

URBAN NEEDS AND CHANGING ENVIRONMENTS: REGENSBURG'S WOOD SUPPLY FROM THE EARLY MODERN PERIOD TO INDUSTRIALIZATION

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When on June 27, 1830, a storm felled a large number of trees in state forests near Kelheim in Bavaria, the regional government of the Regen District¹ made a suggestion to the municipal authorities of Regensburg, a city of approximately 20,000 inhabitants at that time.² In order to avoid a shortage of wood and to prevent speculators from threatening the city's supply, the municipality, the regional authorities suggested, should establish and run a timber depot. As an incentive, they offered Regensburg 10,000 *Klafter*³ of wood from the Kelheim state forests. Regensburg's authorities responded politely, but they did not show much enthusiasm. Although they agreed that the town had long needed a wood depot, they nonetheless felt obliged to stipulate a set of conditions for the realization of the project.⁴ The state should calculate a fair price and cover all costs and risks of the wood's transport between the Kelheim forests and Regensburg's *Holzlande*, the area in the center of the city where wood was landed from the Danube. Additionally, the members of the magistrate demanded further negotiations on the form and frequency of payment for the project. They pointed out that building and maintaining a depot would be expensive, while the purchase or renting of land would involve substantial economic risks for the town. Thus the central argument for the construction of wood depots in Regensburg as in other towns—that a wood shortage would unduly disadvantage a town's growing population of poor people—was countered by the claim that such a project would impose an undue financial burden on the community. In the words of the Regensburg magistrate:

As the high authority knows, the commune is not in splendid condition at all and has to bring enormous sacrifices to meet the demands of a growing number of dissolute people, shirkers and the unemployed. Because of this, the administration must check everything carefully, particularly in the recent matter of the depot . . .⁵

The urban authorities did in fact check the issue carefully. They looked for possible sites, they examined the amount of wood needed by local businesses and private households and they inspected the available wood and procured experts' opinions. When the experts voiced their skepticism and the state authorities made clear that they were much more interested

in their own economic goals than in their social responsibility,⁶ the city suspended further activity. A brief note by Regensburg's vice mayor Johann Wilhelm Anns (1766–1842), written on the margin of the government's letter, concluded that the project had to be temporarily halted because the city could not afford to enrich the state's finances.⁷

Material and Energy Flows: The Regional Frameworks

A city's supply of energy constitutes one of the main factors connecting urban life and economy to the city's geographical, political and natural environment. The southern German city of Regensburg is situated on the northern edge of the Bavarian part of the Danube valley. The region's fertile soil and mild climate created favorable conditions for agriculture, thus leaving only a small area covered by woodland. Looming over the northern banks of the Danube, to the northeast of Regensburg, are the foothills of the *Bayerischer Wald*, a mountainous region dominated by woodland. The Upper Palatinate region north of the city had a long tradition of preindustrial mining and metal production. As a result, it did not constitute a significant source of wood for the region. The confluence of the Danube and Regen rivers in Regensburg was a geographical feature of great importance for the city's wood supply. The Danube was used to transport wood downstream from western regions, particularly from the forests near Kelheim, and upstream from the forests near Wörth and Donaustauf; the Regen connected the city to the woodlands of the *Bayerischer Wald*. From the late eighteenth to the mid nineteenth century, this geographic framework remained largely unchanged. However, as a result of various political developments, Regensburg's relationship with its hinterland was dramatically altered, thereby creating a set of entirely different resource management conditions.

In the eighteenth century Regensburg was an independent city. Beyond the fact that it hosted the diet of the Holy Roman Empire, it was of little importance beyond its immediate region. In this period, Regensburg ruled only a very small *extra muros* territory that did not contain any woodland.⁸ Completely surrounded by a hostile neighbor (the Bavarian Electorate), Regensburg could neither practice any independent forestry or forest policy nor could it benefit from the unrestricted trade and transport of wood on the Danube and Regen rivers. More than once, Bavaria used this situation to weaken the city's political status and economic development by cutting its wood supply.

Things changed during the Napoleonic period, when Regensburg became the capital of a short-lived principality. As a consequence of the secularization of property formerly owned by the bishopric and the monasteries of Obermünster and Niedermünster, the new principality con-

istrate—much like magistrates in similar communities—refused to bear the social consequences of this new paradigm. This conflict is well documented in the city's archive, which also contains abundant evidence attesting to the usual contemporary efforts to solve the growing problems by better organizing regional trade in wood and transport, as well as by introducing energy-saving techniques and exploiting nearby fuel substitutes such as peat and soft coal. The written correspondence between Regensburg and other towns offers ample evidence of how frequently such resource management issues were discussed. They also demonstrate a prevailing view in which wood was seen as a limited natural resource, thereby limiting the region's economic development until the coming of the railway network, which allowed Regensburg to extend its supply system for hard coal. In addition, the trade and manufacture of wood products was a significant factor in stimulating Regensburg's economic development in the nineteenth century. This may seem contradictory but can be explained by specific regional circumstances.

Urban Wood Supply and Urban Environmental History

For decades, historical research did not pay much attention to the question of wood supply. While A. H. Cole (1970) characterized the marketing of wood for fuel in nineteenth-century America as an "economic activity in need of a historian,"¹¹ it was Joachim Radkau who explained why the wood supply of preindustrial European cities had been of little interest to historians.¹² Urban historians, Radkau argued, often concentrated their research on issues inside a town's walls and failed to consider the way that cities were interconnected in networks of trade, supply, food and waste disposal.¹³ Political and forest historians were interested in the modern territorial state and state forest administration, seen as the "winners" of the political, social and economic transformation taking place during the late eighteenth and early nineteenth century. In 1993 Martin Melosi called for an environmental approach to urban history: "What remains to be done is . . . [to] broaden the work of the internalist scholars to extend the study of growth, infrastructure and pollution well beyond the city limits, and second, coax the scholars of humans and the natural world into the cities."¹⁴ Clearly, his appeal has been heard on both sides of the Atlantic. The third international conference on urban history in 1996 focused on urban energy supply.¹⁵ In this context Joachim Radkau tried to solve the preindustrial "mystery of urban firewood supply" by defining different types of cities with regard to the different situations they had to deal with when managing their supply.¹⁶ The environmental history approach in urban history continued to gain in significance with further research.¹⁷ Based on the work of the Deutsche Forschungsgemein-

schaft project, *Holzversorgung als kommunale Aufgabe. Stadt und Wald im 18. und 19. Jahrhundert*, a conference in 2001 focused on southern Germany and Austria from 1750 to 1850, comparing problems and developments in urban wood supply in towns of different size, geographical situation and legal status.¹⁸ Freytag and Piereth outlined the different fields of problems and politics associated with urban wood supply, particularly in the nineteenth century. These included: economic changes, such as deregulation, liberalization, new common markets (*Zollverein*) and industrialization; state-building, including the integration of former independent cities into new territorial states and the conflict over communal constitutional rights; social policy, including communal and governmental responsibilities in dealing with urbanization, demographic growth and pauperism; and resource management issues such as forest policy, the discourse regarding wood shortages and the substitution of fuel wood.¹⁹

Adopting Reinhard Koselleck's famous term, Günther Bayerl characterized the eighteenth century and its utilitarian view of nature as a "*Sattelzeit*"²⁰ (a transitional phase between two epochs), providing the intellectual base for the new dimensions of industrialized exploitation realized in the late nineteenth and twentieth century.²¹ The regional evidence concerning Regensburg's wood supply suggests the late eighteenth and nineteenth century was a "*Sattelzeit*" in European urban environmental history. The city's management of major processes of political, social and economic transformation has to be seen as closely connected to its resource management and its view of natural resources.

This article provides a short outline of the different stages of Regensburg's development, as outlined above, and discusses the city's policy and the documented discourse on resource management. In this context the article discusses the coexistence of—even the struggle between—factors of conservation and stability with those of innovation—"die Gleichzeitigkeit des Ungleichzeitigen," in the words of Reinhart Koselleck.²² In addition to recognizing the vital role that issues of social organization play in dealing with natural resources and urban development, this article also incorporates the results of research in the economic and political history of Regensburg in the period under discussion.

A City Without a Hinterland

For centuries, the early modern imperial town of Regensburg was an independent enclave surrounded by Bavarian territory. The Bavarian princes, however, never entirely accepted the loss of their former medieval capital. As a consequence, they kept trying to regain the city, both through warfare and by exerting political and economic pressure.²³ Due to these political circumstances, as well as to the small size of its own

territory, Regensburg's supply of any kind of forest and agricultural products was the source of constant problems and frequent crises. Regensburg's building authority (*Bauamt*) was responsible for the city's wood supply and also organized the wood trade, but its scope was limited; in the late eighteenth century, for example, the *Bauamt's* activities in trading construction wood were terminated.²⁴ Blockading Regensburg's import of cereals or wood was a normal instrument of Bavarian politics toward the town, during the Thirty Years' War and the eighteenth century alike.²⁵ In the mid eighteenth century Regensburg was surrounded by a belt of newly erected customs checkpoints. The new Bavarian customs order, introduced in 1765, brought further restrictions.²⁶ In 1768, a Bavarian wood depot was erected on the banks of the Regen River near the village of Reinhausen. From now on the major part of the wood that was destined for the town was no longer allowed to be unloaded at Regensburg's central *Holzlande*.²⁷ Instead, the Bavarian government dictated that the wood had to be landed at the Bavarian depot.²⁸ In addition to their impact on imperial Regensburg, the Bavarian restrictions also affected the Holy Roman Empire's diet situated in Regensburg and its resident diplomats. The situation escalated in 1771–72, when considerable political pressure throughout the *Reich* was necessary to force Bavaria to loosen its restrictions.²⁹

By the eighteenth century, Regensburg, in essence, existed without a hinterland. In this era even a coach trip outside the city's boundaries was subject to a special tax ("*Promenadesteuer*").³⁰ When provisioning wood, the most common experience for Regensburg's inhabitants was not contact with woodland or foresters, but with Bavarian customs officers. And that was a risky undertaking, as Regensburg's complaints to the Bavarian elector Max III Joseph (1745–1777) prove.³¹ In 1767, a cartwright from Regensburg bought an oak tree from a farmer in the hinterland and paid 3 fl.³² Following the Bavarian customs order he had to pay 58 x.—almost one third of the price—in tax for the import of one tree. But, to render the transport easier, the tree had been cut into three pieces. As a consequence, the customs officer demanded a tax more than three times higher: 2 fl. 56 x.—almost 100 percent of the price. Under these circumstances the deal fell through and the farmer went home with the timber while the cartwright was left empty-handed. When Regensburg's cartwrights addressed their demands for wood to the town's bishop, whose Donaustauf and Wörth forests, though not situated far from the town, were separated from it by Bavarian territory, they pointed out that they could not get the material from anywhere else.³³ But even the bishopric practiced an increasingly severe export policy against the city, although its own foresters confirmed that the actual amounts of exported wood did not harm the development of the forests.³⁴

In the summer of 1768 Gottfried Ziegler, a joiner, had an experience with Bavarian customs officers quite similar to that of his cartwright colleague in 1767. Upon purchasing 103 planks of oak in Vohburg, a small market place about 55 km away from Regensburg, the local administration granted him permission for the export. However, the transport was stopped at the customs checkpoint of Abbach near Regensburg. The Bavarian customs officers did not allow Ziegler to import the wood into the city. Like Regensburg's coopers before him, the joiner was told that he was obliged to get his supply from the Bavarian timber depot of Lechhausen near Augsburg and therefore he had to address Anton Ott, a timber merchant from Schongau. What made Abbach's officers refuse the export? And why did they refer to a timber depot situated more than 100 km away? Following a mercantilist program and a policy of forest protection known as *Waldschutzpolitik*,³⁵ Bavaria had installed a system of strict export controls for wood, one which was not directed only at Regensburg. In 1748 the Lechhausen timber depot was constructed in order to control the supply of the imperial town of Augsburg as well as the wood trade on the river Lech, which flows into the Danube and was therefore connected to the most important waterway for exporting wood from Bavaria towards Vienna.³⁶ Anton Ott, a river driver and wood merchant engaged in the *Taufelholz* (oak used for the fabrication of barrels) trade, had been given a contract, written in 1768, giving him a monopoly on trade with any kind of construction timber (*Schnitt- und Taufelholz*) derived from oak. The clear intention was to take the wood trade out of its regional context and to establish a centralized control mechanism over all relevant activity in the country. A small enclave like Regensburg, therefore, became a victim of the broader socioeconomic and environmental program of the Bavarian state.

Since Regensburg effectively had no hinterland, urban life was disconnected from the forests outside the town's wall. As a result, the majority of people living in the town experienced a certain alienation from the forests from which they received their wood. Their relationship to wood as a material for fuel and construction purposes was primarily one of consumers facing a constantly difficult supply. The urban alienation from the origins and production of natural goods—here founded on political circumstances—seems like a blueprint of many people's experience in modern industrialized and urbanized societies. But there is also a spatial dimension to this alienation; because of the town's political situation vis-à-vis its hinterland, in the seventeenth and eighteenth centuries few of Regensburg's citizens had much experience with the local forests. There was no forest in the city's territory where walking (*Spazieren*) could develop as part of urban leisure culture as it did in the hinterland of other early modern cities.³⁷ The circumstances in the city were far from those in

Nuremberg, where a baroque garden culture developed outside the city walls under the control of the city's forest authorities.³⁸ The greatest concentration of trees in Regensburg's territory in the late eighteenth century was not in a forest, but rather on an avenue granted to the city by the German Emperor's first commissioner (*Prinzipalkommissar*) at the Empire's diet, Carl Anselm von Thurn & Taxis, in 1779.³⁹ Planted between 1779 and 1785, two parallel lines of approximately 1,500 trees followed the outside of the town's wall. Regensburg's citizens and magistrate gratefully printed a medal addressed to Thurn & Taxis in recognition of the contribution his gift had made to urban life by facilitating "public walking" ("*ob additum urbi ambulationis publicae*").⁴⁰ Regensburg's authorities also organized projects on the Danube islands, *Oberer Wöhrd* and *Unterer Wöhrd*. On the *Oberer Wöhrd* the city's *Bauamt* planted a tree-lined avenue as early as 1654, and on the *Unterer Wöhrd* three lines of 27 oaks were planted in 1781.⁴¹ When Regensburg's authorities started to plant avenues, which Hans Walden has characterized as "public green spaces created for the purpose of leisure and to offer the illusion of an urban forest," they were not merely transforming the landscape by reshaping an existing constellation of woodland and open land; they were, in fact, constructing the green parts of the urban secondary environment. But even this could not be realized with the city's own natural resources. When the masters of Regensburg's cooper trade granted Regensburg several hundred willow trees in 1783, they had to import them from Nuremberg.⁴²

The Principality's Capital

When Karl Theodor von Dalberg assumed the office of *Fürstprimas* in 1802/03, he created a forest office as part of the principality's government, thereby formally addressing the issue of the town's wood supply. As a result of the regulations of the *Reichsdeputationshauptschluss*, promulgated in 1803, the former archbishop of Mainz and archchancellor of the Holy Roman Empire received a newly created territory around the principalities of Aschaffenburg and Regensburg and the earldom of Wetzlar. The Regensburg principality consisted of the former bishopric, the former imperial town and the monasteries formerly subject to the Empire.⁴³ In the new Regensburg territory, Dalberg was confronted with three fundamental issues: he inherited a bankrupt city with approximately 1.5 million fl. of debt;⁴⁴ he gained the former bishopric with its huge and potentially valuable forests;⁴⁵ and finally he was confronted with the geographical handicap of a town that was still surrounded by Bavarian territory and that the Bavarian government was keen to absorb.⁴⁶ Fol-

lowing a rationalist political and economic program, Dalberg's first priority was to consolidate the state's finances by establishing efficient administrative structures and improving the territory's economic power.⁴⁷ To this end approximately 51,000 *Tagwerk* of forested property were subject to particular attention by the new forest authority.⁴⁸ Following the economic principles of the new forest science,⁴⁹ woodland was measured and estimated and a new forest commissioner named Oelschläger collected information on the principality's forests and planned their future organization.⁵⁰ A manual was purchased for Dalberg's foresters and the seeds of forest plants were imported from Tirol.⁵¹ Although the Dalberg administration attempted to manage the state forests from a strictly economic point of view, it also tried not to neglect traditional rights of usufruct, the requirements of agriculture and rural society and Regensburg's urban wood supply. However, the removal of forest litter for agricultural use, for instance, shows a certain governmental naivety toward resource management in everyday agricultural life. While Oelschläger claimed that the transfer of litter from the forest to arable land could not be completely stopped, Dalberg insisted that the litter was necessary for a healthy forest and that it should only be taken from hollows where wind had piled up the material.⁵² As far as the capital's wood supply was concerned, government policy tried to harmonize the state's fiscal interests with those of wood traders and urban consumers. When the Dalberg government planned to augment the forest tax (*Stammrecht*) for wood which was sold from the forests near Donaustauf and Würth to the principal town of Regensburg and the Bavarian town of Straubing, Oelschläger carried out a careful study to estimate the costs that arose from cutting the trees, the transportation of the wood to the Danube river, loading and shipping, losses on transport, unloading and transport within the city.⁵³ His calculations clearly show that he was not only interested in the state's potential profits, but that he was also conscious of the possible consequences that changes in the tax code might have for Regensburg's wood trade.⁵⁴ Therefore, he suggested only a minimal increase in the forest tax (*Stammrecht*) for coniferous wood, where there was only a small profit to be made by Regensburg's timber traders, but a more significant increase for beech.⁵⁵

In the end, the forest's value as a financial resource outweighed its social welfare function. The Dalberg administration's most notable project dealing with the principality's forest resources was outlined in the instruction for the new Deputation of Commerce (*Kommerzien-Deputation*) in December 1808.⁵⁶ The instruction assumed that the Dalberg state held approximately 50,000 *Morgen* (approximately 31,500 acres) of forests. The population of the duchy of Regensburg was estimated at 26,000. According to this document, the average inhabitant of the duchy consumed half

a *Klafter* of hard wood and one *Klafter* of soft wood including the equivalent amount of small pieces of wood, burl wood and brushwood per annum. The further assumption was that one *Morgen* of forest provided an average of one *Klafter* of soft wood and half a *Klafter* of hard wood per annum. The result of the calculation was that 25,000 to 26,000 *Morgen* of forest would be enough to supply the principality's inhabitants with wood. The estimate took into account further factors that could diminish the area of woodland suitable for clearing: forests in poor condition, usufruct rights and forests situated in areas not suitable for agriculture. Finally authorities calculated that 10,000 *Morgen* could be transformed into pasture and arable land. For the following ten years, authorities advocated cutting approximately 1,000 *Morgen* annually, thereby increasing annual forest earnings from 40,000 fl. to 100,000 fl. The Deputation of Commerce, according to the plan, would sell the wood and organize the new system of awarding and exporting Regensburg's artisanal products. Parts of the *Frauenholz* near Kelheim were slated to be cleared first, while the owners of forestal usufruct rights were to be compensated with woodlands in the immediate vicinity. Also, since the *Frauenholz* was situated on Bavarian territory, the Bavarian authorities had to be persuaded of the plan's desirability.⁵⁷ The anticipated gain from the project was that it would discharge the principality's debt burden as well as stimulate the local economy.

From the records we know that the clearing of forests was indeed initiated, but the Napoleonic Wars prevented the proper use of the timber. On April 23, 1809, parts of the city, occupied by Austrian soldiers at the time, were severely damaged and burned by Napoleon's troops. A total of 135 buildings were destroyed during this incident.⁵⁸ Under these circumstances the wood taken from the *Frauenholz* could not, as projected, be used as a stimulus to local production. Instead, the entire supply was used for the reconstruction of the damaged districts.⁵⁹ Due to the war, as well as to the absorption of Regensburg into Bavaria in 1810, it is not possible to judge the long-term economic outcome of Dalberg's policy of boosting trade and economic growth through forest clearance. However, conclusions can be drawn concerning the relationship between the city and regional forests under the influence of Dalberg's policy. The urban economy was the key issue in the duke's economic and political planning and as a result the management of the regional forests was reorganized along strictly utilitarian lines. Like the agricultural hinterland, woodlands had to serve the state's financial needs and urban economic development. Under such circumstances, the city could benefit from a relatively secure timber supply even if Bavarian restrictions still presented something of an obstacle to bringing wood into town.

City and Territorial State

There is no indication that Bavarian authorities continued with Dalberg's ambitious project. Nor is there any evidence that suggests that the Bavarian state was particularly interested in Regensburg's wood supply. The above-mentioned files documenting the negotiations over the erection of a wood depot in the 1830s testify to a struggle between the state and the city over the control and obligations of the urban wood supply. The state's initial offer was clearly motivated by the intention of finding a regional customer for the huge amounts of wood that had been brought down by storms, though this intention was veiled by an expression of paternal social concern for the city's supply. As part of its 1830 restructuring proposal, the regional Department of Internal Affairs (*Regierung des Regenkreises—Kammer des Innern*) suggested the possibility that the state could, if necessary, establish and run the depot under its own direction if the city offered the required territory.⁶⁰ However, the Department of Finance (*Regierung des Regenkreises—Kammer der Finanzen*), which was responsible for the administration of forests, was less amenable. The only thing it agreed to was selling the wood at the price of the forestal tax and accepting payment in installments.⁶¹ Arguing that after removing the storm-cracked wood from the forests there would be no wood production and sale from these forests for several years,⁶² the state authorities made clear that their actions followed the conditions of a market economy. In this context, it is important to note that the state was an actor within the market, not just an institution controlling it and defining the legal framework. In many nineteenth-century German territories the state was the biggest owner of woodland and therefore had a virtual monopoly in supplying wood to the market. Based on his studies on the Bavarian policy in the Rhine Palatinate (which was part of Bavaria from 1816 to 1940), Bernd-Stefan Grewe notes that during the early nineteenth century the motive of economic gain outweighed the motive of social obligations within the wood marketing policy of the state's forest administration.⁶³ The forest administration increasingly used auctions in order to improve revenue and guided the price policy among private merchants. However, Grewe sees no evidence that shortage of supply was used intentionally in order to inflate prices. But this was exactly what Regensburg's urban authorities blamed the state's forest administration for in 1837.

In 1830, urban authorities were not yet ready to take the economic risk of building a communal wood depot that would guarantee the wood supply for the urban population. They pointed out that they actually had to compete with a price level of 4 fl. 39 x. per *Klafter* offered by private merchants at the city's *Holzlande*. The state had demanded a forest tax of 2 fl. 42 x. for the wood that was taken from the *Frauenholz* near Kelheim

and affirmed that it could be sold at Regensburg's *Holzlande* for 5 fl. 30 x. to 6 fl.⁶⁴ In contrast, a commission of the magistrate, having visited the *Frauenholz*, estimated that the wood, which was described as very solid, could not be sold in Regensburg for more than 4 fl. Apart from that, the commission complained that the pathways were in a bad condition and the *Klafter* had been loosely assembled (*sehr durchsichtig aufgerichtet*).⁶⁵ In addition to setting a low tax, providing delivery to the *Holzlande* and enabling payment in installments, the commission recommended that the state should also provide the palisade wood needed for fencing the depot.⁶⁶ The magistrate found one private wood merchant particularly irritating. This merchant insisted, somewhat polemically, that the state would only win and the city could only lose in this deal.⁶⁷ According to the author of the study, wood marketing did not pose any risk to the state. The state already possessed the wood, could organize cheaper opportunities for transport and more efficient measures of security against theft. The Chamber of Finance made evident the state's priorities when it declined the city's conditions, characterizing them as not being beneficial to the state but only beneficial to the local population.⁶⁸

During the following years the Bavarian state was unable to outline a clear position for dealing with the communal wood supply. The question of urban wood supply in the German *Vormärz* was closely related to political tensions after the 1830 revolution in France, the economic consequences of the *Zollverein* free trade system (founded in 1834) and population growth in many cities.⁶⁹ Facing extreme price rises for fuel wood, contemporary authors reminded the state of its obligation to ensure the welfare of the poor. Wolfgang Piereth has noted that wood was the only indispensable good which was owned by the state in considerable quantities.⁷⁰ The Bavarian government was in fact concerned about the social and political instability arising from the fuel wood issue. A commission and a special officer (Franz Berks at the Ministry of Internal Affairs) were charged with observing the market.⁷¹ The regional district governments were ordered to communicate instructions for an efficient use of communal forests and optimized wood supply. They were also supposed to ask the communal authorities for reports about the management of communal wood, the steps taken for economizing fuel wood and the possibility of introducing wood substitutes. The correspondence between the regional government of the Regen District and the magistrate of Regensburg show how the state's bureaucratic activities did not take specific regional frameworks into sufficient consideration. On behalf of the central government in Munich, the regional government decreed that the Regensburg magistrate promote an earlier start to and an intensification of the wood harvest in the communal forests. Local authorities were also charged with ensuring that the poor were supplied with wood at an

affordable price.⁷² In his response, the magistrate noted that the city did not possess any communal wood and therefore the supply of cheap wood could not be guaranteed without help from the state's authorities and the state's nearby forests.⁷³ The second governmental decree gave several orders to be realized immediately: the search for and exploitation of nearby deposits of peat, soft coal and hard coal; the introduction of energy-saving ovens and stoves; the introduction of public common stoves for bakers; the installation and management of markets for the wood trade where necessary; and the abolition of intermediate trade and speculation in wood.⁷⁴ The regional government demanded the magistrate report on the status of these points within eight days.

Regensburg's response to these decrees does not enable us to judge whether the city's *Holznot* was a real or merely a rhetorical phenomenon.⁷⁵ A letter from Heinrich Wilhelm Sondermann, one of Regensburg's city district mayors, provides strong evidence that a syndicate of local traders who restricted the delivery of wood to the town was largely responsible for the price rises.⁷⁶ The city's letter provides us with three important pieces of information.⁷⁷ First, in the late 1830s fuel wood prices in Regensburg had reached a level critical enough to raise concerns with the communal authorities. Second, Regensburg's authorities tried to avoid a wood shortage by using substitutes and energy-saving technical innovations. The letter noted that the magistrate and the Council of Social Welfare (*Armenpflegschaftsrat*) had bought 100,000 pieces of peat in Neuburg/Danube (approximately 90 km upstream from Regensburg). Twelve thousand pieces were sent in one early transport. Although there were no coal deposits within the city's territory, the report mentioned the private initiative of a soft coal mine near Kneiting, northwest of the city, which was characterized as being unprofitable for the shareholders. In the city's institutions for social welfare (*Armenanstalten*), tiled stoves had been replaced by iron circular ovens (*Circular-Öfen*). The city also reported an increase in purchases of energy-saving stoves among the town's citizens, but rejected the idea of introducing public baking ovens as impractical. The third important piece of information from the city's report was the ongoing feud between the state and the city concerning the state's influence on and responsibility for the communal wood supply. Apart from the speculation of local wood merchants, the magistrate lists several reasons for rising prices that were related to the state's policy. These included: a reduction in wood production from the public forests after the windstorms of the early 1830s; the wood consumption of the brick kilns in Ingolstadt, approximately 70 km upstream from Regensburg, where the state was building huge military plants; and finally speculation on the opening of the channel connecting the Main and the Danube, a project related to the state's infrastructure policy. The magis-

trate concluded its analysis with a very specific demand: that the state's police and forest authorities in the Kelheim region deliver their hoards of wood to the Regensburg market. By doing so they could show local consumers the true price of wood ("*die wahren Holzpreise*") and wood merchants the limits of their practices ("*den Holzhändlern so Schranken aufzeigen*"). The lack of consistency in the state's policy can be seen in further discussion of the possible construction of a wood depot: whereas the state's internal affairs authority continued to demand the erection of a timber depot under the city's direction,⁷⁸ the state's regional forest administration refused to play a constructive role in this issue, and later tried to benefit from wood auctions and intermediate trade.⁷⁹

City and Wood

The magistrate's report from 1837 also mentions a growing consumption of wood by a growing number of local industries, including a sugar refinery, a steam shipyard, a porcelain factory and a pencil factory. But Regensburg did not participate in the process of economic and industrial development, demographic growth and urbanization to the same extent as other southern German cities during the first half of the nineteenth century. Economic historian Karl-Heinz Preißer has characterized the industrial development of the Upper Palatinate Region in the nineteenth century—including Regensburg—as a case of "retarded industrialization" (*zurückbleibende Industrialisierung*).⁸⁰ Unlike the Bavarian capital of Munich or the Franconian metropole Nuremberg, where the population doubled in the first half of nineteenth century, Regensburg saw only moderate growth. Between 1812 and 1852, the population grew from 18,374 to 25,898.⁸¹

Comparing Regensburg's fuel wood consumption of the late eighteenth century with figures from the 1830s reveals considerable stability: following Bavarian figures, the imperial town of Regensburg in the year 1770 imported 25,656 $\frac{3}{4}$ *Klafter* of fuel wood, 19,198 $\frac{1}{4}$ *Klafter* from Bavaria and 6,458 $\frac{1}{2}$ *Klafter* from other territories.⁸² In Bavaria 5,628 *Klafter* were cut in the district of Zwiesel in the *Bayerischer Wald* and floated down the river Regen.⁸³ Due to ongoing discussions about the installation of an urban wood depot in the late 1830s, data was also collected in 1837. The magistrate had carefully investigated the annual amount of fuel wood needed by private households, artisans and industry, public authorities and schools. It concluded that the city—not including the Thurn & Taxis court⁸⁴—needed 27,491 *Klafter* in total, 7,503 *Klafter* of which were consumed by breweries and factories, with 918 *Klafter* required for public offices and social welfare.⁸⁵ This was not a particularly substantial rise compared to the amount documented in 1770.

As a result of its comparatively retarded growth and industrializa-

tion, Regensburg's wood supply may not have played the same crucial role as in other regions during the first three decades of the nineteenth century. The Franconian problem of wood shortage and rising prices after the foundation of the *Zollverein* free trade zone in 1834, which saw a substantial increase in wood exports towards the more industrialized Rhine-Main region and further northwest,⁸⁶ had a delayed effect on Regensburg's wood market. According to the Regensburg magistrate, speculation in wood prices, fueled by the imminent construction of the Donau-Main Canal, began to increase considerably. By 1845, the completion of this project made it possible to transport huge amounts of wood from the *Bayerischer Wald* westward.⁸⁷ In the opinion of city-district mayor Heinrich Wilhelm Sondermann, the rising prices were clearly due to speculation or, in his colorful phrase, to "*Kunst und Wucher*."⁸⁸ For this reason, the city's authorities opened a second wood landing on the *Unterer Wöhrd* and once more intensified their planning for the construction of a public wood depot. This intervention into the local wood trade was meant to ensure the city's supply and help maintain affordable prices. But the development of a communal policy also had a further goal: to improve fire prevention by concentrating fuel wood storage for private households, businesses and public institutions outside the city. Beside the internal investigations of the town's wood requirements, the city's authorities also wanted to gain insight into the experiences of other cities with interventionist wood marketing practices. They addressed letters to Augsburg, Bamberg, Munich, Passau, Nuremberg, Würzburg and Mainz, asking the cities to report back on several matters: whether their wood depots were organized as private or communal enterprises; whether they were designed exclusively for trading or also for storage; what their storage capacities were; what the tax on storage was; what costs arose for administration; whether the institutions succeeded in avoiding speculation—"*Holzwucher*;" and what price level was in line with the price level of private trade.⁸⁹ The responses indicate that each city chose very different strategies depending on the different regional environmental, economic and political frameworks.

In the first half of the nineteenth century Regensburg was not able to construct as large a wood depot as many had hoped. The foundation of a private association (*Holzverein*) similar to that in Mainz was also unsuccessful. But another private initiative gained importance. The merchant Simon Maier-Loewi had bought a huge area of woodland near Zwiesel in the *Bayerischer Wald* and in 1840 began to float logs down the river Regen. He tried to accelerate the planned extension of the Regen and offered to cooperate with the city in organizing the float and the sale of wood in Regensburg for a moderate price.⁹⁰ Maier-Loewi's initiative promoted the specific regional development of wood transport in the second

half of the nineteenth century, a development which proved remarkably advantageous to the city's wood supply and prices. The state took constructive measures to make the river Regen more accessible for wood transportation. As a result, Maier-Loewi and, later, other private merchants, organized mass log floats on the Regen. From 1859 onward, the state also began to organize large log floats, bringing thousands of *Klafter* of fuel wood and timber into town. After 1855, Regensburg had its own landing point on the banks of the river Regen in the village of Steinweg. Between 1853 and 1862, the city organized its own campaigns to float logs downriver for fuel wood and timber.⁹¹ Unlike the state's forest administration near Regensburg, the one in the *Bayerischer Wald* offered huge amounts of wood for a moderate forestal tax. Now the city could not only manage its own supply; it also gained importance as a log reloading point, first to the Ludwig-Main Channel and later to the railway system. Due to this specific development, the wood processing industry became a nucleus of regional industrial and economic development in the second half of the nineteenth century.⁹²

Resource and Transport

The study of Regensburg's wood supply history makes one point very clear: whether we examine the restrictions against Regensburg's coopers in the eighteenth century, the permission of Dalberg's authorities for a citizen from Donaustauf to export charcoal from the local forests to Vienna in 1804⁹³ or the work of the pencil factory Rehbach (established in Regensburg in 1821), which was interconnected with a global network of supply (cedar wood) and distribution,⁹⁴ the wood supply issue is never limited to just the local context. Questions of regional forest use and forest development were linked to the fields of regional and supraregional wood marketing, politics and transport. For geographical and political reasons water transport was a factor of strong and lasting influence on Regensburg's wood supply. In the eighteenth century the fact that transport on the river Danube provided the most significant way of exporting wood from Bavaria provoked the Bavarian state to seize control over this waterway and the cities situated on its shore. The advantages of rivers—which for a long time were the most efficient paths for the transportation of wood—came at the cost of enormous amounts of construction wood required for building and maintaining bridges, landing points and bank reinforcements.⁹⁵ Since the wood landing and storage areas were inevitably situated next to the river, they were frequently affected by floods and ice floes that flushed the hard-won wood away. Furthermore, regardless of the political constellation in any given place, the entrepreneurs engaged in the wood trade in any period were highly influential in determining the local wood supply, and they frequently abused this power.

The coming of the railroad was also an important factor in the history of Regensburg's wood supply. The region's eventual interconnection with the new railway transportation system in 1859 was not a linear process of innovation, but rather a development caused by a variety of different factors. At first, the policy of the Bavarian King Ludwig I (1825–1848), who preferred the construction of waterways, avoided the early linking of the region to the railway system. At the same time, huge amounts of wood needed for the construction of the Austrian railway system were floated towards Austria on the Danube.⁹⁶ The development of upstream transportation by steamship on the Danube, Regensburg's connection to the railway system, and the linking together of Bavarian and Bohemian railways in 1862 changed the framework of the city's local wood supply as well as its trade relations. Imports of cheap Bohemian hard coal and construction wood from Southeastern Europe now reached the region. Apart from this, however, the use of regional wood, floated to Regensburg on the river Regen, remained an important part of the communal supply until the early twentieth century.

Conclusion

When examined from a historical perspective, Regensburg's wood supply is part of a broader web of social, economic, political and ecological relationships. These include: aspects of communal policy, regional forest management and development, the surrounding territorial state's politics and regional and supraregional wood marketing and transportation. Urban development in the late eighteenth and nineteenth century was influenced by the fundamental process of political, social and economic transition that changed the face of European societies and economies and established—an important point in terms of environmental history—the fossil-fuel energy regime. The way the city's representatives organized the city's supply of fuel wood and timber has to be discussed in this specific context. Does the issue of urban wood supply in the eighteenth and nineteenth century qualify as an indicator of a transition period, a "*Sattelzeit*" in urban environmental history? The development of Regensburg's wood supply, as it has been analyzed in this article, seems to offer a fitting example for supporting this assumption.

The study of Regensburg's wood supply also confirms Günter Bayerl's argument that attitudes toward nature became increasingly utilitarian in eighteenth-century Europe, thereby providing the intellectual base for a new dimension of industrial exploitation in the nineteenth and twentieth centuries. The process of wood's commercialization (wood as a raw material as well as woodland as a part of the landscape) de-

terminated the state's policy in Bavaria during the late Old Regime as well as in Dalberg's principality and in the nineteenth-century Bavarian kingdom.⁹⁷ Nineteenth-century Regensburg, which no longer existed as an independent political entity, insisted on the state's traditional obligations concerning the city's supply but met a Bavarian state that—more than the short-lived Dalberg regime—had difficulties in balancing social responsibility with economic interests arising from its possession of wood. Both the state and local governments failed to find a consistent strategy between interventionist and market economist options.⁹⁸

In broad terms, the history of Regensburg's wood supply can be seen as a struggle between the desire for conservation and stability on the one hand and the need for change and innovation on the other. At the very time when the construction of the Austrian railway system required enormous amounts of wood, much of which was transported down the Danube from Bavaria, King Ludwig I's rather romantic distaste for railways and his promotion of the channel building project connecting the Danube and the Main delayed Regensburg's linkage to the railway system for one or two decades. On the other hand, Simon Maier-Loewi's successful private initiative of the mid nineteenth century was based on a rather conventional transport option: floating the logs that were harvested in the mountains of the *Bayerischer Wald* region down the river Regen. The initial refusal of Regensburg's magistrate to cooperate with Maier-Loewi needs to be seen in the same context as the long-running dispute over the establishment of a wood depot. It cannot be adequately characterized as a careful and provident strategy or a form of communal protest against the state's politics; rather, it illustrates the inability of traditional communal politics to react adequately to changing requirements in resource management.

Since the Middle Ages, Regensburg's ecological footprint has extended well beyond the region over which it had political control.⁹⁹ The fact that urban resource management officials were unable to manage the areas from which the town drew its wood supply meant that they were constantly exposed to the influence of external factors. These circumstances differed from those that determined other cities' wood supplies. A comparative study of urban resource issues would likely demonstrate that a city's supply of natural resources plays an integral role in the way it organizes its relationship with its natural environment under changing political, economic and demographic frameworks. Urban wood supply at the beginning of modernity, at the brink of the "networked city," is therefore a subject that deserves a closer look from an urban environmental history point of view.

Notes

¹ The administrative districts of the early nineteenth-century Bavarian kingdom were named after rivers. The river Regen flows from the mountainous regions of the *Bayerischer Wald* to Regensburg, where it meets the Danube.

² Karl G. Kick, "Städtische Sozialpolitik," in *Geschichte der Stadt Regensburg*, 2 vols., ed. Peter Schmid (Regensburg, 2000), 1:349.

³ As a measure of capacity, one Bavarian *Klafter* equaled approximately 3.13 cubic meters.

⁴ Magistrate of Regensburg to the government of the Regen District, Chamber of Internal Affairs, Regensburg, August 18, 1830, Stadtarchiv Regensburg (Municipal Archive of Regensburg, hereafter: StadtA Rgbg.) ZR-I 8107.

⁵ *Ibid.* See also Wolfgang Piereth, "Mitten im Holze aus Mangel an Holz kaum eine Suppe kochen können. Staatliche Forstpolitik und städtische Holzversorgung im vormärzlichen Bayern," in *Städtische Holzversorgung. Machtpolitik, Armenfürsorge und Umweltkonflikte in Bayern und Österreich (1750–1850)*, Beihefte der Zeitschrift für Bayerische Landesgeschichte, Reihe B, eds. Wolfram Siemann, Nils Freytag and Wolfgang Piereth (Munich, 2002), 141–154.

⁶ Government of the Regen District, Chamber of Finances, to the magistrate of Regensburg, September 11, 1830, StadtA Rgbg. ZR-I 8107.

⁷ *Ibid.*

⁸ Martin Knoll, "Regensburg, der Reichstag, der Kurfürst und das Holz. Aspekte eines Ressourcenkonflikts um städtischen Bedarf, reichspolitische Repräsentation und territoriale Wirtschaftspolitik im späten 18. Jahrhundert," in *Städtische Holzversorgung*, eds. Siemann et al., 39–54. Two views of Regensburg painted in 1725 by Samuel Friedrich Schmieder (1691–1771) show a hinterland that is dominated by open land. See Peter Schmid and Klemens Unger, eds., *1803—Wende in Europas Mitte. Vom feudalen zum bürgerlichen Zeitalter* (Regensburg, 2003), 377. A map of Regensburg's *Burgfrieden* drawn in 1765 by Jacob Sebastian Püchler shows the territory's borders separating it from any woodland; see image on page 79 of this article. For the development of the *Burgfrieden* and the conflicts arising around its borders, see Alois Schmid, *Regensburg. Historischer Atlas von Bayern/Altbayern* 10 (Munich, 1995), 147–151.

⁹ Michael Scherm, *Zwischen Fortschritt und Beharrung. Wirtschaftsleben und Wirtschaftspolitik im Regensburg der Dalbergzeit* (St. Katharinen, 2003), 242–246. I also want to say thank you to Michael for his help with smoothing out the worst linguistic kinks in this text.

¹⁰ For Bavarian state policy, see Piereth, *Mitten im Holze*, 148–152.

¹¹ A. H. Cole, "The mystery of fuel wood marketing," *Business History Review* 44 (1970): 359; See Joachim Radkau, "Das Rätsel der städtischen Brennholzversorgung im 'hölzernen Zeitalter,'" in *Energie und Stadt in Europa. Von der vorindustriellen 'Holznot' bis zur Ölkrise der 1970er Jahre*, ed. Dieter Schott (Stuttgart, 1997), 46.

¹² Radkau, "Rätsel," 44–45.

¹³ In 1979, a German conference discussed questions of supply and disposal in urban history for the first time. Rudolf Kieß' contribution to this discussion on urban wood supply did not transcend the then dominant forest history interpretation of early modern chaos followed by successful forestry and resource management guaranteed by the modern centralist state after 1800. See Rudolf Kieß, "Bemerkungen zur Brennholzversorgung von Städten," in *Städtische Versorgung und Entsorgung im Wandel der Geschichte*, ed. Jürgen Sydow (Sigmaringen, 1981), 98.

¹⁴ Martin V. Melosi, "The Place of the City in Environmental History," *Environmental History Review* 17 (Spring 1993): 19.

¹⁵ Schott, *Energie und Stadt in Europa*.

¹⁶ Radkau, "Rätsel," 48–61. Radkau's city types include: cities possessing their own large woodlands; cities where the geographical situation allowed the delivery of large amounts of wood via waterways; cities with mining industry or salt production; and cities that possessed the power to control the surrounding region and its natural resources. Kieß, "Bemerkungen," 79, had already introduced a more general distinction. He followed three leading aspects of urban wood supply: the question of resources, the legally defined opportunity to use these resources and the problem of transport.

¹⁷ For perspectives and state of research see Dieter Schott, "Resources of the City: Towards a European Urban Environmental History," in *Resources of the City. Contributions to an Environmental History of Modern Europe*, eds. Dieter Schott, Bill Luckin and Geneviève Massard-Guilband (Aldershot; Burlington, 2005), 1–27; Verena Winiwarter, "Plädoyer für eine Umweltgeschichte der Stadt," *Pro Civitate Austriae N. F.* 3 (1998): 7–15; Christoph Bernhardt, "Umweltprobleme in der neueren europäischen Stadtgeschichte," in *Environmental Problems in European Cities in the Nineteenth and Twentieth Century/ Umweltprobleme in europäischen Städten des 19. und 20. Jahrhunderts*, ed. Christoph Bernhardt (Munster; New York; Munich; Berlin, 2001), 5–23; Joel A. Tarr, "Urban History and Environmental History in the United States: Complementary and Overlapping Fields," in *Environmental Problems*, ed. Bernhardt, 25–39. Due to the fact that environmental problems occur in a more concentrated form in big cities with their dense populations and their industrial development, it seems that European metropolises up to now have attracted more scientific attention than smaller towns. For instance, in Germany, Hamburg has an extraordinarily well-examined environmental history. See Arne Andersen, ed., *Umweltgeschichte. Das Beispiel Hamburg* (Hamburg, 1990); Charles Closmann, "Modernizing the Waters. Water Pollution and the Harbor Economy in Hamburg, Germany 1900 to 1960" (PhD diss., University of Houston, 2002); Charles Closmann, "The Currency of Contamination. Industrial Wastewater and the German Hyperinflation in Hamburg, Germany," in *Dealing with Diversity. Second International Conference of the European Society for Environmental History, Prague 2003, Proceedings*, ed. Leos Jelecek (Prague, 2003), 180–182; Hans Walden, *Stadt—Wald. Untersuchungen zur Grüngeschichte Hamburgs* (Hamburg, 2003).

¹⁸ Siemann et al., eds., *Städtische Holzversorgung*.

¹⁹ Nils Freytag and Wolfgang Piereth, "Städtische Holzversorgung im 18. und 19. Jahrhundert. Dimensionen und Perspektiven eines Forschungsfeldes," in *Städtische Holzversorgung*, eds. Siemann et al., 1–8.

²⁰ Reinhart Koselleck, "Einleitung," in *Geschichtliche Grundbegriffe. Historisches Lexikon zur politisch-sozialen Sprache in Deutschland*, 8 vols., eds. Otto Brunner, Werner Conze and Reinhart Koselleck (Stuttgart 1972–1997), 1:xv.

²¹ Günter Bayerl, "Die Natur als Warenhaus. Der technisch-ökonomische Blick auf die Natur in der frühen Neuzeit," in *Umwelt-Geschichte. Arbeitsfelder, Forschungsansätze, Perspektiven*, eds. Reinhold Reith and Sylvia Hahn (Vienna; Munich, 2001), 50.

²² Reinhart Koselleck, *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten*, 2nd ed. (Frankfurt/Main, 1984), 323–325.

²³ Peter Schmid, "Ratispona metropolis Baioariae. Die bayerischen Herzöge und Regensburg," in *Geschichte*, ed. Schmid, 1:51–101.

²⁴ "Übersicht der Stadt-Bauamts-Functionen als Beantwortung der von der kurerzkanzlerischen hohen Landeskommission diesseitiger Behörde vorgelegten Fragen," Regensburg 1802, State Archive Amberg (hereafter: StA Amberg), Fürstentum Regensburg Geheime Kanzlei 83.

²⁵ Rainer Gömmel, "Die Wirtschaftsentwicklung vom 13. Jahrhundert bis zum Zweiten Weltkrieg," in *Geschichte*, ed. Schmid, 1:488; Wilhelm Kaltenstadler, "Bayerische Zollverfassung und Zollpolitik 1769–1777. Beiträge zur bayerisch-österreichischen Handelspolitik," *Zeitschrift für Bayerische Landesgeschichte* 30 (1967): 654–730; Roland Schönfeld, "Studien zur Wirtschaftsgeschichte der Reichsstadt Regensburg im 18. Jahrhundert," *Verhandlungen des Historischen Vereins für Oberpfalz und Regensburg* 100 (1959): 32–41.

²⁶ Knoll, *Regensburg*, 40–42.

²⁷ Wood from Bavarian production which was transported via waterway had to be landed at Reinhausen. This was the major portion of the wood consumed in Regensburg. See Knoll, *Regensburg*, 50.

²⁸ *Ibid.*, 48–51.

²⁹ Kaltenstadler, *Zollverfassung*, 662–675.

³⁰ Michael Kubitzka, “Regensburg als Sitz des Immerwährenden Reichstags,” in *Geschichte*, Schmid, 1:153.

³¹ Knoll, *Regensburg*, 45.

³² 1 *Gulden* (fl) = 60 *Kreuzer* (x).

³³ Applications to the bishop’s administration: Regensburg magistrate to Bishop Clemens Wenzeslaus, February 2, 1765, HStA Munich, Thurn und Taxis Abgabe 1974 30–1/70; Leonhardt Himler to bishopric’s “Hofkammer,” February 12, 1773 (praes.), Th. u. T. Abg. 31–2/8; Johann Conradt Heuerfeldt to bishopric’s “Hofkammer,” undated copy, before February 9, 1774, Th. u. T. Abg. 31–2/10.

³⁴ Forstamt Donaustauf to bishopric’s “Hofkammer,” Donaustauf January 25, 1786, HStA Munich Th. u. T. Abg. 30–1/82.

³⁵ Eckart Schremmer, *Die Wirtschaft Bayerns vom hohen Mittelalter bis zum Beginn der Industrialisierung* (Munich, 1970), 548.

³⁶ Knoll, *Regensburg*, 40–41.

³⁷ See Walden, *Stadt—Wald*, 393–401. Forensic records of Regensburg’s municipal archive report cases of Regensburg’s citizens being accused of going to regional woodlands to meet prostitutes there. Unfortunately no concrete locations are identified. In any case, whoever wanted to enjoy this kind of leisure activity had to leave the city’s territory. Thanks to Robert Grötschel for this information.

³⁸ See Gerhard Hirschmann, “Nürnberger Gartenkultur im Barockzeitalter,” in *Wald, Garten und Park. Vom Funktionswandel der Natur für die Stadt*, eds. Bernhard Kirchgässner and Joachim B. Schultis (Sigmaringen, 1993), 35–50.

³⁹ Eugen Trapp, “Beziehungs- und Grenzfragen. Regensburger Stadtbaugeschichte zwischen Aufklärung und Vormärz,” in 1803, eds. Schmid and Unger, 291–294. For the development of public green space in Regensburg between the seventeenth and nineteenth centuries, see Peter Morsbach, “Untersuchungen zur städtebaulichen Entwicklung Regensburgs in der 2. Hälfte des 18. Jahrhunderts,” *Verhandlungen des Historischen Vereins für Oberpfalz und Regensburg* 131 (1991): 145–149.

⁴⁰ Trapp, *Beziehungs- und Grenzfragen*, 292. However, Katharina Kellner indicates that the avenue was not created without conflict, as lower social classes were thereby prevented from engaging in their former practices of using the area outside the town walls for hanging their washing on clotheslines, collecting litter, grazing their goats, etc. See Katharina Kellner, *Pesthauch über Regensburg. Seuchenbekämpfung und Hygiene im 18. Jahrhundert* (Regensburg, 2005), 180–182.

⁴¹ Kellner, *Pesthauch*, 178; Trapp, *Beziehungs- und Grenzfragen*, 287.

⁴² Trapp, *Beziehungs- und Grenzfragen*, 287. Obviously the city’s nursery, first mentioned in 1779, could not deliver this number of trees. See Kellner, *Pesthauch*, 178.

⁴³ § 25 “Reichsdeputationshauptschluss,” in *Quellen zum Verfassungsorganismus des Heiligen Römischen Reiches Deutscher Nation 1495–1815*, ed. Hanns H. Hofmann (Darmstadt, 1976), 344–345. For a short survey of Dalberg’s principality in Regensburg, see Jürgen Nemitz, “Zwischen Reich und Bayern. Das Fürstentum Dalberg,” in *Geschichte*, ed. Schmid, 1: 285–298.

⁴⁴ Scherm, *Fortschritt*, 213.

⁴⁵ “Beschreibung des Fürstentums Regensburg im Jahre 1808 in nationalökonomischer und finanzieller Hinsicht,” § 20: “In dem Domäneneigentum des Fürstenthums Regensburg ist die Staatswaldung, welche von Stauf bis Straubing das Ufer der Donau begränzt, die schönste Perle,” cited from Scherm, *Fortschritt*, 186, note 712.

⁴⁶ "Bemerkungen über die geographisch-topographische Lage des immediaten Territoriums des Fürstenthums Regensburg nebst Vorschlägen zu einer künftig zu bestimmenden Grenze," Regensburg, October 4, 1803, StA Amberg Fsm. Rgbg. Geh. Kanzlei 254.

⁴⁷ See Scherm, *Fortschritt*, 186–205.

⁴⁸ 26,650 *Tagwerk* of this property were situated in the Dalberg territory, the rest was distributed over different regions under Bavarian reign, see report by forest commissioner Oelschläger, Regensburg, June 1, 1804, StA Amberg Fsm. Rgbg. Geh. Kanzlei 155. One *Tagwerk* measures approximately 0.34 hectares.

⁴⁹ Being equipped with both the traditional empirical knowledge of foresters and hunters and the economic and scientific skills taught at contemporary cameralist faculties, authors like Georg Ludwig Hartig (1764–1837) and Heinrich Cotta (1763–1844) are seen as the founders of forest science in Germany. Their aim was to provide a scientific and economic basis for forestry and to professionalize the education of foresters. In the late eighteenth and early nineteenth centuries the first forestal academies, offering forest science as a subject of higher education, were installed in different German territories. See Karl Hasel, *Forstgeschichte. Ein Grundriß für Studium und Praxis* (Hamburg; Berlin, 1985), 219–247.

⁵⁰ Ibid. A paper written by state council Benzel, Regensburg, July 23, 1803, which comments on Oelschläger's report, refers several times to the economic forestry principles of Georg Ludwig Hartig (1764–1837). For Hartig's biography and position in contemporary forest science, see Kurt Mantel and Joseph Pacher, *Forstliche Biographie vom 14. Jahrhundert bis zur Gegenwart* (Hannover, 1976), 1:250–259.

⁵¹ Forest commissioner Oelschläger reported on April 19, 1807, that in autumn 1806 the forest authority had ordered seeds from Wilhelm Nagel in Saalfelden (Tirol) and that 4 lb. of ash seeds, 2 lb. of stonepine seeds and 54 lb. of larch seeds were delivered to be grown in tree nurseries, HStA Munich Th. u. T. Abg. 29–1/49.

⁵² Report by Oelschläger, Regensburg, June 1, 1804, and Dalberg's comment on the Oelschläger report, Aschaffenburg, August 1, 1804, StA Amberg Fsm. Rgbg. Geh. Kanzlei 155.

⁵³ "Vortrag," Regensburg, January 2, 1807, HStA Munich Th. u. T. Abg. 29–1/44.

⁵⁴ According to Oelschläger, the forest tax for pieces (*Scheiter*) of beech wood in Donaustauf forests was 2 fl. 45 x. per *Klafter*, whereas the average price paid in Regensburg in 1806 was 8 fl. 16 4/5 x. Depending on circumstances the total sum of costs and fees could reach 3 fl. 46 x. and reduce the possible profit for the merchant in Regensburg to 1 fl. 45 4/5 x. The possible profit from trading coniferous wood only was 5 4/5 x.

⁵⁵ Oelschläger proposed that the forestal tax for 1 *Klafter* of pieces of beech should be augmented from 2 fl. 45 x. to 3 fl., the tax for billets (*Prügel*) of beech from 1 fl. to 2 fl., but the tax for coniferous wood only from 2 fl. to 2 fl. 6 x.

⁵⁶ "His Eminence is convinced that it is important and necessary for the welfare of His good city to improve the trade of its artisans at a time when income and wealth are diminished by the end of the Holy Roman Empire's diet and by a reduced cash flow from abroad, and at the same time the Bavarian customs system restricts trade with locations in the vicinity.

The most important thing is to reenergize the activity of local artisans by paying awards, which enable them to sell records of their application and ability more cheaply than is possible in other regions or cities.

The implementation of such a project particularly requires a source of money . . . for paying the awards.

Even if forests are important because they provide fuel for the inhabitants and the material necessary for a well developed wood trade, it is nonetheless a fact that if there are more forests than necessary for the needs of the population, a state must act appropriately in cutting those forests and changing woodland into pasture, arable land and farms, where grounds are adequate and soil is fertile."

Instruction, Kop., exped. Regensburg December 21, 1808, StA Amberg Fsm. Rgbg. Geh. Kanzlei 25.

⁵⁷ State minister Frhr. v. Albini was ordered to contact Bavaria's first minister Mongelas. Albini was to point out that Dalberg's project was quite similar to contemporary Bavarian efforts to sell state forest. Note, Regensburg, January 3, 1809, StA Amberg Fsm. Rgbg. Geh. Kanzlei 25; "Commissorium für den fürstl. Domainen- und Forstrath Aschenbrüher," Regensburg, January 1, 1809, StA Amberg Fsm. Rgbg. Geh. Kanzlei 25.

⁵⁸ Trapp, *Beziehungs- und Grenzfragen*, 317–318.

⁵⁹ Dalberg, Secret conference to the Deputation of Commerce, Regensburg (exped.), December 18, 1809, StA Amberg Fsm. Rgbg. Geh. Kanzlei 25.

⁶⁰ Regional government of the Regen District, Chamber of Internal Affairs, to Regensburg's magistrate, Regensburg, August 14, 1830, StadtA Rgbg. ZR-I 8107.

⁶¹ Regional government of the Regen District, Chamber of Finances, to Regensburg's magistrate, Regensburg, August 26, 1830, StadtA Rgbg. ZR-I 8107.

⁶² Regional government of the Regen District, Chamber of Internal Affairs, to Regensburg's magistrate, Regensburg, August 14, 1830 StadtA Rgbg. ZR-I 8107.

⁶³ Bernd-Stefan Grewe, *Der versperrte Wald. Ressourcenmangel in der bayerischen Pfalz 1814–1870* (Cologne, 2004), 345–367.

⁶⁴ Government of the Regen District, Chamber of Finances, to Regensburg's magistrate, Regensburg, August 26, 1830, StadtA Regensburg ZR-I 8107.

⁶⁵ "Anmerkungen," StadtA Regensburg ZR-I 8107.

⁶⁶ Regensburg's magistrate to government of the Regen District, Chamber of Finances, Regensburg, September 7, 1830, StadtA Regensburg ZR-I 8107.

⁶⁷ "Gutachten über die Anlegung eines Holz-Magazins," Regensburg, August 29, 1830, StadtA Regensburg ZR-I 8107.

⁶⁸ "Die dießfalls angebothenen Bedingungen sind solcher Art, daß dabey nicht der Vortheil des Aerars, sondern jener der hiesigen Bevölkerung vorherrschend seyn dürfte," government of the Regen District, Chamber of Finance, to Regensburg's magistrate, Regensburg, September 11, 1830, StadtA Rgbg. ZR-I 8107.

⁶⁹ See Piereth, *Mitten im Holze*, 143–144. The 1837 edict of the Bavarian government, forwarded to Regensburg's magistrate by the regional government on September 7, 1837, StadtA Rgbg. ZR-I 8107, specifies the following set of reasons for the actual rise in fuel wood prices: a growing population, an enlarged market due to the *Zollverein*, the unusually long-lasting cold temperatures of the previous winters and the management of communal forests, which supposedly was not done in the right way for several decades.

⁷⁰ Piereth, *Mitten im Holze*, 144.

⁷¹ Ibid.

⁷² Government of the Regen District, Chamber of Internal Affairs, to Regensburg's magistrate, Regensburg, November 11, 1830, StadtA Rgbg. ZR-I 8107.

⁷³ Regensburg's magistrate to the government of the Regen District, Chamber of Internal Affairs, Regensburg, November 16, 1830, StadtA Rgbg. ZR-I 8107. As a reply to this argument the regional government pointed out that the magistrate had not accepted the offer of constructing a wood depot and therefore had to manage the wood supply of the poor on its own. See Government of the Regen District, Chamber of Internal Affairs, to Regensburg's magistrate, Regensburg, January 6, 1831, StadtA Rgbg. ZR-I 8107.

⁷⁴ Government of the Regen District, Chamber of Internal Affairs, to Regensburg's magistrate, Regensburg, September 7, 1837, StadtA Rgbg. ZR-I 8107.

⁷⁵ See the definition by Christoph Ernst, *Den Wald entwickeln. Ein Politik- und Konfliktfeld in Hunsrück und Eifel im 18. Jahrhundert* (Munich, 2000), 327.

- ⁷⁶ Suggestion (“Vorschlag”) of the district mayor Heinrich Wilhelm Sondermann to the city’s magistrate concerning the rise in wood prices, Regensburg, June 1, 1837, StadtA Rgbg. ZR-I 8107.
- ⁷⁷ Report of Regensburg’s magistrate to the government of the Regen District, Chamber of Internal Affairs, Regensburg, September 20, 1837, StadtA Rgbg. ZR-I 8107.
- ⁷⁸ Government of Oberpfalz-District, Chamber of Internal Affairs, to Regensburg’s magistrate, Regensburg, June 12, 1841, StadtA Rgbg. ZR-I 8107.
- ⁷⁹ Forstamt Neustadt to Regensburg’s magistrate, Geisenfeld, May 18, 1838; Forstamt Kelheim to Regensburg’s magistrate, Kelheim, June 12, 1838; Forstamt Burglengenfeld to Regensburg’s magistrate, November 23, 1838, StadtA Rgbg. ZR-I 8107.
- ⁸⁰ Karl-Heinz Preißer, *Wirtschaftliche Entwicklung einer Region. Die Oberpfalz im 19. Jahrhundert* (Weiden; Regensburg, 1999), 21–22. Preißer analyzes the economic development of the Upper Palatine Region during the nineteenth century, studying indicators like number, size and technological standard of factories, the structure of regional trade, productivity and supraregional competitiveness of local industries, demographic development, capital investment, etc. From his data he argues that in this region there was a “zurückbleibende Industrialisierung” in comparison with other regions and that in the first third of the nineteenth century there were unsuitable preconditions for an industrial “take-off.”
- ⁸¹ Edward L. Shorter, *Social Change and Social Policy in Bavaria 1800–1860* (Cambridge, MA, 1967), 807. Shorter documents for the same period indicate a population growth from approx. 63,000 to 127,385 inhabitants in Munich and from approx. 27,000 to 53,638 in Nuremberg.
- ⁸² Knoll, *Regensburg*, 51.
- ⁸³ *Ibid.*
- ⁸⁴ The role of the house of Thurn & Taxis, the owner of many of the forests formerly belonging to the bishopric, in the city’s wood supply needs further research.
- ⁸⁵ Report to the regional government of the Upper Palatine District, Chamber of Internal Affairs, Regensburg, January 12, 1838, StadtA Rgbg. ZR-I 8107.
- ⁸⁶ Piereth, *Mitten im Holze*, 141, 148.
- ⁸⁷ Report of Regensburg’s magistrate to the government of the Regen District, Chamber of Internal Affairs, Regensburg, September 20, 1837, StadtA Rgbg. ZR-I 8107.
- ⁸⁸ Suggestion of the district mayor Heinrich Wilhelm Sondermann to the city’s magistrate concerning the rise in wood prices, Regensburg, June 1, 1837, StadtA Rgbg. ZR-I 8107.
- ⁸⁹ Regensburg’s magistrate to the magistrates of Augsburg, Bamberg, Munich, Nuremberg, Passau and Würzburg, Regensburg, September 20, 1837; Regensburg’s magistrate to the magistrate of Mainz, Regensburg, December 8, 1837, StadtA Rgbg. ZR-I 8107.
- ⁹⁰ Eva Maria Hammer, “Die Holztrift und Flößerei auf dem Regen. Die Bedeutung des Holztransports auf dem Regen für die Entwicklung der nördlichen Vororte Regensburgs im 19. und frühen 20. Jahrhundert,” in *Donau-Schiffahrt* 4 (1987): 82.
- ⁹¹ *Ibid.*, 82–83.
- ⁹² *Ibid.*, 87–91.
- ⁹³ Decision of Landgericht Donaustauf, February 4, 1804, HStA Munich Th. u. T. Abg. 1974 29/1–13.
- ⁹⁴ Kerstin Kellnberger, *Die Wirtschaftsentwicklung in Regensburg vom Industrialisierungszeitalter bis zum Ausbruch der Weltwirtschaftskrise 1929* (Dipl. thesis, University of Regensburg, 1992), 93–94.
- ⁹⁵ The example of the “Allgemeine Darstellung der Verhältnisse der Stadt Regensburg, deren Statuswesen 1803,” StA Amberg Fsm. Regensburg Geh. Kanzlei 254, describes this issue as a heavy economic burden for the city’s building authority.

⁹⁶ Piereth, *Mitten im Holze*, 148, note 32, documenting a report of Munich's magistrate from August 1837. For the role of industrialization—especially railways and coalmining—as factors in wood consumption, see Bernd-Stefan Grewe, "Das Ende der Nachhaltigkeit? Wald und Industrialisierung im 19. Jahrhundert," *Archiv für Sozialgeschichte* 43 (2003): 72–78.

⁹⁷ Grewe, "Ende der Nachhaltigkeit," 68–70, points out the economic importance of the forest economy for the states' finances in the early nineteenth century and the social conflicts caused by the expulsion of traditional users from the forests.

⁹⁸ Dirk van Laak discusses a tendency of growing interventionism on the part of the state and communes in nineteenth-century towns. He sees social policy and the development of infrastructure as two aspects of states' and communes' reactions to the problems caused by urbanization and industrial capitalism. See Dirk van Laak, "Der Begriff 'Infrastruktur' und was er vor seiner Erfindung besagte," *Archiv für Begriffsgeschichte* 41 (1999): 292–295.

⁹⁹ See William E. Rees, "Ecological Footprints and Appropriated Carrying Capacity: What Urban Economics Leaves Out," *Environment and Urbanization* 4 (1992): 121–130.