

## The Industrialization of the Danube Cityscape: Danube Ports during the Concurrent Urban Development of Vienna and Budapest 1829-1918

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### ZUSAMMENFASSUNG

#### Donauhäfen in der konkurrierenden Stadtentwicklung zwischen Wien und Budapest 1829-1918

Die Industrialisierung von Flüssen war eine der wirtschaftlichen Kernfragen des 19. Jahrhunderts, insbesondere in der „Donaumonarchie“ des Habsburgerreiches. Mit dem Aufkommen von Dampfschiffen begann eine neue Epoche der Umweltgeschichte. Die Schifffahrt passte sich nun nicht mehr den natürlichen Umweltbedingungen an, sondern die Flussufer wurden so umgebaut, dass sie von den Reedereien industriell genutzt werden konnten. Da die Flussregulierung enorme Summen verschlang, wurden der Staat, die Aristokratie, Rathäuser und internationale Kapitalgesellschaften zu den wichtigsten Akteuren. In der Donaumonarchie wurde die Erste Donau-Dampfschiffahrts-Gesellschaft (DDSG) mit britischem Know-how gegründet und von den mächtigsten Adelsfamilien im Reich unterstützt. Da die natürlichen Gegebenheiten in Budapest (bis 1873 Pest-Buda) deutlich besser waren als in Wien, entstand dort eine sich rasant entwickelnde Schifffahrtsindustrie. Bis 1867 genoss die DDSG in der Österreichisch-Ungarischen Monarchie die Unterstützung sämtlicher staatlicher Akteure. Seit 1867 wurde Budapest, auf Wunsch der ungarischen Regierung, gezielt zu einer Metropole ausgebaut. Im Zuge dieser Bestrebungen wurden Kaianlagen errichtet, die Budapest zum wichtigsten Hafen des Donauhandels machten. Budapest wurde zu einer wirklichen Donaustadt mit grandiosen Bauwerken und industriellen Hafenanlagen an dem durchs Zentrum verlaufenden Fluss. Wien sah in dem aufstrebenden Budapest einen Konkurrenten. Die radikale Donauregulierung in Wien war auch eine Reaktion darauf. Allerdings war dieses Unternehmen nicht erfolgreich. Die Wiener Hafenkais hatten kaum eine positive Auswirkung auf die wirtschaftliche, geschweige denn auf die bauliche Entwicklung der Stadt. Die Donau-Stadtlandschaft Wiens blieb zwar bis 1918 ein Ort lebhaften Logistikbetriebs, aber ohne dabei – wie es in Budapest der Fall war – repräsentative und industrielle Impulse für die Stadt zu setzen.

KEYWORDS: river ports, Danube, industrialization, urbanization, Budapest, Vienna

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## Introduction

The history of modern river ports is inseparably linked to the overall urbanization process of the “long nineteenth century.” On the one hand, the development of river ports in cities was part of the industrial revolution because of its reliance on steam energy. On the other hand, the history of river ports is also a chapter in the history of river regulation. Both processes contributed to the emergence of cities. Instead of a fragmented network of towns in the Danube Valley, two main centers developed: Vienna and later Budapest. Both cities sought to monopolize the energies of the river and, as the emerging Budapest strove to become an imperial capital parallel in grandeur to Vienna, a spirit of competition also arose. This paper discusses the birth of the modern ports in Vienna and Budapest, from the beginning of industrialization until the First World War. The objective of the study is to consider the wider perspectives of the two cities, and it is striking to note that the riverside is an area of historical heritage in which Budapest had a significant advantage. The industrialization of the river offered a unique opportunity for emerging cities in the borderlands of Europe. After 1867, Budapest experienced very rapid modernization (an accelerated style of urban development termed “American”). Prior to the late nineteenth century, Budapest had remained for a long time at the periphery of European urbanization. Also, as an emerging city in the borderlands of European urbanization, it has “not been part of the focus of urban historical research in the past.”<sup>1</sup>

The case of Vienna is somewhat different. As a residential city of the Habsburg monarchs, Vienna retained its prominent status during the modernization period of the nineteenth century. The development of the “Ringstrasse” became a part of canonized urban history and was seen as a project typical of modernization.<sup>2</sup> At the same time, the emerging city of Budapest seemed to be a challenge for Vienna. Vienna wanted to remain at the forefront in all sectors of the Empire’s economy, including in Danube shipping. Besides dealing with its emerging rival, Vienna had a greater aspiration too. The city aimed to retain its rank among the leading world metropolises, an elite group of cities that included London, Paris and New-York.<sup>3</sup> That very ambition, however, typifies the mentality of an emerging city.

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<sup>1</sup> ESZTER GANTNER, HEIDI HEIN-KIRCHER: “Emerging Cities”: Knowledge and Urbanization in Europe’s Borderlands 1880-1945—Introduction, in: *Journal of Urban History* 43 (2017), 4, special issue, pp. 1-12, here p. 1.

<sup>2</sup> See for example SPIRO KOSTOF: *The City Assembled*, London 1992.

<sup>3</sup> For more information on the relationships between Vienna and Budapest, see: CSÚRI KÁROLY, FÓNAGY ZOLTÁN et al. (eds.): *Kulturtransfer und kulturelle Identität: Budapest und Wien zwischen Historismus und Avantgarde*, Wien—Szeged 2009; JALSOVSZKY KATALIN, TOMSICS EMÓKE (eds.): *K. u. K. Kaiserliches Wien, königliches Budapest: Photographien*, Wien—Budapest 1996; GERHARD MELINZ, SUSAN ZIMMERMANN: *Wien—Prag—Budapest: Urbanisierung, Kommunalpolitik, gesellschaftliche Konflikte (1867-1918)*, Wien 1996.

A very common theory is that emerging cities at the peripheries follow the patterns of urban centers in core territories. However, “a concept such as this often refers to a specific example, which is interpreted from a colonial perspective and ignores the actual conditions or context.”<sup>4</sup> Hence, emerging cities like Vienna, but also Budapest, created their own urban patterns due to their unique historical traditions and geographical positions. One of the most important geographical factors in these developments was the Danube itself, which was not only a “landscape element” but also a “cultural-political feature:” “The River Danube has served several times as a natural border between civilizations, political systems and governments.”<sup>5</sup> The Habsburg Empire (after 1867 the Austro-Hungarian Empire) was also called (unofficially) the “Danube Monarchy.”<sup>6</sup> Budapest and Vienna had their own (unofficial) names too, both of which refer to the river: Vienna was known as the “Donaumetropolis,” and Budapest as “the Queen of the Danube”.

Though the river ports are not the best-known features of Budapest and Vienna<sup>7</sup>, they played a key role in the emergence of the cities. They contributed to the concentration of modern industry and offered an expansive logistical space. In the nineteenth century, fluvial shipping underwent major structural transformations. Those transformations changed the meaning of a port as well. In the early stages, a characteristic feature of the urban landscape in port cities were stable quays that allowed small steamboats to be loaded and unloaded. Over the course of the century, ports were enlarged and equipped with docks (basins), special elevators, large storage houses, their own railway track systems and stations (in the most developed cities). The modern cargo (commercial) port was a kind of city within the city, a separated entity at the edge of the residential districts. All that remained part of the public urban space were passenger stations, if these operated at all.

<sup>4</sup> GANTNER/HEIN-KIRCHER (as in footnote 1), p. 16; some examples: MARIO STRECHA: Zur Frage des Einflusses der Metropole Wien auf die kulturelle Identität Zagrebs im 19. Jahrhundert, in *Österreichische Osthefte* 37 (1995), pp. 579-594; LUĀA KLUSÁKOVÁ: Cultural Institutions as Urban Innovations: The Czech Lands, Poland and the Eastern Baltic, 1750-1900, in: MALCOLM GEE, TIM KIRK et al. (eds.): *The City in Central Europe: Culture and Society from 1800 to the Present*, Ashgate 1999, pp. 85-98.

<sup>5</sup> GÁL ZOLTÁN: Ruptures in the Danube Region: Territorial Co-operation as a Playground of European Integration, in: SUSAN MILFORD, ISTVÁN TARRÓSY (eds.): *The Future of Europe—the View from the Danube Region*, Pécs 2007, pp. 97-112, here p. 98; HUSZÁR ZOLTÁN: The History of the Danube as an International Waterway from the Roman Times until the Middle of the 20th Century, in: *Civilia. Revue Pro Oborovou Didaktiku Spolecenskych Ved* 3 (2012), 1, pp. 90-100.

<sup>6</sup> ERHARD BUSEK, ALEKSANDRA GJORESKA: The Danube Region: Transformation and Emergence, in: *Eastern Journal of European Studies* (2010), 1, pp. 9-20.

<sup>7</sup> MARTIN SCHMID: Stadt am Fluss: Wiener Häfen als sozionaturale Schauplätze von der Frühen Neuzeit bis nach dem Zweiten Weltkrieg, in: LUKAS MORSCHER, MARTIN SCHEUTZ et al. (eds.): *Orte der Stadt im Wandel vom Mittelalter zur Gegenwart: Treffpunkte, Verkehr und Fürsorge*, Innsbruck 2013, pp. 275-312.

The main objective of this paper is to investigate how the industrialization of the waterfront became a main issue in the concurrent urban development of Vienna and the emerging city of Budapest. This is not a classical center-periphery relationship but a history of the birth of a new center. We will see how a new technology (steamers) increased economical capital in a city like Budapest, which had excellent natural conditions for shipping and ports, and how this capital contributed to the growth and development of the city. The main actors in Budapest were the merchants, who were able to exploit the capacities of the new ports to the greatest advantage. The increasing shipping capacity in Budapest generated reactions in Vienna. But it was not the government or merchants who developed the port there. In Vienna, the city hall was primarily responsible for the industrialization of the river.

Thus, the study is structured as follows. The first chapter deals with the general technical aspects of the industrialization of the waterfronts: the stabilization of the riverbanks (the quays) and the evolution of dock systems with artificial basins. The second chapter describes the history of the first steamer company (Erste Donau-Dampfschiffahrts-Gesellschaft, DDSG) in the Habsburg Empire, which was a typical example of a monopolized technical company. The following chapter debates the question of Danube regulation in both Vienna and Budapest, which formed the basis of new port systems. The DDSG played a central role in this process in both cities. In the last chapter, we will see how the shipping industry benefited the emerging city of Budapest and, moreover, how the Hungarian government wanted to establish an international shipping industry independent from Vienna. The DDSG played a contradictory role in this process: it was one of the most lucrative enterprises in Budapest but, on the other hand, was half Austrian owned (and international).

This paper is part of a longer project that aims to compare the modern urbanization of the two Danube cities of Budapest and Vienna. The most important publication of the project to date, "Danube City Landscapes,"<sup>8</sup> contains papers on Vienna and Budapest and looks at how both cities managed the issue of water regulation and how they were able to use the new urban territories after this regulation had taken place. Generally, the papers do not take a comparative approach. A second important book, which was published as part of the project, was an exhibition catalog.<sup>9</sup> This work aimed to systematically compare urban development processes—not only in the waterfront areas of the Danube, but also at a general level—by looking at different urbanization processes within the classical industrialization. However, a central subject was the Danube itself. This paper aims to elaborate on some theses of that

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<sup>8</sup> SZABÓ CSABA, TAMÁSKA MÁTÉ: *Donau-Stadt-Landschaften: Budapest—Wien / Danube City Landscapes, Budapest—Vienna*, Berlin 2016.

<sup>9</sup> TAMÁSKA MÁTÉ: *Donaumetropolen: Wien Budapest. Stadträume der Gründerzeit*, Wien 2015.

book. The second part of this project discusses and debates the period that followed the collapse of the Austro-Hungarian Monarchy.<sup>10</sup>

## 1 The Industrialization of Rivers

Nowadays, it is commonly acknowledged that the regulation of rivers<sup>11</sup> and the construction of quays and ports are inseparable from modern urbanization.<sup>12</sup> A wealth of international literature is available on this subject.<sup>13</sup> Changing political ambitions left their imprint on the urban fabric of port cities.<sup>14</sup> Due to the very costly investments involved, the planning of ports can be seen as a buffer zone for political ambitions. Therefore, by studying the developments of the Danube ports, we are able to gain key insights into the changing geopolitical role of the river as well.<sup>15</sup>

Before the great regulation works took place, river-side cities had to be built beyond the floodplain on river terraces or higher ground. When rivers were regulated and the riverbeds stabilized, the urban territory could immediately be extended to the water's edge. The importance of newly designed riversides cannot be overstated. Those spaces shaped the industrial society, expressed its identity and reflected its new relationship to nature.<sup>16</sup> The regulated and "industrialized" river offered spaces for recreation (promenades), housing, industry and logistics. The usage of riversides was determined by the interests of various local developers. The different functions of urban life like logistics, industry, housing, entertainment, agriculture and recreation occupied different spaces along the river. Therefore, the modern waterfront was a kind of laboratory of modern city planning, anticipating the future (twentieth

<sup>10</sup> IDEM: *Metropolen Wien—Budapest: Parallele Stadträume aus dem 20. Jahrhundert*, Salzburg 2018. For further planned projects, see the project's website, URL: <https://wienbudapest.webnode.hu/> (2018-10-28).

<sup>11</sup> TERJE TVEDT, TERJE OESTIGAARD (eds.): *Water and Urbanization*, London—New York 2014. (*A History of Water*, Series III, 1).

<sup>12</sup> ANDREW C. ISENBERG: *The Nature of Cities: Culture, Landscape, and Urban Space*, Rochester 2008.

<sup>13</sup> RICHARD WHITE: *The Organic Machine: The Remaking of the Columbia River*, New York 1995; ARI KELMAN: *A River and Its City: The Nature of Landscape in New Orleans*, Berkeley et al. 2003; STÉPHANE CASTONGUAY, MATTHEW EVENDEN: *Urban Rivers Remaking Rivers, Cities, and Space in Europe and North America*, Pittsburgh 2012.

<sup>14</sup> DAN BOGART: *Department of Economics Inter-modal Network Externalities and Transport Development: Evidence from Roads, Canals, and Ports during the English Industrial Revolution*, in: *Networks and Spatial Economics* 9 (2009), pp. 309-338; DEREK H. ALDCROFT, MICHAEL J. FREEMAN (eds.): *Transport in the Industrial Revolution*, Manchester 1983.

<sup>15</sup> ROAR HAGEN, GRAHAM CHAPMAN, TERJE TVEDT: *Water, Geopolitics and Collective Power in the New World Order*, London—New York 2011.

<sup>16</sup> ELISABETH HEIDENREICH: *Fließräume: Die Vernetzung von Natur, Raum und Gesellschaft seit dem 19. Jahrhundert*, New York 2004.

century) in which urban zones followed the principle of the functional city.<sup>17</sup> From the nineteenth century onwards, the same modern riverside patterns developed in a number of very different countries from the USA to Eastern Europe: “The river continued to influence economic developments as it both enabled transportation and later also provided power for industrial development.”<sup>18</sup> In the following passages some characteristics of transshipment ports will be presented.

First of all, the difference between various types of transshipment ports has to be defined. Environmental history dates the start of the industrialization of rivers from the building of the first fixed quays.<sup>19</sup> Of course, ports had also existed prior to this time, but they were more or less natural geographical features. Until the nineteenth century, the possibility of artificially modifying a river’s dynamics (especially a river like the Danube) was very limited. Modern engineering, the science of hydrology and the industrial revolution (steam energy) opened the way for a new river-city relationship.<sup>20</sup> The new ports of the late eighteenth century, and especially those built in the nineteenth century, created a new artificial environment. The river was modified according to the demands of shipping, flood protection and, to a significant degree, to cater for hygienic needs as well (it should be noted that the increased urgency for water regulation in the nineteenth century was caused by the cholera epidemics).

Ports built prior to the nineteenth century served only the smaller, traditional boats. Therefore, the typical quays of the time (most famous in Amsterdam, Paris or St. Petersburg) were relatively small.<sup>21</sup> These quays served, first and foremost, as a protection against floods and as commercial spaces. Manpower was used for loading cargo on and off ships (Fig. 1). The quays were part of a greater concept for urban design that mixed economic and aesthetic functions. For example, the Neva in Saint Petersburg became a monumental public space and also an important thoroughfare in the newly established city.

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<sup>17</sup> KEES SOMER: *The Functional City: The CIAM and Cornelis Van Eesteren, 1928-1960*, Rotterdam—Amsterdam 2007.

<sup>18</sup> STEPHEN R. MICELI: *Industrialization and Immigration: Labor at the River’s Bend*, diss., University of Toledo, 2009, p. 85.

<sup>19</sup> VERENA WINIWARTER, MARTIN KNOLL: *Umweltgeschichte: Eine Einführung*, Stuttgart 2007, p. 177.

<sup>20</sup> SCHMID (as in footnote 7), p. 278.

<sup>21</sup> KOSTOF (as in footnote 2), pp. 39-46.



Fig. 1: Transition of the cityscape: the quays with manually run logistics operations (view from Pest towards the Royal Castle of Buda); Budapest City Archives (Budapest Főváros Levéltára, BFL), photo by Klösz György about 1900  
 URL: <http://fortepan.hu/?tags=&x=0&y=0&view=query&lang=hu&q=82485>

The fundamental change in port systems came about in the epoch of steam power during the second half of the nineteenth century. In the history of urbanization, it is not always stressed enough that, for a long time, steam power played a major role in shipping as well as in railways. Planners developed systems in which railway and river transport complemented each other.<sup>22</sup> Since rail transport was faster and more flexible, ships eventually fell behind in this competition. Passenger transport by water also suffered a drastic setback in the late nineteenth century.<sup>23</sup> However, shipping remained a profitable way of transporting mass products, such as grain, stones or even (in some cases) coal.<sup>24</sup>

Due to the new relationship between railways and river transport, trans-loading systems needed to be reconsidered. Mass goods demanded more space, elevators (instead of manpower), large-scale storage facilities, and

<sup>22</sup> For example, the famous economist Daniel Friedrich List (1789-1846) developed a plan for the “united” Germany in 1833, in which river transport and the railways complemented each other. DANIEL FRIEDRICH LIST: *Über ein sächsisches Eisenbahn-System als Grundlage eines allgemeinen deutschen Eisenbahn-Systems und insbesondere über die Anlegung einer Eisenbahn von Leipzig nach Dresden*, Leipzig 1833.

<sup>23</sup> WOLFGANG SCHIVELBUSCH: *Geschichte der Eisenbahnreise: Zur Industrialisierung von Raum und Zeit im 19. Jahrhundert*, München 1977.

<sup>24</sup> LUDWIG WERTHEIMER: *Die wirtschaftlichen Grundlagen der Donauschiffahrt*, Wien 1930, p. 30.

docks. In the new industrial system, traditional quays were unfit for the task as they lacked the necessary space. The inadequacy of quays led to chaos and meant they could not function effectively. It was also a universal trend that quays in close proximity to residential areas lost their importance, while ports (for cargo and commercial use) far away from the center became increasingly important during the late nineteenth and early twentieth centuries.

Though the first examples of regulated docks date back to the eighteenth century and the first decades of the nineteenth century (in Liverpool, London, and Boston), a general change in the technology of port design took place only in the last decades of nineteenth century.<sup>25</sup> The fundamental problem with river ports was the dynamics of water levels and flooding (the most dangerous of which were the ice floods). The famous docklands of London offered a solution for that (from the first decades of the nineteenth century onwards)<sup>26</sup>: artificial basins were constructed around the storage houses, protecting them from floodwater. The London Docklands served as a model example for engineers in Central Europe as well.

The artificial basins occupied large territories. Because the historical urban centers lacked the space for modern ports, urban planners started to design new ports closer to the edges of cities. During the nineteenth century, river cities aimed to establish systems similar to the one in London. A typical modern commercial port had the following characteristics. Firstly, it was located at the edge of the city. Secondly, it occupied a large territory; thirdly it was gated and separate from other urban spaces (entry was forbidden for the public) and, fourthly, it featured docks (including basins and winter harbors), which ensured that trans-loading from ships to rail (goods stations) could remain operational all year round. These patterns were devised in the most developed industrial countries like Great Britain, the USA, France, the Netherlands, Belgium and Germany.

The emerging cities of the Habsburg Empire differed from other cities of Western Europe in a number of important ways.<sup>27</sup> First of all, they experienced a delay in water regulation. As it was noted in a very popular geographical work of the time: “The reason why the Danube trade road lags behind Europe’s other waterways is that shipping on the Danube has remained unfavorable for a long time. Until recent times, the river was mostly unregulated and therefore not altogether suitable for economic usage.”<sup>28</sup> The regula-

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<sup>25</sup> KOSTOF (as in footnote 2), pp. 41-44.

<sup>26</sup> J. R. MC’CULLOCH: *A Dictionary Practical, Theoretical, and Historical of Commerce and Commercial Navigation*, London 1880.

<sup>27</sup> WERTHEIMER (as in footnote 24), pp. 30-35.

<sup>28</sup> *Az Osztrák-Magyar Monarchia írásban és képekben* [The Austro-Hungarian Empire in Text and Images]. 2. kötet: Bécs és Alsó-Ausztria [2. Book: Niederösterreich], Budapest 1888, chapter: A Duna, mint vízi út. [Danube as Waterroad], URL: <https://www.arcanum.hu/hu/online-kiadvanyok/OMMonarchia-az-osztrak-magyar-monarchia-irasban-es-kepben-1/becs-607/becs-kozgazdasagi-elete-exner-vilmos->

tion of the Danube in Vienna and Budapest only began in the last third of the nineteenth century. A second characteristic of the Danube cities of the Habsburg Empire was that the divisions of railway and ship transport were not definitely clear. As mentioned above, this division meant that riverboats in other developing cities round the world were only used to transport mass goods over long distances, while passenger transport gradually lost its importance. This was not the case in the Habsburg Empire and even less so in the Hungarian Kingdom, where the most important connections between some smaller towns (such as Mohács, Paks and Baja) and the main urban centers continued to be via water.

However, the most important geopolitical feature of the Danube was that the main cities for shipping were not situated at the river mouth. Some Romanian cities like Galaț or Brăila<sup>29</sup> could be considered emerging cities, but they were only mid-sized towns compared to Budapest.<sup>30</sup> This was unlike in Western Europe, where the most important commercial cities were situated at river mouths, like Hamburg, Amsterdam, Rotterdam, London or Arles.<sup>31</sup> For a long time, the most important Danube city was Vienna, which was situated in the middle section of the river.<sup>32</sup> Budapest, which became the second capital on the Danube during the second half of the nineteenth century, also lay in this section of the river. Because both cities aspired to play a very similar role in the Danube shipping economy, a rivalry started between them.<sup>33</sup> The emerging of Budapest was a typical example of nineteenth century urban development and it was directly linked to the industrialization of the river. The technology of steamers also played a role in the political developments of the time. The Hungarian aristocracy was able to capitalize on the economic profitability of the shipping industry, using it to make the first steps in creating a second capital within the Habsburg Empire.

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<sup>29</sup> CONSTANTIN C. GIURESCU: *Istoricul orașului Brăila, din cele mai vechi timpuri pînă astăzi* [The History of Brăila from Ancient Times to the Present Day], Bucureșt 1968.

<sup>30</sup> GONDA BÉLA: *A magyar hajózás története* [A History of Hungarian Shipping], Budapest 1899.

<sup>31</sup> STEPHAN FREUND, MATTHIAS HARDT, PETRA WEIGEL: *Flüsse und Flusstäler als Wirtschafts- und Kommunikationswege*, Bonn 2007.

<sup>32</sup> VERENA WINIWARTER, MARTIN SCHMID, SEVERIN HOHENSINNER, GERTRUD HAIDVOGL: *The Environmental History of the Danube River Basin as an Issue of Long-Term Socio-Ecological Research*, in: SIMRON JIT SINGH, HELMUT HABERL et al. (eds.): *Long-Term Socio-Ecological Research. Studies in Society-Nature Interactions across Spatial and Temporal Scales*, Dordrecht 2013, pp. 103-122.

<sup>33</sup> ECKART D. STRATENSCHULTE, FLORIAN H. SETZEN: *Der europäische Fluss: Die Donau und ihre Regionen als Strategieraum*, Berlin 2011; ZOLTÁN GÁL: *The Danube Region—Past, Present and Future Prospects of Transnational Cooperation as a Playground of European Integration*, in: *Eurotimes* 7 (2009), pp. 148-158.

## 2 Steamers Write Geopolitics 1829-1867

Until the epoch of the steamers, the hegemony of Vienna in the Danube Basin went unquestioned.<sup>34</sup> This situation dates back into the sixteenth century when the Ottoman Empire occupied large territories of the Hungarian Kingdom. This was a period when Vienna became both an imperial city and a frontier to the East.<sup>35</sup> Its situation was very similar to that of a city at a river mouth, only the “harbor of Vienna” (harbor understood here as a cultural-historical notion) opened not to the sea but to a different civilization (the Ottoman Empire). This situation continued, though in a more moderate way, after 1683, even though the whole of the Hungarian Kingdom with its constituent countries was taken over by the Habsburgs.<sup>36</sup> This reputation of Vienna as a classical port came to an end with the arrival of steamers and the establishing of the first modern quays in Budapest.<sup>37</sup>

The first steamship (named “Carolina”) began running between Vienna and Budapest in 1817 but the undertaking was not successful. At that time, the Danube was not suitable for machines like this. The owner of the steamship was a Hungarian merchant Anton Bernhard (Antal) from Pécs.<sup>38</sup> The enterprise lacked financial capital and political support, too. Such a major undertaking could not be successful in the Habsburg Empire without government support. One decade later, in 1829, the DDSG was launched.<sup>39</sup> The

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<sup>34</sup> PÉTER KOVÁCS: The Role of the River Danube in the Spatial Development of Central and South-East Europe, in *Geographica Pannonica* 15 (2011), 2, pp. 51-56; RUDOLF WIERER: *Der Föderalismus in: Donauraum*, Wien 1960.

<sup>35</sup> BARBARA RIEF VERNAY: “Imperial Vienna”: Postmodern Staging of Urban History and Heritage as a Competitive Factor, in: ANAMARIJA BATISTA, SZILVIA KOVÁCS et al. (eds.): *Artistic Transformation of the City Space: Stimulation of the Sensual Sphere by Using, Collecting and Reflecting Urban Situations*, Budapest—Vienna 2014, URL: [https://issuu.com/artinpublicspace/docs/artistic\\_transformation\\_of\\_the\\_city\\_64eef6cb7dea09](https://issuu.com/artinpublicspace/docs/artistic_transformation_of_the_city_64eef6cb7dea09) (2018-10-21), pp. 56-57.

<sup>36</sup> In the eighteenth century, the Hungarian Kingdom was a target area of migration from German-speaking countries. MATHIAS BEER: *Die “trockene Auswanderung”: Eine thematische und forschungsgeschichtliche Einordnung*, in: IDEM, DITTMAR DAHLMANN (eds.): *Migration nach Ost- und Südosteuropa vom 18. bis zum Beginn des 19. Jahrhunderts*, Stuttgart 1999. Beer compares these migration trends to the later migration to North America by naming the phenomenon a “land-exodus” (“trockene Auswanderung”).

<sup>37</sup> PETER CSENDES, FERDINAND OPLL: *Wien: Geschichte einer Stadt. Bd. 3: Von 1790 bis zur Gegenwart*, Wien 2005.

<sup>38</sup> DEZSÉNYI MIKLÓS, HERNÁDY FERENC: *A magyar hajózás története [A History of Hungarian Shipping]*, Budapest 1967, p. 53.

<sup>39</sup> For the history of the DDSG, see HUSZÁR ZOLTÁN: *A Duna vonzásában: Fejezetek a Dunagőzhajózási Társaság történetéből [The Pull of the Danube: Chapters from the History of the Danube Steamer Shipping Company]*, Pécs 2013; HELMUT GRÖSSING: *Rot-Weiß-Rot auf blauen Wellen: 150 Jahre DDSG*, Wien 1979; IDEM: *Die “Erste” Donaudampfschiffahrtsgesellschaft*, in: *Wiener Geschichtsblätter* 22 (1967), pp. 133-139.

founders came from England (John Andrews and Joseph Pritchard) and enjoyed the political support of the Monarchy. Their stocks were shared by aristocrats and emerging magnates (including Klemens von Metternich and Count István Széchenyi—the two most important political figures of the time in Austria and Hungary), so the company was able to garner sufficient political and financial capital to succeed. Furthermore, the DDSG gained a fifteen-year monopoly on the Danube for steam-boat shipping (though the monopoly was eventually extended well beyond this).

Initially, the DDSG imported the model of river shipping companies directly from England. The ships were built there (in the first years only), the structure of the company followed the English (capitalist) model and most of the crew came from abroad too. Because the DDSG was not wholly an Austrian enterprise (though it was supported by the court of Habsburgs), the Hungarian political elite were able to use it to pursue their own ambitions of creating a new capital city in the Danube geopolitical area. So, the DDSG was both a common undertaking of Vienna and Budapest but also a point of rivalry between them. Thanks to the introduction of steamers, Budapest was able to take over the central functions of several industries, including the logistics of agricultural products, ship construction and, later, the establishment of the continent's biggest mill industry.<sup>40</sup> But, at the same time, the DDSG succeeded in integrating the local interests of Vienna and Budapest into one expanding capitalist enterprise. The geopolitical expansion of the company was oriented towards the Balkans and the Black Sea, and the political elites in both Vienna and in the emerging Pest-Buda (only after 1873 Budapest) supported this strategy. It was especially after that that the Ottoman Empire lost its hegemony in the Balkans and the Danube became a free route to the Black Sea (following the Congress of Paris in 1856).

Early on, the DDSG determined not only the logistical operations but also the regulation works in both cities. This meant that the DDSG was a leading facilitator of urbanization and water regulation. Vienna's connection to the Danube was very complicated.<sup>41</sup> First of all, the city's geomorphological situation was not at all favorable for shipping. As it passed through Vienna, the Danube formed a broad system of waterways, the conditions of which were often volatile.<sup>42</sup> The second basic problem was that the main branch of the river was a significant distance away from the city. In the Middle-Ages, the Danube flowed directly past the city (the so-called Wiener Arm), where the Donaukanal is today. Over the following centuries, the main watercourse

<sup>40</sup> PETER CSENDES, ANDRÁS SIPOS (eds.): *Budapest und Wien: Technischer Fortschritt und urbaner Aufschwung im 19. Jahrhundert*, Budapest—Wien 2003.

<sup>41</sup> ELLEN ARNOLD (ed.): *Dealing with Fluvial Dynamics: A Long-term, Interdisciplinary Study of Vienna and the Danube*, in: *Water History* 5 (2013), 2, Special Issue.

<sup>42</sup> MARGRETH KEILER, DANIELA THALLER: *Die Donau*, in: CHRISTINE EMBLETON-HAMANN, MARGRETH KEILER et al. (eds.): *Wien Umweltstadtführer*, Wien 2009, pp. 43-49.

moved about five kilometers to the north. The regulation works carried out by the Habsburg central planning offices up until 1870 aimed to re-establish the so-called Donaukanal as a functional waterway for shipping. The first modern regulation works concentrated on the Donaukanal as well (1832), but without any significant success.<sup>43</sup> The DDSG also concentrated its efforts here and established its headquarters on the Donaukanal (1858, Dampfschiffstraße 2).

After demolition of the city walls began in 1858, the function of the Donaukanal once again became the subject of debate. One proposal was to cover the waterway. Ludwig Förster (1797-1863), the planner of the Ringstraße, took a very different position and suggested that basins be built for the creation of new ports.<sup>44</sup> However, the port on the Donaukanal could only be established as part of a general regulation of the Danube. Throughout the 1850s, no decision could be reached on how to regulate the river, so the Donaukanal only received a new downtown wharf (Franz-Josefs-Kai) but not a proper port. This section of the Danube was also a part of the Ringstrasse, so it was designed in an aesthetically pleasing style and afforded views out over the river, while the suburban section of the Donaukanal continued to be dominated by logistical operations and industry. Along almost the whole length of the river were loading zones of various sizes. Warehouses (mostly small or medium-sized) were set up here along with small factories. The industrialization of the riverbanks progressed step by step. This unregulated development ended in chaos. Proper regulation only took place at the end of the nineteenth century. In the 1890s, Otto Wagner planned a metropolitan railway (Stadtbahn) along the Donaukanal. As part of its construction, the riverside was remodeled into a well-organized industrial area (as a traffic axis). The hinterland beyond the railway (including, for example, Spittau and Roßau)<sup>45</sup> remained unchanged. The dichotomy of the aesthetically designed “metropolitan quays” and the “the chaotic, industrialized outskirts” was similar to that of the Danube riverbanks in the young city of Budapest, only in Vienna’s case, it was on a much smaller scale.

At the very beginning of the nineteenth century, the riverbanks of Pest-Buda did not have any aesthetically designed public space. However, the natural conditions of the river were much more favorable than in Vienna. The river had a relatively stable course. It is telling that the twin cities of Pest and Buda were established in the Middle Ages at the same river-crossing point

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<sup>43</sup> For the regulation works and plans, see BERTRAND MICHAEL BUCHMANN, HARALD STERK, RUPERT SCHICKL: *Der Donaukanal: Geschichte, Planung, Ausführung*, Wien 1984; FRANZ BALTZAREK: *Der Wiener Donaukanal: Projekte und Infrastrukturplanung um einen Nebenarm der Donau*, in: *Wiener Geschichtsblätter* 28 (1973), pp. 97-104.

<sup>44</sup> PETER CSENDES: *Donauregulierung und Wienflusseinschwülbung*, in: *IDEM/SIPOS* (as in footnote 40), pp. 73-78, here p. 75.

<sup>45</sup> PETER PAYER: *Der Wiener Donaukanal: Alltagskulturelle Bedeutung und Imagewandel 1800-2010*, in: *Wiener Geschichtsblätter* 66 (2011), 2, pp. 151-172.

that had previously been used by the Romans.<sup>46</sup> The Danube was used as a transport route between Pest and Buda (and Óbuda, north of Buda) even before the legal union of the cities (1873). On the other hand, it needs to be stressed again that the center of commercial and political life had gravitated for hundreds of years towards Vienna. In this East-West (or more precisely South-East and West) trade, Pest and Buda had merely acted as transit points. Alongside Mosonmagyaróvár, Győr and Komárom<sup>47</sup>, Pest was a very important town in the commercial life of the Danube, but it was by no means the dominant center. However, the emerging of Pest-Buda gave rise to another geopolitical factor. The twin city offered the most important ferry crossing point on the Danube between the two macro regions of the Hungarian Kingdom, the Great Plain and Transdanubia. As a result, Pest-Buda became the most important transport junction for agricultural goods coming from the Great Hungarian Plain.



Fig. 2: Industrialization of shipping: the shipyard of the DDSG in Óbuda; Magyar Földrajzi Múzeum, photo by Erdélyi Mór about 1900  
 URL: <http://fortepan.hu/?tags=&x=0&y=0&view=query&lang=hu&q=96225>

<sup>46</sup> IZSÁK ÉVA: A városfejlődés környezettörténeti kérdései Budapest példáján [Urbanization from the Perspective of Environmental History in the Example of Budapest], in: KÁZMÉR MIKLÓS (ed.): Környezettörténet: Az utóbbi 500 év környezeti eseményei történeti és természettudományi források tükrében, Budapest 2009, pp. 237-243.

<sup>47</sup> GONDA (as in footnote 30), pp. 1-38.



Fig. 3: The changing riverside cityscape: the port of the DDSG and the magnificent new building of the Hungarian Academy of Science (opened in 1865); BFL, photo by Klösz György about 1900  
 URL: <http://fortepan.hu/?tags=&x=0&y=0&view=query&lang=hu&q=82083>

The DDSG was primarily interested in long-distance commerce (linear trade). In 1835, at the initiative of the main figure of the Hungarian reform movement, Count István Széchenyi, the company acquired the ownership of Óbuda Island (Óbudai-sziget), where it built a shipyard and set up a winter harbor (Fig. 2).<sup>48</sup> For almost four years, steamers operated between Vienna and Budapest (with a stop in Bratislava). Until the railways were established, the steamers served as the main means of passenger transport between the two cities (the travel time being only 14 hours down the river and 2 days upstream).<sup>49</sup> The competition between locomotives and steamers finally came to an end in the 1850s. The success of the DDSG was widely admired at the time; having started out with only between two and four steamers, two decades later the company was operating 130 steamers and 400-500 cargo ships.

<sup>48</sup> VARRÓ JÓZSEF: *Az óbudai Hajógyár története 1835-től 1992-ig* [History of the Shipyard in Óbuda from 1835 to 1992], Budapest 1998; RALF THOMAS GÖLLNER: *Zur Geschichte der Széchenyi-Kettenbrücke in Budapest*, in: *Ungarn-Jahrbuch* 31 (2011-2013) [2014], pp. 203-238; HOLLÓ SZILVIA ANDREA, ZSIGMOND GÁBOR: *A fatestű bárkától a tengerjáró óriásig* [From Wooden Sloops to Grandiose Vessels], Budapest 2013.

<sup>49</sup> More about DDSG: <https://www.geschichtewiki.wien.gv.at/Donaudampfschiffahrtsgesellschaft> (2018-11-25).

The DDSG established ports, shipyards and services from Linz to Galati.<sup>50</sup> In 1853, the DDSG also built the first quays in Budapest, located at the bridge-heads of Lánchíd (the bridge was erected in 1849, Fig. 3). The government of Pest continued the expansion started by the DDSG, so, by the time the major regulation works took place in the 1870s, the city had an approximately 600 meter-long port-quay. This is an example of how the interests of a “multinational” enterprise overlapped with municipal interests in Pest and Buda.<sup>51</sup>

In the general history of the emerging Hungarian capital, this was a period when Budapest and Vienna shared common interests. The aristocratic leaders of the political scene admired the technological revolution that was taking place in England. The DDSG imported English technology and the enterprise strategies of capitalism and modernization into the Habsburg Empire.<sup>52</sup>

Between 1844 and 1856, the director of the shipyard in Óbuda (Budapest) was the Dutchman J. A. Masjon. He regularly made study trips to England, France and even to North America.<sup>53</sup> Thus, the technical modernization of the shipyard followed international trends. However, though the technology came from the capitalist part of the world, the ideas of imperialism were also influential and typical for the time. The DDSG was a semi-private company, and the central government in Vienna saw it as a tool with which to overtake the hegemony of the Balkan countries. But it was not only Vienna’s central government who saw the DDSG as a political tool. The local elites in Budapest also saw the DDSG and its shipyard in Óbuda as a leading branch of domestic industry. The “Hungarianization” affected some technical aspects of the shipyard (more and more Hungarian materials were used), but the most spectacular change was a symbolical shift, which manifested in the use of language. In 1843, a popular local newspaper posed the question: “Would it be a handicap for the steamers if they had Hungarian names? [...] We cannot talk about a growing nation until there are such outward signs of this.”<sup>54</sup>

In the first period of shipping, Vienna’s interests could hardly be distinguished from those of Budapest. The investors in both cities originated from the same elite group and had close connections to the imperial court. The second period of port constructions started after 1867, when rivalry between the

<sup>50</sup> KORIZMICS LÁSZLÓ: Jelentés a dunai hajózásról [Report about Danube Shipping], in: *Budapesti Szeme* (2) 4 (1858), 14, pp. 427-449.

<sup>51</sup> KOLUNDZSIA GÁBOR: Die Donaukais in Budapest, in: SZABÓ/TAMÁSKA (as in footnote 8), pp. 245-262, here p. 251.

<sup>52</sup> For more information on the British (and Dutch) contributions to the modernization of the world, see NIALL FERGUSON: *Empire: How Britain Made the Modern World*, London 2004.

<sup>53</sup> Vasárnapi Újság from 1857-01-18, URL: <http://epa.oszk.hu/00000/00030/00151/datum03227/cim203228.htm> (2017-09-03).

<sup>54</sup> Fővárosi Újdonságok [News from the Capital City], in: *Pesti Hírlap* (1843), p. 409, quoted from DÖRY JENŐ (ed.): *Pillanatképek az óbudai hajógyár hőskorából (források) [Snapshots from the First Years of the Shipyard in Óbuda, Sources]*, in: *Óbudai Anziks* (2016), autumn, pp. 104-119.

emerging Budapest and the traditional center of Vienna significantly intensified.

### 3 The Great Regulation: Ambitions and Actors (1867-1875)

Debate around the planning of the Danube waterway continued throughout the whole of the nineteenth century. The scope of this paper does not permit a detailed history of this process. However, it is worth mentioning that it took about 80 years from the time when the first cartographical works were produced for the Danube Mappation (from 1823) until the Iron Gate was finally opened in 1869 (which made shipping towards the Black Sea possible).<sup>55</sup> The regulation works in Vienna and Budapest required a similarly long time. The most important motivation for the regulation was flood protection. The ports were seen as an additional benefit.

Of course, floods also occurred before the nineteenth century. Historical river towns always had to adapt to the changing dynamics of the water. No buildings were built on the low riverbanks, or only very simple constructions. Capitalism brought with it a new relationship with, and mentality towards, the natural world. This change gave way to colonization, regulation and dominion over nature.<sup>56</sup> The cultural-historical change in the cities under investigation here can be attributed to the great floods in Vienna (1830) and in Pest-Buda (1838). As mentioned above, the hydrological substratum was different and more favorable in Budapest. Two basic regulation concepts can be identified. The first group of planners tried to preserve the natural conditions of the river and was ready to settle for only the fixing of the watercourse. The other group of planners envisioned a radical change in the landscape. In the case of Vienna, the municipal government succeeded in implementing the radical concept, while the local government in Budapest was unable on its own to undertake the regulation works, and they were managed, instead, by the central government, who preferred more cost-efficient methods.

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<sup>55</sup> “Danubius-Mappatio,” the Danube Mappation, was conducted by the Habsburg Court and not by the city administration. DÓKA KLÁRA: A Duna-mappáció (1823-1845) történeti áttekintés [Danube Mappation (1823-1845): Historical Overview], URL: <http://www.dunamappacio.hu/tanulmanyok/dokaklara.pdf> (03.09.2018); FÖLDES GYULA: Felső-Csallóköz árvédekezésének története [History of the Water Regulation in Felső-Csallóköz], Pozsony 1896; TÖRY KÁLMÁN: Az Alduna szabályozása [Regulation of the Lower Danube], Budapest 1972; for more literature, see SEVERIN HOHENSINNER: *Bibliografie historischer Karten und Literatur zu österreichischen Flusslandschaften*, Wien 2015.

<sup>56</sup> GERTRUD HAIDVOGL: *Von der Flusslandschaft zum Fließgewässer: Die Entwicklung ausgewählter österreichischer Flüsse im 19. und 20. Jahrhundert mit besonderer Berücksichtigung der Kolonisierung des Überflutungsraums*, diss., University of Vienna, 2008; EDIT KIRÁLY: “Die Donau ist die Form”: *Strom-Diskurse in Texten und Bildern des 19. Jahrhunderts*, Wien et al. 2017.

The idea of directing the river along an artificial watercourse in Vienna was debated from 1810 onwards. Joseph Schemerl von Leythenbach (1754-1844), who designed the Donaukanal around 1800, conceived a grandiose plan based on his experiences in Holland and Germany, however, the technical tools necessary for regulating a major river like the Danube had not yet been developed. Three decades later, Lajos Forgách (1795-1858)<sup>57</sup>, a military engineer, published an idea similar to that of Schemerl. Forgách's plans served as a basic concept for the regulation works that started in 1870<sup>58</sup>. He adopted parts of the design of London's dockyards for the project in Vienna. He designed quays, storage houses and even railway tracks.

While river regulations in Vienna had to solve the problem of shipping as well (especially for the steamers), the more favorable natural conditions in Budapest meant such measures were not necessary there. In spite of this, however, some planners wanted to regulate the river in a radical way. One such man was Pál Vásárhelyi (1795-1846)<sup>59</sup>, who had formerly worked on the Danube Mappation, and presented his vision for Pest-Buda after the catastrophic flooding in 1838. He proposed a 1.5-2 kilometer long dyke in the middle of the Danube, stretching from Margaret Island (Margit-sziget) to the then-planned Chain Bridge (Lánchíd)<sup>60</sup> but his ideas did not find any supporters among the cities' political leaders. Pest and Buda did not have as powerful an aristocracy as Vienna so it was impossible to find financial backing for a radical undertaking such as this. Later, the emerging industrial capitalism there experienced a similar downturn to that of Vienna. Therefore, the Council for Public Works (Fővárosi Közmunkák Tanácsa), an urban planning organization which was under the control of the central government and not the town council, also rejected the plans that Franz (Ferenc) Reitter (1813-1874) presented in 1865.<sup>61</sup>

Reitter came from the Banat where there was a long history of river regulation. He started his career as a railway engineer and later worked on the Danube Mappation. In his regulation plans for Budapest (1865), he designed a new canal for Pest—roughly semi-circular in shape—where the Ring Boulevard (Nagykörút) now runs. The canal was meant to be used for shipping and

<sup>57</sup> SZINNYEI JÓZSEF (ed.): Magyar írók élete és munkái [Life and Works of Hungarian Writers], digital publication, Magyar Elektronikus Könyvtár, URL: <http://mek.oszk.hu/03600/03630/html/> (2018-09-04).

<sup>58</sup> LUDWIG FREIHERR VON FORGÁCH: Über die zweckmäßigste Führung des Donaustromes in der Höhe Wiens, mit Inbegriff des Wiener Donau-Kanales, Wien 1840.

<sup>59</sup> KENYERES ÁGNES (ed.): Magyar Életrajzi Lexikon [Hungarian Biographical Lexicon], digital publication, Magyar Elektronikus Könyvtár, URL: <http://mek.oszk.hu/00300/00355/html/index.html> (2018-09-03).

<sup>60</sup> VÁSÁRHELYI PÁL: A budapesti állóhíd tárgyában [About a Stable Bridge in Budapest], in: Athenaeum from 1838-03-04, 03-11, 06-14, 06-17, 07-05, 08-19.

<sup>61</sup> KENYERES (as in footnote 59).

logistics.<sup>62</sup> The plan was a late adaptation of the classical ground plan of Amsterdam (constructed in the seventeenth century): “This urban extension (of Amsterdam) was the largest and most homogeneous of its time. It was a model of large-scale town planning, and served as a reference throughout the world until the nineteenth century.”<sup>63</sup>

In Budapest, the capital needed to carry out such a project was lacking, so the radical regulation plan was rejected. It was not the only proposal for radical changes to be rejected by the government for financial reasons. Another idea was to construct a straight watercourse in place of the curved stretch of river south of the Gellért-hegy, one of the city’s most prominent hills.<sup>64</sup> In Budapest, it was completely impossible to radically alter the course of the river because it passed directly through the city. As a result, the regulation was carried out according to the model established by the DDSG. The government only financed the enlarging of the quays<sup>65</sup> but this also gave rise to conflicts around how the quays should be aligned. It was mainly for this reason that the central government decided against ordering a general regulation plan from local engineers and instead commissioned Vienna-based engineers Pietro Paleocapa and Ferdinand to do the job. Their work focused solely on narrowing the river bed in order to speed up the current (the main problem was that the river did not have enough energy to shift ice-floes).<sup>66</sup> The regulation plans in 1870 did, however, also bring forward ideas that had been conceived as part of the former works (carried out by János Mihalik in 1847).<sup>67</sup> It is important to stress that the plans for modern harbors were elaborated even in Mihalik’s plan. He had proposed three sites for commercial ports: one in Újpest (where a winter harbor had been operating since the 1850s), a second one at the river fork “Soroksári-ág” and a third one behind the “Kopaszi-gát Dam.”<sup>68</sup> None of these required a radical change in the watercourse. The is-

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<sup>62</sup> REITTER FERENCZ: Duna-szabályozás Buda és Pest között: Pesti hajózási csatorna. A Csepelsziget s a soroksári Dunaág balpartján fekvő ártér ármentesítése [Regulation of the Danube between Pest und Buda: Shipping Canal in Pest. Water Regulation in Soroksár], Pest 1865.

<sup>63</sup> UNESCO Document Nr. 1349: Seventeenth-Century Canal Ring Area of Amsterdam inside the Singelgracht, URL: <https://whc.unesco.org/en/list/1349> (2018-09-03).

<sup>64</sup> VADAS FERENC: Regulierung der Donau und die Kaianlagen, in: CSENDES/SIPOS (as in footnote 40), pp. 79-87.

<sup>65</sup> KOLUNDZSIA (as in footnote 51), p. 251.

<sup>66</sup> PREISICH GÁBOR: Budapest városépítésének története 2: A kiegyezéstől a tanácsköztársaságig [The History of Budapest’s Urban Design. Vol. 2: from 1867 until 1919], Budapest 1964.

<sup>67</sup> János Mihalik (1818-1892): Experiences on the regulation of the Rivers Po Tisza and his contribution to the regulation of Ferenc-csatorna [Ferenc-Canal] made him a leading expert of the time. Mihalik took part in the debates about the regulation of the Danube in Vienna too. VÁSÁRHELYI (as in footnote 60); WOLFGANG KOS, RALPH GLEIS (eds.): Experiment Metropole. 1873: Wien und die Weltausstellung, Wien 2014, p. 324.

<sup>68</sup> VADAS (as in footnote 64), p. 84.

lands of Budapest offered ideal places for shipping with minimal modification. The winter harbors and shipyards (like [those](#) in Óbuda and Újpest) could be established by closing off forks in the river. In summary, the Hungarian government was able to build a modern, industrialized river landscape (built 1871-1877) at a minimal cost.

The growing role of Budapest in Danube shipping caused alarm and anxiety in Vienna. The radical regulation of the river in Vienna was partly an answer to this challenge.<sup>69</sup> The Donauregulierungskommission was founded in 1849 (in this year Budapest also put forward a plan for river regulation) and was tasked with finding the best way of regulating the Danube that would both solve the problem of flood protection and optimize shipping. In 1850, a number of plans were submitted<sup>70</sup>, but the commission rejected all of them. The official argument for that was that none of them solved the problem of the missing ports.<sup>71</sup> The real reason was that all the plans proposed a radical change in the course of the river with a new artificial canal. The influential engineer Florian Pasetti (1793-1875) blocked these proposals. Pasetti was of the opinion that radical regulation was both impossible and dangerous. He published his own version of regulation plans in 1864, in which he preserved the main watercourses.<sup>72</sup> He designed the Donaukanal as an inner-city quay and placed the commercial port in the Kaiserwasser (a fork of the river), while the main arm remained where it had been before, at some distance from the city. The plan is reminiscent of Reitter's idea of a port-ring. A major difference was, however, that the port-ring in Budapest would have cut into the urban fabric (requiring houses to be demolished), while Passati's plan allocated new land for urban development. Most of the influential political figures at the time (most notably, the Baron Cajetan Felder and the lobby around the DDSG) rejected Passati's proposal, although his solution could have been realized at a much lower cost than the radical ideas put forward by others.<sup>73</sup> The decision was very much politically motivated.

Vienna in the 1860s was characterized by the struggle between the Court government and the emerging communal politics in the city hall. The mayor, Cajetan Felder, saw the Danube regulation as a great opportunity to show the political power of the city hall. He even dreamed of building a second Ringstraße. While the Ringstraße itself was a project of the imperial court, the city hall was responsible for the regulation works. Felder hoped that the high

<sup>69</sup> BÉKÉSI SÁNDOR: Zwischen Hochwasserschutz und Stadtpolitik: Zur Entstehung des Donau-Durchstichs bei Wien, in: SZABÓ/TAMÁSKA (as in footnote 8), pp. 229-244, here p. 229.

<sup>70</sup> The plans are published in PETER MOHILLA: Die Vorgeschichte der Donauregulierung, in: *Der Aufbau* 36 (1981), 7, S. 250-261.

<sup>71</sup> CSENDES (as in footnote 44), p. 74.

<sup>72</sup> Plans published in BÉKÉSI (as in footnote 69), p. 231.

<sup>73</sup> *Ibidem*, p. 233.

investment costs could be recovered through the sale of new building plots.<sup>74</sup> So the city hall saw the project as a communal undertaking. It should not be forgotten that this was a time of great optimism and advancement in the area of engineering. The Suez Canal had just been completed (built by an Austrian-Italian expert Alois Negrelli)<sup>75</sup>, which sped up the process in Vienna too. In addition, a firm that had worked in Suez offered the city the most modern machines.<sup>76</sup> So Vienna's city hall decided to make a radical change in the watercourse of the Danube. Between 1870 and 1875, a completely new canal was built and the old branches of the river were either filled in or were left as closed bodies of water, separate from the main watercourse.

#### 4 The Industrialized Riversides and the Emerging of Budapest: 1875-1914

Around 1880, the regulated riverside area in Vienna differed greatly from that in Budapest. Vienna had a completely new district, while in Budapest the urban fabric had been upgraded but remained fundamentally unchanged. The quays were commonly not the most technologically advanced features of the modern ports systems, and were structured to suit the demands of the first half of nineteenth century. They were ideal during the phase of development when economic and industrial operations had not yet moved to the outskirts of the cities and were still scattered throughout the main urban and residential districts. The long, narrow quays mostly served small factories. Therefore, immediately after the quays in both Budapest and Vienna were opened, a new debate started about the potential construction of a modern commercial port. However, this debate never reached a conclusion and construction did not start until the First World War.

As above mentioned, Vienna hoped for a second Ringstraße along the riverbank with a mix of residential districts and industrial areas. But the planned waterfront was never realized. The only new residential district was built in Kaisermühlen but was very modest, considering Vienna's aspiration of being a Danube City. Around the Handelskai, on the edge of the main urban area, a new industrial zone developed, near the established industrial zone of Nordbahnhof. The app. 12 quay (Stromhafen) was dominated by the buildings of the DDSG and the Kaiser Ferdinands-Nordbahn as well as some storage houses. The largest building was the grain store, erected in 1911-1913. Some factories settled here as well, for example the Wiener Mörtelfab-

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<sup>74</sup> HANS BOBEK, ELISABETH LICHTENBERGER: *Wien: Bauliche Gestalt und Entwicklung seit Mitte des 19. Jahrhunderts*, Wien 1966, pp. 103-125.

<sup>75</sup> ZACHARY KARABELL: *Parting the Desert: The Creation of the Suez Canal*, New York 2003.

<sup>76</sup> BÉKÉSI (as in footnote 69), p. 235.

rik<sup>77</sup>, but no large-scale industrial development took place because the municipal authorities did not want to sell the expensive plots for the low prices that that would have entailed. The layout of the quay also hindered development. The railway track (built in 1876) ran parallel to the river, forming a barrier between the city and the water. The very narrow strip of land between the tracks and the water (not even 100 meters in width) was not enough for large buildings. Transport along the quays was also complicated, so large amounts of cargo could not easily be loaded and unloaded at the quays like at a modern commercial port with docks. A further problem was that the usage of the ports was difficult during a flood and especially during ice floods. Establishing winter ports (in Kuchelau and Freudenau) after 1899 partly solved this problem.<sup>78</sup> The planner A. Z. von Weber-Ebenhof designed the port in Freudenau in such a way that the basin could function as a commercial port later on.

In Vienna, hopes for increased logistical capacities were not fulfilled until after 1875. The important goal of establishing strong links to Budapest in the grain industry was also unsuccessful.<sup>79</sup> The other typical mass-produced commodity of the time, coal, was later transported to Vienna by train.

The changes that took place in Budapest were more obvious. In the downtown area the quays functioned as small loading ports and passenger terminals. Of course, the number of passengers was relatively small compared to that of the railways.<sup>80</sup> The quays had a double function. On the one hand, they were a transport facility and on other hand they provided an aesthetically attractive public space within the cityscape (Fig. 4). Two levels allowed for this double function. The lower section was used for ships while the upper level served the needs of the city (promenades, trams). After 1892, a similar double-quay system operated on the Donaukanal in Vienna, where the urban metropolitan train (Stadtbahn), which was designed by Otto Wagner, ran alongside the river.<sup>81</sup> Over time, the inner city quays in both Vienna and Budapest gradually lost their importance as ports, but their contribution to the modern cityscape remained significant.

<sup>77</sup> BOBEK/LICHTENBERGER (as in footnote 74), pp. 103-125; WOLFGANG CZERNY (ed.): *Dehio-Handbuch. Die Kunstdenkmäler Österreichs: Wien. II. bis IX. und XX. Bezirk*, Wien 1993, p. 27; RICHARD LUKESCH: *Die Donau in Wien. Vol. 1: Am Strom*, Wien—Leipzig 1929.

<sup>78</sup> CSENDES (as in footnote 44), p. 76; *Der Freudenauer Hafen in Wien. Denkschrift zur Eröffnung des Freudenauer Hafens am 28. Oktober 1902*, Wien 1902.

<sup>79</sup> BÉKÉSI (as in footnote 69), p. 240.

<sup>80</sup> FRISNYÁK ZSUZSA: *Verkehrslinien und räumliche Struktur Budapests*, in CSENDES/SIPOS (as in footnote 41), pp. 109-114, diagrams p. 113.

<sup>81</sup> PAYER (as in footnote 45), p. 155.



Fig. 4: The two levels of the port quays: the lower level was used for logistical operations while the upper levels functioned as part of the urban space with promenades and urban transport (today: Petőfi tér); BFL, photo by Klósz György about 1900  
URL: <http://fortepan.hu/?tags=&x=0&y=0&view=query&lang=hu&q=82665+>

The Donaukanal ran along the edge of the Vienna's inner city, an area that was not the most attractive in terms of urban design. Contrastingly, the riverside in Budapest functioned as the main boulevard. Here, a major promenade, new hotels and, most significantly, the Parliament Building (designed by Imre Steindl and completed in 1904)<sup>82</sup> made the Danube a main feature of the capital.<sup>83</sup> In this way, the image of the emerging Budapest was connected directly with the riverside.

A very typical characteristic of the emerging Budapest was that the riverside boulevard and the industrial quays bordered each other without any transition zone. Industrial areas started directly behind the residential and public buildings. The area behind the Great Market Hall (Központi Vásárcsarnok, 1897, Samu Pecz) and the Customs House (Vámház, 1874, Ybl Miklós)<sup>84</sup> is the most typical example of this. The two buildings were established on the banks of the Danube, directly adjacent to the historic city walls. Because both institutions also required serious logistical capacity, a river freight station

<sup>82</sup> VÁSÁRHELYI (as in footnote 60).

<sup>83</sup> VADAS (as in footnote 64), p. 86; TAMÁS CSAPÓ, TIBOR LENNER: *Settlement Morphology of Budapest*, Cham 2016.

<sup>84</sup> VÁSÁRHELYI (as in footnote 60).

(with a railway connection) was built here, complete with warehouses (1878/88), grain mills and a large-scale elevator (Fig. 5).<sup>85</sup> Similar urban zones that functioned as logistical centers where agricultural goods could be unloaded and transported into the city can be found in Vienna and other European cities, too. But the difference in Budapest was that these facilities were located downtown, with direct access to the water. A further peculiarity of Budapest was that the agricultural industry played a similar or even more important role in the whole urbanization process compared to other industrial sectors.<sup>86</sup> As grain was traditionally a shippable good, and mills used hydro-power before steam-power and (later) electric power, the Danube was well suited as a transport route for the agricultural industry. Because ships carrying grain generally came from the south, most of the mills settled here in close proximity to each other.<sup>87</sup> Together, these circumstances gave rise to an urban area just south of the Customs House that eventually became a characteristic part of the skyline. The Danube's city gate became an iconic feature of the emerging city, not because of its beauty (like the Corso or the Parliament Building) but because of the economic power it represented. This was a time when Budapest was forming its own "catchment area," independent from Vienna. Naturally, the emerging city achieved the greatest success in sectors where Vienna could not compete, such as the agricultural industry, and especially the mill industry, which needed large ports as well.

By the turn of the century, Budapest had grown in confidence and influence enough to make its own policies regarding the Danube. For this purpose, the old system of the joint DDSG company was outdated and inadequate, so the Hungarian government founded its own independent Hungarian River and Sea Shipping Company (Magyar Folyam- és Tengerhajózási Részvénytársaság, MFTR) in 1894.<sup>88</sup> However, this enterprise could not really work alongside the DDSG: Budapest, supported by the central government, clearly wanted to become the central power on the Danube. The establishing of the Hungarian River and Sea Shipping Company was one important step in this direction. However, the shipping industry did not receive enough support from the government and urban planners. By the turn of the century, Budapest's quays had become too small to cope with the growing demand on logistics. Between

<sup>85</sup> JUHÁSZ LAJOS: A közraktár-kérdés Pesten a XIX. század közepén [The Warehouse Question in Pest in the Mid-19th Century], in: *Tanulmányok Budapest Múltjából* 8 (1940), pp. 49-59.

<sup>86</sup> GÁBOR GYÁNI: Das Verhältnis von Urbanisation, Großstadtentwicklung und der Donau, in: SZABÓ/TAMÁSKA (as in footnote 8), pp. 73-85.

<sup>87</sup> KLEMENT JUDIT: Gőzmalmok a Duna partján: A budapesti malomipar a 19-20. században [Steam Mills on the Banks of the Danube: The Budapest Milling Industry in the 19-20th Century], Budapest 2010.

<sup>88</sup> DEZSÉNYI/HERNÁDY (as in footnote 38), p. 92.

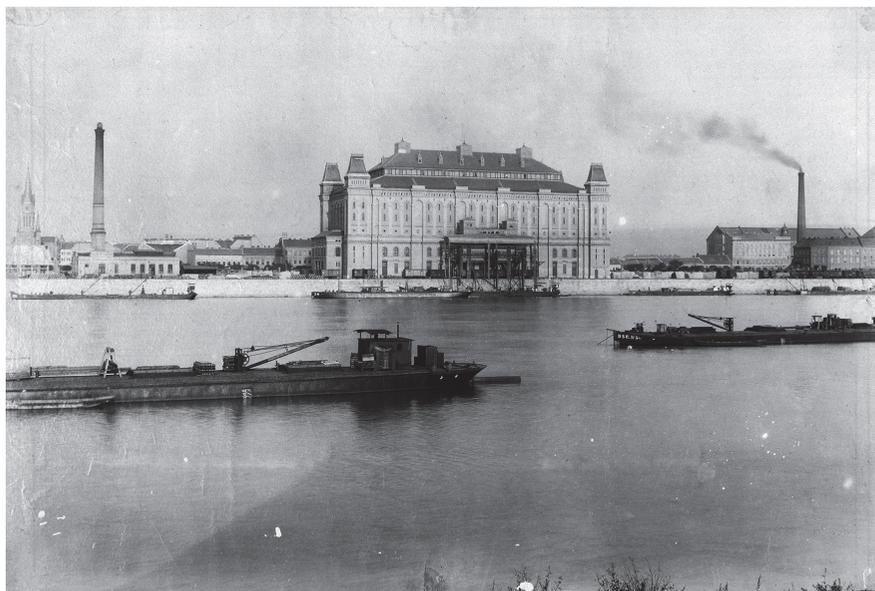


Fig. 5: The industrialized suburban landscape: the port with elevators and industry in the background (mill companies), in the south of Pest; BFL, photo by Klösz György about 1900

URL: <http://fortepan.hu/?tags=&x=0&y=0&view=query&lang=hu&q=82550>

1885 and 1899, the capacity of Budapest's shipping trade had doubled. Therefore, the quays had to be extended.<sup>89</sup> Moreover, shipping experts urged the construction of a modern commercial port complete with artificial basins. Gonda Béla (1851-1933, planner of the Iron Gates) made plans in 1901 but the government did not finance them.<sup>90</sup> The journal *Pesti Hírlap* reported bitterly: "The whole country suffers if the capital does not have a modern commercial port."<sup>91</sup> The establishment of the new port started around this time but it was not completed until 1927.<sup>92</sup>

At the same time, Vienna recognized that the river regulation would not fulfil its own hopes of becoming a leading Danube city. Leopold Bauer (1872-1938)<sup>93</sup> presented a solution to this problem in 1917/18. Bauer was a

<sup>89</sup> GONDA (as in footnote 30), p. 111.

<sup>90</sup> CSEH VALENTIN: A petróleum kikötő [Petroleum Harbor], Zalaegerszeg 2014.

<sup>91</sup> *Pesti Hírlap* from 1915-01-05, p. 2.

<sup>92</sup> WIRTHL JÓZSEF: A ferencvárosi Duna-átrakodó berendezésének helyszínrajza [Plan of the Logistic Port in Ferencváros], in: Magyar Nemzeti Levéltár Országos Levéltára [Hungarian National Archiv], Budapest, inventory S 118; No. 1178/1-2, 1916, URL: <https://maps.hungaricana.hu/hu/MOLTerkeptar/35291/?list=eyJmaWx0ZXJzIjogeyJQSUMiOiBblIlFUyJdfSwgInF1ZXJ5IjogIkhJRVI9KE1PTFRlcmtlcHRhckhpZXJhamNoeS0xMTIpIn0> (2018-11-25).

<sup>93</sup> More on Bauer in: Brno Architecture Manual, URL: <https://www.bam.brno.cz/architekt/79-leopold-bauer> (2018-10-02).

student of Otto Wagner and an advocate and practitioner of modern architecture. He produced a design that was supported by the Viennese director of town planning (Stadtbaudirektor) Heinrich Goldemund, who suggested that the new building complex with its impressive tower would be a symbol of the new metropolitan Vienna, similar to St. Stephen's Cathedral (Stephansdom), which was an icon of the historical city. Bauer designed a skyscraper as well, a building so monumental that it would cover the road. He emphasized the futuristic vision of the plan by painting automobiles and trucks on the road.<sup>94</sup> This concept offered a vision for Vienna's cityscape that was more powerful and much grander in scale than that of Budapest with its Parliament Building and Royal Castle. However, both cities were to have an important historical legacy: the Hungarian Parliament is an example of nineteenth century modernization while Bauer's plan stands as a model of twentieth century monumentality.<sup>95</sup>

## Conclusion

This paper demonstrates the parallel development of river ports in Vienna and Budapest. It also outlines the reasons behind the parallel trends. The regulation works of the Danube started with the "Danube Mappation." The generation of engineers who worked on the Danube regulation gained experience on that earlier project. Therefore, it was not only the spirit of the age, but also shared knowledge and experience with the river that explains why the question of regulation came up at the same time in both Vienna and Budapest (Pest-Buda). We find that there were not only similar ideas conceived for Budapest and Vienna, but also a number of engineers who worked for both cities too.

This parallelism also coheres with the establishment of the profit-oriented steam-boat company DDSG. During this period, new logistical technologies were spreading throughout Europe and the rest of the world, including steamboats, elevators and storage facilities. The DDSG was organized according to a very rational set of principles and structures. In line with this, it was decided that the company's main facilities (shipyard, winter harbor) be established in Pest-Buda, where the natural conditions of the Danube were much more favorable than in Vienna. The DDSG constructed the first quay-ports in Pest-Buda and played a key role in the growth of Budapest's grain trade.

<sup>94</sup> Das ungebraute Wien 1800-2000: Projekte für die Metropole, Sonderausstellung des Historischen Museums der Stadt Wien, 10. Dezember 1999 bis 20. Februar 2000, Wien 1999, pp. 271-278.

<sup>95</sup> It is worth mentioning that some elements of the plan reappeared in the general plan for Linz after 1938. The German occupiers wanted to build a "second Budapest" there, a city of water: JOST DÜLFFER, JOCHEN THIES, JOSEF HENKE: Hitlers Städte: Baupolitik im Dritten Reich. Eine Dokumentation, Köln et al. 1978.

The situation changed in 1867 when a new concept for Budapest's urban design was tabled. Financial troubles forced political actors to choose a regulation plan that involved only minimal changes to the natural conditions of the river. Therefore, the city's ports followed the lines of the former quays and the existing structure of the urban area did not change radically. Some logistical operations remained in the downtown area, while other new industrial and logistical projects were set up directly behind the city's most central and iconic quays. This kind of urban layout—where aesthetically designed public and residential spaces were established in close proximity to industrial areas—also characterized the Donaukanal in Vienna. However, the view from the Donaukanal is very different to the view from the waterfront in Budapest. The Donaukanal is smaller and has more bends. Thus, Vienna's cityscape is more fragmented, and there are no vantage points that afford both a view of the river near the Ringstrasse and the industrial areas at the same time.

Vienna's Danube ports were fundamentally different from those in Budapest. The regulation works resulted in a radically new urban structure. Such a radical change to the river was not the simplest solution. But at the same time, because the radical plan was also a monumental one, the emerging municipal elite (unlike the Court government) could use the project to display its power. The city hall hoped to make a profit by selling new building plots for investors but the financial crash in 1873 hampered efforts to recover the costs of the works. The most important problem, however, was that the new watercourse did not solve the problem of ports. From an urban planning point of view, the very long and narrow quays, which lacked a proper connection to the surrounding urban areas, did not offer an ideal space for further development. Moreover, because the city hall authorities hoped, during the initial period, to attract developers of residential projects, they hesitated to sell the properties to industrial companies. Budapest's quay-ports, on the other hand, had a high rate of return. As the regulation costs here were comparatively lower than in Vienna, the growing commerce made a profit for the city. In fact, growth was so rapid that the quay ports could hardly cope with the demands. The ports of Budapest did not resemble the ones in London. They functioned periodically as marketplaces where peasants sold their produce. A similar scene existed on the Donaukanal (starting with the fish market) but the Handelskai failed to attract the industrial capacity it should have, when we consider the costs of the regulation. The Handelskai never became the dockyards of Vienna: it remained a very typical urban periphery in a permanent state of transformation.