

Introduction

THE DANUBE EMPIRE

On June 10, 1879, the venerable Hotel Imperial in Vienna hosted a formal dinner to celebrate the establishment of the Donauverein, or Danube Association. Members had formed the new advocacy group to educate citizens about the benefits of river engineering works and to petition local, national, and imperial governments in the Habsburg Empire to fund these works. In the months leading up to this meeting, local assemblies had gathered to discuss goals and possibilities for such an association and had attracted multifaceted interest groups from milling unions to agricultural lobbyists.¹ The association's hope was to transform rivers and waterways throughout the empire to facilitate transportation, promote trade, and make rivers safer and more useful to people living along them. The Donauverein's secretary, the famed geologist Eduard Suess, had overseen the Danube's regulation at Vienna a few years earlier and expressed another lofty goal for the Danube's regulation, stating that it represented not only "great cultural progress" but "a new moment in the peaceful development within the monarchy."²



Figure I.1. Hotel Imperial (circa 1900) © Wien Museum.

The gathered participants at the Hotel Imperial (fig. I.1) certainly gave Suess reason to hope that the multinational Habsburg Empire, a state twice the size of modern Germany with thirty-nine million people and a dozen (officially recognized) languages, could enjoy “peaceful development” and move away from the acrimonious political rhetoric that was coming to characterize parliamentary proceedings and certain provincial politics.³ Rather than national divisions, the Danube Association’s members believed in a cause that relied on transnational unity and cooperation. The diverse coalition that had assembled in the Hotel Imperial promised to fulfill this vision. Delegates rose and spoke passionately about the Danube’s unitary place in the empire, the river’s indifference to tribal or national differences, its universal threat in the form of flooding, and the common call for its regulation among the populace everywhere. One participant declared that the envisioned regulation works truly fit the Emperor Franz Joseph’s motto “*viribus unitis*” (with united strength) because they would promote the well-being of the empire’s entire population.⁴ Such sentiments

imbued the Danube with a certain quality, one that had the ability to unite people through common experiences and expectations. This was certainly on the mind of the attendees, who included representatives from several riparian cities in the empire's Austrian and Hungarian halves, river engineers, assorted envoys from manufacturing and trade organizations, imperial ministerial officials, and invited guests.

When Vienna's mayor stood up to speak, he too emphasized the transnational dimension of these river engineering projects, asserting, "We would like nothing more than for all areas of the monarchy to recognize that this undertaking is not a local one, nor one simply within Austria, but rather its success will bring great fruit to both halves of the Austro-Hungarian Empire."⁵ He ended his speech by toasting the Hungarian representatives present, whom he hoped would continue to spread the association's agenda in Hungary.

Government officials, prominent figures, and members of the public in Hungary appeared supportive of the Danube Association in its early days. Returning home from the opening dinner, Pál Bacsák, the vice deputy (*alispán*) of Pozsony County nestled thirty miles downstream from Vienna, presented the dinner proceedings to his constituents. He assured listeners that members of the Imperial Diet in Vienna had already promised a "warm reception" for his plans to better coordinate regulation efforts between engineers, businesses, and government agencies and that the Pozsony Chamber of Commerce planned to petition the central government in Budapest to follow suit.⁶ When the Danube Association organized an excursion to travel to the miles-long rocky rapids at the empire's southeastern border, the Iron Gates, the Hungarian Ministry of Public Works and Transport likewise dispatched a representative to accompany them.⁷ The trip was also opened to select members of the public, and because so many petitioned to participate the newspapers published articles declaring that the association was no longer considering attendees.⁸ When some in Hungary questioned this cooperation with the "Viennese" Danube Association, others leaped to its defense, offering full-throated approbation of the association's goals of improving trade along the Danube.⁹ Indeed, the esteemed Hungarian geographer János Hunfalvy lent his support to the cause, arguing that such an association and its work regulating the Danube would ultimately benefit Hungary.¹⁰

Regulation work was certainly not without its detractors, nor was it always smooth sailing. Nevertheless, the following chapters trace ef-

forts by groups and individuals who pursued and undertook hydraulic engineering works as part of their vision for improving the security and prosperity of members of the public and of the empire as a whole. Improving navigation guaranteed cities and towns a reliable flow of food, merchant wares, wood, construction materials, and coal.¹¹ The empire's food supply strained under its eighteenth-century population boom, and reclaiming alluvial floodplains provided more arable land to feed people, a need underscored by several eighteenth-century famines.¹² Raising and unifying embankments and levees promised to protect communities from floods, while reclaimed land enabled the creation of new urban districts for housing and employing growing industrial populations.¹³ Commercial infrastructure facilitated trade up and down the river and around the empire.¹⁴ New sewage systems used the river to wash away industrial (and human) effluence, increasing sanitation when water levels were high enough.¹⁵ Crown Prince Rudolf would say of these efforts in the late nineteenth century, "For decades, the Danube's regulation [has become] one of Austria-Hungary's most important economic [*volkswirtschaftlich*] tasks."¹⁶

Constructing the Danube Empire

During this period, the transformation of the Danube River's environments was often tied to new behaviors and activities that contemporaries hoped would support the well-being of the general population and underpin the functioning of the Habsburg Empire. Members of the Habsburg dynasty became deeply involved in this process, calling for the reengineering of its imperial environs to produce the desirable material conditions necessary for ensuring prosperous trade relations, stable political developments, harmonious social interactions, and strong military capacities.¹⁷ Aside from the political utility of these engineering works, Maria Theresa and Joseph II explicitly saw the results as supporting their people's well-being.¹⁸ Successive rulers mobilized bureaucrats and engineers and cooperated with private industries to achieve these goals. The government had no single avenue for achieving these aims, though as the opening vignette reveals, engineering the empire's waterways, especially the Danube, provided rulers and citizens with several attractive results. In the mid- to late eighteenth century, mathematicians, military engineers, and particularly those studying applied fields like "mechanics" or "hydraulics" (so-called *Hydrotechniker*) undertook engineering works on rivers that included blasting physical hindrances

like rocky cataracts, straightening rivers by digging transections, draining adjacent marshes, and erecting embankments, all in the name of reclaiming land, preventing floods, and promoting trade.¹⁹

Although advocates for river engineering works frequently promised economic gains, governmental and associational representatives also emphasized desirable social and political outcomes, such as greater imperial unity. While the émigré historian Oszkár Jászi, a former civil servant in the empire, looked back a decade after the empire's collapse and bemoaned that the Danube's geographic orientation stymied integration in the empire, most nineteenth- and early twentieth-century observers painted a much brighter picture of the Danube's integrative role for state and society.²⁰ Early nineteenth-century travelogues frequently described the river's unifying role for the many people living along it. "Of the [empire's] rivers, we must mention above all the Danube . . . with its tributaries, it encompasses two-thirds of the monarchy."²¹ Another declared "that mighty artery [the Danube] arises in the heart of Europe, and through its noblest parts flow elements of life and prosperity; the wide, richly blessed valley of the mighty stream has become home to twenty-one peoples [*Völker*]."²² Lajos Kossuth, one of the leaders of Hungary's 1848–49 uprising against Habsburg rule, perceived a natural connection among people living along the river. He envisioned the establishment of a Danubian Confederation (albeit in opposition to the Habsburg Empire) that united the different nationalities within its basin.²³ Overseeing Danube regulation works in the 1850s, the noted statistician and historian Carl Freiherr von Czoernig declared confidently, "The Austrian Empire has more advantageous water networks through its natural position than any other state on the European continent . . . even if the Austrian Empire didn't have all these connections, the Danube—Europe's most beautiful and powerful river flowing through the entire length of the empire with its hundreds of miles of navigable tributaries—would still position Austria as first rate among the European states for world trade."²⁴ The Austrian botanist and lawyer Adolf Dürnberger waxed lyrically that "when we observe the Danube, we feel something of its great past, and it is as if this lonely river was aware that for millennia it had been a route of world-shaping events, the carrier and communicator of Western culture, the natural founder of a great empire."²⁵ With such pervasive sentiments, it is unsurprising that contemporaries frequently dubbed the Habsburg state the "Danube Empire" (fig. 1.2).

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Figure I.2. The Habsburg Empire with the Danube River, Major Tributaries, and Large Cities © Josh Fangmeier, 2024.

Much of the following work focuses on the ideas, plans, and efforts to engineer the river and construct this “Danube Empire.” Technical experts advanced many different plans as their understanding of hydraulics evolved throughout the nineteenth century. Different interest groups also sought divergent outcomes from the engineered river, which led some to prefer certain ideas and visions over others. As the Danube was a shared space, usage and modification of the river drove negotiation and compromise between communities, individuals, and companies, geographically dispersed riparian towns, and most critically between citizens and their governments. These interactions, negotiations, and experiences along the river constitute the heart of this story.

There were, however, plenty of disagreements over the river’s usage, sparking conflict, resistance, and loss. Bertalan Andrásfalvy has



Figure I.3. View of the City Vác with Ship Mills on the Danube (1826) © Wien Museum.

detailed the ways that peasants in the Sárköz region of Hungary protested eighteenth-century efforts by landowners and royal authorities to embank the Danube. As population growth drove up the price of grain, plans to drain wetland commons and reclaim the land for private crops benefited landowners. Peasants feared—rightly, as it would turn out—that cutting the river off from its floodplain and building ad hoc embankments on parts of the river would exacerbate flood dangers and threaten land and waterscapes that peasants depended on for pastures, orchards, and fishing.²⁶ Tensions also arose between different professions on the river, some of whom benefited from Maria Theresa's and subsequent monarchs' championing of navigation and trade over other livelihoods. Decades of edicts regulated, reduced, and eliminated ship mills, which, for example, were blamed for worsening floods (fig. I.3). Because ship mills anchored and ground grains at the deepest and fastest-flowing parts of the river, they blocked the

path of ship captains seeking to avoid running aground on sandbanks and shoals.²⁷ They were sacrificed for the sake of river commerce. The river's use was also a cause of conflict among terrestrial parties. Establishing factories along rivers to take advantage of them for transportation, cooling, and effluence disposal, manufacturers ran afoul of agriculturalists over prescribed limits of water usage and other water rights.²⁸

These challenges had at their core a concern with the physical and ecological consequences of regulation and the effects thereof on humans and their livelihoods. Regulation and drainage companies that lopped off over one hundred meanders from the Tisza River and reclaimed hundreds of thousands of acres of land in Hungary got rid of the marshes, fens, gallery forests, and meadows that peasants had depended on centuries.²⁹ Draining wetlands reduced the diversity of flora and fauna that reed cutters, cattle farmers, net repairers, fowl hunters, and others depended on. Local fishermen and angler clubs also complained that regulation works and steamboats reduced their catches. Closing off shallow, slower-flowing side branches and deepening rivers (thus accelerating their currents) did eliminate the ecological conditions that certain fish species required to feed and breed.³⁰ However, speaking to the Association for Lower Austrian Geography in 1871, the founder of Vienna's Zoological and Botanical Society, Georg Ritter von Frauenfeld, stated more judiciously, "While steam navigation has caused great damage to fish stocks, none have disappeared because of it."³¹ There was blame to go around; fishermen for overexploiting rivers to supply market demand, steamboats and regulation works for disrupting habitats, and factories for spewing effluents into rivers.³² Such complaints did little to deter plans for the Danube or other rivers' regulation, which were more often than not delayed by financial or political, rather than ecological reasons.

Indeed, on the other hand, many citizens, local businesses, non-governmental actors, and municipal authorities in the nineteenth century were actively involved and invested in this process of physically transforming rivers around the empire. Much the way the Danube Association envisioned, these groups used governmental and democratic avenues to engage with provincial, national, and imperial authorities. They used these channels to assert their interests and to shape the visions set out by central governments so that hydraulic engineering works would protect their material well-being, not threaten it. Trans-

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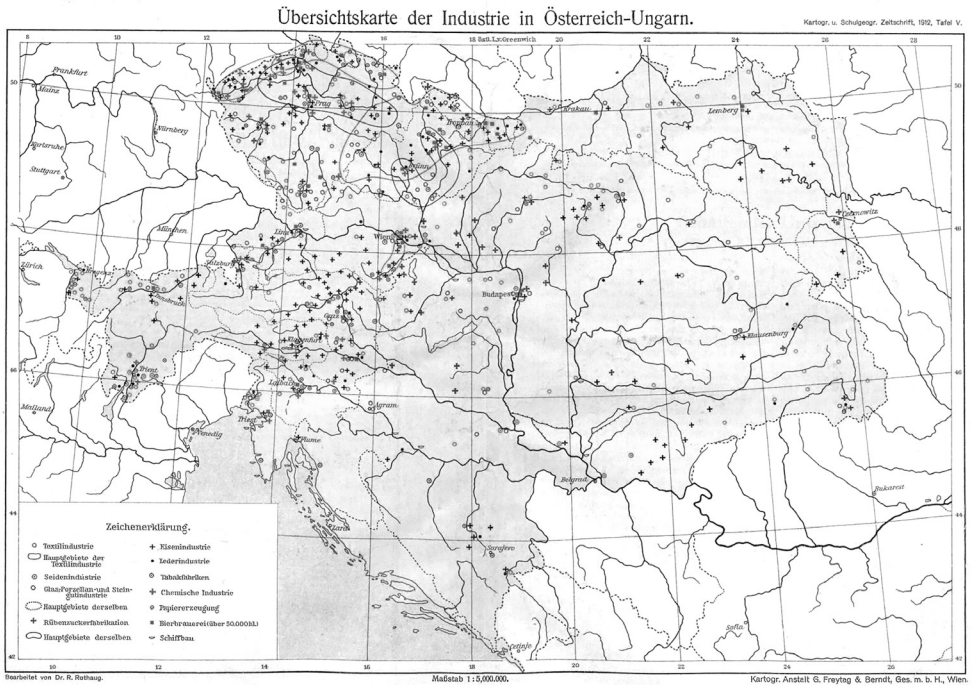


Figure I.4. *Overview of Industry in Austria-Hungary, 1912* © freytag & berndt-brands.

forming the Danube changed people's practices and engagement with each other throughout the empire, reflecting the Danube's transition from a local, communal space into a more cohesive, imperial realm.

The Danube Question

The Danube River's prominence provided a clear focal point to channel interest and support from inhabitants of the empire for its regulation. The river ran for more than 850 miles through the heart of the empire, and its major tributaries knit together Alpine territories in the west, the lower Bohemian Massif in the north, and nearly the entire Carpathian Basin in the south and east. When the Danube Association constituted itself, the empire encompassed 5,000 miles of navigable waterways. Steamboats only plied one-third of Austria's navigable waterways and three-fifths of Hungary's, while the remaining waterway traffic was confined to rafts, barges, and other smaller vessels.³³ These waterways were useful for moving around industrial, commercial, and

agricultural goods, but they also did all sorts of work, from driving machines to cooling industrial processes. Imperial geographers clearly illustrated the dependence that such sectors had on rivers. As part of an educational manual for young students, Rudolf Rothaug's cartographic "Overview of Industry in Austria-Hungary" revealed at a glance the dense cluster of industries situated on the empire's major river systems (fig. I.4).

Although the Danube's expansive geography loomed large in domestic affairs, the Danube Association's adherents nevertheless recognized the challenges that existed to making the river system a more significant force for empire-wide cohesion. Despite statistical reports that published precise total lengths of navigable rivers each year, navigability on the empire's rivers was never a constant figure. Instead, it was subject to annual and regional climatic shifts. Unseasonable flooding and drought affected shipping, as did seasonal variations in high and low water levels brought on annually by winter freezes, glacial melts, spring and summer rainfall, and dwindling precipitation in late fall and winter.³⁴ The complex climatological influences on the Danube catchment area—rainier marine in the west, drier continental in the east, and milder Mediterranean in the south—meant that precipitation and water levels were hard to predict from year to year.³⁵

With such variable water levels, flood prevention was also a key agenda of river regulation works. Flooding had both natural and anthropocentric causes, as chapter 4 will explore in greater detail. Riparian communities around the empire were subjected to an inordinate number of summer floods and winter ice-dam flooding on the Danube and on other rivers around Europe in the eighteenth and nineteenth centuries thanks to the final iterations of the Little Ice Age, which brought colder winters and rainier summers to parts of Central Europe.³⁶ Human activity also exacerbated conditions that led to flooding. Early modern deforestation in the Danube Basin, changing land usage patterns along the river and its tributaries, and the empire's growing population also disrupted the soil and accelerated the erosion of riverbanks.³⁷ These factors caused rivers to meander, become shallower, and more readily freeze and flood. Engineers and companies dredged and deepened rivers, channelized branching arms into a single bed, and constrained rivers behind embankments and levees in a grand effort to minimize the chance of flooding, but these attempts were not always successful.³⁸ Mindful of the intricate and interlocking

factors governing the Danube's hydrology, the Hungarian journalist Kornél Szokolay succinctly summarized this challenge for his readers in 1880, arguing, "We can only start regulation when a plan for the entire Danube is established, because we cannot improve certain stretches without unregulated portions deteriorating further."³⁹ Overcoming the diverse conditions along the empire's waterways demanded unity of vision.

These challenges were part of a broader "Austrian Question" that Deborah Coen has described in *Climate in Motion: Science, Empire, and the Problem of Scale* regarding strategies of governance that went hand in hand with management of the environment. Coen argues that governing cultural diversity in the empire mirrored the immense logistical challenge of governing an empire filled with vastly divergent climates and topographies, from semiarid steppes to cool mountain pastures to flood-prone alluvial plains. Contemporary scholars, naturalists, and officials around the Habsburg Empire recognized this difficulty and endeavored to study and understand the interrelated components of these diverse natural features. Armed with this knowledge, they devised strategies to both address the challenges they presented and expound the many virtues and advantages that such varied landscapes and climates conveyed to the empire and its people.⁴⁰

The Danube Association also tried to mobilize action to address these common challenges. Promoting the river's regulation to both advance navigation and reduce flood risks was part of its empire-wide activities. Its influence uniting political and budgetary agendas in legislatures around the empire was palpable in the decades following its establishment. The association also gained imperial patronage from Crown Prince Rudolf and later boasted Franz Ferdinand's support as well. Beyond organizing speaking events and petitioning the government, the association's leadership also organized special excursions up and down the Danube to bring government officials and members of the public on steamboats to inspect firsthand ongoing regulation works and to visit unregulated stretches that local communities wanted help modifying. The influential *Wiener Presse* credited the association with inspiring a resurgent interest in the Danube Question.⁴¹ Advocates petitioned Austria's Imperial Diet (Reichsrat) on behalf of provincial interests, and the Danube Association's publications influenced engineers and representatives in both Austria and Hungary.⁴² Public engagement coupled with government directives ensured

funding for the Danube's regulation for the remaining decades of the empire's existence until 1918.

Coal, Steam, and Industrialization Fuel Dominion over the Natural World

Riparian communities in the Habsburg Empire were not alone in wanting to redefine their relationship with nature. Until the modern era, natural elements like disease, climate, and soil nutrients strongly influenced all human development, limiting population growth, food production, and economic output. Fernand Braudel consciously compared these constraints to Europe's onerous socioeconomic and political burdens when he labeled them the "*Biological Ancien Régime*."⁴³ Like Hercules battling against the shape-shifting river god Archelous to win Deianira's hand in marriage, however, humans recognized that to battle and subdue nature and to overcome its constraints would grant them the desired goal of a more amenable (and profitable) environment within which to live.

The energy to accomplish these tasks was, for most of human existence, limited to work done by human and animal muscle, which was fed a steady diet of carbohydrates that plants had photosynthesized from the sun's energy. Climate and geography affected the solar energy and precipitation available to plants and thus the calories that humans could harness to do their work. To supplement their labor, inventive humans built mills to capture wind and water—fluids that move and circulate due to the sun's energy—or devised technologies for making human and animal labor more efficient.⁴⁴ The sun also powered the growth of forests and grasses, which humans burned for heat to cook, keep warm, and make all sorts of things from soap to ceramic. Coal, the fossilized remains of organic matter, also served this purpose where it was available.

The herculean task of remaking nature gained powerful tools with the harnessing of steam power during the Industrial Revolution. The knowledge necessary to build and operate steam engines was honed over a century of observations, devices, and discoveries. By the early eighteenth century, Thomas Newcomen's atmospheric engine burned coal to boil water and release steam into a cylinder, which, when cooled, formed a vacuum, allowing atmospheric pressure to depress a piston into the cylinder and draw water up a pipe. This invention freed coal from its use as an ersatz fuel in place of biomass and instead used it