed that one of the rings of the only Sitka spruce tree living on Campbell Island, 600 kilometers south of New Zealand, namely, the ring dated to 1965, should become the marker for the divide between Holocene and Anthropocene epochs. Chris Turney and his team found that the ^{14}C content of the tree rapidly grew in 1965 date due to fallout from nuclear bomb testing that

1 This paper was written with the support of program entitled "Tudás, tájkép, nemzet és birodalom: A tájkép megismerésének és átalakításának gyakorlatai Magyarországon és a Balkánon, 1850–1945" [Knowledge, Landscape, Nation and Empire: Practices of knowing and transforming landscape in Hungary and the Balkans, 1850–1945] that is program number FK 128978 of the National Research and Development and Innovation Fund, Hungary (NKFIH).

had taken place some years earlier.[2] This perspective emphasizes the globalized nature of ecological change. Turney's observation focuses on a location that looks extremely remote, thus, marginal from the Global North. Reinforcing the same message, the scientist talks of biochemical changes taking place at the level of cells in a tree that a human being purposefully planted there, thousands of kilometers away from its natural habitat. Turney overcomes what might appear as a contradiction between global challenge and local phenomena by stressing that human activity had its impact even in the most remote locations in 1965.

Anthropocene may simply be translated as the Age of Humans. This term emerging around the year 2000 indicates that human influence has become the single most important factor changing the biophysical system of the Earth. The use of the term has been criticized from a number of perspectives. According to critics, talking of Anthropocene recreates the idea of a sharp division between nature and culture that is the very notion that has led to the current damages to sustainability, it veils the role that capitalism has played in biophysical change, and it also ignores non-Western perspectives of ecology as well as the historical contingency of thinking of ecological crisis in the West.[3] Despite the importance of chronology and historical narrative in these discussions, few historians have used Anthropocene as a framework of analysis. Coming close to Turney's proposed dating, J. R. McNeill and Peter Engelke's recent global environmental history associated Anthropocene with the term Great Acceleration that signifies the rapid rise of the quantity of greenhouse gases in the atmosphere.[4] The authors posit that while the post-1945 period was the age of omnipresent ecological destruction, the Cold War was only one of the factors behind biophysical changes since global-scale urbanization, demography, and consumption were powerful factors in their own right. McNeill and Engelke also demonstrate that while talking about the impact of Cold War, countries of the 'West' and the 'Socialist States,' including China, were all engaged in environmentally harmful activities as part of the arms race and struggle for influence. This latter view is not the mainstream among environmental historians working on East-Central Europe. As Zsuzsa Gille's and, more recently, Viktor Pál's monographic studies have pointed out, a number of writings emphasize that it is the Soviet Union and Sovietized thinking that is to blame for pollution and loss of biodiversity

2 Amos, "'Loneliest tree' records human epoch."

3 See Moore, *Anthropocene or Capitalocene.*

4 McNeill and Engelke, *The Great Acceleration.*

and habitats.[5] The purpose of this paper is to contextualize planned and actual anthropogenic landscape change taking place in Hungary, one of the countries of the 'Socialist Bloc,' emphasizing both specificities of global connectedness and locally specific features. As Zoltán Ginelli has recently argued, Hungary's semiperipheral position is a vantage point from which relations that look like dichotomies may be reviewed: "Semiperipherality shares both central and peripheral aspects: being strongly connected through its cultural or geographical proximity to the global center, but remaining peripheral, dependent and subjugated to the global core as its 'internal other'; not having colonies, but benefiting from civilizational superiority and imperialist practices over the global periphery; developing a strong urge to catch up with and imitate the center, while sharing its civilizational and modernization mission towards the periphery."[6] Looking at the Anthropocene thesis from this angle contributes to describing the relationship between capitalism and global biophysical change as well as the 'Western'-ness of the term Anthropocene.

The idea that state socialist regimes developed a Sovietized and harmful pseudo-science instead of carrying out research in the interest of humans has encroached on the popular image of poplar trees in Hungary. On August 30, 2017, the Assembly of the Capital City of Budapest decided that it should get rid of all the trees belonging to the species commonly called 'Canadian poplar' because its flowers damage respiratory health, carry the risk of fire, and is a relic from socialist times.[7] The decision indicated that it referred to the species taxonomically named *Populus* × *canadensis*. However, this term is a terrain of ambiguity. In the accepted nomenclature of the poplar species, which came into force in 1955, *Populus* × *canadensis* is no longer accepted as a name of a taxon.[8] It is most likely that the decision of the assembly targeted *Populus* × *euroamericana*, which is a hybrid of a North American poplar species, *Populus deltoides*, and another one believed to be an indigenous species of Hungary, *Populus nigra*. The text of the decision errs when it ignores that this hybrid is not the result of a scientific or pseudo-scientific project; instead, it is a natural outcome that has been around since the eighteenth century. The frequency with which hybridization can take

5 Pál, *Technology and the Environment in State-Socialist Hungary*; Gille, *From the Cult of Waste to the Trash Heap of History*.

6 Ginelli, "Hungarian Experts in Nkrumah's Ghana."

7 City Council, Municipality of Budapest, http://infoszab.budapest.hu:8080/akl/tva/Tir.aspx?scope=kozgyules&sessionid=6894&agendaitemid=94197 Accessed March 5, 2018.

8 Bartha, "A Magyarországon előforduló nyár (Populus L.) taxonok."

place is in fact talked of as a danger to the genetic stock of poplars.[9] Throughout the twentieth century, especially since the 1920s, a number of cultivar varieties have been produced of the *Populus* × *euroamericana* hybrid. In fact, the name *Populus* × *canadensis* may also refer to the variety called Merilandiana that is called 'early poplar' in common Hungarian.[10] With the recent politicization of the poplar, we are at the heart of the uncertainty between nature and culture and its archival production in the post-socialist context. Moreover, this is an instance when dendrology experiments and conventional historical records both form part of the archives used for historical research.

The short proposal to eliminate the poplar from Budapest did not spell out the most important context of the link between state socialism and poplar species: paper and cellulose production. Moreover, there are a number of other contexts to keep in mind. Poplar, growing faster than all other families of species considered for forestry in the twentieth century, made it important for urban planning, design of highways, and for containing desertification of areas of the Great Plains of Hungary since the 1920s. Yet, it was the rapid rise of demand for paper products and the cost associated with their import that brought the poplar project to center stage in the history of forestry of the state socialist period of Hungary. Poplar was not the only species that triggered large-scale investment and institutional and transnational effort for increasing the area of growth—in the hope of obtaining more arable land and raw material for industry. The story of pine, especially *Pinus silvestris*, merits a separate study in this regard.[11] The history of afforestation is also intertwined with the history of poplar projects in Hungary, though it cannot be equated with it.[12]

In this paper, I study the history of knowledge production about poplar in Hungary in order to look at links between state socialism, scientific approaches, global institutions, ideas about the economy, and the Anthropocene during the Cold War period until the mid-1970s. In the first part, I explore the question if there was both an 'Eastern' and a 'Western' science in light of the production of poplar species and emerging views and research about a canker disease that attacked poplar plantations in various parts of the northern hemisphere in the twentieth century. The second section interprets and contextualizes formulas that high-ranking Hungarian foresters presented at global events related to

9 Gaál, "Az őshonos nyárak és füzek génmegőrzése."

10 Bartha, "A Magyarországon előforduló nyár (Populus L.) taxonok határozókulcsa és rövid jellemzése."

11 Balogh, "Transnational Modernity, Biography and the Anthropocene in a Cold War Arboretum."

12 Balogh, "A Program for Afforestation."

projecting future commodification of forest resources. I will consider these thoughts in light of activities and agendas of Cold War institutions, such as, the European Economic Committee of the UN (UNECE) and the Comecon. The third section brings together the issues of science, data and economic decisions, and relates these to the social and political context of the Yugoslavian-Hungarian deal about paper production that had been in preparation since 1969 and was eventually signed in 1975. Studying the entangled nature of scientific, political, and economic projects related to poplar species, along with the history of how knowledge emerged in state socialist Hungary, contributes to understanding projects and actual changes in the nature-culture relationship during the Cold War decades.

The picture I draw here will not be a complete discussion of how the Anthropocene unfolded in state socialist Hungary. I do not discuss the roles that afforestation and poplar played in the history of the relationship between changing flood basin landscape and hydropower generation projects, such as Bős-Nagymaros or Lake Tisza. I also exclude the issue of pollution that the papermaking industry produced. Energy production, pollution, and protest are topics that other historians have been working on and they deserve separate papers.[13] The present approach is relevant for the discussion on the validity of the term Anthropocene. It looks at developments from the perspective of a semiperiphery and studies forestry, which is an area of knowledge production where the relationship between nature and culture had a century of history by the 1960s.

A Case for Entangled History: Poplar Science in Hungary in the Context of Postwar Ideas about Development and Transnational Science

The history of the poplar species is an entangled history transgressing geopolitical and chronological demarcation lines. Thus, the history of how the transnational scientific poplar project interacted with the launch and expansion of the poplar project in Hungary is a site for assessing the plausibility of the assumption that there was a 'Socialist' as opposed to a 'Western' science during Cold War.

Poplar is one of families of the tree species that are termed as fast-growing because its rotational cycle, as established by modern forestry, is a fraction of the

13 Kochetokova, "Industry and Forests." For an analysis of the Lake Tisza project see Borvendég and Palasik, *Vadhajtások*; for pollution see Pál, *Technology*.

number of decades that beech, pine, and oak take to reach what is believed to be their optimum industrial size. As a result, proliferation of poplar tree hybrids was one of the global projects that intended to bring about large-scale anthropogenic change in the post–World War II decades under the umbrella of the Food and Agriculture Organization of United Nations (FAO). As a result of an emerging global timber market, new ideas of economic development, and the growing importance of exploring industrial uses of timber in forestry research, beginning in the 1930s there were botanical and forestry experiments aimed at selecting and improving the poplar species.[14] By that time, the European experience in the cellulose industry showed that the material was indispensable, but importing spruce as a major resource put a large burden on the national economy in times of exportation difficulties.[15] European countries lacking pine forests or with significant regional variation of accessibility, such as the Netherlands, Italy, Yugoslavia, and Hungary, were in a particularly difficult situation in this regard. Italy became the first hub of collecting and selecting poplar species and Italian foresters gained specialized knowledge in vegetative propagation (cloning) of selected clones.[16]

The poplar program in Hungary has to do with three transnational histories. First, there were pre–World War II links to Italian forestry. Second, Hungary took part in so-called international provenance studies that aimed at finding what the optimal conditions were for certain varieties.[17] Third, in 1949 the government of the Rákosi era allowed some foresters to take part in the 3rd Full Session of the International Poplar Commission (IPC) in Belgium and in the Netherlands.[18] In fact, Hungarian foresters Miklós Rosner and György Koltay were the only participants from the 'Socialist Bloc' at the event. The international event in actual fact included only European participants: Swedish, British, Swiss, French, Hungarian, Italian, many Dutch and Belgian, and a few Luxembourgian foresters. FAO and the international organization of forestry research institutes, IUFRO, also sent a representative in their own right.[19] The meeting of 1949 was an important milestone for the Hungarian perspectives because, due to

14 For changes in world economy and invention of the idea of national economic space see Goswami, *Producing India*; Mitchell, *Rule of Experts*. For global timber economy see Beattie, *Empire and Environmental Anxiety, 1800–1920*; Ravi, *Modernizing Nature*.

15 *Papers of the 2nd World Forestry Congress.*

16 Kopecky, "A nyárak nemesítése."

17 Koltay, "*A nyárfa.*"

18 Ibid.

19 International Poplar Commission.

discontinued membership of countries of the 'Socialist Bloc' in FAO and other UN organs in the 1950s, there was no Hungarian delegation at the subsequent six full meetings. During that decade, Yugoslavia was the only East-Central European country to take part in some of the full IPC meetings. From 1955, meetings became biannual or less frequent. Yet, this was a sign of decline only until 1961 when the IPC started to have its Executive Committee. By the 1960s the IPC stopped being a Western and Southern European event. Yugoslavia hosted a full session in 1962, Teheran was the venue of the full meeting in 1965, Bucharest in 1971. In the light of this trajectory, the regional event that Hungary hosted in September 23–29, 1956 was an important opportunity for reinvigorating the IPC network of contacts both among socialist countries and across the Iron Curtain.[20] Assessing the international embeddedness of the poplar project of Hungary, the report on the event believed that:

> In the first place, we need to highlight the general impression that foreign participants took with them. A few of them have taken part in other poplar conferences and when comparing our event and the other ones they stated that what they saw here was proof of the high standard of research and practical work. We may say that we used to work in isolation, but it has its advantages besides disadvantages, namely, we continued to work on processes (cross-breeding distant species, homogenous hybrid poplar stands) that have been rejected abroad and we managed to bring these to fruition.[21]

In other words, the report was critical of the era of isolation but was keen to point out that parallel experiments and innovation might contradict and refute contemporary mainstream practices. The IPC regional event was an occasion to gather feedback on ongoing experiments and applications. It also indicated that poplar research in Hungary began around 1950, during some of the coldest years of the Cold War and that is why a booming and high international visibility was possible and feasible immediately after Stalin's death. Moreover, the event highlighted that there were three crucial issues for a transnational poplar research program, namely, reconciling sustainable levels of biodiversity of forest stands with needs of industrial use and with the push to lower costs of planting and felling, the acceptance and credibility of experimental results, and the issue of a poplar disease, *Dothichiza canker*. It was also clear that the

20 Bakkay, *A Magyar Tudományos Akadémia és az Országos Erdészeti Főigazgatóság együttes rendezésében megtartott nyárfakonferencia.*

21 MNL OL XXVI-K-3 box no. 16. "A nyárfakonferencia" [The poplar conference].

three issues were intertwined. What the report on the regional event suggested as a definitive conclusion about the viability of homogenous plantations was actually still in an experimental stage in 1956. Two years earlier, János Magyar, the forester with superior knowledge of mathematics, set out to resolve the question of what constituted the minimum necessary biodiversity for the poplar project. His conclusion was that it would not make sense to mix different poplar species in the same stand; however, best results may be expected if below poplars there is a second tree level in the stand that is made up of species that tolerate shade. During the discussion of his results, György Koltay plainly stated that "The biological condition of homogenous poplar stands is bad, and their productivity remains acceptable only as long as the negative impact of biological conditions does not show up."[22] The concise nature of Magyar's methodology and presentation asked for more research on more numerous stands before a final conclusion could be reached.

In the same years, another factor, the spread of *Dothichiza canker*, also underlined the salience of experiments about the biological condition of stands where poplar hybrids dominate. The issue of canker became so serious that it looked it would end the career of some of the most promising *Populus* × *euroamericana* clones in the second half of the 1950s. The disease causes the bark of poplar trees to swell and deform, but it may also begin as a leaf infection. Trees are likely to survive initial the disease, though many tend to die and collapse during the next wet period because of their reduced level of resistance. In Hungarian poplar stands, the symptoms appeared suddenly in the early 1950s, and specialists had to dig for a description that appeared in print in 1938. The cause of canker was a mystery that took years to solve. The bibliographical references of papers published in the 1950s point to lacunae in transnational knowledge circuits during Hungary's years of relative isolation. In 1953, T. R. Peace's the comprehensive study of poplar in UK stated that it had no information about the spread of canker in Eastern Europe, while researchers of the Forestry Research Institute of Hungary (Erdészeti Tudományos Intézet – ERTI) did not reference Dutch experiments and results from the 1930s and 1940s that T. R. Peace of the UK Forestry Commission praised.[23] Hungarian foresters also did not know of Alma Waterman's work which referenced turn-of-the century

22 Magyar gained reputation with his work on designing the web of protective forest belts necessary for increasing agricultural output in 1948–49. Magyar, "Nyárasok faállományszerkezeti vizsgálatának eddigi eredményei."

23 Peace, *Poplar*.

results, including specifications of large-scale canker damage registered in 1915–1916 in some of the states of the USA.[24] The common denominator in literature was another British botanist, K. A. Sabet, who posited a link between weather and *Dothichiza canker* and between fungi and bacterial infection causing it.[25] Eventually, foresters agreed that the disease appeared as a result of combined presence of fungi known as *Cryptodiaporthe populea (Sacc.*) and bacteria.[26] By the time *Magyar nyárfatermesztés* (Hungarian Poplar Cultivation) was published in 1962, Hungarian researchers were aware of all previous publications and the various names that authors used to name the disease.[27] Since all authors agreed that there was no cure for the disease, research was oriented towards identifying resistant and vulnerable varieties and circumstances that increase risk. To avoid a major loss of stands, foresters needed to prevent weakening of trees from dry periods and unsatisfactory soil conditions, and too much manure also increased susceptibility. The example of *Dothichiza canker* allows one to highlight three features of the transnational aspects of poplar research. First, the range of the poplar species and varieties that forestry experimented with was a common pool across the Iron Curtain in the 1950s. In fact, if it was not for the widespread of *Populus* × *euroamericana* clones, *Dothichiza canker* would not have threatened poplar plantations. Second, decades of expertise in vegetative propagation for engineering suitable variants did not mean that it became possible to control nature-culture interaction. Third, in the early 1950s, knowledge circulation was lacking between Hungarian foresters and their Western counterparts, but this did not mean a complete stop to scientific articles crossing borders. Peace's study mentioned the lack of information in key publications appearing in the 'West.' This situation changed by the early 1960s, but the regional IPC event of 1956 played a key role in realizing distances and reconnecting Hungarian researchers to the circulation of ideas elsewhere.

These conclusions clarify the fact that the contemporary status of the state socialist form of political control was relevant to the history of the poplar in Hungary. Initially, planting more poplar species as means of water management along rivers and as part of protective forest belts was one of the aspects of

24 Waterman, "Canker and Dieback of Poplar Caused by Dothichiza Populea."

25 Sabet, "Studies on the Bacterial Die-Back and Canker of Poplar."

26 Tóth, "Megfigyeléseim a nyárfákról." See alsoWaterman, "Canker and Dieback of Poplar," 175–83. https://academic.oup.com/forestscience/article-abstract/3/2/175/4763880?redirectedFrom=PDF Accessed on July 10, 2018.

27 Keresztesi, *A magyar nyárfatermesztés*.

afforestation. Afforestation had nearly a century of history by 1950, but it was during Rákosi's regime that it became a means of mobilization and a link to 'Stalin's plan to transform nature,' which was launched after the postwar famines in the Soviet Union. Propaganda and the need to respond or adjust to it remained an integral part of political life after the Rákosi era and after 1956. The poplar project evolved into a national assessment of all postwar poplar stands, and, subsequently into the National Poplar Committee under one of the key bodies of the early Kádár era, the Committee of Economic Affairs of the Council of Ministers. This meant the politicization of the attitude towards the poplar species and ever more propaganda about the issue.[28] The high number and content of articles that appeared in the most important contemporary journal targeting foresters, *Az Erdő*, also confirm that the poplar campaign and the goals it set had a profound impact on forestry in the early 1960s. Looking at propaganda related to the poplar campaign is one of the ways to connect related written source material that researchers and institutions produced and a wider social realm of foresters and forestry employees working on the ground. Under such conditions, oversimplification of tasks and the tendency to look at poplar species as panacea were everyday issues. Poplar made its way to the agenda of the local units of the National Forestry Association. It appears from the debate articles that a younger generation of foresters was impatient with the limitations that classification of niches meant in terms of the choice of species. In regions such as Hajdú County, replacing oak with poplar looked like a natural process that loss of soil humidity had been triggering for nearly a century. However, senior researchers, especially Imre Babos, who produced textbooks about afforestation, were squarely against replacing oak stands along the Tisza River or overusing spruce and poplar in the Western border area.[29] The tone that some members of the generation of foresters who played major role in producing basic literature for afforestation campaign in the 1950s used in an official professional journal to discredit the excesses of poplar propagation shows that there was a political decision to place limits on the undesirable transformation of forests, land use practices, and landscapes that the propaganda might have brought about. Debates about the ways soil and niche classification limited the expansion of the area covered

28 Keresztesi, "Nyárfagazdálkodásunk helyzete." About the Committee of Economic Affairs see Csernyánszky, "Kádár csúcszerve. A Gazdasági Bizottság megalakítása."

29 Debate about poplar in the journal called *Az Erdő* 1963–64: Babos, "Hozzászólás Polner Antal;" Babos, "Viszontválasz Borsos Zoltánnak;" Borsos, "A fafaj megválasztás néhány kérdéséről; Cebe, "Hozzászólás a fafajmegválasztás kérdéséhez."

by poplar species, in other words, about the usefulness of experimentation and scientific observation, intensified among Hungarian foresters as the poplar project gained political salience and a national dimension throughout the 1960s. As we shall see in the third section of this paper, the assessment carried out between 1973 and 1976 found that while the campaign of 1960–61 reached its goal in terms of drastically increasing the presence of poplar species in terms of both percentage and visibility in specific landscapes, poplar-based afforestation often took place without due regard for soil quality and requirements.

Studies summarizing knowledge produced on poplar cultivation (volumes published in 1954, 1962, 1978, and 1996) are consistent about stating that the poplar program in Hungary began as a set of transnational entanglements.[30] This consciousness reflects that taking part in projects with global reach was considered to be a prestigious and valuable act throughout these decades. The interaction between the agenda of IPC and poplar research in Hungary shows that differences between experiments and goals did not constitute a fundamental divergence of scientific work on specific fields. This unity did not only stem from common elements of point of departure such as the reception of related work in Italy and the IPC meeting of 1949. The goal of Hungarian poplar researchers was to produce and eventually present globally relevant results on the occasion of regional level academic meetings even when formal full-scale participation in FAO meetings was halted by the 'Eastern Bloc.' Dendrology and scientific forestry aspects of the poplar project were fundamentally about the belief that it was possible to transform the state of nature into another one in which a group of specifically designed non-human species turn into resources in the foreseeable future and, thus, benefit goals of national economic development.

In summary, increasing the area covered by poplar was a transnational project in the post–World War II era. Despite years of relative isolation from transnational level knowledge production, the main goals of the poplar project in Hungary were in tune with international developments and major threats were also shared. Due to relatively fast growth, short rotational cycle, and the industrial qualities of its timber, the poplar species carried the promise for growing industrial output and economic growth, or at least, improving the terms of trade in a number of countries of the northern hemisphere by the late 1950s. The Hungarian poplar project was not a pseudo-scientific exercise. Yet, politicization of the poplar campaign and, thus, the difficulties of setting limitations for it,

30 See Koltay, *A nyárfa*; Keresztesi, *A magyar nyárfatermesztés;* Keresztesi, *A nyárfa és a fűzek*.

arguably, distinguished it from parallel projects elsewhere. However, zeal and propaganda were coupled with professional demand for experimental evidence before moving forward with plantation and the selection of cultivars.

Global Commodification, Economic Projections, and Cold War Institutions

Before turning to the question of how landscapes changed and how the timber was eventually used, the next step in assessing the relationship between the Anthropocene and the Cold War in the light of poplar projects is to consider the changes that the years between 1955 and 1975 brought about in terms of thinking about the calculability of the timber commodity chain and how entanglements worked in this field from the point of view of Hungarian foresters. The proposals that Hungarian forestry economists aimed to mainstream at the transnational level were closely intertwined with the vision about Hungary's position in global economy that informed the "New Economic Mechanism" of the second half of the 1960s. This introduction of a new approach to state socialist economy in Hungary catalyzed thinking about linkages between timber and commodification and the global position of Hungary. Thus, the argument of this section complements recent results in the analysis of the global position of Hungary at that time. Tamás Gerőcs and András Pinkasz and the monographic study of István Feitl argue that one of the major histories of the political economies of 1960s was the failure of the countries of the Socialist Bloc to set up frameworks of closer integration that might have opened a way of emancipation in place of dependencies. Dependence was the result of the contemporaneous drive of modernization and import substitution and, more generally, a semiperipheral position.[31] Second, this section also contributes to bridge the gap that seems to exist between the popularity of long-term economic projections with Hungarian foresters and the market-oriented New Economic Mechanism.

There were three sites where interaction between Hungarian foresters' economic ideas and transnational environments took place. Two of these were institutions operating within the framework of the United Nations: the FAO World Forestry Congresses, held every six years since 1948, were essential for aggregating and disseminating new ideas about what forests meant for society and economy. The congresses of Seattle (1960), Madrid (1966), and Buenos Aires (1972) were groundbreaking in this regard for their role in drawing attention to

31 Gerőcs and Pinkasz, "A KGST a világrendszerben;" Feitl, *Talányos játszmák*.

both global inequality and ecological sustainability in these assessments.[32] At the European level, the United Nations Economic Commission for Europe (UNECE, operating since 1947) was another important and permanent site for prognostication that brought together experts from across the 'blocs.' In 1972, the summary report of the activities of UNECE emphasized that collecting statistics about production and trade of wood and timber products was a novelty in the postwar period.[33] The regular publication of Timber Bulletin for Europe was a key output of the activities of UNECE in the field. It maintained a database of commodity prices that allowed projecting and mapping economic factors, such as, demand for certain goods, availability of resources, and patterns of aggregate growth. Third, a specialized body of experts working on issues related to timber, cellulose, and paper appeared on the Comecon scene in the late 1950s. The Permanent Committee on Timber, Cellulose, and Paper Comecon was set up in 1956 and soon began to work on a 15-year prospective plan.[34] The documentary footprint of that plan was an assessment of technological development vis-à-vis 'capitalist' countries, assessing the volume and extent of trade between individual member states and capitalist countries, with an evaluation of dependency and setting up a framework of exchange within which growth in efficiency and catching up would be possible. This exchange potentially included joint projects, but no specific ones were launched.

Biographies are the link connecting archives of a regionally specific UN body, professional global meetings, Comecon, the ministry-level dossiers of state socialist Hungary, and the story of poplar projects. In Hungary, foresters working in key positions during the late 1960s and early 1970s belonged to the same generation attending the Forestry College of Sopron just before 1945: Emil Sali, Aladár Halász, András Madas, and Béla Keresztesi were in their early fifties in 1970. While in the early 1960s, Keresztesi had the most political capital, it was Madas who reached the highest position in the group. After spending decades in senior positions at the Office of Planning, he was deputy minister at the giant Ministry for Agriculture and Food Procurement between 1972 and 1975. Upon his retirement, he produced academic texts that are keys to understanding how a generation of high-ranking forestry economists thought about turning forests into sustainable commodities under conditions of state

32 See FAO Unasylva.

33 *Az Európai Gazdasági Bizottság tevékenysége 1947–1972*.

34 MNL OL XIX-K-13-a box no. 22.

socialism.[35] Having to engage with the issues that a new price mechanism meant for forestry, and with the poplar project, influenced Madas's thinking in a decisive way. From the mid-1960s, Madas posited in all his publications that the export of primary agricultural products could not finance paper related import, but export of previously imported timber material was an important asset in this regard.[36] Madas became committed to applying the idea of 'timber economy' that reflected that forest management, timber processing, and international trade should be treated as a whole.[37] For him, this meant that calculations about future timber consumption and availability at the continental and global scale should precede regional and national level planning and decisions.[38] The long-term plan that the National Technical Development Committee of Hungary published in 1967 frequently referred to the Timber Bulletin that the UNECE published. Together with Aladár Halász, he was one of the Hungarian expert delegates to UNECE and he had a career there: Madas was repeatedly elected chief expert of forestry. In the mid-1960s, as a result of his participation in UNECE and his familiarity with statistical work produced at that institution, Madas began to work out a model about timber supply for the global scale. He presented his work at the section he chaired at the World Forestry Congress of 1973 and a year later the publishing house of the Hungarian Academy of Sciences published his model in English.[39] On the one hand, his work was premised on assessing whether a certain region was a major timber importing region or an exporting one and if it was feasible to establish link between centers of demand and of supply. He did not see sites of export as underdeveloped. Rather, he argued that the most underdeveloped areas were those that were unable to export due to lack of infrastructure. His prime example for this was mechanization of timber production in Canada, the country that needed to double its export capacity if growing demand in the USA was to be satisfied. His geographic analysis had blind spots: he only considered growing demand in China in passing and he believed that the lack of infrastructure in Western Africa and in Latin America would prevent these areas from becoming centers of export. He was most nuanced in his assessment of Northern Europe, Japan, and North America. One of the most outstanding features of his presentation was that he treated

35 Madas, *Erdészeti politika;* Madas, Ésszerű környezetgazdálkodás a mezőgazdaságban.

36 For example see Halász and Márkus, *A fagazdaság ökonómiai alapjai.*

37 Madas, *World Consumption of Wood*, 19.

38 Ibid. 7–8.

39 Halász et al., Beszámoló a Hetedik Erdészeti Világkongresszusról; Madas, *World Consumption of Wood.*

Europe together, without reference to the Iron Curtain, but discussed the Soviet Union separately. In this form, 'socialist' countries were only one of a group of countries where Soviet exports were expected to grow to an unspecified extent. Madas's second but related starting point was that historical trends and correlation between demography, GDP, and demand for different timber products should be combined in arriving at plausible estimate. He offered corrections to earlier models published by UNECE on this basis. Importantly, he posited that 20 percent of all forested areas should be reserved in the interest of the oxygen balance of the atmosphere and for recreational purposes. Altogether, Madas argued that demand would double until 2000 due to a surge in the consumption of paper products and despite a relative decline of many other categories of timber commodities, but he believed that this increase may be met in a sustainable manner. The model showed a belief in the possibility of prediction based on economic rationality and mathematical modeling and was receptive to fresh concerns about ecological crisis. He did not spend time on discussing the role of Hungary in the model, but the implicit message was difficult to miss: each country needed to integrate into a regional and global economic scene that had nothing to do with being or not being a socialist economy or a Soviet ally. His analysis also made it obvious that there was no database available at the time that could match his ambition to predict supply and demand.. Therefore, for his projection and estimation he used data available for end points fixed in time. He also thought it obvious that it is demand and supply that determined the future of commodities. Within this picture it would make no sense at all for a government to force the use of resources disregarding its own global position or not admitting uncertainties. For Madas, a sensible policy was one that was clear about challenges, addressing them strategically. Rational economic decisions and projections had a place, but short-term decrees contingent on concerns for a political support base could hardly fit in. In 1966, Halász, as head of a team of foresters, edited a publication that consisted of tables about timber trade. These tables did not list the 'socialist bloc' or Comecon member states as a separate region within Europe and did not apply political divisions to any other part of the world.[40] This choice reflects a vision where commodity and hard currency requirements depended more on opportunities and availability than on power blocs.

40 Halász, *Faellátásunk helyzete és fejlődése.*

'Paper timber' export and import in several European countries between 1955 and 1964 in 1000 m^3

Country	Import			Export		
	1955	1960	1964	1955	1960	1964
Austria	138.6	307.4	626	–	–	3.2
Belgium	201.9	330	516	12	13.7	11
Bulgaria	–	–	–	–	–	–
Czechoslovakia	–	–	–	125.9	307.1	445
Denmark	4.9	3	–	0.3	0.3	9.5
United Kingdom	364	328.8	313	–	–	–
Finland	28.4	206.1	1120	3083.8	3176.1	837
France	656.7	833.3	1108	5.7	400.6	733
Greece	–	–	–	–	–	–
The Netherlands	335.2	276.4	374	0.3	11.8	10
Yugoslavia	–	–	–	700.2	445.1	358
Poland	–	75.3	205	534	372.7	512
Hungary	177.6	196.4	331.8	82.6	69.2	176.7
GDR	435.8	675.7	843	–	–	–
FRG	1663.8	1272.3	1242	0.9	8	34
Norway	818.7	1133.7	1898	225.8	290.2	286
Italy	740.1	1127.7	1203	–	–	–
Portugal	–	–	1.3	0.1	120.9	155
Romania	–	–	–	0.2	354.8	926
Spain	8.6	48.4	123	–	–	1.6
Switzerland	440.6	144.2	127	0.7	1.8	10
Sweden	279.9	603	259	1051	407	1308
Soviet Union	302.1	150	–	547.2	1589.4	4046

Table 1. Export and import of 'paper timber' in several countries
(Translation of Halász 1966, 54.)

These published tables had their roots in Ministry reports showing that Hungary was chiefly integrated into the European timber market via cellulose and paper products.[41] The narrative was clear: the volume and value of imports multiplied between early 1950 and the early 1960s and stabilized at the high

41 MNL OL XIX-K-9-az box no. 37. "A fafelhasználás, az erdőgazdálkodás és a fafeldolgozás" [Timber use, forest management and timber processing].

end. The changing figures related to export was the outcome of Hungary being increasingly involved in the re-exportation of timber from the Soviet Union for the purposes of paper production.[42] Emil Sali, the Head of Forestry Department within the ministry, and member of Madas's generation, believed that a greater capacity to share across Comecon countries would reduce the financial difficulties that paper demand caused.[43] The report of Madas's team about global trends and resources had reservations about Soviet Union's capacity to open up new routes to timber in Siberia, and thus underlined that cooperation has to mean more than trade with the Soviet Union. Moreover, Madas's team of researchers also saw limited further growth of timber resources and high labor costs in Northern Europe, and thus predicted that timber imports would grow steadily in 'capitalist western' economies.[44] In their view, for Hungary, the way to go forward was to grow its own timber stock, and equally importantly, push for regional cooperation across borders. Comecon would have been a likely candidate for becoming a framework for this change, but Madas and the generation of forestry economists discussed above never seemed to have proposed anything in that regard. And this was a not simply a coincidence.

In 1957–58, as part of breaking away from the Stalinist notion of autarky, but keeping to the idea of import substitution, a number of experts' meetings discussed the position and status of Comecon member countries in terms of potential timber resources and timber processing industrial capacity as well as their major problems. However, there was a long-lasting disagreement regarding the scope of the committee. While Hungary, the GDR, and Bulgaria were interested in more cooperation, Romania wanted to limit it. Their stance was that the Permanent Committee on Timber, Cellulose, and Paper should first discuss whether a certain product could be included in the agenda. Initially, the Soviet Union supported Romania's position.[45] One of the turning points of the discussion was when Hungarian representatives of the Committee argued that the Soviet support for the Romanian position related to agenda setting was untenable in the light of statements that the Soviet delegation at UNECE made about the importance of cooperation.[46] During the first years of its existence,

42 Ibid.

43 MNL OL XIX-K-9-az box no. 37. "Az erdőgazdasági termelés feladatai" [Tasks of production in forest management].

44 Madas et al., *A fafogyasztás és faellátás várható alakulása.*

45 MNL OL XIX-K-13-a box no. 22. folder no. 6.

46 Ibid.

the work of the Permanent Committee revolved around gathering data and information, and decisions about strategic direction that should be followed. The meeting held in Moscow in February 1958 accepted that in the field of developing paper production, one of the goals should be sharing the burden of industrial capacity building among Comecon member states. The Hungarian delegation suggested that considering the technological superiority of GDR industry in processing hardwood, it might be considered if GDR can increase its capacity to take resources of other member states to produce cellulose.[47]

The document that Comecon's Permanent Committee accepted was premised on a dilemma: it highlighted that paper production and production capacity were insufficient in Comecon countries and that these countries had overused their forest resources since the end of World War II and that this trend had to be reversed. As a workaround, the document promoted the use of reed, hay, and waste until better machines and production lines became available for more efficiency. The report that Hungary prepared about its own situation emphasized that with all efforts of afforestation and mechanization, only 50 percent of yearly timber requirement was expected to come from the forests of the country. The summary also showed that Hungary imported only 3 percent of its paper needs from Comecon countries while its paper import from 'capitalist' countries increased 62-fold even as overall paper supply decreased between 1950 and 1957. The drop in total use of paper was a sign of shortage rather than of drastically increased efficiency.[48] Moreover, some of the technologies of cellulose production were entirely absent.

Cellulose and paper production were not the main focus of reports that Hungarian authorities prepared for the purposes of drawing up the 15-year plan of Comecon. The possibility of replacing timber with other materials, reusing waste, introducing more and better machinery in felling, moving, sawing, furniture making, and meeting the requirements of railways, mines, and construction occupied the center stage.[49] Yet, these documents recognized that there was a need for change in the type of resources and cellulose products the paper industry utilized for better keeping up with demand in Hungary.

47 MNL OL XIX-K-13-a box no. 22. "Az erdőgazdaságra vonatkozó következtetések és javaslatok" [Conclusions and suggestions relating to forest management] 3.

48 MNL OL XIX-K-13-a box no. 22. "A faanyag és cellulóz terén dolgozó…" [Working the field of timber and cellulose…].

49 MNL OL XIX-K-13-a box no. 22. "Irányelvek kidolgozása a cellulóz és papíripar 15 éves műszaki fejlesztéséhez" [Working out guidelines for the 15-year technical development of cellulose and paper industry].

The initiative regarding the shared establishment of cellulose factories among Comecon countries did not have a bright future. It also disappeared from the agenda of the meetings of the Permanent Committee by early 1961–62.[50] Unfortunately, the archival record of the work of Hungarian representatives in the Permanent Committee between 1963 and 1968 is yet to be located. For the years in which related documents reappear in the archives of the supersized Ministry of Agriculture and Food Provision, Hungarian reports on meetings of the permanent Comecon committee on agriculture and forestry express a degree of disappointment in regard to how much cooperation actually took place. This picture resonates with István Feitl's argument about the failed attempt of Hungary and Poland to fundamentally change the structure of Comecon.[51] Despite wide-ranging data collection, estimates, and prognoses about the way substantial coordination within Comecon could improve the economic position of member countries in global comparison, by 1970 standardization and bi- or trilateral scientific cooperation were the only noticeable Comecon activities in the field of forestry. There were serious issues with mechanization due to the lack of available machines within Comecon and the unwillingness of member states to sign multilateral agreements.[52] In terms of the archival landscape, the simple filing of reports written in Russian replaces discussions and position papers.[53] There were no plans submitted for a joint cellulose project.

A revealing episode from 1973 connects global thinking and local events of the paper supply chain. Besides Madas, several members of the Hungarian delegation to the Seventh World Forestry Congress were also stakeholders in the issue of the poplar project. In 1973, Keresztesi was the head of ERTI and editor of collective efforts to summarize the state of the art of the Hungarian poplar project in 1962 and also in 1978. Aladár Halász was deputy head of the Department of Economics of the Ministry of Agriculture and Food Procurement; Endre Szenes was the director general of LIGNIMPEX, the state export-import agency dealing in timber. Thus, it was one of the highlights of the weeks spent in Argentina when, as part of their organized study trip, the delegation joined a Finnish party visiting a cellulose and papermaking factory near Rosario. The Hungarians were delighted to see an adjacent paper tree plantation consisting of 5–15 year old pine and eucalyptus species with felling

50 MNL OL XIX-K-13-c box no. 14. and MNL OL XIX-K-13-a box no. 23.

51 Feitl, *Talányos játszmák;* Gerőcs and Pinkasz, "A KGST a világrendszerben."

52 MNL OL XIX-K-9-m box no. 327. "Varna meeting."

53 See for example MNL OL XIX-9-m box. no. 116, 244. and 346.

going on in a part of the area at the time of visit. The group was so impressed with the method of propagation and care for the seedlings that they gathered and produced a detailed technical description of each step of the process.[54] The scene represented the ideal situation of high technology applied in a paper tree plantation of very short rotational cycle a few kilometers away from a large processing complex that produced both cellulose and paper products. The ground reality in Hungary was far from this exotic perfection.

On the Ground: Data, Cooperatives, and the Yugoslavian-Hungarian Paper Deal

In response to the lack of effective Comecon coordination in timber processing, the Hungarian government eventually moved to bilateral solutions, and imported related machinery from the Soviet Union, Czechoslovakia, the USA, and Italy. In the field of paper imports, the major bilateral move was a contract on timber products that LIGNIMPEX, on behalf of the Hungarian government, signed in the autumn of 1975 with Yugoslavia concerning joint production of cellulose and paper. The deal with Yugoslavia entailed that Hungary would transport poplar as raw material for paper to two Yugoslav paper mills along the River Sava: Krsko in present-day Slovenia, and Srmska Mitrovica (Szávaszentdemeter) in present day Serbia. Throughout the second half of 1960s, the relationship between the political elite of the Hungarian and the Yugoslavian party-states improved beyond imagination.[55] Thus, bloc level politics did not stand in the way of using the opportunities that the Danube provided for timber trade. At the same, the relationship with another potential partner, Czechoslovakia, was at an all-time low around 1969–70. The volume of timber that Hungary had to bring to the factory at Srmska Mitrovica was three times larger than the volume intended for the Krsko plant. In return, Hungary would receive cellulose and paper products at a price that was 5% below the Scandinavian market price. The most important objective of the Hungarian government was to save hard currency on paper importation.[56] In the lack of records about the negotiations, one may only assume that the Yugoslav government was interested in signing a deal to overcome problems of raw material supply to the factories. Transports

54 Halász et al., *Beszámoló a Hetedik Erdészeti Világkongresszusról,* 560–65.

55 See for example Bottoni, "Majdnem Nyugat."

56 I could not locate the contract itself, which is not in the archives, but MNL OL XIX-K-9-m box. no. 311. describes it.

to Krsko were to begin in the summer of 1976, while to Sremska Mitrovica only in 1977. The contract signed with Yugoslavia meant that the volume of poplar timber production needed to rise sharply until 1980 and stabilize at a high level for the next fifteen years.[57] To gain insight to the ground realities of the poplar project in Hungary, we may look at the Yugoslav–Hungarian deal as the outcome of three decisions on the Hungarian side. First, it had to be decided that there should be no processing capacity built in Hungary for the timber material that the poplar project would produce. Second, the quantity and quality of timber had to be calculated. Third, transporting timber from Hungary to the processing plants had to be judged feasible and possible from the point of view of logistics.

Regarding the first question, archival traces are scanty, but it is clear that it was a matter discussion for nearly a decade as to whether the country should build its own productive capacity.[58] In 1958, Madas believed that expansion of the paper mill at Csepel would solve the question.[59] Another potential candidate was the paper mill in Dunaújváros (formerly Sztálinváros), south from Budapest, along the Danube. It was built and became operational in the mid-1970s, but studies submitted to the Ministry of Light Industry did not see it feasible to expand it further to process poplar grown in Hungary.[60]

The question of how the quantity and quality of available poplar timber was assessed is a more complex issue. The Hungarian–Yugoslavian poplar-paper deal entailed a large-scale effort of resource commodification that consisted of several steps during the 1960s and the 1970s. In 1966, the assessment of the implementation of the plan that the National Poplar Committee drew up showed that by 1970 there would be an abundance of poplar ready to be commodified. As András Madas put it in a letter to the deputy head of the National Planning Office (OT): "since liberation we have planted circa 330,000 hectares of forest. Fast-growing poplar species constitute around 20 percent of these new forests. Thus, the capacity of the country to produce raw material has been considerably increased."[61] However, the scale of the planned Yugoslavian–Hungarian deal made authorities feel that there might not be enough poplar trees in Hungary

57 MNL Ol XIX-K-9-m box. no. 311. Note that the guide for archival unit XIX-K-9-m did not always reflect actual stack situation. Assistance from archivist György Ritter was crucial for locating relevant material.

58 MNL OL XIX-K-9-az box. no. 37. "Földes László" folder no. 13.

59 Madas, "Nyártelepítések jelentősége papír- és cellulóziparunk fejlesztése szempontjából," 231–36.

60 MNL OL XIX-K-9-az box. no. 37. "Földes László" folder no. 13.

61 MNL OL XIX-K-9-aj box. no. 22. "Földes László" folder no. 12.

to fulfill contractual obligations.[62] Thus, only a year later, the Department of Forestry of the Ministry of Agriculture and Food Provision also carried out an assessment of the availability of raw material for the Yugoslavian–Hungarian deal, making an account of poplar and willow species that were considered 'paper timber.' The assessment showed that the Hungarian party would be able to fulfil its obligation in the first year of the contract, especially since supplies to Sremska Mitrovica were to begin in 1977. The calculation also stated that even though large areas of poplar stands were set to mature in the same period, it would only be possible to keep up with such a rise in demand if additional species and sources were included, such as spruce imported from the Soviet Union and beech from Hungary.[63] In 1975, amid such uncertainty, the Department of Forestry embarked on a third survey that was intended to produce a reliable database and be more comprehensive than the previous ones. The design of the study was such that it reflected awareness of the fact that the partnership with Yugoslavia meant that calculations about economic feasibility and availability of supplies had to be combined with a long-term ecological assessment of the poplar project that had been on-going since 1960. Sali explained in the books summarizing poplar research that researchers used data directly from management plans, but they checked each area for which a plan was prepared before 1966, and the survey included all forests where the proportion of poplar species was at least 5 percent.[64] The assessment of 1958, which preceded and conditioned the forming of the National Poplar Commission, concluded that several local level forest management plans erred in assessing ratios of poplar species in afforested areas. In 1958, Keresztesi, in his paper summarizing this data, estimated that 162,658 ha. of poplar would be planted between 1958 and 1975.[65] The assessment of 1975–78 showed that in 1973 the total area of poplar was 154,300 ha. and this figure was expected to decrease in the coming decade. This meant that in peak years poplar species covered around 11 percent of total forested area, while this figure was closer to 8 percent in most years of the period under discussion. This figure is comparable to the area covered by pine in the late 1960s. Delegated staff of ERTI and the planning unit of the

62 MNL OL XIX-K-9-m box no. 206. "Assessment of poplar project in 1967–68 and expected volume of timber." See also among papers of the Forestry Research Institute MNL OL XIX-K-13 box no. 339. and 341. For doubts see MNL OL XIX-K-9-m box no. 209.

63 MNL OL XIX-K-9-m box. no. 294.

64 Sali, "Nyárfatermesztési célkitűzések," 13.

65 Keresztesi, "Nyárfagazdálkodásunk helyzete," 219.

Department of Forestry used computers for developing the predictive model and for calculating the quantity and quality of timber for each subsequent year. The models showed that certain factors, especially considerations of quality, would result in loss of the area of poplar until 1990, while additional plantation was also considered.[66] Although when narrowing it down to the question of the Yugoslavian–Hungarian deal, the survey gave a positive response, the overall result was that the quality of poplar in Hungary was less than mediocre and that this was due to hasty decisions about the locations of poplar stands that did not take soil conditions seriously enough during the early 1960s. Foresters also concluded that Hungary would not be able to supply a pulp making factory if it were built on its territory. The recurring evaluation of the impact and implementation of the 20-year plan of the National Poplar Committee, namely, increasing the area and quality of poplar within the total forested area and within the afforestation effort, was one of the catalysts and opportunities for thinking in terms of a 'timber economy' in Hungary.[67] The assessment was a formidable and successful exercise that contained valid methods for assuring data quality, evaluation, and predictive analysis using all available computational technology to achieve the best results. It was no less than the reappraisal of the sustainability of commodification of poplar species and stands in the light of changes that the new economic thinking, collectivization, and global market integration brought about in the relationship between nature and culture in Hungary. Uncertainty about the conclusion of assessments might make the impression that the study was the outcome of 'communist'-style official optimism and calculation.[68] However, the methods of data collection were the outcome of several factors, such as, ideas about the economy and about nature, transnational circuits of and long-term practices of knowledge production, and conflicts over land use. Forestry has been a data intensive science since the mid-nineteenth century. As part of the forest management documentation, foresters were expected to create a plan about how and when a specific forest area reached optimum timber output for the intended type of product. Experiments and mathematics were used for producing tables about growth rate of different tree species, and calculations of value and prices were also an integral part of the knowledge base. Data collection and the assessment of data played a key role in the poplar project as a result of

66 Sali, "Nyárfatermesztési célkitűzések," 14-28.

67 Madas, et al., *A fafogyasztás és faellátás várható alakulása.*

68 Tulbure, "Post/Socialist Infrastructures of Knowledge."

continuities within the profession, and not only due to the nature of the state socialist regime or advances in computational technology.

As part of the complexity, specifically state socialist conflicts over land use also mattered. The launching of the plan of National Poplar Committee coincided with the final wave of aggressive collectivization. Studies of Gábor Máté demonstrate that in the drive to apply chemicals and water management techniques, collectivization at times brought about landscape degradation and created ecological issues that were not present before.[69] It is yet to be explored how the poplar plan impacted the first years of new cooperatives, but there is at least one document that allows researchers to highlight points of tension. In regard to Somogy County, the author of a 1963 report believed that natural conditions were suitable for poplar and it would be possible to plant 6,000 hectares. According to the draft, cooperatives would have to undertake the bulk of the task, besides the Hungarian State Railways and Water Management authorities. The author, however, noted that 40–70 percent of seedlings died due to carelessness and grazing.[70] When Madas and Halász dealt with the economic behavior of newly formed cooperatives and the actual shortage of raw materials such as pine and firewood, they brought attention to several risks that rational economic behavior of the leadership of cooperatives might cause. Madas pointed out that in terms of land ownership pattern, Hungary was unique among 'socialist' countries. There was virtually no private forest by the 1970s, but cooperatives managed 22 percent of forested areas and a relatively low proportion, 77.7% of forests, were under direct state management. Madas and Halász believed that this was not an ideal situation since cooperatives treated forests as secondary areas of activity and used timber for relatively inferior purposes, thus keeping the valuable material off the market.[71] The pressures that the Yugoslavian-Hungarian deal triggered resulted in a showcase of these issues. In the first year of the contract, issues with actual supplies were so serious that they could potentially jeopardize the entire deal. The question of prices was no less complicated than logistics. In the climate of post-1968 economic regime where enterprises were encouraged to make profit, buying up stocks was only possible if the price offered was higher than it would have been for other products. Ministerial administration sought a fix to these pressing issues experienced on the ground. In order to make the supply chain operate, central administration organized meetings for various regional

69 Máté, "Táj és kollektivizálás."

70 Library of the National Forestry Association, Bundle for the year 1963.

71 Madas, *Erdészeti politika*, 248–49.

level actors of the reshaped realm of cooperatives, forestry enterprises, and state enterprises involved in trading timber related commodities.[72] Despite serious issues encountered regarding cooperation between forestry enterprises and cooperatives, the latter were expected to take an ever-larger share in the poplar program since without their poplar stands the entire operation would have fallen short of supply.[73] Because of these developments, and other logistics issues, less than half of the required quantity left for Yugoslavia by mid-June 1976, and later months looked uncertain too. It was also a difficult logistical task to make sure that production in the eastern part of Hungary reached the ports where ships departed from. Although the two neighbouring Pest and Bács-Kiskun counties, and a county along the Danube, Győr-Moson-Sopron, were the prime areas of poplar, without the output of the Trans-Tisza region there would not have been enough timber to transport.[74] Despite these concerns and the social sensitivity of the World Forestry Congress of 1973, forestry economists did not consider social conflict or forms of resistance to the poplar campaign as a factor.[75] It requires a further reading against the grain to locate specific instances and forms of resistance to the poplar project.

The Yugoslavian–Hungarian paper deal led to a major professional, institutional, and academic enterprise to assess and predict the future availability of a species seen as a natural resource, the presence of which had been the result of anthropogenic intervention in the late 1950s and during the 1960s. Attention shifted to the issue of identifying and sustaining ecological conditions that made commodification possible. The assessments of the poplar project included the problem of the distance between data and information, institutional interests, Hungary's place in the global economy and within the so-called 'Eastern Bloc,' and the problem of combining local efforts into a single cause. The correlations and risks that the tables point to reflected that the production of paper poplar was a site where the collectivization of agriculture, forestry, prices induced by the New Economic Mechanism, and scientific practices of producing information about nature all intertwined.

72 MNL OL XIX-K-9-az box no. 37. "Földes László" folder no. 5. and XIX-K-9-m box. n. 412.

73 MNL OL XIX-K-9-m box no. 311. and Sali, "Nyárfatermesztési célkitűzések."

74 MNL OL XIX-K-9-m box no. 311. and 412.

75 MNL OL XIX-K-9-az box no. 37. "TSZ-ek faanyagának értékesítése" [Selling timber from coops].

Conclusion

This paper addressed the science and economy of an Anthropocene thesis from the vantage point of semiperipheral Hungary during the Cold War. It chose the poplar species as the subject matter because poplar-based industrial production underwent a surge in post–World War II Hungary and it included large-scale efforts at landscape change, while research activities began in the first half of twentieth century. Historicizing poplar is an opportunity to study how the performativity and transnational nature of economics and life sciences intertwined with the political history of Cold War institutions and the social-political history of state socialist countries to bring about a new era of nature-culture relationship that we may call the Anthropocene.

The first section highlighted that forestry research on the poplar species was an essentially transnational one, even if that history might look domestic or isolated to present-day interpreters. The history of the interaction between activities of the International Poplar Committee was intertwined with major stages of the Cold War, such as the withdrawal and return of countries of the Socialist Bloc to UN organizations. Moreover, the institutionalization of links among researchers also connects to natural-cultural histories, such as the history of engineering hybrid clones, the idea and technology of tree plantation, and the presence, destruction, and economic loss that living organisms preying on trees might cause. This is not to deny that that the social history of landscape change, and the way professional groups might influence it, was arguably specific to state socialist regimes such as Hungary. That is because the science of the Anthropocene is about entanglements.

Economic models that top leaders of Hungarian forestry profession presented at global events were reflections and an attempted means to break away from a semiperipheral position, despite the limitations and failed hopes that Comecon meant by the 1960s. The section on the projecting of long-term patterns of timber availability showed that it was the combination of the drive to growth, consciousness of dependencies, emerging notions about a potential ecological crisis, and a shifting social context that resulted in changes in the nature-culture relationship. The global economy and ecology of the era of Anthropocene has been a process of emergence, rather than an outcome of plans.

Besides transnational entanglements of science and economic models, the history and specific stories of data collection proved to be a hub for understanding

what was specific about the way ideas about aggregate demand and economic potential come together with measurements of ecological sustainability—to turn potentially valuable resources into commodities of calculable-calculated value in state socialist Hungary. The third section addressed how the state socialist economy of Hungary adapted to the changing natural-cultural circumstances that its very actions of commodification contributed to. The assessment of the poplar project between 1973 and 1976 pronounced that what looked like policy at first sight was the hybrid of many factors: incompletely counted trees, the political decision to promote or harm certain interests, human economic behavior and its perception, and regional and global ecological, economic, and political contexts. The Yugoslavian–Hungarian paper and cellulose deal signed in autumn 1975 was the key element at the juncture of the poplar planation campaign that began 1960s and assessments of timber resources. The context of the deal underlines that linking local events and global change is indispensable for the studying the Anthropocene from a historical perspective.

These histories of linkages, entanglements, and complexities help us see both state socialism and the Anthropocene less as a matter of course. Since the history of the formula of nature-culture is not fully accessible, there is scope to add new and unexpected elements to it in order to change the model of future ecology.

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FEATURED REVIEW

The Habsburg Monarchy 1815–1918. By Steven Beller. Cambridge: Cambridge University Press, 2018. 315 pp.

Important, summative assessments of the Habsburg Monarchy have been appearing with increased frequency in recent years. One factor is the series of rolling centenary anniversaries beginning with the outbreak of World War I followed by the death of Franz Joseph, the fall of the Monarchy and the foundation of the successor nation-states. Another is the maturation of a generation of historians who emerged in the decades from the 1970s to 1990s. Many were trained in America and are associated with the "revisionist" trend, which emphasizes the continued viability of the Monarchy and the contingent, constructivist, multivalent nature of nationalism. Pieter Judson (born 1956) and Steven Beller (born 1958) have both recently published general histories of the Habsburg Monarchy in its last century. The monumental series published by the Austrian Academy of Sciences entitled *Die Habsburgermonarchie*, which covers the period 1848 to 1918 and provided much impetus to the "revisionist" trend, is nearing its end. Other general histories, whether by single authors or multi-authored, are also planned for publication.

A previous generation of historians undertook a similar process of summation and synthesis in the 1960s. The prevailing viewpoint then portrayed a decaying, anachronistic Monarchy weakened by rising nationalism. Historians such as A. J. P. Taylor, Robert Kann, Hans Kohn, Hugo Hantsch and Erich Zöllner, who all published or revised general works in the post–World War II period, had built on the nationalist focused work of the inter-war period, especially the influential analysis of the Hungarian emigré Oscar Jaszi. Kann, Kohn, Hantsch, and Jaszi were born within old, pre-war Austria-Hungary and had thus personally witnessed the end of the Monarchy and the difficult, tragic aftermath. By the 1960s their views dominated the historiography. The influential series of volumes in the Austrian History Yearbook of 1967 were largely ordered around competing nationalities and the concepts of centripetal and centrifugal forces, inspired by Jaszi's framework. The English historian Carlile Macartney (born 1895) capped a lifetime of work with his massive general history published in 1968. He begins the book with the failure of Austrian state centralism in Hungary in the late eighteenth century and proceeds in admirable breadth and detail to outline the gradual retreat of the state and Empire in response to the

multiple challenges of the nineteenth century, including rising nationalism. Thus by the late 1960s, the general consensus was of an old-fashioned, dynastic Monarchy out of step with the modern world of nation-states. Broadcast in 1968, Edward Crankshaw's BBC documentary series entitled "The Fall of the House of Habsburg, 1848–1918"—largely based on his book published five years earlier—encapsulated this interpretation for a wider audience.

From the 1970s onwards these paradigms of a rigid, feudal, reactionary Monarchy torn apart by competing nationalisms have increasingly been questioned. Starting with reassessments of economic history then spreading to aspects of the governmental system, the administration, legal practice, politics, education, civil society and the military—amongst many other topics—the older assumptions have gradually been overturned. According to this "revisionist" view, the economy was developing well, the legal and educational authorities were mostly fair, the military was creating a relatively coherent, loyal army and the political and administrative framework showed significant flexibility when faced with the demands of an engaged, organized, active populace.

Pieter Judson's acclaimed book brings together many of these "revisionist" arguments into a sophisticated, compelling conceptual framework. The guiding theme is the changing relationship between the state (defined broadly) and the populace. For the pre-1848 years this was mainly a triangular schema of ruler/state, local elites (mainly aristocrats) and people (especially the peasants). Judson shows how the Habsburg state and ruler often appealed over the heads of the aristocrats directly to the people, thus empowering the central state against local structures and traditions and also slowly forming a loyalty or patriotism amongst the common people towards the distant, abstract, beneficent ruler and her (Maria Theresa's) or his (Joseph II's) institutions. The wars against an assertive revolutionary and Napoleonic France further encouraged this gestating loyalty and patriotism. The subsequent Metternich years emerge in Judson's account not as a stagnant, oppressive interregnum but as a dynamic, engaged, developing and stimulating era.

The complex turning point of 1848–49 is covered extremely well. Rather than the familiar battles and political intrigue, Judson shows how the populace actively participated in the newly opening public sphere to articulate potential reforms to the Empire. This burgeoning grass-roots political culture and the issue of representative bodies gradually transformed the relationship between ruler/state and the people. Layers of administration and representative bodies, along with a myriad of changing political actors and organizations, meant

increased state involvement in everyday life as well as increased demands from the citizens. A complicated, contested, rowdy, fluid set of constitutional and political institutions and practices evolved. Amidst the many difficulties and challenges, there was also adaptation and accommodation—from the state, the political actors and the general populace. Throughout the book Judson illustrates his arguments with examples from across the Empire—Dalmatia, Bosnia, Bukovina, Transylvania, Tyrol, Galicia, Croatia, South Styria as well as Bohemia, Moravia and Hungary—giving a sense of the Monarchy's tremendous geographical diversity and grounding his arguments in specific contexts. Nationalism is, to some extent, presented as tool for instrumental, pragmatic purposes—whether to form and integrate a political movement or for tactical maneuvering within the system. This mirrors the approach of Judson's previous book *Guardians of the Nation* and of Tara Zahra's work on national indifference or flexibility.

Judson has reflected on the latest scholarship—much of it "revisionist" in nature—and provided a general narrative framework based on the relationship between ruler/state and the people. He has questioned and rethought countless issues within the historiography of the Monarchy. He has also provided some comparative perspectives, placing the Habsburg Monarchy within general European developments. His book is an impressive achievement and is full of provocative ideas and formulations that point towards possible future directions for new research.

Steven Beller, in a prolific career, has written books on Vienna's Jews, anti-Semitism, Theodore Herzl and Franz Joseph as well as a general history of Austria. In his acknowledgements he concedes that his present book has some overlap with previous works yet he, nevertheless, wished to outline his interpretation in response to recent historiography, in particular Judson's book. Beller's book is more traditional and less "revisionist" than Judson's. It provides more of a standard narrative based around high politics and foreign affairs.

There are some constant themes—modernization (only defined near the end as representative government, national self-determination, popular sovereignty and rule of law [p.275]), successive challenges (Beller uses the term "squaring the circle" [pp.77, 119, 135, 151, 185, 227]), the Habsburg Monarchy as a "European necessity" (p.7; pp.273–86) and an awareness of the Empire's possibilities (p.21; p.220). Nevertheless, it is sometimes difficult to trace the connecting threads through the book, while the overall argument is rarely stated in an explicit, integrated manner. This is partly because Beller covers more ground then Judson including cultural developments (especially the Biedermeier

and c1900 eras), foreign entanglements and the financial strains of maintaining a military befitting a "Great Power." Beller is best in the final chapters of the book when he combines historiographical comment with interpretive exposition. For example, chapter 6 "1897–1914: Modernization" presents a fascinating portrayal of a flourishing Empire (a stable society and economy, intellectual ferment and achievement) coupled with "everlasting political crisis," an aging Monarch and an elite embroiled in the Balkans.

Throughout the book, Beller conveys the multiple options and possibilities for the Habsburg Monarchy. Beller outlines this theme in the introduction:

> Central European culture was not one which encouraged certainties…. It was a culture fated, almost, to see ironies rather than coming to definite conclusions, not definite theories but rather the penumbra of possible alternative interpretations that connected, one to the other…. As we shall see, this lack of a decisive approach, a lack of a definite national identity, or of a unified national culture, or even of an obvious, straightforward political purpose, was a large part of what brought the Monarchy down, repeatedly, during the course of the nineteenth century, a century of modernization on national, decisive lines. (pp.22–23)

Beller's characterization of the governing elite is of a conservative, fearful, aristocratic closed circle generally in opposition to the wider populace. This is a stark contrast to Judson's schema, which postulates a flexible, symbiotic, if sometimes difficult, relationship between the state (in a broader sense than the Viennese ruling class) and the people. Beller's view is from the centre—of the governmental, military and administrative elite trying to control and direct events and people. Judson's focus is primarily from below—on the local, everyday level of engagement between the expanding state and its citizens. These are not necessarily incompatible viewpoints. The Monarchy was a vast, diverse and complex entity, as is evident from the myriad of topics and viewpoints in *Die Habsburgermonarchie*. Amidst perpetual crisis there was reform and adaptation, amidst despair there was hope, amidst extreme nationalism there was fervent patriotism—sometimes simultaneously, sometimes changing over time and often in the same individual or movement. How does Beller, then, navigate the Monarchy's bewildering variety and diversity?

Starting with 1815 Beller provides an overview of the Metternich system—both internationally and domestically. While acknowledging that Metternich's security state was not particularly efficient, Beller still states that:

> the suppression of an active political scene meant that the emerging German-speaking middle class and intelligentsia in the Monarchy never gained the practical experience in representative politics that their equivalents in northwestern Europe did at this stage of social and economic development…. Had there been more of an active forum for political debate in these crucial post-war decades, a more Viennocentric, albeit German-speaking, but *Austrian* political consensus might have been able to mitigate, or even co-opt the centrifugal forces of nationalism that would dominate politics later in the century. (pp.35–36)

Yet was such political reform in a Catholic Empire recovering from decades of revolutionary and Napoleonic violence and upheaval ever possible or realistic? Which other countries undertook progressive political reform directed by forward-thinking elites towards representative, constitutional government and freedom of expression immediately after 1815? None of the "Great Powers." The small states of Baden and Wurttemberg had constitutions in 1818 and 1819, Belgium and France experienced Revolutions in 1830 and the British Reform Bill was passed in 1832. The elites in all of these cases were generally reactive, moderate and pragmatic.

Interestingly Beller pursues the idea of missed opportunities in the following section, beginning with Ferdinand's ascension to the throne in 1835. Certainly there was even less possibility for reform under the mentally incompetent Ferdinand. Nevertheless, society, the economy and nationalist culture were rapidly developing, despite the "drag" (Beller's term) of Metternich's system. The 1848–49 Revolutions, in Beller's account, exposed further and deeper questions of modernity—Germany, nationalism, representative and constitutional government, the place of Jews, amongst the more significant. Franz Joseph became the ruler and he is well characterized by Beller as "brave, but not imaginative; conservative, even reactionary, but also practical and empirical in his approach, prepared, ultimately, to let the ends justify the means" (p.90). Yet the 1850s "revolution from above" was, according to Beller, not accompanied by sufficient support or loyalty (p.100). From 1861 onwards, then, the task facing the Monarchy was "to achieve the necessary basis of political and financial support" (p.107). Beller's assessment of the 1867 Compromise is mostly negative, principally because it perpetuated national strife (pp.126–27). This was exacerbated by the onset of mass politics leading to the world of c1900; politically chaotic but also culturally, intellectually, creatively innovative, indeed evincing a form of modernity (p.191). In the context of regional and local administration,

Beller acknowledges that some indistinct sort of "multinational federation" was emerging and that "national groups were realizing their goals within the Monarchy's parameters" (p. 211). Nevertheless, the administrative costs and the ongoing political crises crippled the military budget. The Monarchy, it seems, was trying to balance between incompatible goals and viewpoints, without truly committing to any fundamental new direction.

Here, on the cusp of World War I, Beller summarizes his overall argument. The relationship between state and citizen "was still mainly 'top-down'"—a contrast with Judson's representation of a complex negotiation between state and citizens (pp.223–24). According to Beller, it was up to the decision-makers to "square the circle" and introduce decisive, fundamental reforms.

> The Monarchy could have, hypothetically, developed as a progressive, federal, prosperous, efficient and law-abiding state, where each nation's equal status was protected, and acted as a magnet for the rest of southeastern Europe, becoming a *real* European necessity. (p.225)

These sentiments are reminiscent of Taylor's and Kann's view (recently also asserted by Helmut Rumpler) that the only a federalized Monarchy could have survived into the modern era. In addition to these domestic problems of "everyday empire," the ruling class of 1914 continued to believe in the Monarchy as an old-fashioned "Great Power," which had to project prestige and power—hence the decision for war. Ironically, when the ruling class was finally decisive, it led to the destruction of the Monarchy (p.248).

After an account of World War I, Beller concludes with a section entitled "Conclusion: Central Europe and the Paths Not Taken." In the first section, largely covering possible domestic reasons for the failure of the Monarchy—liberalism, nationalism, the 1867 Compromise—Beller concludes that "the Monarchy was still a viable entity in 1914" (p.276). Nevertheless he stresses that the military and the Monarch remained old-fashioned and dangerously detached from wider society. In the final pages Beller states that:

> In an era when modernity meant allowing societies to govern themselves, when modernization went hand in hand with Kantian self-determination, the old Habsburg role of being an imperial power, of governing people well, whether they accepted your legitimate authority as their ruler or not, would not work… The problem was that the Monarchy, as a political enterprise, was unable to create in modern

> form the authority and legitimacy that it had possessed before the modern age…. The Habsburg leadership was never able to square the circle that could turn a dynastic conglomeration of possessions into an all-embracing home for all its people, as well as peoples. It could never come up with a way to convert necessity into a coherent identity. The "Austrian Idea" never achieved cogent meaning. That is why the Habsburg Monarchy collapsed in the crisis of 1918. (pp.284–86)

Fundamentally, Beller's argument seems to have two crucial aspects—war and democracy. According to his analysis, dealing effectively with these twin aspects of "modernity" remained mere possibilities or "paths not taken." The spectre of war haunts the book, even if there is little explicit discussion of it. The Monarchy survived the Napoleonic Wars intact and even expanded its territory. It had its chances to continue as a "European necessity" or a vital component of the international scene. Yet throughout the nineteenth century according to Beller's book, the military did not keep pace with its rivals and the political system could not provide the necessary funding or legitimacy. While the Monarchy survived minor upheavals and defeats in 1848–49, 1859 and 1866, it did not have the coherence or loyalty to withstand the total war of 1914–18. Neither, Beller notes, did Germany, Russia or the Ottoman Empire. If the measure of a state is its ability to wage war, then, the Monarchy was an ailing, declining state in its final decades. Would a democratic, federalist Monarchy have survived the war? What form of democracy could have been implemented, taking into account the delicate balance of interest groups within the Monarchy? In fact, there had already been considerable progress towards a wider democracy, particularly in the Austrian half. For example, the 1907 introduction of equal, universal manhood suffrage in Cisleithania preceded similar reforms in Sweden (1909), Holland (1917) and the United Kingdom (1918). It proved, however, no panacea for the Monarchy's problems.

In conclusion, the books by Judson and Beller have clearly contrasting goals and arguments. Judson focuses on the dynamic between the Imperial state and the wider populace, especially in provincial and local contexts. Empire, in Judson's book, is conceived of as a large umbrella, multi-national entity. Judson emphasizes the everyday interactions of the people with a contested, inefficient system, which nevertheless facilitated discussion, participation and distribution of resources. Beller views Empire in more traditional terms—territorial acquisition, monarchical power and the assertion of military prestige and strength. His book is about the governing elite's traditional conceptions of

the Monarchy and their difficulties in the modern world of representative bodies and rising nationalism. While acknowledging the "revisionist" trend and never conceding the "inevitability" of the Monarchy's collapse, Beller's assessment is considerably more pessimistic than Judson's.

What framework will future general histories of the Habsburg Monarchy adopt? The multi-faceted nature and role of nationalism will always be an important aspect of the Monarchy's history but it will probably never return to the prominence and dominance within the historiography that it occupied in the inter-war and immediate post–World War II eras. My wish list includes more comparative history, some focus on the nexus of military/civil society/politics and on the everyday experience of politics. The historiography of the Monarchy could go in any number of directions. For now, at least, despite Beller's reservations and caveats, the "revisionist" viewpoint has become the new orthodoxy.

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BOOK REVIEWS

Legenda vetus, Acta processus canonizationis et Miracula sanctae Margaritae de Hungaria: The Oldest legend, Acts of canonization process, and miracles of Saint Margaret of Hungary. Edited by Ildikó Csepregi, Gábor Klaniczay, and Bence Péterfi. Translated by Ildikó Csepregi, Clifford Flanigan, and Louis Perraud. Central European Medieval Texts 8. Budapest – New York: Central European University Press, 2018.

Another volume in the *Central European Medieval Texts* series is the second presenting hagiography. Bilingual editions of the narrative sources from Central Europe and modern translations into widespread academic languages are undoubtedly necessary. The hagiographical corpus of Saint Margaret (1242–1270), daughter of King Béla IV, and Dominican nun, is one of the most important ones. Holy princesses following St. Elizabeth of Hungary present the transition towards new models of sanctity, but also represent the prestige of the ruling dynasties, and reflect their cooperation with the mendicant orders. The book offers the first translation of hagiography related to Margaret into English and any modern language (except for Hungarian translations, and fragmentary translations into Czech and Slovak, and excerpts in various studies). The history of the translation goes back to the 1980s, with delays and several editors and translators involved over time, and luckily reached a happy ending much faster than the centuries-long quest for the canonization of Margaret, with success in 1943.

The volume contains the oldest legend (between 1272–75), the acts of the second canonization investigation (1276)—both on the basis of existing editions, a series of recently discovered documents on the fifteenth-century miracles, edited for the first time, and a few more documents related to medieval canonization attempts (both newly discovered and those edited earlier).

G. Klaniczay's introduction not only summarizes the state of research on the saint (overview of hagiography and canonization efforts), but adds observations on the phenomenon of royal and female sanctity, especially in the thirteenth century. The introductions to particular parts explain the vicissitudes of the sources from the dossier and their relation to canonization attempts.

The edition and translation of two oldest texts, the legend and the acts, which further served as bases for later lives of the saint, form the core of the volume. The editors accept Marcellus as the author of the oldest legend, for which they adopt the designation *Legenda vetus*. The basis for the translation is the most recent edition by Szovák (1999), which introduced emendations to the first edition by its discoverer Bőle (1937). The explanation of the base text is somewhat hidden in the introduction by Csepregi (p.38); it would perhaps merit a separate section, including applied conventions, etc. The editors accept Szovák's corrections, and profit occasionally, as signaled in the apparatus, from further variants proposed by Ilona Nagy working on the Hungarian vernacular legend, or note variants by Bőle. Corrected readings are introduced in the apparatus only; it is a question whether they would be better placed in the main text itself. Biblical citations are identified at places. New critical editions are not the objectives of the series; in this case as well the editors take the old source edition as the basis and add some critical insights. We often have to admit that a new critical edition of the source in question would be desirable. Part III, *Acts of the Canonization Process*, is the most voluminous one (570 pages!), based on Fraknói's edition (1896), adding minimum apparatus to the Latin text. The translation of depositions of witnesses, answering the *puncta interrogatoria* in detail, is a great achievement. Footnotes bring in a lot of useful information: identification of persons, dates, and places, explanation of local realia, but also issues concerning female sanctity and alike.

The volume summarizes recent important findings concerning Margaret's hagiography and canonization attempts (Deák, Krafft, Nagy, Péterfi) for a broader audience as well. The history of the St. Margaret dossier abounds in discoveries. The basic sources from the period shortly after Margaret's death are supplemented with the edition and translation of the documents found by Péterfi in the Archivio Orsini (Archivio Storico Capitolino, Rome), described in 2011. The introductions to Parts IV–V provide the first description of the hitherto unknown 6 charters (one of them with transcription of 7 others), including miracle depositions, for non-Hungarian readers. Their edited material is of utmost interest to the Hungarian audience as well.

The editor argues that the set of documents was related to the renewed attempt at canonization during the reign of Matthias Corvinus, which was known about for a long time (thanks to two undated petition letters from ca. 1462–64), but precise information had been missing. The hypothesis that the charters got into the Orsini family archives (where they remained unknown for centuries

even to those who renewed the attempts at her canonization in the following centuries) via Latino Orsini, who acted as cardinal protector of the Kingdom of Hungary and was probably entrusted with submitting the issue, is convincing.

The documents include depositions of miracles that happened at the tomb of Margaret in 1446–67, edited and translated in Part V (V/1–11), with necessary corrections in the Latin text and notes in the English translation (mainly identification of persons and places, specification of dates, etc.). They have a noteworthy format of charters issued by the Buda chapter and authenticated by public notaries. They provide information about the local cult on the Island of Hares in the Danube, about which we did not know much previously.

Part IV contains *Correspondence relating to Margaret's medieval canonization attempts*, altogether 9 mandates and letters: besides two hitherto unknown documents—the copy of the first papal mandate for starting the investigation (1272) and the petition of Emeric, bishop of Várad/Oradea (1306)—discovered in the Orsini dossier by Péterfi, the editors included other documents related to the Angevin and Corvinus attempts at canonization (edited previously by Krafft and Fraknói).

The last part, a useful tool, offers a list of hagiographic sources—there is much more in the Margaret dossier than the sources translated here — their first and best editions and modern translations. A Slovak translation in *Legendy stredovekého Slovenska* (ed. Marsina, transl. Vaneková, 1997) could be added to the list of translations of the *Legenda maior* by Garinus (for long referred to as the *Legenda Neapolitana*, BHL 5331). It should be noted that the listed Czech translation of the *Legenda vetus* by Pražák contains only its part (around a third). The summary of the life and miracles of Margaret in a chapter of the *Epithoma rerum Hungararum* by Ransanus (ed. Kulcsár, pp.123–31, BHL 5333) could have been included in the discussion and catalogue of the sources, especially as it falls within the reign of Corvinus, a couple of decades after the new depositions and petition.

The volume will be of interest not only to scholars of medieval hagiography, but also those interested in the insights into everyday life in the cloister, in towns and villages, and in general life in thirteenth-century Hungary. Besides translating the known important sources, the editing and translating of hitherto unknown documents gives the volume an added value.

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Mulieres suadentes – Persuasive Women. Female Royal Saints in Medieval East Central Europe and Eastern Europe. By Martin Homza. Translated by Martina Fedorová et al. East Central and Eastern Europe in the Middle Ages 42. Leiden: Brill, 2017. 260 pp.

Undoubtedly, the topics of female sanctity and the role of women in ruling dynasties, pertaining also to conversion to Christianity in medieval Europe, have been extensively researched during recent decades. Most studies however focus on Western Europe, while the analogous phenomenon in East Central and Eastern Europe is usually overlooked or appears only marginally. This gap has partially been filled by the publications of medievalists from the region, including Martin Homza's monograph published in Slovakian in 2002. Their reception was, however, limited due to the language barrier. For this reason the English, expanded version of the book is more than welcome.

The book opens with a short but important chapter explaining the methodological approach of the author, the presence of which is a definite improvement upon the original edition. The next two chapters describe the phenomenon of the religious role of women in ruling dynasties in Central and Eastern Europe, especially persuasive women, that is, those who influenced their pagan husbands, sons, or grandsons. The comparative character of this analysis is praiseworthy.

The following three chapters are case studies of the images of three such women. The cult of Ludmila of Bohemia and its influence is discussed with a special focus on her image in the homily *Factum est*. Homza shows its similarity to that of Olga of Rus', observed in various sources in the following chapter. Finally, in analyzing the figure of Adelaide—according to the thirteenth-century *Hungarian-Polish Chronicle*, the mother of St. Stephen of Hungary, who converted her husband Géza (*Yesse*)—the author poses the question of her real existence on the one hand and of the ideological basis of her presence in the chronicle on the other. The book ends with a short conclusion.

The material gathered in the book without a doubt is not only very interesting but also important for further research. However, the material is presented in ways that might be questioned, as the use of some of the analytical categories is problematic.

I would like to focus on only one, namely, the way the author understands the category of sanctity, which seems to be rather fluid. I do this, of course, not

in order to claim that sanctity, especially in the Middle Ages, is a sort of either/or category; however, some distinctions should be observed more carefully. In fact, contrary to the title of the book (*Female Royal Saints*), of the group of Central and Eastern European women the author focuses on, only Ludmila and Olga were really venerated as saints, while Dubravka of Poland and Jelena of Croatia were never treated as such; the latter can hardly even be called a persuasive woman, as she did not participate in the conversion of anybody. Of course the author himself is conscious of this and informs us of the cult of particular figures or its lack, but one must ask if sanctity is in fact the category which could be effectively used in the analysis of all of their images. I would rather suggest that the book is much more about the patterns of female royal religiosity than about sanctity or female royal saints.

This problem might be related with a misunderstanding that appears in the very beginning. Discussing the question of royal sanctity in his methodological chapter, Homza calls Bloch's *Les rois thaumaturges* and Kantorowicz's *The King's Two Bodies* "a fundamental change in hagiographic studies" (p.4). Yet, in my opinion, neither of those can be treated as a part of such studies, as both are rather focused on the phenomenon of sacralization of royal power—strictly connected, but distinct from royal sainthood. As Janet Nelson aptly noted in her 1973 *Royal Saints and Early Medieval Kingship*, "the concept of sanctity itself could be not only sharply differentiated from sacrality but turned against it" (p.43).

Sometimes even in the case of figures that are to be found in Folz's *Les saintes reines du Moyen Âge*, we should be very careful in asking about their real cult and its influence. We should also distinguish different patterns of sanctity. For instance, Homza uses the example of Ottonian saint queens and empresses, Matilda of Saxony and Adelaide of Burgundy, and shows them as "the most immediate inspiration for a creation of the image of St. Ludmila" (p.86), as well as "the most important models to legitimize a new dynasty in a broader context of East Central and East Europe" (p.87). However it should not be overlooked that although both women were believed to be saints, in fact it was only in very limited circles. In the case of the former we do not know of any cult at all, while the cult of the latter remained very local. From this point of view, their status as commonly accepted saints might be questioned, but even more so, it is doubtful that their images could be so influential in Central Europe. The other problem is that although Ludmila was presented in her hagiography as a pious widow, she was at the same time—a fact undoubtedly crucial for her cult—a martyr. So we may wonder to what extent the above-mentioned examples of queens/

confessor saints might be seen as models for her image. For the same reason one could also ask whether St. Ludmila's and St. Olga's model of sanctity were really as close as the author claims.

Paradoxically, even the case of the sanctity of Helena, mother of Constantine the Great, is much more complicated than the author suggests ("Who has ever questioned the sainthood of Helena?"—he rhetorically asks [pp.181–82]). It is exactly her status in Latin Christianity that was for a long time unclear, as was that of her son (and remaining so in the medieval West). She was undoubtedly treated as a model for royal women (as Constantine was for rulers), but not necessary treated as a venerated saint in the strict sense. Not even mentioning the lack of churches or altars dedicated to her from the Early Middle Ages, let us just note that she is omitted in all but one (the ninth-century Usuard) of the most important martyrologies, her name did not appear in calendars until the eighth century, and during the following centuries is not commonly present. This is, for example, the case of most of the oldest Bohemian calendars. So of course the author is right that the example of Helena and Constantine must have been known to the authors of Ludmila's and Wenceslaus's hagiographies, but it is not clear whether they really thought of her as a saint figure and if her influence was obvious enough to allow for the claim that in Ludmila's life "the name of St. Helena was deliberately avoided" (p.49). Of the group of Central and Eastern European woman the book covers, it is only Olga who is openly compared to Constantine's mother.

This is not to oppose the general idea that Helena was a very important model for medieval female rulers, including the realm of female royal sanctity. Both royal female sanctity and female religiosity had, however, as the author aptly shows himself, many different sources. The idea that the conversion of a country is related with a male-female couple can also be explained in many ways. It is therefore not clear why Homza, who shows this very interestingly, in many cases decides, in the end, to reduce this phenomenon only to an *imitatio Helene et Constantini*.

Concluding, I must repeat that we have received an important book, which gathers overlooked material from Central and Eastern Europe and analyzes it with a broad, comparative approach. However, the analysis itself sometimes disappoints due to its lack of precision, especially in the application of analytical categories.

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Late Medieval Papal Legation: Between the Councils and the Reformation. By Antonín Kalous. Viella History, Art and Humanities Collection 3. Rome: Viella, 2017. 255 pp.

Antonín Kalous, the well-known young Czech medievalist, published his book on late medieval papal legation in 2017. The author, as the subtitle of his excellent work shows, focused his research mostly on the period beginning with what can be characterized as the success of the popes against the conciliar movement and other institutions of the Church. The spread of the German Reformation, by contrast, marked the outset of a whole new era, also because it resulted in reforms in the Curia, which changed the system of papal representation, including the role of the office of full legation, the *legati de latere*. Therefore, Kalous excluded the conciliar and the Reformation periods, so that the system of papal representation could be described and analyzed as a separate period in between.

The research was based on the examination of canon law, papal plenitude of power, and the ways of distribution of that power in the second half of the fifteenth century. The author investigated how the office of the so-called *de latere* legates fit into the system of papal administration and i.e. how they were handled within the church. It was not a stable institute, yet the legates shared the power, the *plenitudo potestas* of the pontiffs, like the curial offices did. According to Kalous, the engagement of legates in the selected period was an answer to the challenges of a new era, as they could have been applied in cases of various types. One of the most important tasks of the legates was to distribute dispensations and licenses according to their faculties (*facultates*). Naturally, legates were also political and diplomatic envoys; they were active in the international diplomacy and used their spiritual authority in order to act as peacemakers in European conflicts.

The book in question is divided into four larger chapters. Apart from a summary of previous research, they all serve one main goal, namely, to show the complexity of the system of late medieval papal legation. The first chapter deals with the questions of terminology and the typology of late medieval legates and nuncios from the time of the reforms of the papacy in the late eleventh century, accompanied by a detailed analysis of the sources. It was crucial to handle this topic delicately, since the term legate was indeed in active use in the Middle Ages, and despite the fact that contemporary canonists dealt with

the question theoretically, several legal issues remained being attached to it. Furthermore, Kalous dedicated his attention to the possible distinction between legates and nuncios, to the difference between the generic and specific usage of terms (*legati laterales, constituti [missi], nati*), and he also examined the question of the papal judges-delegate and the practice of subdelegation. The author did not aim to cover the entirety of Western Christendom, but focused primarily on East Central Europe and the states of this region: the Holy Roman Empire, Bohemia, Hungary, and Poland. This approach is justified not only from the viewpoint of historical research, but the contemporary situation also vindicates this perspective since the mentioned territories appeared together frequently in the authorizations of legates.

The second main section of the book discusses the question of authority and powers of the late medieval legates, which derived from the papal plenitude of power, and so from the popes themselves who created and shared their powers with them in form of a transfer. The other fundamental source was the Roman law from which the essential terms like *iurisdictio*, *imperium*, etc. derived. *De latere* legates had the highest possible authority, yet they needed special mandates for certain measures. Their faculties (*facultates*) were exceptional rights and privileges, a concession of papal reserved powers. Legates represented the pope as the highest judge too; however, this was not the sole aspect of their operations. Their presence meant "celestial gifts," a blessing for the region they entered; they could mean the way to salvation for the people there.

The third chapter of the book focuses on the modus operandi, and the condition of the legates and their own journeys and activities. Kalous answers questions like what the practice of the legatine missions was like, what rules they followed, if there were any regulations at all, and how they managed to get to their provinces. The author dedicated a subsection to the financial aspects of the legations, the *procuratio canonica* until the fourteenth century, and the new way of central payments that the legates gained after that century. It is crucial to emphasize that in the investigated era legates did received a regular salary whilst on their missions. Kalous, just like in his whole book, collected a series of examples to support the general statements.

The last chapter deals with the diplomatic and political features of legations as well as, in the words of the author, how we come "from the how to why." The fundamental questions according to the author are the following: Why did the legates leave Rome, and why did the popes send them? Kalous cites the words of Pope Innocent III, who gave the explanation for the necessity of the

authorization of legates as, "a man could not be simultaneously in diverse places." Nevertheless, the factual reasons behind sending out papal representatives could have been extremely diverse, although crusades represented the most crucial problem of the given period. Therefore, the questions of the fifteenth-century crusades against the Ottomans, the heretics of Bohemia, and the theory of just war were analyzed and presented by Kalous with a handful of fascinating and telling examples.

In summary, the book of Antonín Kalous is an essential contribution to the history of a special medieval institution, the papal legation. The author incorporated the sources and secondary literature from the very beginnings of the practice of authorizing *de latere* legates to the end of the Middle Ages. However, his main effort was to complete an analysis on the fifteenth-century situation. This choice is especially worth noticing, since previous research has focused mostly on the eras prior to the fifteenth century, or after it. From a Hungarian point of view, it has to be highlighted as well that Kalous chose his examples mostly from the circle of legations that were related to East Central Europe, among them a series of Hungarian affairs. The author shows an extraordinary knowledge not only regarding the Czech sources and literature, but the German, Polish, and Hungarian too. This valuable contribution can be recommended to everyone who is interested generally in the history of papal legation as well as a special segment of the fifteenth-century history of East Central Europe.

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Water, Towns and People: Polish Lands against a European Background until the Mid-16th Century. By Urszula Sowina. Frankfurt: Peter Lang, 2016. 529 pp.

This work contributes immensely to urban and environmental history in general, and Polish medieval studies in particular. The book comes as the obvious culmination of Urszula Sowina's years of archival research and careful sifting of both published and unpublished sources. The author employs a diverse set of sources, including charters, town statutes, notary books, lay and ecclesiastical court records, as well as letters, chronicles, and learned treatises on medicine and the natural world. Yet she does not confine herself merely to textual evidence but combines it with the latest archeological findings, including the data and images related to cistern, well, and water-pipe construction. The work further succeeds in its aim to contextualize the Polish case within a wider European frame. Each section opens with reference to areas outside Poland and careful comparisons are made throughout. Unsurprisingly, given the subject, Italy appears prominently as a counter-example, but special prominence is also given to cases in France, the author's other area of expertise. Given the time period covered, it is important to note that the author defines Poland within the boundaries it currently occupies, thus including both Silesia and Pomerania. The work benefits greatly from this choice as it allows for the inclusion of more densely sourced areas formerly occupied by the Teutonic Knights, including Gdańsk, Toruń, and Elbląg, and the large body of research related to Wrocław. She does not focus her interests further into the lands of former Poland–Lithuania, which means detailed explorations of Lviv or Vilnius that might have proved interesting are absent, but the line had to be drawn somewhere. Krakow, due to the abundance of its surviving sources and its prominence as the former medieval capital, receives the most attention. While the work is obvious in its focus on towns and their relationship to water, the hinterland is not completely absent, and the section on the roles of suburban gardens and fishponds is enlightening for its blurring of the urban rural divide.

As to the content, the introduction proves useful reading to anyone interested in the historiography of water and environmental studies in Europe over the last thirty years and particularly the often less well-known work done in Central Eastern Europe. The book is further divided into three main parts with the final section comprising more than half of the total volume. Part one

captures in twenty pages historical opinions on the nature and quality of water as discussed by learned individuals in Poland, starting with Vitruvius and ending with Sebastian Petrycy of Pilzno, a doctor and philosopher writing in the early seventeenth century. This part frames for the reader the medieval understanding of water, humans' relationship to it, and how this dynamic impacted the course of urban development over the centuries. Part two moves from the realm of ideas to the physical relationship between urban sites and rivers; categorizing urban sites as low-land and up-land by their relationship to water courses. It covers briefly the various types of mills in use, highlights the importance of water-related rights, transport, fishing, and water's impact on a sites' topographical, social, and economic development. Part three is really the bulk of the work, and here the author's deep knowledge of the field and primary source material shines. She covers the broad range of cisterns, wells, fountains, and storage reservoirs employed in Poland, discussing their development and design but more remarkedly places them in their social context. Here, she uses Krakow as a specific example, discussing tax policies and costs while convincingly demonstrating how the building out of the city's public water system was heavily promoted by, and closely linked to, the interests of its burgher elites. In other sections, she gives some attention to the lives, remuneration, and working habits of Poland's "master fountain builders," and compares the use of ceramic vis-à-vis wooden piped water supply systems and the water-raising methods used to supply them across Central Eastern Europe. The author's exploration of the topic as a whole is impressively broad in scope and deep in particulars. While her research is specific enough to give the cost of iron fittings for a new well bucket in Krakow in 1414 (p.220), she simultaneously casts a wide comparative gaze, tracing European water supply systems from Roman aqueducts to the *Noria* of Arab Spain, and German *Wasserkunste*, before offering a meticulous tracking of Polish water-works from the fourteenth to the sixteenth century. This list provides only a sampling of the topics covered in detail in part three.

Indeed, throughout the book, the author lays out a veritable cornucopia of information; seemingly every smidgeon of interesting data related to water she has pulled from archival cupboards over the last twenty years. Its very diversity and expansiveness however, make the work somewhat indigestible. The lack of a strong narrative thread and the many interesting but tangential asides leave the reader feeling somewhat lost at the banquet. This problem is further compounded by the rather skimpy index which makes hunting for specific nibbles difficult. Part of the difficulty may come from the fact that the book is a translation from

the Polish original, which although generally superb, includes a few minor errors and leaves something stylistically to be desired. Taken together, it is not an easy work to read, but the depth of research and broad range of topics covered make it well worth the effort. Anyone wishing to know more about water and its uses in Poland, and indeed the rest of Europe during the middle ages, would profit highly from cracking its cover.

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L'Europe des Lumières/Europa der Aufklärung. Oeuvres choisies de Éva H. Balázs/ Ausgewählte Schriften von Éva H. Balázs. Edited by Lilla Krász and Tibor Frank. Budapest: Académie Hongroise des Sciences – Corvina, 2015. 424 pp.

The publication of the articles and manuscripts in French and German of Éva H. Balázs, organized on the occasion of her 100th birthday, offers profound insights for international scholarship on the Enlightenment into her creative research. These texts, which were written between 1969 and 1990, laid the foundations for her ambitious monograph *Hungary and the Habsburgs 1765–1800: An Experiment in Enlightened Absolutism*, published in English translation in 1997. They are, however, also self-standing examples of her scholarship on the Enlightenment in Hungary.

The studies, which are cautious in their argumentation and build on one another, present the characteristic features of the Enlightenment in Hungary, which began to emerge in the latter half of the eighteenth century. These features included religious and confessional plurality, the distinct social strata which served as vehicles and mediaries of Enlightenment thought (which included segments of the upper and middle nobility and the intelligentsia, but not the economically weak municipal "bourgeoisie"), and the fundamental importance of freemasonry for the theoretical, political, and cultural orientation of Hungarian representatives of Enlightenment thought and their political engagement, which ranged from cooperation with the traditional Habsburg elites to open political opposition.

Balázs's analyses are significant in part because of the very precise perspective they offer on the distinctive features and the interwoven social conditions of the Enlightenment in Hungary. They systematically reveal the meanings of Habsburg Enlightened Absolutism and its transformation in Hungary, as well as the threats it faced. They also offer a cautious presentation of the socioeconomic constellations in which the Enlightenment unfolded in Hungary, including the varied economic-geographical spaces and their distinctive (primarily) agricultural production methods, the strong influence of Habsburg economic policy, the complex and varied connections to economic life in Europe at the time, etc. Last but not least, they also draw attention to the sociocultural conditions of the Enlightenment in Hungary, for instance the gradual waning of confessional tensions and oppositions, the growth of interest in improving education through

visits to schools and universities (first and foremost in Central Europe—the Göttingen University played a prominent role in this), Enlightenment forms of sociability (such as lodges and reading circles), and the emergence of a literary marketplace.

Through the nuanced reconstruction of the conditions and motivations which underlay the emergence of the Enlightenment in Hungary, Balázs creates opportunities for analyses of the scope for action of the Enlightenment thinkers, both from the perspective of subjective perceptions and from the perspective of actual institutional frameworks. She makes very clear that their cooperation with the power elites of the Habsburg realm offered them chances to exert an influence on both culture and politics, but she also shows persuasively that there were relatively rigid borders which limited this cooperation and influence. The Freemasonry Patent, for instance, which made freemasonry illegal, and the results of the state parliament of 1790 pushed the representatives of Enlightenment thought out of the political sphere step by step, compelling them increasingly to limit their efforts to the field of culture.

Balázs is able to offer these insights in no small part simply because she shows an intimate and thorough knowledge of the relevant sources. She has examined an extensive array of material on the Hungarian Enlightenment of which precious little use had been made, and she has also looked at familiar sources from new perspectives. She shows tremendous sensitivity to important questions of theory and offers not simply a mechanical registry of the various utterances of the historical actors, but also reflects of what they actually sought to express. In her interpretations, she draws not simply on a precise and broad knowledge of history, but also on her familiarity with the complex theories of historical knowledge itself.

Balázs' works are distinctive in their field in part because they exemplify a creative change of research approaches. Alongside biographical studies, she includes synthesizing interpretations. From the outset, her reflective form of biographical writing contextualized the historical actor in his or her distinct social, cultural, and political constellation. This focus on context is considered indispensable to the biographical genre today. And because they draw on biographical case studies, the syntheses she offers are both more colorful and more historically informed.

Balázs abandoned the long-standing research perspective of national Enlightenments earlier than other researchers on the Enlightenment. Fully aware of the diversity of the representatives of Enlightenment thought in Hungary,

she consistently frames her arguments as discussions of the Enlightenment in Hungary and not of the Hungarian Enlightenment. Her research emphatically emphasizes the European orientations of Hungarian Enlightenment thinkers, and it integrates them persuasively into the larger European context. She does not start from the premise of a European Enlightenment, but rather adopts a theoretically consistent approach and emphasizes the different manifestations of Enlightenment thought in Europe. Her interpretations suggest that Enlightenment thinkers in Europe raised the same questions, but they arrived at different answers depending on the different cultural contexts. Unlike some contemporary scholars of the Enlightenment, she argues in favor of the thesis of the unity of diverse Enlightenments in Europe as a precondition of reciprocal exchange.

The collected works of Éva H. Balázs, which are now available thanks to the efforts of Lilla Krász and Tibor Frank, represent research on the Enlightenment which meets the highest international standards. The element of chance which happened to draw her attention towards the scholarship in the intellectual history of the eighteenth century turns out to have been quite fortuitous for research on the Enlightenment as a broadly international movement and, more narrowly, the Enlightenment in Hungary. Her writings strike one as representative of an innovative approach to the interpretation of the Enlightenment as a cultural practice in its European dimensions.

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Russia and Courtly Europe: Ritual and Diplomatic Culture, 1648–1725. By Jan Hennings. Cambridge: Cambridge University Press, 2016. 297 pp.

Diplomatic history has fallen out of favor in recent decades, paling before trendier approaches and topics. Jan Hennings leaps into the fray with this daring book, making no apologies for his pursuit of what could be a dusty subject. The resulting book demonstrates that there is yet much of interest and importance to be done in this area. Taking the formal ceremonial aspects of diplomacy as seriously as its substantive political goals, he situates Muscovite diplomatic practices within the accepted framework of early modern European understandings. He reorients the field by moving beyond debates over the degree of Russian backwardness, to show, instead, that Russia functioned well within the parameters of early modern European norms. Russian rulers and ambassadors fully understood the defining principles of diplomatic exchange and operated flexibly within them. He illustrates that the tendency of modern historians to scoff at Russia's rigid ritualism, its tendency to sacrifice substance for form, was already evident in the writings of Europeans at the time, but both then and now, these derisive assessments miss the point. Form and substance were of a piece: a monarch could not wrest major diplomatic concessions without maintaining his or her ritual standing among European rulers.

Hennings' richly researched comparative approach and impressive linguistic range allows him to establish that Russia was neither more nor less hide-bound and ritualistic than its interlocutors. Representatives of the English, French, Venetian, and Austro-Hungarian courts all insisted on the niceties of precedent just as much as the Russians did, and, moreover, Russians were just as deft at compromising and reworking according to the needs of the moment as any of their contemporaries. Hennings supplies some entertaining examples of each end of the spectrum, hidebound to flexible. He treats the reader to occasional laughs. My favorite, I think, was the discussion of the careful timing of the dismount by receiving and visiting diplomats, to whom the question of which one touched the ground first was of utmost importance. The sixteenth-century Habsburg envoy Herberstein, we learn, slyly kicked his foot free of the stirrup, thereby tricking his Russian host into jumping off his horse, while Herberstein himself took his time.

Exploring the fraught question of whether Russia was in or out of Europe, Hennings leans toward inclusion. Although tropes of barbarism and exoticism

not infrequently colored European writers' impressions of Russia, when it came to diplomatic theater, Russia was assigned a role distinctly within the European, Christian orbit. Non-Christians, by contrast, were greeted with more distancing rituals. For instance, where the ambassadors from Russia or other European countries would kiss the hand of their royal European hosts, non-Christians were denied that intimacy. Still, the author concludes, the key questions were not about membership in Europe but rather about participation in "transcultural political space" characterized by "gradually standardized codes of behaviour and communication" (p.247). Rather than static, isolated "scenarios of power," court receptions were interactive, constantly subject to reworking as needed, though within accepted parameters of ceremonial language. By the time Peter I entered that field, Russia was no longer struggling to catch up with those norms of conduct but was actively contributing to shaping them.

A clear introduction sets the historiographic framework for the book and makes a compelling case for the significance of this reexamination of early modern diplomacy. The early chapters work through Muscovite interactions with foreign courts, mainly European but also with some attention paid to its eastern and southern neighbors. The first chapter explores early modern perceptions of Russia and more generally, ways of categorizing cultures and polities. Chapter Two explains the peculiarities of Muscovite diplomatic practices. Narrow channels of communication, sharply prescribed forms and genres of reporting, and restrictive rules about what diplomats could and could not do in particular situations all lent Muscovite interactions a distinctive flavor, but did not set it far apart from its contemporaries. Hennings manages not only to present this information with verve and clarity, but also to inflect it consistently with his important argument about Russia's participation in a shared field of court ceremony and the high stakes involved in succeeding in that arena. Chapter Three turns to Anglo-Russian encounters, providing close readings of diplomatic exchanges in the second half of the seventeenth century.

The book gains momentum as it moves into the era of Peter the Great in the final two chapters, where it decodes some of the most mystifying moments in that imposing ruler's reign. Why, for instance, did the unmistakable Peter—two meters tall and easily recognizable—pretend to travel incognito as part of an embassy to Europe in 1698? Through the lens of diplomacy, Hennings reveals the practical advantages of this transparent ruse, which allowed Peter to bypass many of the constraints of formal diplomatic protocol and to get business done. Or, what did it mean when Peter accepted the title of *imperator* in 1721, when

his forbearers had already been imperial rulers by their own lights with the title of *tsar'* for close to two centuries? The closing chapters tackle these and other important questions of the Petrine era.

Based on research in archives in Russia, Austria, France, and Britain, using both visual and textual sources, and built on wide-ranging erudition, *Russia and Courtly Europe* sheds truly new light on a much-studied era.

Valerie Kivelson
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Die literarische Zensur in Österreich von 1751 bis 1848. By Norbert Bachleitner, with contributions by Daniel Syrovy, Petr Píša, and Michael Wögerbauer. Literaturgeschichte in Studien und Quellen, Bd. 28. Vienna, Cologne, and Weimar: Böhlau Verlag, 2017. 528 pp.

The modern social sciences have extended the uses of the term "censorship" far beyond its original interpretive framework. In the introduction to his most recent book, Norbert Bachleitner, a professor of literary history at the University of Vienna, offers a detailed account of the different interpretations of this term, but his study takes a narrow, traditional understanding of the word as its point of departure. He examines a specific realm of the state use of power with which the state seeks to exert supervision and control over communication in print between its subjects or citizens with the intention of protecting and preserving the social and political establishment.

There are almost innumerable studies on censorship and the history of censorship in German. They tend for the most part to focus on the practices of censorship under the Enlightened Absolutism of the eighteenth century and during the Vormärz period in the Habsburg Empire and the German states. Bachleitner's book nonetheless constitutes a new contribution to the field, first and foremost simply because it offers a comprehensive history of roughly 100 years of censorship between the mid-eighteenth century and the 1848 revolutions. He draws on the registries of censored books which were regularly compiled in Vienna, censorship documents of the Viennese and Prague committees and police bodies, and works of imaginative literature, which is hardly surprising, since he himself characterizes the inquiry as "literary-sociological" in its inspiration (p.13). For he is interested, first and foremost, not in the history of the institutions through which censorship was practiced or their work processes and the people who collaborated with them (though he provides a detailed presentation of all this), but rather in the decisive influence of censorship on literature and literary life. He calls attention to the fact, however, that censorship (and the practices of self-censorship to which it gave rise), while it may have had repressive and limiting effects on authors and works, also had some positive effects. For instance, censorship compelled authors to develop "Aesopian" methods or writing, i.e. "strategies of writing that were suitable for symbolic language" (p.28), and restrictive measures taken by the authorities often drew the attention of potential readerships to the works censored.

As a kind of preparatory phase in the project, a database was created under Bachleitner's leadership entitled "Verdrängt, verpönt – vergessen? Eine Datenbank zur Erfassung der in Österreich zwischen 1750 und 1848 verbotenen Bücher" ("Suppressed, Frowned Upon – Forgotten? A Database for a Survey of Books Forbidden in Austria between 1750 and 1848;" http://univie.ac.at/zensur). The database is itself based on the lists of censored publications regularly compiled in the imperial center. Perhaps the most important contribution of Bachleitner's book is the clear discussion and analysis it offers of this database. The focus is on the works censored. In other words, Bachleitner addresses questions such as how these works can be grouped according to theme, language, publication date, and place of publication, what kinds of works were censored most frequently and according to what justifications, were there any significant shifts in the period under discussion, who were the most frequently censored authors and publishers, and in which time periods was the censor's power to impose limitations the most unbridled. The processes become almost palpably clear on the basis of the statistics, for instance: religious considerations were pushed somewhat to the background; after the French Revolution political motifs were of primary concern; works of imaginative literature (first and foremost works by French novelists) began to figure in ever greater numbers among the forbidden books in the first half of the nineteenth century; greater tolerance was shown for publications which were intended for an educated, refined, wealthy readership; and a stricter attitude was adopted towards works which were written for broader social layers, in particular the younger generation.

In the first two chapters after the introduction, Bachleitner examines the "Enlightened-paternalistic" censorship of Maria Theresa and Joseph II, as well as the period between 1792 and 1848. The latter roughly half-century was, after three transitional years at the beginning, a period of a "sternly restrictive," "paternalistic-authoritarian" system of censorship. However, one could not describe the history of censorship over the course of the hundred years in question as a straight line tending in the same direction. Rather, the analyses of the data suggest ebbs and flows from the perspective of the strictness of the censors as consequences of important political events. The history of the institutional frameworks shows considerable continuity, but as far as the functioning of the censors is concerned, a process of professionalization was underway. Beginning in 1781, the call for imperial centralization as a move away from (and in opposition to) the degree of administrative autonomy which the provinces had earlier enjoyed from some perspectives gradually was implemented,

even if this process was not entirely completed by the mid-nineteenth century. The fourth chapter, entitled "Ein Blick in die Länder" ("A Look into the Lands"), examines this process. The chapter includes two essays by three authors on the history of censorship in the Kingdom of Bohemia (by Petr Píša und Michael Wögerbauer) and the Kingdom of Lombardy–Venetia (by Daniel Syrovy) in the eighteenth and nineteenth centuries. The inclusion of studies by other authors is a bit unusual in a monograph, but the essays in question offer an important supplement and counterpoint to Bachleitner's summary, which adopts a central-imperial perspective. It might have been worthwhile to have included a discussion of censorship in Hungary and Transylvania, since, with the exception of the chapter on the history of the theater, both Hungary and Transylvania seem to have escaped Bachleitner's notice.

In the fifth chapter, Bachleitner offers a summary of the questions of censorship in the life of the theater. In keeping with the tradition of works on the history of censorship, this is followed by engaging case histories, which cast light on the history of literary publications, two forbidden "motifs" (the devil and suicide), and clashes between censors on the one hand and writers and poets on the other (this is the most substantial section of this part of the book). A short conclusion offers a sketch of avenues for further research. More thorough study of the practices and regulation of censorship in the states of Europe (the German states, France) and the other provinces of the Habsburg Empire (for instance, Hungary) could offer a subtler and more nuanced understanding of the subject, as could more discussion of the personalities of the censors. Systematic analyses of the period between 1849 and 1918, based on similar questions and perspectives, might reveal larger-scale historical processes. The appendix includes a few documents concerning state regulation of censorship and a few censorial reports. It might have been fruitful to have included more of these reports, since they provide glimpses into the minds and reasoning of the people who worked as part of the censorship apparatus.

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Das global vernetzte Dorf: Eine Migrationsgeschichte. By Matthias Kaltenbrunner. Frankfurt am Main: Campus Verlag, 2017. 598 pp.

In his impressive and inspiring study, Matthias Kaltenbrunner tells the remarkable story of the migration history of six villages in the Sniatyn district of western Ukraine from the end of the nineteenth century until today. Until World War I this region was located at the southeastern border of Austrian Galicia, and in the interwar period it was part of Poland.

Beginning in 1898 and more intensely after 1905, these villages were involved in transatlantic migration to Canada. From the second half of the 1890s, Ukrainians from Galicia went in increasing numbers to North America for work or settlement. Between 1899 and 1914, 261,000 Ukrainians migrated to the United States and about 171,000 to Canada (p.130).

A well-known pattern of migration processes is that family and local networks largely determine directions of migration. Usually, migrants go to places where members of their family or larger local community already live. After the first families from Rusiv (the book's central case study) and neighboring villages left for the Canadian prairies in 1898, Canada became the prime destination of migration from this area. While the first migrants left with the aim of permanent settlement and building new farms in Canada, from 1902 and more strongly 1905, a non-permanent pattern of migration emerged. Now most of the migrants did not intend to settle in Canada, but to earn money for supporting their families and for buying additional land for their farms at home after their return.

Kaltenbrunner's core interest are the networks among migrants and between them and their villages. His study clearly confirms that such networks were extremely important to the process of migration, but he also demonstrates that they lasted for several decades after World War II, when western Ukraine became a part of the Soviet Union.

While transatlantic migration is the book's most important subject, it also analyses forced and voluntary migration during World War II and during the period of Soviet rule. Here Kaltenbrunner discusses Soviet arrests and deportations between 1939 and 1941 as well as in the early postwar period, the deportation of forced laborers under German occupation, and labor migration within the Soviet Union.

The author was able to use a very wide range of sources, among them archival material from the Austrian, Polish, and Soviet periods, but also from

Canadian and US archives. Most important for his analysis of village networks are letters that were exchanged between migrants and their families. In addition, he used a large number of memoirs and, for the postwar period, interviews that he conducted with villagers between 2013 and 2015.

The author gained access to a surprisingly large number of personal documents, especially letters. A fact that contributed to the rich source base for these villages is that the writer Vasyl' Stefanyk (1871–1936) was born in Rusiv and spent most of his life there. His short novel *The Stone Cross*, first published in 1901 and set, as most of his writings, in his native village, became a classic work of Ukrainian literature on migration and is part of school curricula until today. Stefanyk's own family—one of his sons migrated to Canada—and the families who served as inspiration for Stefanyk for some of his literary characters, appear also in Kaltenbrunner's book. Stefanyk's literary fame clearly contributed to the fact that archives and individuals kept more personal documents than usual or even published some of them.

The strength of the study consists of three points in particular. First, the author very skillfully uses these personal documents in order to analyze networks of migrants and villagers and their economic and emotional ties. His well-written account brings personal fates and motives very close to the reader and they are tied very effectively to the analysis of economic, cultural, and political circumstances. Second, the long-time frame of the study from the end of the nineteenth century until the beginning of the twenty-first century makes strikingly clear that migration (in a voluntary or a forced form) was a central feature of the villages' and region's history for the entire period. Furthermore, the author strongly and convincingly situates migration in the context of the social and political conditions of the villages. Thereby, in a way the book is also a history of western Ukraine in the twentieth century from the perspective of villagers' experiences. Above all, the chapter on transatlantic networks in the Soviet period has a pioneering character (pp.403–544). It shows a remarkable amount of contacts and exchange of letters, goods, and visits from the beginning of the 1960s onward that connected these western Ukrainian villages with former inhabitants in North America.

Furthermore, the study powerfully rejects any image of remote, isolated, backward villages, but demonstrates their "global interconnectedness," despite the economic poverty that prevails here until today.

Even excellent studies, as Kaltenbrunner's book clearly is, oblige a reviewer to look for critical points or desiderata. Two should be mentioned here. The

first one is that the study does not really attempt to give an answer to a central question of migration history, i.e., what effect return migration had on the villages as a whole in economic, cultural, or political terms, or if returning migrants introduced innovation and change into villages. The second point refers to the fact that local case studies inevitably provoke the question of the extent to which their results can be generalized. For Kaltenbrunner's book this question could be asked primarily in regard to its section on the Soviet period. In contrast to most other parts of rural eastern Galicia, in the Sniatyn area the basic political mobilization of the rural population during the last two to three decades before World War I took place primarily within the framework of the left-wing Radical Party. That party remained strong here also in the interwar period. Many migrants left already with some leftist political loyalties that further strengthened or radicalized when they became laborers in Canada. Many of them worked in the harsh conditions of mines. A rather large portion of migrants in Canada from these villages seem to have maintained pro-communist or at least strongly leftist attitudes also after World War II. This may raise the question of the extent to which this rather unusual feature among the post-war Ukrainian diaspora contributed to the number and intensity of contacts in the Soviet period.

In any case, these points are rather suggestions for further research than a critique of this excellent, rich book that is important for Ukrainian history in twentieth century, for Soviet history, and for the history of migration more generally.

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"Europa ist zu eng geworden:" Kolonialpropaganda in Österreich-Ungarn 1885 bis 1918. By Simon Loidl. Vienna: Promedia, 2017. 232 pp.

In the 2000s, a handful of Austrian historians started to engage with the imperial and colonial past of the Habsburg Monarchy (Walter Sauer, ed., *K.u.K. kolonial: Habsburgermonarchie und europäische Herrschaft in Afrika* [2007]; Evelyn Kolm, *Die Ambitionen Österreich-Ungarns im Zeitalter des Hochimperialismus* [2001]). In investigating the history of the Austro-Hungarian Colonial Society (Österreichisch-Ungarische Kolonialgesellschaft or AHCS), Simon Loidl joined this approach. Loidl questions the trend which excludes the postcolonial approach from historical investigation of the Austro-Hungarian Monarchy (Chapter 1). He argues that the Dual Monarchy regarded itself as a great power, hence it devoted significant effort to the colonial issue. To prove this statement, the author investigates expansion projects which targeted territories beyond Europe. Although Austria-Hungary participated in no concrete overseas colonial projects out of political and economic reasons, a number of colonial pressure groups were organized in Vienna alongside the Ballhausplatz which elaborated concrete colonial plans. Of these colonial pressure groups, the most important was the Austro-Hungarian Colonial Society which tried to harmonize the theoretical questions and practice of colonialism with the needs of the empire.

The monograph focuses on investigating the Austro-Hungarian colonial attitudes vis-à-vis the Austro-Hungarian Colonial Society's propaganda activity and colonial practice. The author describes the political, social, and economic background of the Austro-Hungarian colonial debate at the turn of the century (Chapter 2). Loidl proves convincingly that having its own protocolonial period, the Habsburg Empire had reached the threshold of potential colonialism at the turn of the century. Chapter 3 describes how the society was established, the main points of its program, and the reason why a faction radicalized during World War I. The author tries to reconstruct the biographies of the most important society founders as well.

Using discourse analysis methods, the author scrutinizes books, travelogues, reports, articles, and memoranda written by society members (Chapter 4). Loidl focuses his attention first of all on terms of Austro-Hungarian colonialism and particularities and changes in the course of the colonial debate. Despite the lack of proper sources, the author tries to reveal the social and political background of the most important propagandists of the society.

Chapter 5 catalogues the main tendencies and topics of the AHCS propaganda: the place of Habsburg colonialism in the European and global context, the questions of overpopulation and emigration, their analysis from the perspective of society, and the nationalism and treatment of the everyday problems of the emigrated population. The author briefly discusses the case of Bosnia-Herzegovina and certain military aspects that became dominant in World War I and which facilitated the way for some propagandists into the national-social movement of the interwar period.

The most important actions of the AHCS were reconstructed based on archival sources (Chapter 6). The archival corpus enabled the author to carry out a refined research of emigration and the Brazilian action of the society, two of the key issues of the Austro-Hungarian colonial propaganda and activity. It follows from the foregoing that Loidl uses an empirical approach to his topic as he reconstructs the contact points between the colonial theory and praxis of the society. In this chapter, the author draws parallels between the Austrian and the German social reasons and phenomena of colonialism. The most interesting case is how a group of AHCS publicists adjusted their colonial views to the German world domination plans during World War I.

Through the life story of three persons, the book examines the legacy of the Austro-Hungarian colonial discourse and of the society's propagandists in the interwar period (Chapter 7). After the collapse of Austria-Hungary, the AHCS ceased its activity and its members had to find their place in interwar Austria. Investigating the biographies of Adolf Mahr, Robert Stigler, and Richard Seyfert, Loidl demonstrates clearly that the former members of the AHCS became supporters of Nazism and themselves actors in the racist and colonial ambitions of the Third Reich.

In the conclusion (Chapter 8), Loidl shares the views of Evelyn Kolm. Accordingly, the Habsburg Empire did not participate in the collective colonialism of the great powers and it did not have its own colonial project in the long-run. Yet, having no overseas colonies, Southeast Europe was regarded as a kind of compensation which could be culturally colonized to a certain degree. All in all, the monograph treats the propaganda activities of the AHCS beyond Europe well and provides useful data on the structure and membership of the society.

Although the book's title promises a general overview on the colonial propaganda of Austria-Hungary, the author in fact fails to investigate Hungary. In some cases Loidl hints that the Hungarians hindered and impeded the Austrian colonial initiations, but the author offers no in-depth explanation of

the alleged Hungarian refusal. Furthermore, the author did not put the AHCS in a wider, European context either, and the handful of references to parallel German colonial phenomena do not compensate for this.

Despite these shortcomings, Loidl has produced a dense book that enriches the still embryonic research into the colonial past of Austria. The book demonstrates well the attractivity and potential for further research in this field.

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Der Poststalinismus: Ideologie und Utopie einer Epoche. By Pavel Kolář. Cologne: Böhlau, 2016. 370 pp.

In the course of contemporary historiography devoted to state socialist regimes in Central East Europe, the most attention has been paid to the question of how these regimes were established and according to what measures the process followed. At the same time many scholars have been coping with the question of how and why the state socialist system fell apart. The reviewed monograph represents a study which is devoted to neither of the above mentioned themes, but to a relatively recent historiographical phenomenon focusing on post-Stalinism. Pavel Kolář defines the era as an epoch situated in the time period between Stalinism and late socialism. It is exactly this "between" position that leads the author to interpret post-Stalinism as a phase (*Zwischenphase*) based on a dilemma between the burden of the past and a radiant future. In this sense post-Stalinism is determined by three decisive features. It was the era when class as a category lost its dominance in favor of nation. Simultaneously, the linearity of time started to be replaced by fragmented narration as well as by a certain level of cyclicality. The third aspect was based on the leading role of the Communist party which was now supposed to be renewed as a true Leninist organization. Compared to Stalinism it was rather the era of instability, when the social and political praxis oscillated between utopian zeal and actual questions of the day. This ambiguity leads the author to define post-Stalinism as a form of processual utopia which was different to the previous fanaticism as well as to the pragmatism of late socialism.

The book is structured into five chapters in which the author seeks to reveal different aspects of post-Stalinist processual utopia based on the examples of Czechoslovakia, Poland, and East Germany. The first one ("After Stalin's Death: Factual Revolution") focuses on the role history and historical writing played within the process of the creation of a new communist party identity following the de-Stalinization of 1956. The rediscovery of facticity in the writing of the history of the communist party, especially on the local level, led to a relativization of party identity in comparison to the previous master narrative. In the second chapter ("Party Makes History"), Kolář manifests how in struggling against the cult of personality, the party became a self-confident subject of history (Demiurge). At the same time, he presents here how the discussions about dictatorship and violence changed the shape of the post-Stalinist party line.

The third chapter ("Nation: With or Against Party") is devoted to the antinomy of the communist movement in general, based on the conflicting character of both communist and national emancipation. The author shows how the national discourse overlapped with the communist one, and vice versa. Despite the fact that the national rhetoric was widely present in party agenda, it never became, argues Kolář, a dominant part of the post-Stalinist processual utopia. In the following chapter ("Enemies of the Party"), new images of post-Stalinist enemies are described. As in previous cases, one of the most characteristic features of enemy discourses (e.g., revisionism, social democratism, Zionism) was their unstable and permanently developing and changing character. Post-Stalinist coping with enemies was not based on their annihilation but on persuading strategies. Thus revisionists for example were seen as enemies endangering the official party line, nevertheless they were rather perceived as partners in discussion than former saboteurs set for physical liquidation. In the last chapter ("Longing for the Golden Age"), Kolář pays attention to the post-Stalinist perception of time. In his eyes this era was typical for its return to a pre-Stalinist revolutionary period, which was now perceived to a certain extent with nostalgia. It is this cyclical dimension newly appearing during the post-1956 years that brings the reader to the initial definition of the post-Stalinist epoch, understood as a period trapped between the past and the future.

Without a doubt, the reviewed monograph is a seminal work on the analyzed time period, moreover it represents its first serious conceptualization. Some of the author's findings are fresh and convincing, especially his interpretation of the Khrushchev speech, his remarks on the problematic relationship between national and communist discourses, and his conceptualization of the perception of time during revolutionary and post-revolutionary periods. His arguments are strong especially when they are derived from an analysis of historical writings of the time and from debates on the Stalinist past. Although Kolář's book represents a nicely written and inspiring read, it is provocative and in some aspects problematic at the same time. I fully agree with the author's understanding of post-Stalinism as a relatively unstable era differing from the very universality of the previous period, nevertheless in order to save his comprehensive conception of post-Stalinism as *Zwischenphase*, Kolář tends to describe both Stalinism and late socialism in a very traditional way (radical fulfillment of future; pragmatic era lacking any utopian visions) which contrasts with his analytical approach. While defining post-Stalinism as indecisive time period, he characterizes it as an epoch based on the analysis of the above-mentioned aspects. It is not the aspects by

themselves but the way in which they are understood that is most characteristic and mutually intertwined. Such a comprehension unintentionally portrays post-Stalinism rather as a closed than a vivid and relatively dynamic system. Thus the post-Stalinist internal plurality based on many social, theoretical, and political approaches of the era remains overshadowed by a given set of analyzed features as factuality, past, nation, class, and time. By the same token, it seems to me that the author overestimates some and overlooks other characteristic aspects of the time. Undoubtedly, factuality belonged to key features of post-Stalinist historical writings, regardless of however many Marxist theoreticians of the time criticized absolutization of 'rare facts' at the expense of grasping the reality in its very complexity. Similarly, the past, regardless if Stalinist or pre-Stalinist, played an important symbolic role in the post-Stalinist environment, and the return of Marxists intellectuals to Marx's original texts and to pre-Stalinist theory is a good example of this notion; however, Kolář's conceptual framework does not allow him to recognize post-Stalinist thought as part of the socialist modernity project which was definitely more oriented towards the future than to a nostalgic longing for the golden age being lost somewhere along the way. Taking the future into account as an important part of post-Stalinist thought could then depict the era in a slightly different tone, as a complex of autonomous and original conceptions of the future based on a dialectical overcoming of the past, as the world of miscellaneous socialist visions. In spite of above mentioned polemical comments, I am convinced that the book will attract a broad readership of historians who are taking the state socialist experiment seriously and not merely as a manifestation of totalitarian rule that deserves our condemnation.

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The Invisible Shining: The Cult of Mátyás Rákosi in Stalinist Hungary, 1945–1956. By Balázs Apor. Budapest–New York: Central European University Press, 2017. 415 pp.

Leader cults in modern European history had strikingly common elements. They emerged and existed in democratic, authoritarian, and totalitarian regimes alike, as well as in right-wing and left-wing political systems. Accordingly, the types of these political cults differed from each other. Monographs on this phenomenon have already been published, discussing cultic practices around the persons of Hitler, Hindenburg, Mussolini, Metaxas, Stalin, and Horthy. The authors of these books, such as Ian Kershaw, Anna von der Goltz, Simonetta Falasca-Zamponi, Marina Petrakis, Ian Pampler, and the author of this review, have investigated the different aspects of leader cults, including the Stalinist type.

The Invisible Shining is a long-awaited work because no detailed and systematic analysis has been published on the Hungarian type of Stalinist leader cult so far. The aim of the book is to analyze the Hungarian Stalinist political system's "attempt to implement the Stalinist leader cult in postwar Hungary" (p.1). The emergence of the Rákosi cult and the cults of other "mini Stalins" were the symbolic consequences of the Sovietization of Central and Eastern Europe after 1945. This occurred because the cult of Stalin, "the adaptation of leader worship to local Party secretaries" (p.15), the international hierarchy of cults, and the Stalinist pantheon with its rituals, myths, and symbols were imported from the USSR at that time. Apor emphasizes convincingly that the cults of satellite leaders were partly based on the Soviet model but, on the other hand, were rooted partly in local and national traditions. In addition, the author underlines that the leader cult of Rákosi seems to be "an example of […] self-Sovietization" because Moscow's "direct influence," the role of "explicit Soviet orders" in its construction, "remains unclear" (pp.336–37). The careful analysis of the Rákosi cult provided by Apor highlights this complexity.

This book is divided into three parts: the first is about the construction of the cult, the second is about the societal responses to the cult's expansion, and the third is about the dismantling of the cult. Its structure is based primarily on a thematic, not a chronological, order. The thematic order highlights the agents, institutions, and the techniques of the leader cult. A 45-page chapter (I/1) is devoted to the history and the evolution (chronology) of the analyzed cult, which, with the third chapter, adds a chronological outline to the dominant thematic discussion.

A systematic overview of the construction of the cult is preceded by the short analysis of modern Hungarian leader cults. Apor emphasizes that "although the Stalinist leader cult originated in the Soviet Union, the language employed to deify the leaders of the Hungarian Communist Party did not originate there." The reason for this was the striking similarity "to the verbal repository of interwar cultic representations" (p.45). It means that the leader cults during the Horthy era can also be considered to be the antecedents of the Rákosi cult. This is a very important contribution to the analysis of the Hungarian symbolic politics of the twentieth century.

Apor summarizes the most important aspects of the leader cult of Mátyás Rákosi from its origins and roots, to its phases between 1945 and 1949, and to its fully developed form (1949–1953). The first main chapter analyzes the role and function of this cult, the evolution of the leader's image, and the techniques, occasions, agents, and increasingly centralized institutions of cult-building. Between 1945 and 1948/1949 his leader cult existed primarily within the framework of the Hungarian Communist Party. Rákosi became a Hungarian party leader, "father figure," wise, all-knowing "teacher of the nation," "man of the people," "caring leader," and so on. Between 1949 and 1953 the cult existed in a full-blown form: cult-making was institutionalized and centralized, a wide range of institutions and individuals participated in the complex process of constructing it. Apor systematically refers to the occasions (i.e., the meticulously planned public appearances, anniversaries) and the techniques (speeches, articles, letters, telegrams, biographies, visual representation, and so on) of cult-building when he analyzes the evolution of this leader cult.

In the last three chapters of the first part, the author focuses on three important methods of cult-making: the role of biographies, nationalism and the leader, as well as visual representation. First, the biographies were "heavily exploited" to justify the leadership of Rákosi, "to project the mythical images of the Party secretary" (p.25). They presented an oversimplified, constructed, and depersonalized image of the leader who was the embodiment of the Party and whose life was dedicated to the cause. Second, national traditions, myths, especially the Hungarian revolutionary traditions, were used to justify his elevated position. Rákosi was often portrayed as the heir to the Hungarian freedom fighters. As a result, he was presented "as the embodiment of the entire (national) political community" (p.142). Third, besides language, techniques of visual representation (portraits, busts, posters, newsreels, and so on) were also heavily deployed to describe him as an omnipresent leader.

In the second main chapter, Apor deals with the impact of the Rákosi cult on Hungarian society and with the efficiency of the party-state propaganda. This analysis is based on mood reports, surveys of public opinion, letters written to Rákosi, and telegrams. The author emphasizes that due to the lack of reliable representative sources it is difficult to estimate the extent to which the Hungarian population identified itself with this phenomenon. Apor analyzes positive ("communicative practices" [p. 188]) and negative ("spontaneous manifestations of dissatisfaction" [p.211]) responses to this leader cult. Another chapter about popular indifference and the ineffectiveness of propaganda provides further important details regarding how the propaganda machine worked. Apor concludes that "the Rákosi cult […] found little fertile ground" (p.259), but, on the other hand, this cult "had a remarkable impact on communicative practices, verbal and non-verbal alike;" the population internalized the cultic vocabulary, "even if it generally failed to turn Hungarian society into a community of believers" (p.188).

The third part focuses on the dismantling of the Rákosi cult. The careful analysis is closely connected to the events and trends of political history, first and foremost to the de-Stalinization. The author divides the period into two phases: the decay of the cult (1953–1956), when its significance was slowly decreasing, and its collapse after the Twentieth Congress of the Communist Party of the Soviet Union in 1956, when it disappeared relatively rapidly from public spacesand public discourse.

This monograph, which provides a detailed, valid, and systematic analysis of every important aspect of the Hungarian Stalinist leader cult, is a significant contribution to the better understanding of this political phenomenon. The context of the Rákosi cult was the Soviet symbolic politics, its international system of satellite cults, myths, and symbols, and the Hungarian—especially interwar—cultic traditions, including, the leader cult around Miklós Horthy. The analysis convincingly highlights this complexity. Though the book deals primarily with the Hungarian Stalinist leader cult, it also reflects on important aspects of other parallel phenomena. It provides a theoretically and methodologically valid analysis: the author reflects on, for example, the term 'charisma' and 'the personality cult.' In all these respects, Apor's monograph, based on a wide range of primary and secondary sources, is an indispensable work for those interested in leader cults and in the complexities of East and Central European history.

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Hungarian Women's Activism in the Wake of the First World War: From Rights to Revanche. By Judith Szapor. London: Bloomsbury Academic, 2018. 224 pp.

Judith Szapor's book is an important and novel contribution to early twentieth-century Hungarian women's history, in particular the kind that not only presents substantial knowledge about the history of women but also helps place "mainstream" history in a different light. The time frame covers the period from 1913 to 1922, focusing on the multiple turns between 1917 and 1920, the densest years in terms of women's politics too.

The author discusses the trends and development of women's movements in a wide and detailed historical context, focusing on the system of relations in which they were embedded and interacted. Its aim is to "write women into the aftermath of the First World War" (p.1), covering two revolutions and a counter-revolution, the three major branches of Hungarian women's movement with their (changing) bases, scope of action, slogans, aims, interests, and ideologies, as well as their relationship with the actual political system. In its analyses it considers the complex interconnections and transitions between private and public, formal and informal relations. The scholarly background of the book includes the historiography of European women's movements and the history of interwar Hungary, for both fields using macro- and microhistorical lenses.

Structurally, the book has a general direction and arc from the broad historical-political context to the organizational level, and then to the individual figures, but it also fluctuates among these levels in the narration. The author often refers to later parts of the book, giving it a kind of a "teleological" character.

In the introduction, the author draws our attention to two symbolic events that constitute the frame of the book, representing the poles of the period in question: the 7th Congress of the International Women's Suffrage Alliance in June 1913, hosted by the mayor of Budapest, and the greeting of governor Miklós Horthy by MANSZ (National Alliance of Hungarian Women) in November 1919. The highlighting and close-reading of particular events is a returning method of the book and it proves to be not only a good way to narrate but is also illuminative in understanding the essential differences between the two (maybe three) eras of (women's) politics.

The first chapter presents the progressive prewar women's movements as being able to cooperate not just with one another but also with the governmental

authorities. It tells the history and the major causes, leaders, forums, allies, and rivals of the three main branches of women's politics: the liberal Feminist Association, the Christian, and the socialist women's movement. (Talking about their foundations, Szapor uses the term "origin myths," which looks a bit misleading as the roots she reveals are basically factual.)

One of the main common causes of women's movements was the struggle for equal suffrage, but they were largely differing in their strategies and priorities. A determinative difference is that while the Catholic and socialist women's movements were attached to and found allies in male-led institutions (the church and the workers' movement), the Feminist Association was connected primarily to the international liberal women's rights movement. The divergences especially sharpened in the political circumstances of the postwar era when general suffrage served as a tool for legitimizing the authoritarian system.

In the second chapter Szapor explores a special semi-private meeting place, the Hungarian Women's Debating Club (initiated by Countess Mihály Károlyi and Rózsika Schwimmer in February 1918), as a "case study." As she reveals, behind the seemingly apolitical purpose of "social intercourse," the Club was founded with the purpose of circulating the idea of suffrage among aristocratic women. Thus it was a melting pot of women from different social classes organizing debates on a wide range of issues with many speakers. Behind the cooperation on basic issues, there was much strained disagreement, encapsulating larger and later developments, and after the revolution it became a nest of counter-revolutionary mobilization.

The next chapter explores the two (1918 and 1919) revolutions from the viewpoint of women's politics after the loss of the war. The announcement of universal suffrage happened immediately in November 1918, but it was not put into practice until the beginning of 1920, and under completely different political circumstances. Szapor also reconstructs the names of the women participants in the National Council. The Republic of Councils between March and August 1919 had ambitious and egalitarian projects but also hasty and anti-democratic actions, including the way they prepared and carried out the elections. As the author underlines, it resulted in alienating and radicalizing the conservative middle class, and strengthened their social anxieties and thus their prejudice-led intolerance. It is remarkable that many women were involved in the Commissariats and in other decision-making positions, but the leadership was dominated by men. After the fall of the Republic of Councils, the majority

of its participants went into exile, which resulted in disrupted individual careers and social networks and destroyed prewar unions.

Szapor points out the gendered nature of the reception of Horthy in November 1919. This was manifested in women's (namely MANSZ's) emphatic presence and also in the way Horthy's speech narrated the city and the nation through female symbols. But the author extends the gendered view to the whole era, stressing that women had an active role in restoring prewar social system and values (together with the old borders of the Monarchy); they contributed to creating, realizing, and legitimizing the basic values and slogans of the regime. MANSZ and its rhetoric repressed other women's movements and women's representations, occupying the political space in prewar Hungary. The marginalization of liberal feminists was part (and in anticipation) of the general anti-modernist, illiberal, nationalist, and anti-Semitic trend with actually anti-feminist views. The question—"Who is supposed to represent Hungarian women?"—became a wider question of social norms and national ideologies too.

A separate chapter explores the career and semi-literary writings of the two dominant leaders of the right-wing women's movement, both of them influential figures of contemporary culture too: Emma Ritoók and Cécile Tormay. They both contradicted their own image of the ideal woman (being public figures, unmarried, and in Tormay's case also lesbian), which caused inner conflicts especially in the case of Ritoók.

At the January 1920 elections the message of MANSZ indicated an important shift in women's politics, suggesting that there are no separate women's interests, only national ones. The Christian parties won the elections with the help of women's votes—paradoxically (or just disappointingly), women supported parties with a very restrictive image of gender roles.

The 1920s period of István Bethlen's consolidation mitigated post-revolutionary political and racial aggression but brought ethnic homogenization/exclusion and limitations of political and educational rights for women. Szapor does not mention that the *numerus clausus* law was also created originally for restricting the number of female students (who were to a large extent Jewish). As Szapor emphasizes, the content of citizenship was not determined only by electoral rights.

In the concluding chapter, the author presents an important outlook regarding the long-term impacts and models of the era until today—including its basic values and also the ways of (ab)using democratic tools for anti-democratic

purposes. After the 1989 regime change, conservative and sexist views on gender roles and family returned as a part of the revival of the interwar nationalistic-conservative ideologies. The renaissance in Tormay studies has been also an emblem of the wider revival of the Horthy regime and its ideologies (together with spatial restorations and eliminations).

The book relies on and applies a diverse and up-to-date literature as well as partly unknown archival and press sources involving memoirs, correspondences, and organizational papers. (Hungarian names that I missed from the bibliography doing notable research especially on women's organizations in the countryside are Katalin Kéri and Zsolt Mészáros.) The insightful and well-structured text is also an exciting and enjoyable read in its entirety due to its clear, elegant, and witty style and the good construction of the chapters. The only slightly annoying element is the sometimes redundant narration with returning phrases (especially in the characterization of trends and periods), even if it may have a didactic function. As for the factual part, I found only one mistake on page 42: Lajos Hatvany's (first) wife, Christa Winsloe was not British but a German (sculptor and playwright).

New explorations and smart interpretations are well-suited in the book. The author confidently navigates the tangle of periods, layers, interests, and conflicts, as well as their roots and changes. She sensitively notices the significant details which constitute and represent larger historical processes and make them more understandable. One of the main conclusions of the book is that the history of women as a group cannot be separated from history as a whole—not just in the sense that it was an organic part of it and influenced by it, but also because in certain (not necessarily the most glorious) moments, women (on individual and organizational levels) fundamentally influenced politics by making alliances based on social and ideological bases. It also leads us to see the significance of intersectional relations and the social and political heterogeneity of women and their key causes. One of the greatest merits of Szapor's work is that it reveals and nuances these very intersections and the conflicting interests among the different subgroups of women according to their respective social and political connections.

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