CONSTRUCTING IMPERIAL SPACES: HABSBURG CARTOGRAPHY IN THE AGE OF ENLIGHTENMENT

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In the second half of the eighteenth century, military engineers working for the Austrian Habsburg monarchs mapped in detail for the first time the provinces and borders of their empire. Despite this development, there is a disjunction in the literature between scholars who examine the Habsburg monarchy's evolution under Maria Theresa (1740–1780) and Joseph II (1765–1790), and those who investigate maps and mapping in the period. This historiographical divide prevents scholars from considering the part maps may have played in the efforts of the Habsburg monarchs to construct a centralized multi-ethnic empire as a serious contender to nation-states premised on ethnic homogeneity. Maria Theresa's and Joseph II's military, social, religious and economic reforms and their attempts to increase uniformity within their dominions – which intensified practices, such as mapping and the making of geographic descriptions, and surveys of demographic and natural resources – suggest a modernising entity.

This dissertation analyzes the production, circulation, and use of large-scale topographic provincial and border Habsburg maps for three provinces: the Austrian Netherlands, Lombardy and Transylvania. Based on archival sources located in Vienna, Brussels, Cluj-Napoca, Milan, Paris and Sibiu, I show how Maria Theresa's and Joseph II's desire to map their dominions led to the establishment of imperial corps of military engineers and the development of a network of scientific centers promoting the study of astronomy and geography. Once they had established a number of mapmaking institutions and recruited or educated a new generation of military

engineers, the Habsburg rulers commissioned the first detailed topographic survey of their lands and prepared cartographic material to be used in border regulations with their neighbors.

Maps offer a new angle to interpret and assess the efficiency of early modern governments to construct centralized empires, such as the Habsburg monarchy. Maria Theresa's and Joseph II's determination to obtain a detailed image of their domains and imperial borders illustrates the reliance of Enlightenment rulers on emergent sciences, such as cartography, to further the defense and expansion of their empires.

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1.0 HABSBURG CARTOGRAPHY IN THE AGE OF ENLIGHTENMENT

> The German language is the lingua franca of my Empire: why should I have the laws and public affairs in just one province be issued in its respective national language? I am the Emperor of the German Empire; thus, all the other states, that I own, are just provinces, which in union with the entire State make up a body, of which I am the head. If the Kingdom of Hungary would be the most important and first amongst my possessions, I would make its language the main language of my lands; but that is not the case.[1]

In this fragment from a January 1785 letter, the Holy Roman Emperor and Habsburg Monarch Joseph II justified to a Hungarian Magnate his imperial decree from 1784 imposing German as the language of the central administration in Hungary.[2] The emperor also expressed his imperial vision with respect to the Habsburg dominions, which throughout his life he had tried to fashion into a unitary body. In his crusade against provincially specific administrative organization, legal systems, and recruiting and taxation criteria, Joseph II was not trying to "Germanize" the empire. He simply wanted a centralized state, whose disparate provinces would share more than the ruler. After the death of his mother, Maria Theresa, at the end of 1780, Joseph II was the first Habsburg ruler in centuries who declined to attend the official coronation ceremonies that would have conferred onto him the Hungarian and the Bohemian crowns. This refusal symbolized

[1] "Die deutsche Sprache ist Universalsprache meines Reichs; warum sollte ich die Gesetze und die öffentlichen Geschäfte in einer einzigen Provinz nach der Nationalsprache derselben traktiren lassen? Ich bin Kaiser des deutschen Reichs; dem zu folge sind die übrigen Staaten, die ich besitze, Provinzen, die mit dem ganzen Staat in vereinigung einen Körper bilden, wovon ich das haupt bin. Wäre das Königreich Hungarn die wichtigste und erste meiner Besitzungen, so würde ich die Sprache desselben zur Hauptsprache meiner Länder machen; so aber verhält es sich anderst." Franz Schuselka, *Briefe Josephs Der Zweiten* (Leipzig: Brockhaus, 1846), 151-152.

[2] Derek Beales, *Joseph II. Volume 2: Against the World, 1780-1790* (Cambridge: Cambridge University Press, 2009), 366

Joseph II's commitment to the principle of *Gleichförmigkeit*, or uniform government, in all the Habsburg provinces.[3]

Scholars have connected Joseph II's bold restructuring of the Habsburg conglomerate with his education, the influence of his mother Maria Theresa, his interest in military affairs and his extensive journeys within and outside the Habsburg dominions.[4] All of their analyses neglect an important factor: the emergence of a new geographical understanding of the Habsburg Monarchy's lands. Joseph II grew up in a society with a growing interest in maps, and these maps impacted him. State documents and Joseph II's private correspondence or travel diaries reveal the monarch's use of maps in his decision-making process. Moreover, Joseph II's rule is contemporary with the boldest and most wide-ranging Habsburg mapmaking projects of the eighteenth century. Indeed, from the beginning of Maria Theresa's reign in 1740, the Habsburg rulers and their immediate advisors developed a high appreciation of maps as instruments of empire. At the same time that Joseph II became his mother's co-regent in 1765, the cartographic agenda of the Monarchy intensified and encompassed the first topographic survey of the empire, the production of numerous border maps and the participation of Habsburg scientists in global geographic ventures.

The best-known Habsburg mapmaking endeavor took place between 1764 and 1787, when Vienna invested immense financial and military resources in order to map its territories for the first time. Through its richness of detail and the sheer size of the area covered, the finished

[3] Ibid., 64; Derek Beales, *Enlightenment and Reform in eighteenth-century Europe (*London: I.B. Tauris, 2005), 273.
[4] See for example: Derek Beales, *Joseph II. Volume 1: In the Shadow of Maria Theresa, 1741-1780* (Cambridge: Cambridge University Press, 1987), 29-68; For some of Joseph II's travels see Ileana Bozac and Teodor Pavel, *Călătoria împăratului Iosif al II-lea în Transilvania la 1773* (Cluj-Napoca: Institutul Cultural Român, Centrul de Studii Transilvane, 2006); Erich Donnert and Helmut Reinalter, *Journal der Russlandreise Kaiser Josephs II. im Jahre 1780* (Innsbruck: Kulturverlag, 1996); Eugène Hubert, *Le voyage de l'empereur Joseph II dans les Pays-Bas, 31 mai 1781-27 juillet 1781; étude d'histoire politique et diplomatique* (Brussels: J. Lebègue, 1900); Peter von Radics, *Die Reisen Kaiser Joseph II. und die Volkswirthschaft in Oesterreich-Ungarn: zum 100. Gedenktag seines Todes am 20.2.1790 und aus Anlass der großen land- und forstwirthschaftlichen Ausstellung in Wien 1890* (Vienna: Verlag der Oesterreich-Ungarische Revue, 1890).

map, known at the time as the Great Military Map and called in the literature the *Josephinische Aufnahme* (the Josephine Survey), was impressive, covering more than 220,000 square miles. Twenty-one different surveys of provinces and smaller regions resulted in more than 3,500 sheets drawn at a 1:28,800 scale and 275 sheets drawn at a 1:11,520 scale. Despite all this intensive labor, because astronomic measurements did not precede the geodetic work, the final maps could not be put together to recreate a single, immense depiction of the empire.[5]

Looking back from the twenty-first century it is tempting to characterize this cartographic episode as a debacle and a metaphor for the disappearance of the Habsburg Monarchy at the end of the First World War. Especially as, after 1918, the emerging national historiographies of the Monarchy's successor states contributed to the development of a negative assessment of the deceased empire. In order to legitimize the existence of new political entities on the map of Europe, these new national histories presented the Austrian-Hungarian monarchy as an anachronistic entity bound to disappear.[6] After 1990, the literature on historical memory and nationalism in Central and Eastern Europe deconstructed the process that led to the emergence of the historical myths that helped shape the identity of the post-World War I nation-states, which deconstruction led to a reevaluation of the importance of the Habsburg legacy.[7]

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[5] Annamária Jankó, "An Outstanding Person of the 1st Military Survey: Mihály Lajos Jeney," in *Studia Cartologica 13. Papers in Honour of the 65th Birthday of Prof. István Klinghammer* (Budapest: ELTE-Térképtudományi és Geoinformatikai Tanszék, 2006); Josef Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II., ausgeführt durch den K.K. Generalquartiermeisterstab in den Jahren 1763-1785. Ein Beitrag zur historischen Landeskunde* (Vienna: Alfred Hölder, 1919).

[6] Gary Cohen criticizes historians' tendency to depict the Monarchy as bound to "disappear from the map because of its inability to accommodate the national aspirations of its people." His article also includes numerous examples of historians prioritizing the current national framework over the historical context. Gary Cohen, "Nationalist Politics and the Dynamics of State and Civil Society in the Habsburg Monarchy, 1867-1914," *Central European History* 40 (2007), 241. For a comparative discussion of the national master narratives that developed in Austria, Hungary, the Bohemian lands and Slovakia after 1918 see Gernot Heiss, Árpád von Klimó, Pavel Kolář and Dusan Kováč "Habsburg's Difficult Legacy: Comparing and Relating Austrian, Czech, Magyar and Slovak National Historical Master Narratives," in *The Contested Nation. Ethnicity, Class, Religion and Gender in National Histories*, eds. Stefan Berger and Chris Lorenz (Basingstoke, England: Palgrave Macmillan, 2008).

[7] See for example: Patrice M. Dabrowski, *Commemorations and the Shaping of Modern Poland* (Bloomington: Indiana University Press, 2004); *Staging the Past: The Politics of Commemoration in Habsburg Central Europe,*

Despite the above-mentioned historiographical advances, cartography remains an understudied significant aspect of Vienna's legacy in Europe. This is especially surprising, as Benedict Anderson's classical work on "imagined communities" has noted that maps, along with censuses and museums, shaped the way in which imperial powers imagined their dominions by creating "a human landscape of perfect visibility."[8] The Habsburg Monarchy was no exception. The Great Military Map, finalized in 1787, was an astounding triumph for the Habsburg rulers as it offered the first detailed image of their dominions and constituted an excellent tool for planning military campaigns and economic and administrative reforms. Moreover, the Great Military Map, although the most famous, was not an isolated Habsburg cartographic enterprise, but constituted just one piece of a larger imperial effort. Therefore, rather than interpreting eighteenth-century Habsburg cartographic feats based on our current understanding of what makes a map scientific or accurate, we need to contextualize Vienna's mapmaking efforts and re-assess their success based on the impact they had at the time.

There exist some studies about the cartographic achievements of Maria Theresa's and Joseph II's reigns but, with one notable exception,[9] they do not insist on the connection between the Habsburgs' determination to invest resources in maps and the role of these maps in

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1848 to the Present, eds. Maria Bucur-Deckard and Nancy M Wingfield (West Lafayette, IN: Purdue University Press, 2001); Árpád von Klimó, *Nation, Konfession, Geschichte - zur nationalen Geschichtskultur Ungarns im europäischen Kontext (1860-1948)* (Munich: R. Oldenbourg, 2003).

[8] Benedict Anderson, *Imagined Communities* (London: Verso, 1996), 184-185.

[9] In a brief article, James Vann suggested an intrinsic relationship between the maps that the Habsburgs commissioned and these rulers' conceptualization of their own empire. However, Vann's short piece offers only an outline of the development of cartography within the Habsburg lands and therefore his bold statements are not supported by substantial evidence. James Vann, "Mapping under the Austrian Habsburgs", in *Monarchs, ministers and maps: the emergence of cartography as a tool of government in early modern Europe*, ed. David Buisseret (Chicago: University of Chicago Press, 1992), 153-167. The article also contains many factual errors as pointed out by Michael Hochedlinger, "The Habsburg Monarchy: From 'Military-Fiscal State' to 'Militarization'," in *The Fiscal-Military State in Eighteenth-Century Europe*, ed. Christopher Storrs (Farnham: Ashgate, 2009), 55-94, footnote 50.

governing the empire.[10] Moreover, under the influence of national historians approaching the reforms of Maria Theresa and Joseph II "on a centrifugal and provincial basis,"[11] the history of cartography of the Monarchy has been written in a very disjointed manner. For example, scholars suppressed the Habsburg legacy of the Great Military Map by stressing direct connections between eighteenth century Habsburg provinces and current national states. Therefore, for the past two decades we have been witnessing the publishing of books, multimedia discs and websites with a focus on the separate Habsburg provinces.[12] Studying Habsburg cartographic projects for only one province, looking for a "national" cartographic tradition, or trying to reconstruct the historical geography of contemporary national states is to go against the original purpose of these maps. The Great Military Map, the Ferraris Map of Belgium, the cadastral and geographic maps of Lombardy and the numerous maps of the Monarchy's borders were all coordinated from a single center: the Habsburg capital of Vienna. Clearly, the Habsburgs' goal was to obtain a repository of geographical information about their lands, conceived as one empire, and not as the predecessor of twentieth first-century national states.

Positioning the Habsburg cartographic projects within an imperial context allows us to assess the role of these maps in the process of state centralization as orchestrated by Maria

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[10] Johannes Dörflinger, *Die Österreichische Kartographie im 18. und zu begin des 19. Jahrhunderts*, vol. 1 (Vienna: Österreichischen Akademie der Wissenschaften, 1984); Ernst Hofstätter, *Beiträge zur Geschichte der österreichischen Landesaufnahmen. Ein Überblick der topographischen Aufnahmeverfahren, deren Ursprünge, ihrer Entwicklungen und Organisationsformen der vier österreichischen Landesaufnahmen* (Vienna: Bundesamt für Eich- und Vermessungswesen, 1989); Jankó, "An Outstanding Person of the 1st Military Survey;" Paldus, *Die militärischen Aufnahmen*; Robert Rill, "Die Anfänge der Militärkartographie in den Habsburgischen Erblanden. Die Josephinische Landesaufnahme von Böhmen und Mähren nach hofkriegsrätlichen Quellen," *Mitteilungen des Österreichischen Staatsarchivs,* 49 (2001), 183-202; Oskar Regele, *Beiträge zur Geschichte der staatlichen Landesaufnahme und Kartographie in Osterreich, bis zum Jahre 1918* (Vienna: Verlag des Notringes der Wissenschaftlichen Verbände Österreichs, 1955).

[11] Richard J. W. Evans, "The Origins of Enlightenment in the Habsburg Lands," in *Austria, Hungary, and the Habsburg. Essays on Central Europe, c. 1683-1867* (Oxford: Oxford University Press, 2006), ed. Richard J.W. Evans, 37.

[12] *Hrvatska na tajnim zemljovidima. 18. I 19. stoljeća*, ed. Alexander Buczynski, Milan Kruhek (Gradiška Pukovnija, Hrvatski institute za Povijest: Zagreb, 1999); *Die Josephinische Aufnahme: die erste militärische Vermessung (*Budapest: Arcanum, 2004); Wouter Bracke. *De grote Atlas van Ferraris* (Tielt: Lannoo, 2009).

Theresa, Joseph II and Chancellor Kaunitz. As Grete Klingenstein argues, in the second half of the eighteenth century, the expression "Austrian Monarchy" transformed "from a description of a ruling dynasty into a territorial term."[13] Whereas Klingenstein's primary focus is the discussion of territorial identifiers, such as the Archduchy of Austria, House of Austria, Austrian Monarchy, Hereditary Emperor of Austria, this dissertation brings to the forefront the visual representations of the Habsburg lands that influenced the use of different names for this imperial entity. Examining the maps that the Habsburg rulers commissioned in the second half of the eighteenth century allows us to examine the process of centralization and provincial integration from a new angle. Moreover, a focus on Habsburg cartographic achievements reevaluates the contribution of Vienna and its dominions to international cooperation and the emergence of mapmaking as a scientific enterprise in the Age of Enlightenment.

1.1 THE HABSBURG CARTOGRAPHIC GAZE

In 1747, to celebrate the occasion of their official establishment, the Habsburg corps of engineers dedicated the first overall map of the Habsburg lands to Maria Theresa.[14] The bottom right of the map includes a representation of Maria Theresa receiving a smaller version of this cartographic work, probably from a military engineer, and a variety of objects associated by the middle of the eighteenth century with the science of mapmaking. As seen in Figure 1.1, these items include a

[13] Klingenstein examines contemporary topographies, encyclopedias, newspapers, periodicals, and maps to support her claim. Grete Klingenstein, "The meanings of 'Austria' and 'Austrian' in the eighteenth century," in *Royal and republican sovereignty in early modern Europe: essays in memory of Ragnhild Hatton*, ed. Ragnhild Marie Hatton, Robert Oresko, G. C. Gibbs, and H. M. Scott (Cambridge: Cambridge University Press, 1997), 423-478.
[14] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 29; Hochedlinger, *Austria's wars of emergence*, 309; Oskar Regele, "Die erste Generalkarte der gesamten österreichischen Erblande," *Die Warte. Blätter für Literatur, Kunst und Wissenschaft* 41 (October 18, 1947), 2.

globe, whose visible part displays Europe, a plan of Vienna, the Habsburg capital, scientific treatises and such geodetic instruments as a magnetic compass and a theodolite. In addition to the objects necessary for a successful mapmaking campaign, the scene includes a large cannon and cannon balls, reminding the viewers of the purpose of the military engineers' cartographic works. Indeed, Maria Theresa is not simply admiring this cartographic gift for its artistic value. Instead, as seen in Figure 1.2, her gaze and scepter point towards a map fragment labeled as French territory (*Galiae pars*), one of the Habsburgs' strongest opponents before 1756.[15]

The *General Map of all Imperial and Royal Hereditary Lands* lacked detail and had no real military value. Nonetheless, it can be interpreted as a first concrete expression of the Habsburg cartographic agenda as it unfolded during the reigns of Maria Theresa and Joseph II. The Habsburg act of mapping was not a neutral process but had deep political, economic and social implications. Therefore, I define the Habsburg cartographic gaze as the attempt of Viennese rulers to transpose their vast, complex domains into manageable, comprehensible maps. The ever-present political motivations and consequences of the cartographic gaze entailed the development of specific mapping practices and institutions, such as the creation of an engineer corps, astronomic observatories, map archives, and special protocols for surveying imperial provinces and negotiating border demarcations.[16] The political priorities of the Habsburg monarchs influenced the types of maps they commissioned. In this dissertation I discuss the most time- and resource-intensive cartographic projects pursued during the reigns of Maria Theresa and Joseph II: large-scale topographic maps, border maps and geographic maps.

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[15] Kriegsarchiv (hereafter KA), Karten- und Plansammlung (hereafter KPS), BIX a 1, Sections 11 and 12.

[16] I rely on Pickles' definition of the "cartographic gaze" as a set of mapmaking practices and institutions with specific characteristics, such as: the prioritization of mathematical forms of abstraction, the understanding of mapping as a technical-scientific practice capable of representing nature, and the desire of governments to use maps for political purposes to control their dominions. John Pickles, *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded world* (London: Routledge, 2004), 80.

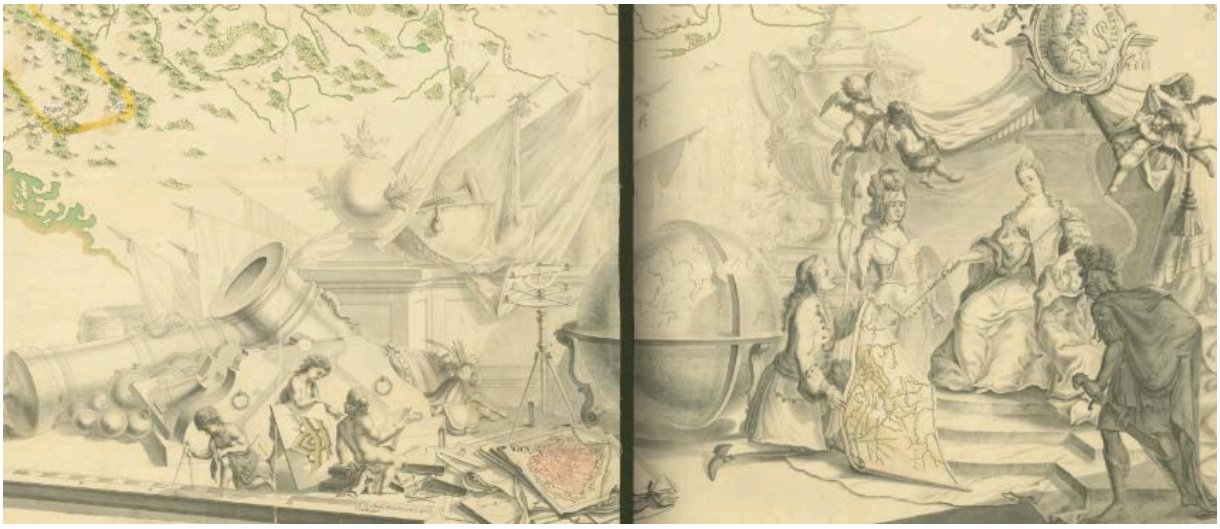

Figure 1.1 Cartouche of the *General Map of all Imperial and Royal Hereditary Lands*

Figure 1.2 Detail from Cartouche of the *General Map of all Imperial and Royal Hereditary Lands*

Ideally, the Habsburg cartographic gaze was totalizing. In reality, Vienna's desire to codify in the form of detailed maps all its territories encountered a variety of challenges. The limited number of trained mapmakers and the high financial costs of surveying slowed down the pace of the cartographic operations. The provincial authorities' priorities influenced the degree to which local officials cooperated with imperial representatives. Last but not least, the Habsburgs' political allies and rivals, including Britain, France, the Ottoman Empire, the Duchy of Parma and Portugal, sometimes challenged and sometimes facilitated the implementation of Vienna's mapmaking agenda.

The Habsburg monarchs were not patrons of cartography only for science's sake. Maria Theresa and Joseph II, together with their main advisor, Chancellor Kaunitz, spent considerable amount of time analyzing mapmaking proposals, commissioning new cartographic projects and inspecting finalized maps. For example, in 1777, when hearing about the death of the childless Duke of Bavaria, Maximilian III Joseph (1727-1777), Maria Theresa immediately understood a war was coming. Her first reaction after receiving this news was going to her rooms with Joseph II and Kaunitz to examine a map and decide on a military plan.[17] By the 1770s, maps had become vital sources for the Viennese rulers in connection with military actions, but also as instruments of centralizing policies.

The cartouche of the *General Map of all Imperial and Royal Hereditary Lands* can be interpreted not only as an expression of Habsburg policies but also as a reflection of developments in the field of mapmaking on a global scale. Before the time of eighteenth-century topographic surveys that aimed to capture all natural and man-made features of a state's dominions based on first-hand observations and measurements, geographers followed a different

[17] Paul P. Bernard, *Joseph II and Bavaria: Two Eighteenth Century Attempts at German Unification* (The Hague: Martinus Nijhoff, 1965), 38.

methodology: they compiled already existing textual and graphical information, combined it with existing astronomic coordinates, and selected what they considered to be the most reliable sources. Therefore, mapmakers prepared their works based on critical examination and discussion of a variety of sources.[18] Indeed, one of the most famous mapmakers of the eighteenth century, Jean Baptiste Bourguignon d'Anville (1697-1782), never left Paris.[19]

The rise of the belief in the existence of "objective" knowledge, however, penetrated the field of mapmaking, and statesmen began to try to harness the power of maps into their service.[20] Scientific transformations in the eighteenth century, such as the increased use of the plane table and reliance on subfields of mathematics, such as trigonometry, to perform land measurements, transformed the perception of maps by the end of the 1700s.[21] "Instruments of precision" established themselves as necessary prerequisites for scientific activities, including mapmaking.[22] Armed with plane tables and their own trained bodies, military engineers and astronomers travelled on-site to perform the data collection required for the production of what officers, civilian bureaucrats and statesmen considered more accurate maps. The trained gaze of mapmakers was seen as essential for the production of good maps so much so that by the beginning of the nineteenth century, "no longer understood as abstractions of reality, maps were

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[18] Anne Marie Claire Godlewska, *Geography Unbound. French Geographic Science from Cassini to Humboldt* (Chicago: University of Chicago Press, 1999), 40-41.

[19] Jean-Baptiste Dacier declared at d'Anville's death in 1782: "almost all the ancient geographers had traveled and very often spoke of what they had seen. Monsieur d'Anville, in contrast, knew the world without having seen it; he never left Paris, so to speak, and had never traveled more than forty leagues from it." Reproduced in Robin Middleton, introduction to *The Ruins of the Most Beautiful Monuments of Greece*, by Julien-David Le Roy, trans. David Britt (Los Angeles: Getty Research Institute, 2004), 137; 139. To give another example, French hydrographer Jacques Nicolas Bellin (1703-1772) never went to sea and did not survey any coastline, but this did not negatively impact his career as a mapmaker. Mary Sponberg Pedley, *The Commerce of Cartography. Making and Marketing Maps in Eighteenth-Century France and England* (Chicago: University of Chicago Press, 2005), 25.

[20] For more information about the emergence of "objectivity" towards the end of the eighteenth century see Lorraine Daston, Peter Galison, *Objectivity* (New York: Zone Books; 2007); Theodore Porter, *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton: Princeton University Press, 1995).

[21] Godlewska, *Geography Unbound*, 47.

[22] Introduction to *Instruments, Travel and Science: Itineraries of Precision from the Seventeenth to the Twentieth century*, eds. Marie-Noëlle Bourguet, Christian Licoppe, and H. Otto Sibum (London; New York: Routledge, 2002), 8-9.

instead taken to be realist replications of each small portion of the world."[23] Large cartographic projects using standardized measurement units such as the French *toise*[24] or the Austrian *klafter*[25] allowed for a seemingly objective quantification of the territory. Quantification allowed science to rely more on global networks rather than remaining a local enterprise.[26] In the same manner, maps based on large-scale topographic surveys and cadastral measurements, presented rulers with an apparently totalizing image of their lands. With the help of these new geographic instruments, the Habsburgs and other eighteenth-century rulers had a starting point on which to base their taxation, administrative and even social reforms.[27]

The 1747 map of the Habsburg lands is a document produced at a moment of transition. Although a product of military engineers, this map was not based on first-hand surveys. Still, the expertise of the Habsburg military engineers was validated in the cartouche of the map by the inclusion of scientific treatises and cartographic instruments. This map also exemplifies that after the 1740s, Viennese decision makers relied on military engineers and astronomers equipped with innovative mapmaking instrumentation to survey and represent various portions of the Habsburg lands. Indeed, by the late 1780s, the intense labor of Habsburg cartographers had produced a variety of maps based on first-hand observation, including large-scale topographic maps, cadastral maps, geographic maps and border maps.[28] The detailed topographic surveys of

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[23] Matthew H. Edney, "Reconsidering Enlightenment Geography and Map Making: Reconnaissance, Mapping, Archive," in *Geography and Enlightenment* (Chicago: University of Chicago Press, 1999), eds. David N. Livingstone and Charles W. J. Withers, 192.

[24] One French *toise* equals 1.94 meters. François Cardarelli, *Encyclopaedia of Scientific Units, Weights, and Measures: Their SI Equivalences and Origins*, trans. M.J.Shields (London: Springer, 2003), 79.

[25] One Austrian *klafter* is equivalent to 1.896 meters. One Austrian mile equals 4 Austrian *klafters* or 7.584 meters. Ibid., 99.

[26] Preface to Porter, *Trust in Numbers*, ix.

[27] James C. Scott traces some of the technologies early-modern states developed to "see" their subjects, territories, and resources. James C. Scott, *Seeing like a State. How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998).

[28] Large-scale topographic maps were mammoth projects based on the work of large teams of engineers and surveyors who performed first-hand geodetic measurements. In the case of the Habsburg Monarchy, most of the provinces were mapped at a scale of 1:28,800. Geographic maps encompassed a large area (such as an entire

provinces and imperial borders created thousands of map sheets spread nowadays among archives in Vienna and what used to be the provinces of the Habsburg Monarchy. Despite this active cartographic agenda, with a few exceptions, scholars have neglected these map-making efforts and the secondary literature is almost exclusively in German.[29] These historiographical limitations do not allow historians of science and empires to justly evaluate the Habsburg contribution to eighteenth-century developments in the field of cartography.

The Habsburg Monarchy was located at the crossroads of Europe, connecting lands under the Russian and Ottoman influence with Italy, France and Prussia. Moreover, until the end of the seventeenth century, another Habsburg branch controlled the throne of Spain. Geography and dynastic connections suggest that the Habsburgs had access to a variety of mapmaking traditions and were active participants in the development of cartography as a scientific enterprise in the eighteenth century. Therefore, an inquiry into the history of Habsburg cartography has to be related to developments in the field of the history of cartography and the production of imperial maps.

Habsburg province), were prepared at smaller scales, and therefore could not include the same amount of detail as large-scale topographic maps. For example, the geographic map of Lombardy discussed in chapter 8 had a scale of 1:1,000. Border maps are a heterogeneous collection, ranging from large-scale representations of very small sections of the borderline, such as a village, to small-scale sketches of a province's entire frontiers. Cadastral plans served the government's interest to manage taxation; therefore, they focus on the land use and are usually accompanied by written lists containing details about the owners and the amount of the taxes. The cadastral maps prepared for the State of Milan in the early 1720s had a scale of 1:2,000.

[29] See for example: Dörflinger, *Die Österreichische Kartographie*, vol. 1; Paldus, *Die militärischen Aufnahmen*; Jankó, "An Outstanding person of the 1st Military Survey;" Jan Mokre, "Die Militärkartographie in der Österreichischen Monarchie bis zum Ende des 18. Jahrhunderts, mit einem Ausblick auf das 19. und das beginnende 20. Jahrhundert," in *Galicja na józefińskiej mapie topograficznej: 1779–1783 / Die Josephinische Landesaufnahme von Galizien: 1779-1783*, vol. 2, eds. Zdzisław Budzyński, Waldemar Bukowski, Bogusław Dybaś, Andrzej Janeczek and Zdzisław Noga (Krakow: Uniw. Pedagogiczny, 2014), 23-30; Jan Mokre, "Geheimhaltung, Spionage und Kartenverfaelschung: Aspekte des Verhaeltnisses zwischen Militaer und Kartographie zur Zeit Maria Theresias," in *Aspekte der Kartographie im Wandel der Zeit. Festschrift für Ingrid Kretschmer*, eds. Wolfgang Kainz, Karel Kriz, and Andreas Riedl (Vienna: Institut für Geographie und Regionalforschung der Universität Wien, Kartographie und Geoinformation, 2004), 86-92; Regele, *Beiträge zur Geschichte der staatlichen Landesaufnahme und Kartographie in Osterreich*; Rill, "Die Anfänge der Militärkartographie in den Habsburgischen Erblanden."

Historians have used maps not only to pin down in space their area of focus, but also as historical sources.[30] The history of cartography is not entirely a new field, but it was not a consecrated area of research until John Brian Harley and David Woodward joined forces and launched *The History of Cartography* project, the most important initiative in recent decades for the history of maps and mapping.[31] The enterprise dates back to 1975, when the history of cartography as a field still lacked a clearly defined goal, being caught among a number of more established disciplines, such as geography and history. Geographers and map historians, Harley and Woodward, aimed to make a synthesis of what was known at the time about maps and the process of mapmaking, while also suggesting directions for future research. They promoted an inter-disciplinary approach, combining fields such as history, geography and anthropology, in order to build a stronger foundation for the field known today as "history of cartography." The published volumes in the series Harley and Woodward pioneered examine maps as products of specific societies, tracing the evolution of cartographic techniques and conventions. These volumes take an encyclopedic approach and represent an essential starting point in understanding the development of cartography in various societies.

After 1980, a new approach to the history of maps, prioritizing the importance of the socio-cultural context, challenged the "whiggish" or "presentist" history of cartography.[32] From

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[30] For a survey of developments in the history of cartography see Matthew H. Edney, "Putting 'Cartography' into the History of Cartography: Arthur H. Robinson, David Woodward, and the Creation of a Discipline," *Cartographic Perspectives* 51 (2005): 14-29.

[31] Until now the following volumes have appeared: *Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, eds. J. Brian Harley and David Woodward (Chicago: University of Chicago Press, 1987); *Cartography in the Traditional Islamic and South Asian Societies* eds. J. Brian Harley and David Woodward (Chicago: University of Chicago Press, 1992); *Cartography in the Traditional East and Southeast Asian Societies* eds. J. Brian Harley and David Woodward (Chicago: University of Chicago Press, 1994); *Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies*, eds. David Woodward and G. Malcolm Lewis (Chicago: University of Chicago Press, 1998); *Cartography in the European Renaissance*, ed. David Woodward (Chicago: University of Chicago Press, 2007); The Volume on Eighteenth Century is forthcoming in 2016 and is edited by Matthew Edney and Mary Sponberg Pedley.

[32] Matthew H. Edney, "Cartography's 'Scientific Reformation' and the Study of Topographical Mapping in the Modern Era," in *History of Cartography, Lecture Notes in Geoinformation and Cartography 6*, eds. E. Liebenberg

the nineteenth century onwards, this older strand of scholarship had strived to present the development of cartography towards more "accurate" representations of reality as a success story. But such narratives neglected the history of the belief in the power of "scientific" maps to represent geography in a precise manner. For example, my dissertation shows that, in the eighteenth century, the imperial commissioners and producers of maps considered maps based on geodetic surveys and astronomic measurements as the most reliable geographic representations. "Accuracy is in the eye of the beholder,"[33] and therefore, when using terms like "accurate," "precise," "correct" or "exact," I express the viewpoint of those past societies who created and used those maps.

For eighteenth-century political decision makers, it became essential to obtain what they considered reliable representations of the territory, in order to expand, defend and centralize their dominions. As one of the leading cartographers of the age, Jean Dominique Cassini (Cassini IV) wrote in 1775: "it is only from the middle of this past century that geography surpassed its lengthy childhood and, supported by the arms of geometry and astronomy, made big strides and became an exact science, endowed with a perfection capable of astonishing the imagination and bringing honor to the human spirit."[34] This statement encapsulates the preoccupation widespread among worldwide empires to measure, inventory and draw the territory of their states. During the eighteenth century, Viennese rulers invested significant resources to train military engineers in

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and I.J. Demhardt (Heidelberg: Springer-Verlag, 2012), 299. I borrow the terms "whiggish" and "presentist" from David Livingstone's assessment of trends within the larger field of the history of geography. David N. Livingstone, *The Geographical Tradition. Episodes in the History of a Contested Enterprise* (Oxford: Blackwell Publishing, 1992), 4.

[33] Barbara E. Mundy, *The Mapping of New Spain: Indigenous Cartography and the Maps of the Relaciones Geográficas* (Chicago: University of Chicago Press, 1996), xix.

[34] The original quote: J'oserai même dire que ce n'est qu'a datter du milieu de ce dernier siecle que la geographie sortie d'une longue enfance et s'appuyant, pour ainsi dire, sur les bras de la geometrie et de l'astronomie, a marché a grands pas, est devenu une science sure exacte, et a acquis une perfection capable d'étonner l'imagination et qui fait honneur a l'ésprit humain," in *Projet d'un Carte Generale de la Toscane*, Archives et Bibliothèque de l'Observatoire de Paris, D 5,33.

the science of mapmaking and to obtain detailed topographic surveys of provinces and imperial borders. The Habsburg Monarchy's infatuation with cartography was not unique.

During the last two decades, no doubt influenced by the legacy of John Brian Harley, interest in the history of cartography in connection with early modern empires has bloomed. The rich literature on the British, French and Spanish Empires demonstrate that imperial rulers actively created mapmaking institutions, commissioned cartographic projects and used the results of geographic surveys to inform further policies. Indeed, gathering geographical information in the form of maps was an essential stage in the expansion and consolidation of these far-reaching states.[35] The studies devoted to China, Russia and the Ottoman Empire are catching up with the new trends in this field.[36] However, the work on the Habsburg Monarchy, despite this empire's central position in Europe, has largely remained focused either on technical mapmaking details or on only certain provinces.

In contrast to the sea-oriented empires, for which the role of cartography has been studied more extensively, the Habsburg Monarchy's expansion remained contained in Europe. In 1790, the Habsburg Monarchy's frontiers covered a distance of more than 5,000 miles,[37] the longest borderline of any European state except Russia. Moreover, Vienna's territorial possessions

[35] See for example Matthew H. Edney, *Mapping an Empire. The Geographical Construction of British India, 1765-1843* (Chicago: University of Chicago Press, 1997); Konvitz, *Cartography in France*; Paul W. Mapp, *The Elusive West and the Contest for Empire, 1713-1763* (Chapel Hill: University of North Carolina Press, 2011); Pedley, *The Commerce of Cartography*; Ricardo Padron, *The Spacious Word. Cartography, Literature, and Empire in Early Modern Spain* (Chicago: University of Chicago Press, 2004); María M. Portuondo, *Secret science: Spanish cosmography and the new world* (Chicago; London: University of Chicago Press, 2009); Neil Safier, *Measuring the New World: Enlightenment Science and South America* (Chicago: University of Chicago Press, 2008); Heidi Scott, *Contested Territory: Mapping Peru in the Sixteenth and Seventeenth Centuries* (Notre Dame, IN: University of Notre Dame Press: 2009).

[36] Giancarlo Casale, *The Ottoman Age of Exploration* (Oxford: Oxford University Press, 2010); M. Pinar Emiralioglu, *Geographical Knowledge and Imperial Culture in the Early Modern Ottoman Empire* (Farnham, UK: Ashgate, 2014); Laura Hostetler, *Qing Colonial Enterprise. Ethnography and Cartography in Early Modern China* (Chicago: University of Chicago Press, 2001); Valerie Kivelson, *Cartographies of Tsardom. The Land and Its Meanings in Seventeenth-Century Russia* (Ithaca, NY: Cornell University Press, 2006); Steven Seegel, *Mapping Europe's Borderlans: Russian Cartography in the Age of Empire* (Chicago: University of Chicago Press, 2012)

[37] Based on the estimation of Beales, *Joseph II*, vol. 2. Beales' estimate of 3924 miles excluded the boundaries with Russia, Switzerland, and the frontiers of the detached provinces, namely Belgium and Lombardy.

presented additional geographic challenges such as: being an almost completely land-locked state with non-contiguous domains and borderlines with some of the greatest powers in Europe, including France, the Ottoman Empire, Prussia and Russia.[38] Ensuring the defense and efficient administration of such a political colossus necessitated a good knowledge of the geographic realities and a well-organized bureaucratic machine connecting Vienna with all Habsburg provinces. Choosing the Habsburg lands as a unit of analysis allows us to nuance the definition of imperial maps.

At first glance nothing differentiates an imperial map from a non-imperial map. Once we dwell more on the maps' production and use, the distinction is clear. Although the territory's inhabitants are active participants in the process of creating the imperial map, they are not the map's primary audience. Imperial maps empower imperial decision makers.[39] Therefore, "the idea of "empire" is constructed through cartographic discourses, which represent a territory for the benefit of one group but exclude the inhabitants of the territories represented."[40] The Habsburg rulers pursued a similar process of using local agents as informers and even mapmakers, in order to obtain a geographical representation of all their provinces as an essential step on the road towards centralization.

Despite the efforts of political elites in Vienna to monopolize the production and use of cartographic information, keeping the information out of the hands of additional parties proved impossible. The Habsburg imperial vision was a project continuously contested both by provincial and international actors. For example, as shown in chapter 3, unauthorized local elites tried and even obtained access to sensitive cartographic information supposedly monopolized in

[38] Ibid., 109.
[39] Matthew Edney, "The Irony of Imperial Mapping," in *The Imperial Map: Cartography and the Mastery of Empire*, ed. James R. Akerman (Chicago: University of Chicago Press, 2009), 40-45.
[40] Ibid., 13.

Vienna. The Habsburg imperial project as reflected in their cartographic efforts clashed with competing mapmaking efforts, especially in the context of border demarcations. For example, the Principality of Moldavia and the Duchy of Parma disputed the validity of Habsburg maps and border tracing projects.

In addition to documenting cartographic rivalries, this dissertation underscores collaborative projects that involved Habsburg engineers and scientists. For example, the joint commitment of Vienna and Versailles to eliminate all enclaves from their shared borderlands encouraged a whirlwind of mapmaking activities at the frontiers of the Austrian Netherlands with France. Moreover, the French scientist Cassini de Thury's pan-European triangulation campaign relied on support from Habsburg centers such as Vienna and Milan. These complex interactions between the Habsburgs and their neighbors, involving competition and cooperation, cannot be unraveled without complementing a study of the technical aspects of the surveying process with attention to the discussion surrounding the maps' commission and reception.

In this dissertation, I am not only assessing the impact of cartography on the Habsburg Monarchy's centralization, but I am also considering how the astronomers and military engineers working in the service of Vienna constituted nodal points in knowledge-producing global networks. In addition to mapmaking endeavors, the Habsburg government facilitated the construction of trans-imperial collaborations to further global geographic projects. With Vienna's support, astronomers working at the observatories in Vienna and Milan took part in international ventures, such as establishing the shape of the Earth and calculating the distance from the Sun to the Earth. In this way, the Habsburg monarchs took active part not only in the mapping of their lands, but also in promoting global geographic projects.

The chapters of this dissertation discuss the types of maps that constituted a priority for the Habsburg government in the eighteenth century. Topographic, geographic and border maps emerged as desirable tools and allies in the efforts of Vienna to obtain a good spatial understanding of its territories.[41] Examining the Habsburg Monarchy's cartographic production reveals how the Viennese rulers integrated cartographic reason as part of their governmental philosophy, now known as Enlightened Absolutism. Rather than limiting my analysis to a theoretical discussion of the development of cartography in the eighteenth century and how its transformation impacted the aspect of maps, my case studies discuss the production, circulation and use of maps for the provinces of Transylvania, Lombardy and the Austrian Netherlands. With the help of these case studies, I integrate the rich Habsburg cartographic legacy with global developments in the Age of Enlightenment, such as the rise of scientific mapmaking.

Large-scale topographic maps, such as the Great Military Map or the Ferraris *Carte de Cabinet* of the Austrian Netherlands, comprise hundreds and even thousands of map sheets, representing the geography of the land in tremendous detail. The most-often cited large topographic map of the eighteenth century is the Cassini Map of France.[42] Whereas the project of the Map of France took more than 40 years to complete, between 1747 and 1788, the Habsburg general quartermaster's staff mapped almost all Vienna's territories in less than 25 years, beween 1764 and 1787, thus offering the political elites a detailed geographical resource. Moreover, while the Cassini map sheets were done at a scale of 1:86,400 and each encompassed a surface of approximately 50 miles over 31 miles, the Habsburg officers drew much more detailed maps of most of their Monarchy at a scale of 1:28,800.[43] Furthermore, in contrast to the Cassini map,

[41] Ibid., 18-19.
[42] For more details about the map of Cassini see Monique Pelletier, *La carte de Cassini. L'extraordinaire aventure de la carte de France* (Paris: Presses de l'école nationale des ponts et chaussées, 1990).
[43] Konvitz, *Cartography in France*, 21-31.

which was made available to the public, Vienna jealously guarded the results of the Great Military Map in manuscript form in the imperial archives. One could argue that the Habsburg success in restricting access to these impressive maps for more than a century hindered the scholars' access to these sources. I want to stress one additional impediment: as these Habsburgs maps finally became more widely known during the first decades of the twentieth century, the Austro-Hungarian Empire disintegrated and the priorities of the new national histories changed. Chapter 3 discusses the production of one section of this Great Military Map: the map of Transylvania (1769-1773). Chapter 4 analyzes the large-scale topographic map of the Austrian Netherlands (1771-1778).

For some of their territories that had been the scene of numerous European wars and that had been mapped by Habsburg opponents, such as Lombardy and the Austrian Netherlands, the rulers in Vienna endorsed the production of publishable geographic maps. These low-resolution representations of Habsburg provinces served a dual purpose. On one hand, the imperial and provincial government obtained access to an updated representation of these dominions. On the other hand, these maps demonstrated to the larger scientific community the Habsburg agents' cartographic ability. In this way, both Ferraris' *Carte marchande* of the Austrian Netherlands (discussed in chapter 4) and the map of Lombardy prepared by the astronomers of Brera (chapter 8) were the Habsburg contribution to the public cartographic discourse in the Age of Enlightenment.

Border maps range in scope from a section of a village to the entirety of one province's frontier. Some of these maps include numerous topographic details, while others present a schematized landscape. In certain cases, such maps were the product of joint commissions, including both Habsburg military engineers and their counterparts from neighboring states. More

often, this type of cartographic material was not shared across the border and was used by the Habsburgs to collect information in preparation for border negotiations. Chapters 5 and 6 explore the cartographic material produced in connection with the demarcation of three border segments located in Transylvania, the Austrian Netherlands and Lombardy. These graphic documents are a heterogeneous group of maps, ranging from large-scale representations of contested village sections to drawings showing the trajectory of a province's borderlines.

As the Viennese decision-makers strived to ensure the defense and efficient administration of their political colossus, they prioritized gathering knowledge about all Habsburg provinces, including the commission of maps. Therefore, this dissertation relates transformations in mapmaking technology and the increased interest of the government in investing in cartographic projects with the emergence of the Habsburg fiscal-military state and the form of government known as Enlightened Absolutism. In the same way that the Habsburg cartographic gaze encountered technological, social and economic limitations, rulers defined today as Enlightened Absolutists failed to achieve complete control and reform of their dominions. Nonetheless, the attempts of rulers such as Maria Theresa and Joseph II to mold their provinces into a unitary state should not be dismissed as their having illusions of grandeur. Analyzing enlightened projects in practice, such as the mechanics of mapping the provinces and borders of the Habsburg Monarchy, will offer new insight into the intertwined histories of empires and science.

1.2 THE HABSBURG CONTRIBUTION TO AGE OF ENLIGHTENMENT

During the past century, the field of Enlightenment Studies has gone beyond the paradigm of the existence of a unitary French Enlightenment that spread throughout the world. Scholars have integrated both local contributions and international networks of exchange that participated in the intellectual fervor of the Age of Enlightenment. The following pages are far from an exhaustive review of all of the significant books and articles that contributed to the historiography of Enlightenment.[44] Instead, I trace a historiographical evolution that highlights the widening and the increasing connectedness of the geographic area that scholars subsumed under the umbrella of the Enlightenment. As the following discussion of the literature shows, we are at a point in historiography during which scholars are striving to reevaluate the contribution of various centers to the Age of Enlightenment as part of a multi-polar dialogue. As the prevailing political entity in Central Europe, the Habsburg Monarchy included some key centers that contributed to the articulation of Enlightenment's ideas as related to the field of cartography.

After the First World War, intellectuals proclaimed the Enlightenment to have been a necessary step in the development of liberal, humanist, and secular values. Ernst Cassirer's *The Philosophy of the Enlightenment* and Paul Hazard's *The Crisis of the European Conscience, 1680-1715* emphasized the cosmopolitanism and the unitary nature of the Enlightenment and at the same time had a strong central and western European bias. Indeed, Cassirer's examples came only from the French, British and German lands.[45] Despite their claim of the universality of the Enlightenment, leading scholars of the field used the work of French thinkers as a mirror through

[44] For a very detailed and informative literature review of the historiography of the Enlightenment see John Robertson, *The Case for the Enlightenment: Scotland and Naples, 1680-1760* (Cambridge: Cambridge University Press, 2005), chapter 1.

[45] Ernst Cassirer, *The Philosophy of the Enlightenment* (Princeton, NJ: Princeton University Press, 1952); Paul Hazard, *La crise de la conscience européenne, 1680-1715* (Paris: A. Fayard, 1961).

which they examined other intellectuals' ideas.[46] Peter Gay's two-volume study, *The Enlightenment: An Interpretation,*[47] builds on Cassirer's legacy, and focuses on "the inherent and irrepressible liberalism of the Enlightenment."[48] This teleological view of history transforms the Enlightenment into an essential stage for Western European culture on its path towards its own version of modernity.

In the 1970s and 1980s, the historiography of the Enlightenment became the historiography of the Enlightenments. A pioneering volume edited by Roy Porter and Mikuláš Teich in 1981 stressed the "national dimensions" of the Enlightenment and brought together case studies from all parts of Europe.[49] By focusing on the plurality of voices contributing to intellectual debates and the specific political, economic and social factors of various geographic areas, historians demolished the idea of a monolithic Enlightenment.[50] As Charles Withers argues, if one were to place on a map where various ideas originated in the eighteenth century, and then connect the dots, the Enlightenment would emerge as a connected, complex graph.[51] The new extreme in which Enlightenment studies were in danger of falling was writing about "national enlightenment," as if the concept "national" had the same meaning in the eighteenth century as in today's world.[52] But the works of scholars, such as John Robertson, showed that

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[46] Dorinda Outram, *The Enlightenment* (Cambridge: Cambridge University Press, 2005), 3.
[47] Peter Gay, *The Enlightenment: An Interpretation* (New York: Knopf, 1969).
[48] Joachim Whaley, "The transformation of the *Aufklärung*: from the idea of power to the power of ideas," in *Cultures of Power in Europe during the Long Eighteenth Century*, ed. Hamish Scott and Brendan Simms (Cambridge: Cambridge University Press, 2007), 159.
[49] *The Enlightenment in National Context*, eds. Roy Porter and Mikuláš Teich (Cambridge: Cambridge University Press, 1981).
[50] Charles W.J.Withers, *Placing the Enlightenment. Thinking Geographically about the Age of Reason* (Chicago: University of Chicago Press, 2007), 6.
[51] Ibid., 8-9.
[52] Jonathan Israel, "Enlightenment! Which Enlightenment?" *Journal of the History of Ideas* 67, no. 3 (2006), 528.

even though local and national contexts influenced the characteristics of Enlightenment greatly, there existed intellectual coherence based on a commitment to human betterment.[53]

In addition to reassessing the impact of a multi-level context, the scholarship transitioned from viewing the Enlightenment as a European program of secular progress to newer attempts that highlight the development of alternative modernities.[54] These alternatives did not develop in isolation. Connectivity was a central element for the emergence of "Enlightenment" that "was a product of, and a response to, global conjunctures."[55] Only by retrieving the variety of voices that contributed to the Age of Enlightenment we can reevaluate the contribution of non-Western societies, such as the Habsburg Monarchy.

The reorientation towards the study of a network of enlightenments reassessed the originality of the reform movement in the eighteenth century Habsburg lands and its connections to what historians call Central European Enlightenment or *Aufklärung*.[56] The enlightened projects from this part of the world became associated with political reforms, as German princes harnessed the enthusiasm and expertise of state officials and intellectual thinkers to pursue administrative, economic and religious reforms.[57] Indeed, as László Kontler shows for the Habsburg Monarchy and the Polish-Lithuanian Commonwealth, the pursuit of Enlightenment did not necessarily have to be subversive of established authorities, secular or ecclesiastical.[58]

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[53] Robertson, *The Case for the Enlightenment*. For more about Enlightenment in Bohemia and the centrality of morality see *The Enlightenment in Bohemia: religion, morality and multiculturalism*, eds. Ivo Cerman, Rita Krueger, and Susan Reynolds (Oxford: Voltaire Foundation, 2011).
[54] Sebastian Conrad, "Enlightenment in Global History: A Historiographical Critique," *The American Historical Review* 117, no. 4 (2012): 1005-1009.
[55] Ibid., 1009.
[56] I follow Peter Wilson's definition and consider Central Europe in the eighteenth century as the territory encompassing the Holy Roman German Empire and other domains controlled by the Habsburg and Hohenzollern dynasties. Peter Wilson, *Absolutism in Central Europe* (London: Routledge, 2000), 8.
[57] Robertson, *The Case for the Enlightenment*, 24.
[58] László Kontler. "Introduction: the Enlightenment in Central Europe?" in *Discourses of Collective Identity in Central and Southeast Europe (1770-1945). Texts and Commentaries. Volume I. Late Enlightenment. Emergence of the Modern "National Idea."* eds. Balázs Trencsényi, Michal Kopeček (Budapest: Central European University Press, 2006), 34-35.

While there is a historiographical debate about the characteristics of its early phase, *Frühaufklärung*, most scholars acknowledge the existence of such a stage in the last decades of the seventeenth century. The *Aufklärung* had its origins as an academic movement and developed in strong alliance with the state. The leading part the Protestant universities and cameralism played cannot be denied.[59] Jonathan Israel's work also identified a radical thread in German politics as a direct reflection of Spinoza's writings; therefore, the political experience of the Reich at the end of the seventeenth century proved varied.[60]

The middle of the eighteenth century witnessed the maturation of the *Aufklärung* and, some argue, the development of a particular form of political government: Enlightened Absolutism, strongly associated with monarchs like Maria Theresa and Joseph II. The common thread of all the various instances of absolutism, Habsburg Enlightened Absolutism included, was the way it legitimized princely authority. Monarchs refused to consult corporate institutions on a formal basis and preferred bargaining with different power groups; moreover, political rulers also responded to pressure from below and outside their lands.[61] Indeed, the emergence of Protestant Prussia as a serious competitor to the authority of Catholic Austria in the Holy Roman Empire led to a military and economic race between the Hohenzollerns and the Habsburgs. The *Aufklärung* flowed from a university-contained current to penetrate the administration and political organization of German states.[62]

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[59] Grete Klingenstein, "Mondo Tedesco," in *L'Illuminismo: Dizionario Storico*, eds. Vincenzo Ferrone and Daniel Roche (Rome: Editori Laterza, 1998), 445.
[60] Whaley, "The transformation of the *Aufklärung*: from the idea of power to the power of ideas," 165-166.
[61] Peter Wilson argues that the type of government described by some as *absolutism* emerged "from the debate on the ideal form of limited monarchy during the early seventeenth century" and had various sources, Enlightenment being one of them. This historian does not offer a unique definition for the term and argues that its structure varied throughout Europe, based on geographical, political, economic and social conditions. Wilson, *Absolutism in Central Europe*, 122.
[62] Whaley, "The transformation of the *Aufklärung*: from the idea of power to the power of ideas," 17l; Klingenstein, "Mondo Tedesco," 447-448.

For the Habsburg Monarchy, Prussia, and the smaller German states of the Holy Roman Empire, the century of reforms instituted from above known as Enlightened Absolutism is embodied in the reigns of Maria Theresa, Joseph II, Frederick the Great, and smaller princes such as the Duke Karl August of Weimar. These rulers all had intellectual interests that led to governmental innovations. Although the policies varied in each case, they all followed a similar trend: a move towards more human legal systems, greater tolerance, education reforms, measures against religious orders and the curtailment of the role of the church, the stimulation of trade and agriculture, and even social reforms such as the abolishment of serfdom.[63]

Even though the eighteenth-century Central European Absolutist governments had a so-called "enlightened" dimension, their priority remained building a military machine to preserve their edge in the international competition. The increase in military expenditure in eighteenth-century European states like Prussia, the Habsburg Monarchy, and the smaller German states determined the reorganization of their administration and economy. Gerhard Oestreich showed how the need for territorial defense led to the formation of new institutions that established and managed military districts, military taxes, and military borders. An increase in army size implied higher costs and motivated rulers to exchange mercenary troops for territorial armies.[64]

These Central European developments correlated with worldwide trends. Maria Theresa's and Joseph II's determination to increase the state's revenue in order to support military expenses[65] was not specific to Central Europe, but was a policy encountered on the whole continent and led to the rise of the so-called fiscal-military states a term first used by John

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[63] Eckhart Hellmuth, "Enlightenment and Government," in *The Enlightenment World*, eds. Martin Fitzpatrick, Peter Jones, Christa Knellwolf and Iain McCalman (London: Routledge, 2004), 447-8.
[64] Gerhard Oestreich, "Army organization in the German territories from 1500 to 1800," in *Neostoicism and the early modern state*, ed. Brigitta Oestreich and H.G.Koenigsberger, trans. David McLintock (Cambridge: Cambridge University Press, 1982), 221-240.
[65] Derek Beales, "Was Joseph II an Enlightened Despot?" in *Enlightenment and Reform in eighteenth-century Europe, 280.*

Brewer to define British political developments in the eighteenth century.[66] Since then, scholars have applied this theoretical framework to most early-modern European powers, including the Habsburg Monarchy.[67]

The rise of the fiscal-military states was the result of early-modern governments' commitment to developing more lucrative fiscal systems to fund larger armies in an age of recurring warfare.[68] In the case of the Habsburg Monarchy, the humiliating military defeats at the hands of the Prussian armies convinced Maria Theresa and her advisers to pursue a reformation of the fiscal and military system. As Peter George Muir Dickson demonstrated in his heavily researched work about Maria Theresa's reign, the Empress and her ministers prioritized "the assertion of fiscal and military power"[69] in order to preserve the Habsburg Monarchy's territories in the face of the Prussian challenge.

Maria Theresa's reform policies went through two main phases: one dominated by Count Friedrich Wilhelm Haugwitz (from 1742 to 1761), and one directed by Count Wenzel Anton Kaunitz-Rietberg (from 1761 to 1780).[70] Count Haugwitz's age introduced the principle of regular taxation of seigniorial lands in peacetime. This revolutionary measure led to negotiation

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[66] John Brewer, *The Sinews of Power: War, Money, and the English State, 1688-1783* (New York: Knopf, 1989).

[67] See for example Jan Glete's book discussing Spain, the Dutch Republic and Sweden as fiscal-military states. Jan Glete, *War and the State in Early Modern Europe. Spain, the Dutch Republic and Sweden as Fiscal-Military States, 1500-1660* (London and New York: Routledge, 2002); Storrs *The Fiscal Military State in Eighteenth-Century Europe*. Even when not using this terminology and claiming that "a correlation between war and development in the fiscal state is not uniform" historians of the early-modern period agree that frequent military conflicts constituted an important factor in the emergence of some of the new fiscal systems. Bartolomé Yun-Casalilla, "Introduction: the rise of the fiscal state in Eurasia from a global, comparative and transnational perspective," in *The Rise of Fiscal States: A Global History 1500-1914* (Cambridge: Cambridge University Press, 2012), eds. Bartolomé Yun-Casalilla, Patrick K. O'Brien, Francisco Comin, 16-17.

[68] Christopher Storrs, "Introduction: the Fiscal-Military State in the 'Long' Eighteenth Century," in *The Fiscal-Military State in Eighteenth-Century Europe*, 7-8.

[69] P.G.M.Dickson, *Finance and Government under Maria Theresia 1740-1780* (Oxford: Clarendon Press, 1987), vol. 1, 15.

[70] Some of the main works discussing Maria Theresa's reforms in detail are: Beales, *Enlightenment and Reform in Eighteenth-Century Europe*; Dickson, *Finance and Government under Maria Theresia*; Beales, *Joseph II*., Franz Szabo, *Kaunitz and Enlightened Absolutism, 1753-1780* (Cambridge: Cambridge University Press, 1994); Charles W. Ingrao, *The Habsburg Monarchy 1618-1815* (Cambridge: Cambridge University Press, 2000).

with the provincial Estates, and in 1749 ten-year taxation agreements were concluded between the monarchy and the local Estates in Bohemia and Austria.[71] In her Political Testament, written shortly after the 1749 reforms, Maria Theresa underlined "how greatly [she] labored to organize and put on a firm footing the military force which is so indispensable for the preservation of the Monarchy…the object of this military system being to ensure that the Provincial contributions come in regularly every month, so that the forces are paid punctually."[72]

The Seven Years' War (1756-1763) proved the deficiencies of Haugwitz's system with respect to military and fiscal reforms and marked the emergence of Kaunitz as the main advisor of the Empress. Chancellor Kaunitz distinguished himself in the international arena of European politics as the person responsible for the "diplomatic revolution" that brought Versailles on the same side as Vienna after 1756.[73] In addition to initiating a bold reorientation of the Habsburg Monarchy's foreign policy, Kaunitz became one of the main architects of the empire's internal restructuring.[74] And mapmaking constituted one of the areas that Kaunitz promoted for almost

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[71] Franz Szabo, *The Seven Years War in Europe, 1756-1763* (Harlow: Pearson/Longman, 2008), 24.
Haugwitz was a disciple of the Austrian cameralist Wilhelm von Schröder and a great admirer of the new administration developed in Prussian Silesia. After capturing this province, Frederick the Great managed to extract 50 percent more revenue than the Habsburgs from Silesia, convincing Haugwitz of the necessity to separate the political and economic branch from judicial administration. Scott, *Enlightened Absolutism*, 152-153; Szabo, *Kaunitz and Enlightened Absolutism*, 76. In contrast to the Prussian regime in Silesia, Haugwitz preserved the Estates' right to approve and collect taxes. However, he doubled the amount of the Contribution and forced the Estates of Bohemia and Austria to send ten years' installments at a time. Ingrao, *The Habsburg Monarchy*, 161-165. Dickson comments on the clear influence Haugwitz had on Maria Theresa's idea about government, as reflected in her two *Political Testaments* from 1750 and 1756 [Dickson, *Finance and Government under Maria Theresia*,, vol. 2, 3]. Regrettably for the ambitious bureaucrat, such a centralizing administrative reform proved incompatible with the structure of the Habsburg Monarchy. The dynasty "did not so much rule *through* the Estates but rather *jointly with* them" [Michael Hochedlinger, *Austria's Wars of Emergence: War, State and Society in the Habsburg Monarchy, 1683-1797* (Harlow: Longman, 2003), 268]. Nevertheless, Haugwitz remained adamant that raising the level of the contribution was essential in ensuring enough funds for the army. In order to gather sufficient money to support a military force of 108,000 men in the Austrian-Bohemian lands, the government was compelled to increase taxation sharply [Robin Okey, *The Habsburg Monarchy c. 1765-1918. From Enlightenment to Eclipse* (Basingstoke, England: Macmillan, 2001), 33].
[72] Carlile Aylmer Macartney, *The Habsburg and Hohenzollern Dynasties in the Seventeenth and Eighteenth Centuries* (New York: Walker, 1970), 126.
[73] Ingrao, *The Habsburg Monarchy*, 172-174.
[74] One of the first measures Count Kaunitz introduced in 1761 was the creation of the Council of State (*Staatsrat*), whose role was in theory purely consultative; in practice it had a strong impact on the monarch's final decisions

four decades. As shown in subsequent chapters, together with Maria Theresa and Joseph II, Kaunitz encouraged investment in topographic surveys, the preparation of maps to help with international border negotiations, and the recruitment of skillful mapmakers.

Chancellor Kaunitz's influence did not end with Maria Theresa's death, but continued during the reign of Joseph II (1780-1790). This emperor's rule is contemporary with *Spätaufklärung* (late Enlightenment) or *Gegenaufklärung* (Counter-Enlightenment), which developed as a result of a fundamental shift in the 1770s. As the *Aufklärer* became disappointed with the reforms of the political rulers, a debate about *Aufklärung* and "true" *Aufklärung* ensued.[75] During this time, Joseph II faced serious rebellions in the Austrian Netherlands, Hungary and Lombardy. This political development was not so much a reflection of the debate mentioned above, as an attempt by provincial elites to reestablish their authority vis a vis various aspects of local government.[76]

Historians attached to writing nation-centered histories credit Joseph II and his aggressive integration policies with the emergence of militant nationalism in his empire. On the other hand, Richard Evans questions the assumption that Joseph II's centralizing policies and the Emperor's goal to impose uniformity in the Monarchy sparked the rise of nationalist movements in places

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Dickson, *Finance and Government under Maria Theresia*, vol. 2, 233-234. Furthermore, Emperor Joseph II started attending the meetings of the Council of State in May 1761, and thus completed the Habsburg decisional triumvirate, composed for the next two decades of Maria Theresa, Count Kaunitz, and Emperor Joseph II. The importance of military might cannot be stressed enough, and just like Haugwitz, Kaunitz had to struggle with the refusal of the provincial Estates to allocate more funding for the army. The chancellor agreed that the size of the Habsburg army during peace-time had to be increased, but he also warned Maria Theresa that excessive military costs could destroy the economic foundations of the Monarchy. Therefore, in Kaunitz's opinion, a good military system had to rest on solid economic bases. The chancellor's efforts to improve agriculture, domestic industry, and customs regulations proved fruitful. Kaunitz managed to decrease the foreign debt of the Habsburgs, and in 1775 and 1777 the Monarchy even registered a positive balance. Szabo, *Kaunitz and Enlightened Absolutism*, 278-280; Ingrao, *The Habsburg Monarchy*, 180.

[75] Whaley, "The transformation of the *Aufklärung*: from the idea of power to the power of ideas," 169-171.

[76] Antal Szántay discusses comparatively Joseph II's policies in Hungary, Lombardy and the Austrian Netherlands, and the provincial reaction. Antal Szántay, *Regionalpolitik im Alten Europa: die Verwaltungsreformen Josephs II. in Ungarn, in der Lombardei und in den österrechischen Niederlanden 1785-1790* (Budapest: Akadémiai Kiadó, 2005).

such as Hungary and the Austrian Netherlands. Instead, Evans suggests that imposing a "Habsburg" identity during Joseph II's reign failed because the eighteenth century *Aufklärung* and the self-perception of the border provinces as backward with respect to Vienna had already contributed in the provinces to the crystallization of attachment to and promotion of vernacular languages, local history and geography.[77]

For a long time the Anglophone historiography was reluctant to accept Joseph II's characterization as an enlightened ruler because he was not an anti-Catholic ruler and he directed his reforms towards the goal of raising more taxes to support a larger army.[78] More recently, however, the work of scholars such as Derek Beales, Heather Morrison, Franz Szabo and Ernst Wangerman, revealed the contributions of Vienna to the debates of the Enlightenment during Maria Theresa's and Joseph II's reign.[79] I contend that as with education reforms, the elimination of censorship or pamphlets directed against the government expressed the enlightened facets of Maria Theresa's and Joseph II's rules, the Habsburgs' contributions to the development of mapmaking and patronage of astronomic and cartographic projects denotes another aspect of the Enlightenment.

Examining the development of a geographic consciousness helps illuminate the transformation of the Habsburg Monarch during the age of the Enlightened Absolutist rulers Maria Theresa and Joseph II. Despite a significant increase in the number of Habsburg cartographic initiatives after 1765, there remains a disjunction in the literature between scholars

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[77] Richard Evans, "Nationality in East-Central Europe: Perception and Definition before 1848," in *Austria, Hungary, and the Habsburgs*, 102-113; Richard Evans, "Joseph II and Nationality in the Habsburg Lands," in Ibid., 134-146.
[78] Beales, "Was Joseph II an Enlightened Despot?" 280.
[79] Ibid.; Heather Morrison, *Pursuing Enlightenment in Vienna, 1781-1790* (PhD Thesis, Louisiana State University, 2005); Heather Morrison, "Harmony and Discord in the Sciences: Vienna's scientific Enlightenment and its engagement with the Republic of Letters," in *Multiple kulturelle Referenzen in der Habsburgermonarchie des 18. Jahrhunderts/Multiple Cultural References in 18th Century Habsburg Monarchy*, ed. Wolfgang Schmale (Bochum: Verlag Dr. Dieter Winkler, 2010), 103-122; Szabo, *Kaunitz and Enlightened Absolutism*, 346-354; Ernst Wangerman, "Reform Catholicism and Political Radicalism in the Austrian Enlightenment," in *The Enlightenment in National Context*, 127-140.

who examine the Habsburg Monarchy's development under Maria Theresa and Joseph II,[80] and historians who investigate the cartographic production for this period.[81] Map-making was crucial to the process of centralization described by Habsburg scholars as it represented an essential turning point in the on-going negotiation for power between center and local authorities. The creation of special institutions in charge of preparing military maps, the training of military engineers as mapmakers, and Vienna's commitment to establishing and representing on maps the trajectory of imperial borders, are all part of this restructuring of the Habsburg Monarchy from a loosely connected empire to a centralized state. Moreover, this empire's position in the center of Europe and the networks of military engineers, Jesuits and other scientists connecting Vienna with the rest of the world clearly impacted the development of cartography in the region. In this sense, the Habsburg Monarchy was an active node in the network of Enlightenment both in a political and scientific sense.

Indeed, a utilitarian and pragmatic perspective of the Habsburg government in the second half of the eighteenth century constitutes only part of the story. Even though the Viennese rulers prioritized military and financial demands as essential for the survival of the Monarchy, we should not discard their cultural and scientific contributions. The production of maps illustrates an overlap of the political-military aspect with the scientific one. On one hand, the participation of the Habsburg Monarchy in numerous military conflicts determined the strong involvement of the Aulic War Council in the process of cartographic production and the rise of the military engineers as an essential unit of the imperial corps. The exigencies of a fiscal-military state caught in an international political competition help explain the Habsburg penchant for keeping sensitive cartographic information secret. On the other hand, Maria Theresa, Joseph II and

[80] Ingrao, *The Habsburg Monarchy*; Szabo, *Kaunitz and Enlightened Absolutism*; Derek Beales, *Joseph II*.
[81] Dörflinger, *Die Österreichische Kartographie*, vol. 1.

Chancellor Kaunitz were also powerful supporters of arts and sciences, and their patronage was sought after by European artists and scientists.[82] The fields of astronomy and mapmaking were no exception.

As scientists from all over Europe engaged in measuring the heavens and the earth, they relied on financial and political support from powerful monarchs to implement large projects, especially if travelling outside the borders of their rulers. For example, with the support of Maria Theresa and Kaunitz, the famous French mapmaker and astronomer César-François Cassini de Thury travelled to Vienna in 1761 to establish the correct longitude of the Habsburg capital in relation to Paris.[83] When the Grand Duke Paul of Russia and his wife visited Vienna in 1781 Joseph II took great pride in showing them the Astronomic Observatory located in the Academy of Fine Arts in Vienna and made sure they listened to Maximilian Hell's description of the expedition he made to Lapland in order to observe the 1769 transit of Venus. Moreover, the emperor showed to his distinguished guests the main astronomic instruments housed in the observatory and explained their use himself.[84] As this dissertation shows, the Habsburg monarchs participated in global scientific projects and promoted impressive mapmaking enterprises. Therefore, they took active part in the development of cartography in the Age of Enlightenment.

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[82] Michael Yonan selected a series of paintings, architectural settings and objects that benefitted from Maria Theresa's patronage and analyzed these items as expression of this ruler's monarchical power. Michael Elia Yonan, *Empress Maria Theresa and the Politics of Habsburg Imperial Art* (University Park: Pennsylvania State University Press, 2011). Kaunitz supported art students and musicians, played a key role in the creation of the Academy of Fine Arts in Vienna in 1772, and promoted French theater. Szabo, *Kaunitz and Enlightened Absolutism*, 23-27; 200-208. Joseph II had a strong interest in theater, music and opera, and appreciated Wolfgang Amadeus Mozart's talent. Beales, "Mozart and the Habsburgs," in *Enlightenment and Reform in Eighteenth-Century Europe*, 95-98.

[83] Cassini de Thury published a description of his journey in the German lands, including his time in Vienna. César-François Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi; par rapport à la figure de la terre pour detérminer la grandeur des degrés de logitude; par rapport à la Géographie, pour poser les fondemens d'une carte génèrale & particulière de l'Allemagne; par rapport à l'astronomie pour connître la position des villes où les astronomes Allemands ont fait leurs observations, et établir une correspondance entre les observatoires d'Allemagne et celui de Paris* (Paris: Nyon, 1765)

[84] Beales, Joseph II, vol 2, 127-129.

The mapmakers' voices constituted another means for the Habsburg Monarchy to participate in a global geographic discourse. The eighteenth century witnessed the emergence of the public sphere as distinct from the private realm. Traditional historical narratives present this age as one of progress for the bourgeoisie, as the concept of citizenship emerged and commoners fought for their political rights. The bourgeois public sphere developed first as a realm for private individuals who shared common readings and intellectual pursuits. The Republic of Letters and the salons constituted a social setting in which aristocrats and burghers discussed cultural commodities, readily available in reading rooms, theaters, museums, and concert halls.[85] The world of letters led to the development of a public discourse and forums for discussion. Although the bourgeoisie arose as the most dynamic element of eighteenth century German society, it still lacked political power and had insufficient financial power to threaten the absolutist political establishment. Therefore, the emergence of the absolute state and the dynamism of the bourgeoisie combined to create the bureaucratic Enlightened Absolutist states of the eighteenth century.[86]

In a similar manner, the most successful mapmakers of the Age of Enlightenment collaborated with the political establishments. At the same time, these scientists built international connections through correspondence and collaborations on geographic projects, thus developing a mapmakers' public sphere. The activity of the observatories in Vienna and Milan furthered Habsburg imperial cartographic projects, but also helped implement global scientific quests, such as establishing the shape of the Earth. The scientific publications based in Brussels, Milan and Vienna served not only to bolster the Habsburg monarchs' reputation as

[85] Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (Cambridge, MA: MIT Press, 1991), 140. For a brief discussion of the salons of Vienna see James van Horn Melton, *The Rise of the Public in Enlightenment Europe* (Cambridge: Cambridge University Press, 2001), 215-219.
[86] Rudolf Vierhaus, *Germany in the Age of Absolutism* (Cambridge: Cambridge University Press, 1988), 19.

patrons of culture, but also to promote scientists such as Maximilian Hell and Barnaba Oriani among the ranks of the Age of Enlightenment's intellectual elites.

Examining eighteenth-century developments from the vantage point of cartography supports the statement that enlightened thinkers and rulers strived "to accumulate and systematize useful knowledge about man's physical and social-moral environment in order to improve that environment."[87] The Habsburg Monarchy's interest in cartography fits this definition perfectly, as gathering geographic information in the form of maps and territorial descriptions was not an end in itself, but rather a preliminary step for imperial reforms or for international border conventions. For example, in 1773, after his journey to Transylvania, Joseph II sent a report to Maria Theresa and the other main ministers in Vienna, expressing a strong criticism of the province's governance and arguing that "the absence of local knowledge makes such a difference in provincial affairs that it is often impossible in practice to implement the best, most far-reaching and from a distance apparently most suitable plans, and that the total ignorance of all Your Majesty's advisers and experts [...] is a real difficulty, impediment and drawback for the service."[88]

Maps offered one way to counteract the lack of local knowledge and, as shown in chapter 3, Joseph II's trip to Transylvania took place in the same year that military engineers finalized the first large-scale topographic map of this province. Habsburg imperial maps synthesized information about the administrative, demographic, economic, religious and social landscape. In this way, cartography bridged the wide distance separating Vienna from its border provinces and provided another thread that kept the Monarchy together. The Habsburg lands can be defined as "a kind of collection: pieced together and gaining definition over time, shaped by a range of

[87] Laszlo Kontler, "What is the (Historians') Enlightenment Today?" *European Review of History* 13, no. 3 (2006): 358.
[88] Beales, *Joseph II*, vol. 1, 362.

circumstances, accidents, and intentions."[89] Although envisioned as a way to centralize the empire, Habsburg cartographic projects did not always proceed according to the plans of the Viennese decision makers, and examining their history provides us a window into the intentions and accidents that mark the development of this Monarchy and its bumpy road towards centralization in the eighteenth century.

1.3 STRUCTURE AND DOCUMENTATION OF THE DISSERTATION

I have chosen to pursue a three-level approach for my project, underscoring provincial specificities, common imperial threads, and trans-imperial connections.[90] I am not addressing these different geographic scales in isolation. By focusing on mapmaking projects in three different border regions - Transylvania, the Austrian Netherlands and Lombardy - I show how cartography contributed to provincial integration and imperial centralization. Additionally, I examine the empire-building project not only as a political program imposed from Vienna, but as a process of negotiation with other empires in the region and provincial elites within the Habsburg lands. To implement this theoretical framework, my research started in the imperial capital, Vienna, followed some of the Habsburg-Bourbon connections to Paris, and continued in the provincial centers of Habsburg authority located in today's Belgium, Italy and Romania, namely in Brussels, Milan and Sibiu.

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[89] Maya Jasanoff, *Edge of Empire: Lives, Culture, and Conquest in the East, 1750-1850* (New York: Alfred A. Knopf, 2005), 6.

[90] My work borrows from the three-level approach of Charles Withers and his suggestion to "consider both the movement of the Enlightenment's ideas above and beyond national contexts." As the concept of a national context is anachronistic when applied to the eighteenth century political realities, for my project, I renamed the three levels as provincial, imperial, and trans-imperial. Withers, *Placing the Enlightenment*, 41.

My proximate frame of analysis is cartography in the context of the Habsburg Monarchy, but my ultimate frame of analysis is connecting fiscal-military policies of imperial states, such as the Habsburg Monarchy, with the rise of science in the Age of Enlightenment.[91] Although scholars have studied the relationship between early-modern empires and mapmaking, they have neglected the Habsburg Monarchy. As the dominant force in Central Europe, with holdings both in the West and the East of the continent, the Habsburg Monarchy was positioned at the crossroads of geographic traditions associated with France, the Italian states, Russia and the Ottoman lands, to name just a few of its neighbors. As the dissertation shows, Vienna both learned from and influenced its allies and competitors. Whereas French and Parmesan mapmakers used graphic conventions similar to the Habsburgs in preparing border maps, the Moldavians had a different understanding about how to draw such a map. Some of the experts in mapmaking that Vienna hired had perfected their skills in the service of other rulers. At the same time, some Habsburg military engineers left the service of Vienna for greener pastures.

My dissertation approaches the topic of Habsburg cartography in relationship to three contexts of varying scales: the imperial background, the trans-imperial networks, and three provincial case studies, namely Transylvania, the Austrian Netherlands and Lombardy. Chapter two, "Engineering Elite Mapmakers: Recruiting, Educating and Organizing Habsburg Military Engineers in the Eighteenth Century," traces the creation and centralization of imperial military mapmaking institutions in order to show how the Habsburg fiscal-military state subordinated the collection of geographical knowledge to imperial interests. I analyze the institutionalization of military engineers, the standardization of their training, and a number of individual careers between 1740s and 1780s. I argue that, by standardizing the training and organization of military

[91] I borrow the terms "proximate" and "ultimate frame of analysis" from Patrick Manning, *Navigating World History: Historians Create a Global Past* (Gordonsville, VA: Palgrave Macmillan, 2003), 273.

engineers, the Habsburg monarchs desired to centralize the production and preservation of maps, in the same way that they dreamed of consolidating their empire.

Chapter 3, "Mastering Space: The Great Military Map of Transylvania," discusses the efforts of the Habsburg Monarchy to integrate this province into the fabric of the empire. Between 1700 and the mid-1770s, with the help of both provincial and imperial mapmakers, the Viennese rulers obtained detailed maps of this province that focused on both economic and military points of interest. This chapter also reveals the limitations of the Habsburg policy of censorship as applied to military maps.

Chapter 4, "A Private Initiative? The Ferraris Maps of the Austrian Netherlands," focuses on the surveying of the Austrian Netherlands between 1771 and 1778. I explore the discussion surrounding the Ferraris project's approval, the connection of this enterprise with the process of border demarcations, and the trans-imperial and provincial hurdles that slowed down the mapping operations. The difficulties Ferraris encountered in reaching his cartographic objectives reveal the challenges of the Habsburg government in the Austrian Netherlands due to the survival of strong local institutions, foreign enclaves and contested lands.

Chapters 5 ("Sketching Imperial Contours: Mapping Habsburg Borders in Transylvania and the Austrian Netherlands") and 6 ("An Elusive Border: Cartographic Projects in the Context of the Lombardy-Parma Border Inspections and Negotiations") switch the thematic focus from large-scale topographic surveys to border maps. From 1750 until 1790, Maria Theresa and Joseph II pursued a consistent policy of signing border treaties with their neighbors. I explore how the development of cartography and scientific instruments impacted the border demarcation process in the eastern, western and southern parts of the Habsburg Monarchy, and led to the development of linear, continuous imperial borders marked by standard signs. I explore for the

cases of Austrian Netherlands, Lombardy and Transylvania, how in the eighteenth century, maps transformed from mere optional appendixes to international treaties, and then into a key documentary base used in the negotiation and the border demarcation process. I argue that cartographic products of the second half of the eighteenth century were not only mirroring political developments but were even conditioning diplomatic negotiations regarding the borders.

Chapters 7 and 8 bring to the forefront of my discussion the contribution of Habsburg astronomers to mapmaking and other geographic projects. Chapter 7, "Scrutinizing the Heavens, Measuring the Earth: Astronomers in the Service of the Habsburg Monarchy," investigates the activity of scientists who contributed to the development of astronomy and mapmaking in the Habsburg lands, with a strong emphasis on the 1760s and 1770s. By analyzing the contribution of Habsburg astronomers affiliated with specific provincial centers (Vienna, Milan, Brussels) in a larger context, I show how these scientists contributed to the development of Habsburg imperial cartography. Additionally, I reveal how Habsburg astronomers connected imperial cultural sites with the wider world and contributed to the development of astronomy and geography on a global scale.

Chapter 8, "An International Network of Astronomers and the Mapping of Lombardy," shows the direct impact of the work of astronomers on the Habsburg cartographic production. After a brief discussion of the limitations of cadastral maps prepared for the State of Milan in the second half of the eigtheenth century, I address the efforts of the Viennese government in the 1770s and 1780s to obtain a geographic map of Lombardy. I explore the discussion accompanying the production process for the map of the Brera astronomers (1788-1796) and situate the story of this cartographic enterprise in two larger contexts: that of the Habsburg Monarchy and that of the trans-imperial scientific community. The efforts of the Brera

astronomers to transform their observatory into an important scientific node of the larger European network motivated these scientists to prepare a map of Lombardy. The astronomers' correspondence networks and Barnaba Oriani's trip to London ensured the acquisition of first-class geodetic instruments and conveyed to Lombardy information about similar European projects.

Approaching the Enlightenment by examining one of its practical facets, namely cartography, allows us to explore connections and tensions between the interests of governments and the international Republic of Letters. The Habsburg rulers commissioned maps as aids in the process of centralization, military defense and expansion. These geographic representations that brought the image of far-away Habsburg provinces to Vienna possibly encouraged Emperor Joseph II's bold reforms and his push towards the elimination of administrative specificities. The geographic projects discussed in this dissertation not only fostered Habsburg political agendas, but also furthered measurements of longitudes with respect to the meridian of Paris, the publishing of geographic maps of the Austrian Netherlands and Lombardy for a wider European audience and the collaboration of astronomers to observe the transits of Venus and to establish the precise shape of the Earth. With its exchanges among provincial centers belonging to the same political state and also across borders, cartography in this period embodies the nature of the Enlightenment.

2.0 ENGINEERING ELITE MAPMAKERS: RECRUITING, EDUCATING AND ORGANIZING HABSBURG MILITARY ENGINEERS

In 1753, Empress Maria Theresa issued a diploma of ennoblement for the military engineer Stephan Lutsch, the son of a humble Lutheran preacher from the Habsburg province of Transylvania. Lutsch's new surname, Luchsenstein, and the lynx holding a telescope included on his coat of arms alluded to the services the engineer had rendered to the empire: his invaluable activity as a mapmaker.[92] The impressive upward social mobility of Stephan Lutsch reflects the Habsburg monarchs' reliance on the services of military engineers throughout the eighteenth century to obtain information about their extensive dominions. In Emperor Joseph II's words: "at least we should do what we can to obtain the necessary notions about the general situation of all the monarchy's domains."[93] One of the measures the Habsburg authorities took to gather knowledge about their realm was investing resources to train and to organize military engineers, the most important mapmakers of the empire.

From the time of its arrival on the stage of empires in the sixteenth century, the Habsburg Monarchy always had to take into consideration the possibility of war on two or even more

[92] Luchsenstein's coat of arms included three fossil tailbones of squids, the symbol of the earth sciences, and a lynx holding a telescope. The word Luchsenstein is a combination of the words "lynx" and "stone." Even his maps are often mentioned in documents as "Luchsenstein" maps. Erwin Raisz, "Colonel Stefan Lutsch von Luchsenstein 1710-1792," *Imago Mundi* 10 (1953): 122.

[93] "il faut faire au moins ce qu'on peut pour acquérir les notions nécessaires au régime général de tous les Etats de la monarchie." Joseph II to the Habsburg ambassador in France, Mercy-Argenteau, on May 20, 1781, reproduced in Alfred von Arneth, *Correspondance secrète du comte de Mercy Argenteau avec l'empereur Joseph II et le prince de Kaunitz*, vol. 1 (Paris: Imprimerie Nationale, 1889), 34.

fronts. The eighteenth century was no different, as the Habsburg lands neighbored or came in close proximity to a wide array of possible dangerous enemies: France, Prussia, the Ottoman and the Russian Empires. Survival in the face of continuous warfare motivated Maria Theresa's radical reforms in the second half of the eighteenth century and successfully increased the size of the Habsburg army. Indeed, the Habsburg Monarchy during Maria Theresa and Joseph II went through a process of militarization; the fiscal and economic systems supported war and defense, and the military also furthered internal transformation.[94] Whereas in the sixteenth and seventeenth centuries the three main elements of Habsburg unity were the dynasty, aristocracy and Catholic Church, the eighteenth century brought to the forefront the centralizing role of the army, bureaucracy and a managed economy.[95]

In addition to the formation of centralized army institutions, the role of the Habsburg army as "a unifying and integrative factor in the defense of the dynastic state" can also be explored through the production of military maps.[96] Military institutions such as the Aulic War Council, the imperial corps of engineers and the general quartermaster's staff incorporated mapmaking activities as an essential component in the process of state defense and centralization. The Habsburg army, just as the empire it served, was not a monolithic entity. The various military corps, which incorporated mapmaking as part of their responsibilities, often had overlapping functions and interchangeable personnel. But despite an incomplete centralization of mapmaking by the second half of the eighteenth century, the strong collaboration of military

[94] Hochedlinger, "The Habsburg Monarchy," 63; For a discussion of the impact of eighteen century military conflicts on the Habsburg Monarchy see Hochedlinger, *Austria's Wars of Emergence*.
[95] Richard J. Evans, "Preface," in *Austria, Hungary, and the Habsburgs*, viii.
[96] "Maria Theresa and Hungary," in Ibid.,17.

engineers, state officials and scientists accelerated Habsburg cartographic production and encouraged mapmaking projects with a very ambitious scope.[97]

The militarization of cartography was not a process restricted to the Habsburg Monarchy, but was the direct result of a rising interest in maps as planning tools among military officers on a global scale.[98] The development of fortifications impacted the war-waging technique and led to the formation of special groups of engineers. In France, the first official corps of engineers maintained and developed the Vauban-type fortifications.[99] Innovations such as the socket bayonet and battlefield artillery also changed the nature of warfare. As armies had to cover larger areas during campaigns, geographical knowledge in the form of maps became crucial.[100] The emergence of a new class of officers along with their appreciation of maps transformed military mapmaking into a scientific enterprise.[101] As Charles Withers remarked, once "the military became map-minded and mapping military minded" states had the much-needed personnel for large-scale mapping projects.[102]

How did the Habsburgs develop a tradition of military engineering? In the first half of the eighteenth century the Habsburg rulers tapped into the existing group of military engineers from newly conquered territories, such as Lombardy and the Austrian Netherlands. Moreover, foreign

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[97] Josef W. Konvitz describes a similar process for France. He shows the role of the Academy of Sciences, military and civil engineers, and state ministers in making cartography an important state ally in France during the long eighteenth century. Konvitz, *Cartography in France*.

[98] Matthew H. Edney, "British Military Education, Mapmaking, and Military "Map-Mindedness" in the Later Enlightenment," *Cartographic Journal* 31 (1999): 14. A recent volume on the role of military engineers in the development of early-modern states minimizes the Habsburg contribution primarily because of the editor's relying on secondary literature in English. Bruce P. Lenman, "Introduction: Military Engineers from Polymath Courtiers to Specialist Troops," in *Military Engineers and the Development of the Early-Modern European State*, ed. Bruce P. Lenman (Dundee, Scotland: Dundee University Press, 2013), 1-46.

[99] Antoine Picon, *French Architects and Engineers in the Age of Enlightenment*, trans. Martin Thom (Cambridge: Cambridge University Press, 1992), 100.

[100] Jeremy Black, "A Revolution in Military Cartography?: Europe 1650-1815," *The Journal of Military History* 73, no. 1 (2009): 52.

[101] Edney, "British Military Education, Mapmaking, and Military "Map-Mindedness" in the Later Enlightenment," 18.

[102] Withers, *Placing the Enlightenment*, 102-105.

engineers, especially from France, enrolled in the Habsburg ranks and contributed to the development of the art of fortifications and mapmaking. As a new generation of engineers trained in the first technical institutions of the Monarchy established itself, the Habsburg authorities diminished their reliance on foreigners and developed a homegrown group of military engineers.[103]

Throughout the second half of the eighteenth century, the Aulic War Council in Vienna imposed centralizing policies on the military engineers' group and attempted to control both their training and responsibilities. In the field of mapmaking, military engineers took over or started overseeing the work of provincial, civilian engineers. By the 1770s independent military corps with engineering expertise, such as the brigade of the Austrian Netherlands, was merged with the imperial army unit. The role of provincial engineering corps, such as the *Collegio* of Milan, was subordinated to the authority of imperial agents trained in Vienna. Despite all of these centralizing efforts, there remained a tension between the imperial desire to engage in detailed mapmaking operations whose results should be secret from prying eyes, and the acute need to hire foreign experts to compensate for the shortage of trained personnel.

This chapter traces the creation and centralization of imperial mapmaking institutions in order to show how the Habsburg fiscal-military state subordinated the collection of geographical knowledge to imperial interests. Rather than restricting the discussion to developments in the Habsburg capital or taking as a unit of analysis only one Habsburg province, I recreate an intricate image of the dynasty's involvement in the development of a group of imperial military

[103] Prince Eugene of Savoy (1663-1736) played an important part in stressing the need for the organization and training of military engineers in the period prior to the one addressed in this chapter. This military commander realized the importance of mapmaking and fortifications experts during the wars of the late seventeenth and early eighteenth century. For more details on Prince Eugene's role see Dörflinger, *Die Österreichische Kartographie*, vol.1, 34; Carl Lustig, "Zur Geschichte der k.k. Genie-Waffe," *Streffleur's Österreichische Militärische Zeitschrift* 26 (1885): 70; Carl Schröder, *Beiträge zur Geschichte des k.k. österreichischen Génie-Corps von seiner Errichtung bis zum Jahre 1763* (Vienna: C. Gerold's Sohn, 1868), 55-59.

mapmakers. The first two sections explore the development of education institutions for military engineers and the creation of special army units for engineers. This institutional development happened both as a result of internal developments, and influences from other states with a powerful engineering tradition, such as France. The third section analyzes the careers of some military engineers who had an impact on the development of cartographic projects in the Habsburg Monarchy. On one hand, people like Stephan Lutsch von Luchsenstein and Dominic de Blasco served only the Habsburg rulers throughout their lives and thus their careers exemplify the influence of provincial mapmaking traditions on imperial cartography. On the other hand, during the eighteenth century, the global environment of imperial competition and cooperation encouraged the circulation of highly qualified mapmaking personnel from the service of one ruler to the other, thus contributing to the dissemination of cartographic knowledge. Mihàly Jeney, Michel Angelo de Blasco and Joseph Ferraris became important nodes in the networks of cartographic knowledge and intensified the exchange of scientific ideas across the Habsburg borders. By examining their career-paths we can better see how the Habsburg military mapmakers contributed to the development of cartography in the Age of Enlightenment. Subjects in the service of warfare waging fiscal military states, these military engineers were also active citizens of the Republic of Letters.[104] Their careers were threads connecting the Habsburg lands with the wider world. The last part of the chapter shows how the Habsburg authorities strived to avoid the leaking of sensitive cartographic information, while at the same time they tried to obtain maps of foreign territories. The Aulic War Council's map archive, re-organized and inventoried in the early 1780s, is a reflection of the Enlightened Absolutist state's desire to control access to geographic knowledge.

[104] The term Republic of Letters implies the existence of cosmopolitan networks of individuals and institutions, collaborating across borders in order to promote scientific projects. Withers, *Placing the Enlightenment,* 46.

2.1 THE IMPERIAL CORPS OF ENGINEERS AND THE GENERAL QUARTERMASTER'S STAFF

Examining the institutionalization and training of military engineers as it emerged in the eighteenth century offers insight into a more general global story: the parallel rise of the category of "expert" and the development of the early modern states.[105] The traditional thesis follows this line of argumentation: military engineers extracted from local communities and from on-site measurements what they considered relevant geographic information. Then, these experts transplanted the complexity of physical and human geographies into maps and written descriptions, which travelled to imperial centers. With the help of these instruments of government, early-modern imperial rulers attempted to refashion their states into centralized empires, often against the interests of the people from whom they had extracted this geographic knowledge.[106]

Accepting the presence of such a group of experts in the eighteenth century Habsburg Monarchy does not elucidate how such a professional category came into existence. What was the background and training of Habsburg military engineers? How were they organized? What skills transformed them into mapmakers of an imperial realm? Answering such questions complicates the narrative of the imperial expert who assists decision-makers in the capital to build an empire. The Habsburg efforts to develop special military units to survey territories and draw maps were not always successful. The engineering corps of the Monarchy was not big enough to implement all the imperial projects. Even the engineers' main responsibility of

[105] Eric H Ash, "Introduction: Expertise and the Early Modern State," *Osiris* 25 (2010), no. 1: 11.
[106] For a discussion of how early-modern empires gathered and utilized information from their peripheries or lands outside their control, see Bruno Latour, "Centers of Calculation," chap. 6 in *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987).

maintaining the fortifications system often overwhelmed them. Nonetheless, the Viennese rulers persisted in their desire to implement large cartographic projects and used other military units, such as the quartermaster general's staff or the artillerymen from the Austrian Netherlands.

The organizing of military engineers in imperial brigades as part of the "military *revolution*" of the seventeenth and eighteenth centuries did not develop in isolation among the various empires.[107] Imperial rulers looked to their allies and competitors as examples, and tried to emulate successful military reorganizations.[108] In 1757, a French officer serving as part of the Habsburg army during the Seven Years' War prepared an unsigned report for Maria Theresa with ideas on how to reform the army. Among his suggestions, he recommended a reform of the engineering corps of the Monarchy because "if there is something close to the heart of its Imperial Majesty, is [the desire] to improve the corps of engineers by imitating the French one."[109] Therefore, in order to understand Maria Theresa's and her military advisors' attempts to organize a Habsburg corps of engineers, we need to take into account the development of French military engineering in the first half of the eighteenth century.[110]

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[107] The role of military engineers in the development of state mapmaking has been studied for the eighteenth century British, French, Spanish empires and the Italian states. Carolyn Jane Anderson, "State Imperatives: Military Mapping in Scotland, 1689-1770," *Scottish Geographical Journal* 125 (2009): 4-24; David Buisseret, "Monarchs, Ministers, and Maps in France before the Accession of Louis XIV," in *Monarchs, ministers and maps*, 99-123; Ennio Concina, "Conoscenza e intervento nel territorio: il progetto di un Corpo di ingegneri pubblici della Repubblica di Venezia. 1728-1770," in *Cartografia e istituzioni in età moderna: atti del Convegno, Genova, Imperia, Albenga, Savona, La Spezia, 3-8 novembre 1986* (Rome: Istituto Poligrafico e Zecca dello Stato, 1987), 147-166; Edney, *Mapping an Empire*; Martine Galland Seguela, *Les Ingénieurs Militaires Espagnols de 1710 à 1803. Etude Prosopographique et sociale d'un Corps d'élite* (Madrid: Casa de Velàzquez, 2008); Konvitz, *Cartography in France*.

[108] In 1694, the French Academy of Sciences defined the term engineer as "one who invents, sketches, and conducts the works and instruments for the attack and defense of fortifications." Ken Alder, *Engineering the Revolution: Arms and Enlightenment in France, 1763-1815* (Princeton, NJ: Princeton University Press, 1997), 56-57.

[109] Vincennes, Service historique de la Défense (hereafter SHD), Archives de l'armée de terre (hereafter AAT), M 1 1582, vol. 3, 25. The document is unsigned so we cannot identify the officer who prepared it.

[110] For an in-depth discussion of the development of French civil and military engineering especially in the second half of the eighteenth century see Charles Coulston Gillispie, *Science and Polity in France at the End of the Old Regime* (Princeton, NJ: Princeton University Press, 1980), 479-548. Jean-Baptiste Vaquette de Gribeauval is one of the best known high French officers detached to help the Habsburg army during the Seven Years' War. As the director of the French artillery in the 1760s, Gribeauval modeled the reform of this military corps on its Habsburg counterpart. Alder, *Engineering the Revolution*, 38.

Numerous studies have analyzed in detail the institutionalization and the activity of French military engineers in the early-modern period.[111] Scholars have demonstrated the role of the Marquis of Vauban in developing a science of fortifications, the interest of the Bourbon kings in using new technologies in improving their odds during warfare, and the emergence of French military engineers as experts in fortifications and mapmaking. Towards the end of the seventeenth century, Le Peletier de Sougy, general commissary of fortifications, organized the French engineering corps in 19 divisions, each under a director of fortifications. The first complete list of military engineers dates from 1696 and includes 280 people.

The consequent reforms of the next decade were not codified in writing until the first official directive for the corps of engineers issued in 1744.[112] The French Minister of War, Marc-René de Voyer Count d'Argenson, influenced the issue of the royal ordinance from February 7, 1744, which issued a regular charter for the corps of engineers, detailing their responsibilities and ranks. Janis Langins considers these ordinances part of d'Argenson's larger effort "described as bureaucratic rationalization, increasing militarization, and formal training." In 1755, d'Argenson continued the process of centralization of the military by unifying the engineers and artillerymen as part of the new Royal Corps of Artillery and Military Engineering.[113] Although short-lived, this 18-month union of French engineers and artillerymen might have influenced the Habsburg's slower approach to the centralization of engineering brigades described in the next pages.

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[111] Alder, *Engineering the Revolution*; Anne Blanchard, *Les Ingénieurs du "Roy" de Louis XIV a Louis XV* (Montpellier: Université Paul-Valéry, 1979); David Buisseret, "French Cartography: The *ingénieurs du roi*, 1500–1650," in *The History of Cartography*, ed. David Woodward, vol. 3, bk. 2, *Cartography in the European Renaissance* (Chicago: University of Chicago Press, 2007), 1504-1521; Janis Langins, *Conserving the Enlightenment: French Military Engineering from Vauban to the Revolution* (Cambridge, MA: MIT Press, 2004); Picon, *French Architects and Engineers in the Age of Enlightenment*.

[112] René Taton, "L'École du Génie de Mézières," in *Écoles techniques et militaires au XVIIIe siècle*, eds. Roger Hahn, René Taton (Paris: Hermann, 1986), 560-561.

[113] Langins, *Conserving the Enlightenment*, 91-93.

In France, for most of the first half of the eighteenth century, the recruitment of new engineers was based on an exam administered by experts in fortifications. Most candidates had to travel to Paris for their examination, but exceptions were made until 1740 for the sons of engineers, tested wherever their fathers were deployed. In 1720, the director of fortifications, the Marquis d'Asfeld, instructed the newly appointed examiner, François Chevallier, to ensure that all recruits knew how to draw plans of fortifications and maps of territories. Additionally, the candidates had to demonstrate knowledge of architectural drafting, arithmetic, geometry, leveling and mechanics.[114] In 1748, after the king established a school for engineers at Mézières, this educational institution became a compulsory step for a career in military engineering.[115]

On April 8, 1756, D'Argenson issued an instruction for this school that reiterated the importance of teaching future young engineers how to use a graphometer, a plane table, and the compass.[116] Moreover, as part of their training, students learned how to survey areas around Mézières.[117] As a result of this extensive apprenticeship, by mid-eighteenth century, French military engineers were renowned all over Europe for their surveying and mapping abilities; furthermore, the Seven Years' War (1756-1763) contributed to the spread of their fame. During this first global conflict, both Austria and Prussia tried to hire officers with engineering knowledge from France. For example, Jean-Baptiste Vaquette de Gribeauval, famous for having reformed the French artillery system in the 1760s, fought on the Habsburg side; meanwhile, Lefebvre, colleagues with Gribeauval during their school days, joined the Prussian troops.[118]

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[114] René Taton, "L'École du Génie de Mézières," 561-563. Also, Gillispie, *Science and Polity in France at the End of the Old Regime*, 509.
[115] Langins, *Conserving the Enlightenment*, 94.
[116] Instrument used to measure angles between the sides of triangles.
[117] Francois de Dainville, "Enseignement des "Géographes" et des "Géomètres"," in *Écoles techniques et militaires au XVIIIe siècle*, 486.
[118] Schröder, *Beiträge zur Geschichte des k.k. österreichischen Génie-Corps*, 75-76. For biographical information about Gribeauval see Alder, *Engineering the Revolution*, 36-38.

Combatants on both sides of the Seven Years' War acknowledged the quality training of French engineers in the art of fortifications and surveying, and tried to emulate this model.

During the first half of the eighteenth century, a distinction developed in France between the corps of military engineers responsible primarily for fortification, and the corps of the *ingénieurs géographes*, who developed as the main group producing maps for the army.[119] These *ingénieurs géographes* devoted most of their energies during peacetime working on large topographic surveys and participating in border demarcation operations.[120] It seems the members of the corps of the *ingénieurs géographes* were trained more in the field than in schools. In the late 1740s, during the early phases of the work on the Cassini Map of France, Cassini did not have access to enough trained engineers in the art of mapmaking. Therefore, he selected personnel from the corps of *ingénieurs géographes* and developed their surveying skills on the job in an area between Paris and Versailles.[121]

Since 1716, in addition to military engineers, the French kingdom also relied on the so-called corps of the *Ponts et Chaussées* (Bridges and Highways), experts in constructing and maintaining the road network. Similar to the military engineers, this corps was centralized and regularized in the decades after its formation. The 1747 creation of the preparatory school for the members of this corps preceded by one year the creation of the school at Mézières. As road building and mapmaking were naturally entwined, the graduates of the School of *Ponts et Chaussées* became valuable cartographers in the service of the French state. Initially, the task of the *Ponts et Chaussées* employees was to evaluate maps made by engineers, and monitor the road and bridge construction projects. By the 1750s, students attending the School of *Ponts et*

[119] Janis Langins examines a section of the engineers' community: the Royal Corps of Military Engineering of the French Army. Langins, *Conserving the Enlightenment*, 66.
[120] Konvitz, *Cartography in France*, 92.
[121] Dainville, "Enseignement des "Géographes" et des "Géomètres"," 488-489.

Chaussées devoted their time to the study of architectural, mechanical and mathematical subjects, and training in cartography was considered an essential skill for making maps in the field. Furthermore, for their final exam, students had to design a detailed map of an imagined territory, a task that illustrated the importance of cartography in developing spatial thinking.[122] These civil engineers of the *Ponts et Chaussées* produced numerous maps in connection to infrastructure projects.[123]

The rich tradition of French engineering could not fail to inspire other great powers of Europe, such as Spain and the Habsburg Monarchy.[124] The year 1756 marked the "diplomatic revolution" of Europe, as the Habsburg foreign minister, chancellor Kaunitz, managed to sign an alliance with the French monarchy. This political rapprochement also gave Vienna more access to French officers trained in the engineering sciences. In 1747, only three years after the first official directive issued for the French corps of engineers, Maria Theresa ordered the formation of an imperial *Genie Corps* (corps of engineers) under the command of the governor of the Austrian Netherlands, Charles of Lorraine (who served in this honorific function until 1780), and a *Pro-Director* (deputy director) who carried out the actual responsibilities.[125]

The 1747 order, followed on July 20, 1748 by an official regulation for the corps of engineers, was not the first attempt to clarify the role of these army experts; the Habsburg army had also used engineers as part of their ranks a century before. For example, on December 4, 1673, the president of the Aulic War Council, Raimund Montecuccoli, issued a set of instructions for all the engineers in the imperial service and subordinated them to the Aulic War

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[122] Picon, *French Architects and Engineers in the Age of Enlightenment*, 101-109; Gaston Serbos, "L'École Royale des Ponts et Chaussées," in *Écoles techniques et militaires au XVIIIe siècle*, 345-363.
[123] Konvitz, *Cartography in France*, 112-113.
[124] Galland Seguela considers the French developments in the field of military engineering essential in understanding the Spanish case. Galland Seguela, *Les Ingénieurs Militaires Espagnols de 1710 à 1803*, 28.
[125] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 29; Hochedlinger, *Austria's Wars of Emergence*, 309; Lustig, "Zur Geschichte der k.k. Genie-Waffe," 71.

Council. As part of their work on the maintenance and defense of fortifications, it was necessary that these experts prepared drawings and architectural plans. During wartime operations, the military engineers deployed with the imperial troops drew maps showing the encampment of troops, marching routes, and especially the territory of newly acquired lands. These maps, incorporated all the settlements, rivers, streams, mills, forests, mountains, swamps, lakes and other significant geographical features. The engineers sent one copy of each map to the Aulic War Council and a second copy to the commanding general. The drawings could not be shared with anyone else.[126]

The existence of prior official instructions for military engineers, such as the Montecuccoli document, does not diminish the importance of the 1747 imperial order and 1748 regulation. Maria Theresa's decision marked the transition of the corps of engineers to institutional permanence.[127] By centralizing this valuable human resource under a common leadership, the Aulic War Council could better plan the allocation of military engineers to fortifications all over the empire.[128] Initially, the corps of engineers was divided into four brigades: German, Hungarian, Italian and belonging to the Low Countries (*Netherländisch*).[129] The table below includes information on the geographic areas for which these four brigades were responsible.

[126] Heinrich Blasek, Frank Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1 (Vienna: Redaction der "Mittheilungen" im K. u. K. Technischen Militär-Comité, 1898), 8-9, 217-218, 221-222.
[127] Erik A. Lund, "The Generation of 1683: he Scientific Revolution and Generalship in the Habsburg Army, 1686-1723," in *Warfare in Eastern Europe, 1500-1800*, ed. Brian Davies (Boston: Brill, 2012), 235.
[128] See for example the table with distribution of engineers from 1773: KA Genie-Hauptamt (hereafter GHA) 1773 17 187.
[129] The term *Netherländisch* used in the original document refers to the territories of the Austrian Netherlands.

Table 2.1 The Division of the Corps of Engineers into Brigades

Brigade	In charge of fortifications in
German	The German hereditary lands: Lower, Upper, Further and Inner Austria, Bohemia, Moravia, Silesia
Hungarian	Hungary, Slavonia, Croatia, Banat of Temesvár, Transylvania
Italian	The Italian lands (Lombardy, Tuscany)
Low Countries	The Austrian Netherlands

Each brigade included twenty-three engineers of various ranks: one colonel, one lieutenant-colonel, two majors, four captains, five first lieutenants, five second lieutenants and five interns. The commander of the engineer corps transferred engineers from one brigade to another, recommended officers for advancement, and prepared yearly projects regarding the repair and construction of fortifications. All second lieutenants and interns carried with them mathematical instruments, a compass, colors and paintbrushes. The officers with higher rank, who supervised the work of these lower engineers, had in their possession at least an astrolabe and a plane table. Clearly, the officers carrying these instruments crucial in the art of surveying and land representation possessed mapmaking skills.

In 1753 the total number of engineers, including the four brigades and the General Administration increased from 98 to 113. By the early 1760s the Italian, German and Hungarian brigades were combined into a single brigade and by 1770 the Belgian brigade was also unified with the imperial corps.[130] On paper it looked like the engineering corps quickly became a centralized institution whose members came from the various provinces of the Monarchy and could be deployed anywhere in the Habsburg lands. In this sense, the creation of the corps of

[130] Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1, 23-36, 43-44.

engineers seems to confirm Richard Evans's claim that the army played an important centralizing role in the formation of the Habsburg national-territorial state.

However, military officers' complaints and reports from the second half of the eighteenth century reveal another story. For example, throughout the 1750s and 1760s, there were not enough military engineers in Lombardy to help with the maintenance of the fortifications. In 1754, the Plenipotentiary Minister of this province, Beltrame Cristiani, complained that the imperial military authorities had relocated many engineers officially assigned to the Italian brigade to other provinces. These engineers only cashed their stipends from the Italian Treasury but did not contribute to the defense of Lombardy.[131] Moreover, a 1762 report from the lieutenant colonel Domenico de Blasco to the Plenipotentiary Minister of Lombardy revealed that only four engineers were actually present in the province during that year.[132] Clearly, the reality on the ground often differed greatly from the paper regulation of the corps of engineers.

Even more striking than the lack of enough engineers to satisfy the needs of the Monarchy, was Maria Theresa's attempt to reduce the number of foreigners in her engineering corps. Knowing that during the Seven Years' War non-Habsburg officers enrolled under Maria Theresa's banners, it might be tempting to think that this ruler was open to hiring experts from anywhere at any time. However, as engineering schools started producing graduates from within the subjects of the Monarchy, the desire to hire foreigners decreased. In June 1764, Kaunitz urged Maria Theresa to obtain foreign engineers either from Alsace or France, in order to contribute to the construction of new fortresses. Initially the empress tried to move engineers from the Austrian Netherlands' brigade to other parts of Monarchy. However, all these engineers

[131] Alessandra Dattero, "Ingegneri militari Italiani, austriaci e belgi in Lombardia nel XVIII secolo," in *Le Corti come Luogo di Comunicazione. Gli Asburgo e l'Italia (secoli XVI-XIX)*, eds. Marco Bellabarba, Jan Paul Niederkorn (Bologna: Mulino, 2010), 185-186.
[132] Ibid., 186-187, footnote 25.

were involved in building channels, roads and dams within this province. Despite Kaunitz's suggestion, Maria Theresa decided they should wait for another year, and at that time they could use the Austrian Netherlands engineers, "without needing to hire foreigners." [133] This instance demonstrates that the number of engineers was often insufficient for the needs of the Monarchy. Moreover, it shows Maria Theresa's commitment to recruit engineers from within her own domains. Despite a small increase in the engineers' contingent by 1771, this army unit only comprised 150 engineer officers during peacetime and 170 during wartime.[134]

The creation and development of the corps of military engineers marks the decision of the Habsburg decision-makers to train and support a special army segment devoted to fortification works. Additionally, as part of their work, the engineers drew maps and plans to improve the system of fortifications, to organize military campaigns and to negotiate border demarcations, such as the ones between France and the Austrian Netherlands in the 1760s and 1770s. At the occasion of their formal institutional establishment, the engineers dedicated an overall map of the Habsburg lands to Maria Theresa.[135] The map includes four territorial divisions corresponding to the imperial brigades of engineers.[136] This symbolic gift expressed not only the cartographic function of military engineers, but also their role in bringing the imperial lands together through the maps they prepared. Indeed, the *General Map of all Imperial and Royal Hereditary Lands* of 1747 was the first map of all the Habsburg lands prepared by an imperial body.[137] The map can

[133] Brussels, Archives Générales du Royaume (hereafter AGR), Chancellerie Autrichienne des Pays Bas (hereafter CAPB), box 455, D 83 I.
[134] Hochedlinger, *Austria's Wars of Emergence*, 309.
[135] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 29; Hochedlinger, *Austria's Wars of Emergence*, 309; Oskar Regele, "Die erste Generalkarte der gesamten österreichischen Erblande," *Die Warte. Blätter für Literatur, Kunst und Wissenschaft* 41 (October 18, 1947): 2.
[136] Regele, "Die erste Generalkarte der gesamten österreichischen Erblande," 2. KA KPS, B IX a 1.
[137] Klingenstein, "The meanings of 'Austria' and 'Austrian' in the eighteenth century," 465.

also be interpreted as a graphical expression of the *Pragmatic Sanction* from 1713, a document that legitimized Maria Theresa's claim to power.[138]

Despite their important role as mapmakers, the military engineers did not monopolize the state's cartographic production. In addition to the regular corps of engineers, the Habsburg military authorities relied on another institution for the production of large maps: the general quartermaster's staff.[139] During the Seven Years' War (1756-1763), this wartime military body planned the logistics of campaigns, and thus relied heavily on maps and plans.[140] Due to its immense utility for the defense of the Monarchy, by the end of the Seven Years' War, the general quartermaster's staff had become the military mapping institution of the Monarchy.[141] The ability to organize the logistics of the army during warfare was applied to planning on how to allocate financial and human resources in order to map the vast lands of the Habsburg monarchs. Much like the corps of engineers, the general quartermaster's staff was subordinated to the Aulic War Council.[142] The general quartermaster's staff employed elite mapmakers and

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[138] The Pragmatic Saction was the first document to state the indivisibility of the Habsburg domains and allowed Charles VI's eldest daughter, Maria Theresa, to inherit the throne. Ingrao, *The Habsburg Monarchy*, 129.

[139] The meaning of the term general quartermaster's staff comes for this group's initial responsibility, to go ahead the army, find proper lodging for the higher officers in the army and chalk signs on the selected houses. Christopher Duffy, *The Military Experience in the Age of Reason* (Ware: Wordsworth Editions, 1998), 177. This institution functioned as a training place for junior officers. In many cases, the generals who reached the rank of lieutenant field-marshal, had probably served as members of the general quartermaster's staff. Erik A. Lund, *War for the Every Day: Generals, Knowledge, and Warfare in Early Modern Europe, 1680-1740* (Westport, CT: Greenwood Press, 1999), 142. A history of the General Staff, which includes a discussion of the general quartermaster's staff is Hubert Zeinar, *Geschichte des österreichischen Generalstabes* (Vienna: Böhlau, 2006).

[140] For a brief discussion of the mapmaking role of the general quartermaster's staff's officers see Zeinar, *Geschichte des österreichischen Generalstabes*, 85-92.

[141] Lund, "The Generation of 1683," 241-242; Hochedlinger, *Austria's Wars of Emergence*, 307.

[142] The historiography does not explain what is the relationship between the general quartermaster's staff and the imperial corps of engineers. Some authors, such as Irina Popova, state that the corps of engineers was subordinated to the general quartermaster's staff, but her citations refer to a study that does not make such a statement (James Vann, "Mapping under the Austrian Habsburgs", in *Monarchs, ministers and maps*, 153-167). Irina Popova, "Representing National Territory. Cartography and Nationalism in Hungary, 1700-1848," in *Creating the Other. Ethnic Conflict and Nationalism in Habsburg Central Europe*, ed. Nancy M. Wingfield (New York: Berghahn Books, 2005), 21.

promising cadets who had recently graduated from the Academy of Engineering in Vienna.[143] Michael Hochedlinger suggests that the transformation of the general quartermaster's staff into the imperial mapping institution allowed the members of the corps of engineers to focus on rebuilding and constructing fortresses.[144] This observation is consistent with an evolution that emerged at the same time in France: the separation of the functions of the military corps of engineers from the *ingénieurs géographes*.

The transformation of the general quartermaster's staff into the mapmaking engine of the Monarchy was probably a deliberate reform, as some statistical numbers reveal. In 1757, only a small group of staff officers knew how to map territories, but by 1766 more than half of the senior officers and 40% of the subalterns had this training. By 1786, 100% of the staff officers had the ability to contribute to mapmaking operations.[145] This shift was also influenced by Franz Moritz Lacy, the first Quartermaster General of the Habsburg Monarchy during the Seven Years' War and consequently in charge of preparing the military operation plans.[146] No one knew better than Lacy the disadvantage Habsburg troops suffered in the field because of the lack of maps. In her detailed biography of Lacy, Edith Kotasek demonstrated this officer's interest in cartography as a government tool, especially after his appointment in 1766 as the Aulic War Council President.[147]

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[143] For example, in 1766, Karl Fischer was a student at the Engineering Academy in Vienna, and in 1768 was assigned to help with the Great Military Map of Transylvania. Friedrich Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie, 1717-1869* (Vienna: W. Braumüller, 1901), 233; Sibiu, National Archives (hereafter AN), Comandamentul general al armatei austriece din Transilvania 1703-1865 (hereafter CC), Document 1 (1769), May 10, 1769.

[144] Hochedlinger, *Austria's Wars of Emergence*, 307.

[145] Lund, *War for the Every Day*, 152-153.

[146] Hochedlinger, *Austria's Wars of Emergence*, 307. Edith Kotasek, *Feldmarschall Graf Lacy: ein Leben für Österreichs Heer* (Horn, Austria: F.Berger, 1956), 24-27. The military historian Christopher Duffy considers the Habsburg general quartermaster's staff the first of the modern staffs, due to Lacy's ability to ensure skilled officers to help every general in the army. Duffy, *The Military Experience in the Age of Reason*, 180.

[147] For example, in the early 1780s Lacy sent officers undercover into Ottoman territories to gather information about those territories and their inhabitants. Kotasek, *Feldmarschall Graf Lacy*, 169-170.

Clearly, the large mapmaking projects financed by the Habsburg Monarchy after 1763 imposed the ability to survey and represent the land as a criterion for selecting members of the general quartermaster's staff. After the Seven Years' War, the general quartermaster's staff possessed capable personnel to direct the first detailed topographic survey of most of the Habsburg lands and to coordinate cadastral surveys. A 1776 document detailing the skills an officer candidate should develop during his instruction included the ability "to map three or four miles of route a day, prepare a plan of a place, or of a camp, [and] reconnoiter."[148] Although the general quartermaster's staff fulfilled a lot of cartographic operations within the Monarchy, the corps of engineers also continued working on imperial mapmaking projects, such as the operation for the border demarcation in the Austrian Netherlands reveal. Moreover, due to the lack of sufficient personnel within the ranks of the general quartermaster's staff, the engineering corps continued to fulfill the role of mapmakers.[149]

The surveying work of the general quartermaster's staff on the Great Military Map started in the border provinces and moved inwards.[150] Between 1763 and 1787, the Habsburg officers surveyed more than 220,000 square miles (approximately 570,000 square kilometers), an estimate that does not include the territory of the Austrian Netherlands. The Habsburg dominions in Italy and Tirol were not surveyed as part of the Great Military Map project.[151] Chapter 3 discusses in detail the Transylvanian section of this cartographic enterprise.

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[148] Cited in Lund, *War for the Every Day*, 153.

[149] In December 1768, out of the total of 94 engineers belonging to the Hungarian, German and Italian brigade, eight participated to the topographic surveys unfolding within the Monarchy. KA Hofkriegsrat (hereafter HKR), 1769 56 25. In December 1769 the number had been reduced to three. KA GHA, 1769 17 65.

[150] This map is officially known in the literature as the *Josephinische Aufnahme*. The expression *Theresianisch-Josephinischen Landesaufnahme* is used in Johannes Dörflinger, "Landesaufnahme und Militärkarten," in *Austria picta. Österreich auf alten Karten und Ansichten: Ausstellung der Kartensammlung der Österreichischen Nationalbibliothek, Prunksaal, 11. Mai bis 8. Oktober 1989: Handbuch und Katalog*, eds. Franz Wawrik, and Elisabeth Zeilinger (Graz: Akademische Druck- u. Verlagsanstalt, 1989), 118.

[151] A detailed discussion of this military survey is included in Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II*. In the case of the Austrian Netherlands, instead of using the

The general quartermaster's staff had to travel from province to province to survey and draw the vast domains of the Monarchy; the project suffered repeatedly as a result of the low number of officers. In order to accelerate the mapping of the empire, Maria Theresa and Joseph II remained open to mapmaking proposals coming from the provinces, as long as the military preserved the monopoly of sensitive cartographic information. The imperial desire to obtain accurate maps of their lands motivated in 1769 the commander of the artillery corps in the Austrian Netherlands, Joseph Ferraris (1726-1814), to forward to Vienna a project for a map of this province.[152] Initially, Kaunitz and Maria Theresa refused to finance this project due to lack of sufficient funds, and only the personal interventions of Charles of Lorraine and Joseph II transformed this initiative into reality.[153]

An important factor in the favor of Ferraris was his decision to utilize as mapmakers the artillery corps. The education infrastructure training this army division had was similar to imperial engineering academies. Therefore, even Kaunitz had to acknowledge that although the survey of the Austrian Netherlands seemed more a project for the engineering corps, using the artillerymen gave the ever so rare military engineers the possibility to focus on maintaining the

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scale of 1:28,800 preferred for all the other sections of these maps, the survey was done at 1:11,520 and a smaller version of this map (1:86,400) was engraved and sold to the public. Dörflinger, *Die Österreichische Kartographie*, vol. 1, 64.

[152] When he was nine years old, Ferraris became the page of the Habsburg empress Amalia. During his stay in Vienna Ferraris studied with the Court Mathematician and Director of the Engineering Academy, Marinoni. After enrolling in the army, when he was 15 years old, Ferraris took part in the War of the Austrian Succession and the Seven Years' War. After his participation in these conflicts, Ferraris spent the next decades in Brussels under the protection of Charles of Lorraine. In 1767, Ferraris became general director of the Artillery Corps of the Austrian Netherlands and organized the engineering school of the Artillery Corps at Malines. Ernst Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," in *La Cartographie au XVIII siecle et l'oeuvre du Comte de Ferraris (1726-1814): Colloque International Spa 8-11 Sept 1976* (Brussels: Credit Communal de Belgique, 1978), 134; Marinette Bruwier, "Le comte de Ferraris et son oeuvre," in Ibid., 21; Claire Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège à la fin du XVIIe et au XVIIIe siècle* (Brussels: Musée Royal de l'Armée, 1984), 33, 62.

[153] The project of Ferraris was greatly inspired by Colonel de Bon the French ambassador in the Austrian Netherlands from the late 1760s. De Bon had served in the Habsburg army during the Seven Years' War and envisioned the map of the Austrian Netherlands as a continuation of the Cassini project. Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 62-63.

fortifications and implementing the 1769 Border Treaty signed with France.[154] The Ferraris survey of the Austrian Netherlands produced detailed maps and geographic descriptions very similar to the Great Military surveys. This example demonstrates that the general quartermaster's staff and the imperial corps of engineers did not control the monopoly of imperial cartographic enterprises. Even by the late 1770s, the Aulic War Council had not relegated mapmaking to only one institution, and officers with cartographic skills entered the Habsburg service in various army divisions. The incomplete centralization of military mapmaking was also a reflection of the structure of education institutions for engineers. Located in only some imperial centers, engineering schools trained both military officers and civilians. Moreover, as the next section reveals, the imperial authorities had to adapt their policies to the existence or lack of a pre-eighteenth century provincial tradition of engineering.

2.2 EDUCATING MAPMAKERS IN VIENNA, BRUSSELS AND MILAN

In his study on the "generation of 1683" of Habsburg generals, Erik Lund showed how most of these officers did not receive formal education in military academies during the seventeenth century. Despite not taking courses at such institutions, a significant number of officers belonging to Lund's case study had technical knowledge as artillerymen, engineers, or staff officers with mapmaking responsibilities.[155] Therefore, the existence of able engineers precluded the creation of a formal learning institution. Lund's conclusions can be expanded to the next generations, as in the first half of the eighteenth century, most Habsburg military mapmakers

[154] AGR CAPB, box 476, documents D 98 C 11 N 19. February 22, 1770, Kaunitz to Maria Theresa; February 19, 1771, Kaunitz to Maria Theresa.
[155] Lund, "The Generation of 1683," 209-210.

developed their mapmaking skills under the supervision of a mentor and not inside the walls of an Engineering Academy. Moreover, after 1718, the integration of new provinces in Italy and the Austrian Netherlands offered the Habsburgs access to a significant group of already trained military engineers.[156] However, this strategy was bound to have a short lifespan and the Habsburgs had to invest in building a new group of military engineers. As the central authorities in Vienna understood the importance of trained engineers on the battlefield, they promoted the creation of Technical Schools in order to increase the number of specialists.[157]

Italian military engineers traditionally played an important role in fortress building and mapmaking in the Habsburg lands and this trend left its imprint on the development of the first Engineering Academy in Vienna.[158] Leander Anguissola from Piacenza, who had distinguished himself soon after he entered the Habsburg service in 1680 as an outstanding drawer of military situation maps (*Situationszeichner*), petitioned prince Eugen of Savoy in 1710 and 1711 to open up a school for engineers and war architects.[159] Anguissola's appeal was consistent with Prince Eugen's desires, as this skilled military commander had been confronted on the battlefields of the Netherlands with a serious lack of able engineers. Therefore, in 1710, Prince Eugen wrote a plea to Emperor Charles VI, urging the monarch to build a school for engineers and to organize military engineers into a special army corps; in his words: "there is not one among our engineers who can construct a proper fortress or even maintain our existing works."[160]

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[156] Schröder, *Beiträge zur Geschichte des k.k. österr Génie-Corps*, 54.
[157] For a very detailed study of the history of the imperial engineering schools and academies in Vienna see Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*. In France formal engineering schools were also established in the first half of the eighteenth century: the school for artillerymen (1720), the school of *Ponts et Chaussées* (1747) and the school for the *Corps du Génie* (1748). Alder, *Engineering the Revolution*, 57.
[158] Lund, "The Generation of 1683," 210.
[159] Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," 133.
[160] Franz Rieger, "Prinz Eugen und das Fürstenthum Siebenbürgen. Vortrag, gehalten im militär-wissenschaftlichen Vereine zu Hermannstadt, am 14. Februar 1896," *Organ der Militärwissenschaftlichen Vereine* 52 (1896): 300-301. The quote comes from Gunther E. Rothenberg, "Some Observations on the Evolution of Technical and Scientific Education in the Austrian Army during the Eighteenth Century," in *Science, Technology, and Warfare: the*

Finally, on December 24, 1717, Charles VI ordered the founding of the Imperial Academy of Engineering in Vienna (*Wiener K.K.Ingenieurakademie*).[161] The directors of this Academy, until its relocation in 1755, were two Italians with strong mapmaking expertise: Anguissola (1718-1720) and Gian Giacomo Marinoni (1720-1755).[162] Charles VI's order for the creation of this new Engineering Academy, strongly influenced by Anguissola's proposals, prefigured a curriculum structured around arithmetic, theoretical and practical geometry, statics and mechanics.

Despite their strong influence over the organization of the Academy, the work of the Italian professors did not go unsupervised. The Aulic War Council kept a close eye on the Engineering Academy and one of the Habsburg generals deployed in Vienna acted as the superintendent of this educational institution.[163] As many of the graduates of the Engineering Academy joined the ranks of the military engineers, the Aulic War Council wanted to ensure their training fulfilled the needs of the imperial army. Whereas Marinoni privileged a focus on theoretical mathematical sciences, the Habsburg military commanders preferred recruits with a strong practical knowledge of engineering sciences. Therefore, on January 7, 1754, the deputy director of the recently formed army corps of engineers, de Bohn, sent an official complaint to the Aulic War Council about the poor preparation of the new recruits. Bohn mentioned that although the graduates of the Engineering Academy had some knowledge of geometry and

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proceedings of the Third Military History Symposium, United States Air Force Academy, 8-9 May 1969, eds. Monte D. Wright, Lawrence J. Paszek (Washington, DC: U.S.G.P.O.,1971), 77.

[161] For a discussion of some other institutions initiated by individuals or local estates, in which students could get some training in the engineering sciences before the opening of the Engineering Academy in Vienna, see Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 5-55.

[162] Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," 133.

[163] Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 57. During the first years of this Academy, Marinoni and Anguissola taught sixteen classes per week on arithmetic, geometry, mechanics and military architecture. Schröder, *Beiträge zur Geschichte des k.k. österr Génie-Corps*, 54.

surveying, they had no proper understanding of other engineering sciences, such as mechanics, hydrostatics or hydraulics.

In their answer to de Bohn's complaint, the directors of the Academy, Marinoni and Millius, admitted that the sciences of mechanics, hydrostatics and hydraulics were very recent additions to their curriculum, as a result of a direct order from the Aulic War Council. Marinoni's and Millius's in-depth discussion of the 1754 curriculum of the Academy, reveals the extensive training students received in the art of mapmaking. During their three years of studies, students learned mathematical notions for surveying and also received practical training on how to perform measurements with the help of instruments such as the plane table. Military architecture also occupied a large segment of the program of study; students learned how to prepare plans and profiles of buildings and studied fortifications designed by Vauban, Pagan and Blondel.[164] The strong bias of the curriculum towards training students on how to survey and represent the territory reveals the existence of a group of skilled mapmakers. And although de Bohn disagreed with the structure of the curriculum, Marinoni developed it based on his understanding of the Habsburg imperial priorities and his prior experience as the coordinator of the survey of the State of Milan in the 1720s.[165]

Shortly after Marinoni's death in 1755, Maria Theresa closed down the first imperial Engineering Academy and reopened it in Gumpendorf, a suburb of Vienna, as a continuator of

[164] Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 82-85.

[165] Marinoni's background helps explain the strong focus of the Engineering Academy on preparing experts in the art of surveying. The court mathematician, Marinoni, had introduced in the Habsburg lands an improved version of the pretorian table, also known as the plane table, a surveying instrument that allowed its operator to draw the landscape on a paper at the same time as they were doing the measurements in the field. Using triangulation rules, the surveyor only had to measure one side of a triangle in order to represent the land surface on the paper. Vienna approved the use of Marinoni's modified version of the plane table for the cadastral survey of Lombardy. Sergio Zaninelli, *Il Nuovo Censo dello Stato di Milano, Dall'Editto del 1718 al 1733* (Milan: Societa editrice Vita e Pensiero, 1963), 41-46; Carlo Capra, *The State of Milan's "New Census,"* http://www.eurocadastre.org/pdf/capraingles.pdf, 2, last accessed on June 13, 2013.

the *Chaos'sche Stiftung*'s (Chaos Foundation) engineering school.[166] The authorities in Vienna used the promise of an army career as a motivating factor for people coming from more modest backgrounds. Moreover, as there were not sufficient engineers within the borders of the Monarchy, poor students were offered free training. For example, on February 29, 1756, the Chancellor of Transylvania sent six poor youngsters from this province to Vienna, so that they could pursue a military career. Maria Theresa decided that four of these youths should take classes at the engineering school in Gumpendorf.[167]

Whereas the earlier Engineering Academy had been under the direct control of the Aulic War Council, the new school in Gumpendorf fell for a brief time under the authority of the Directory of Administration and Finance (*Directorium in Publicis et Cameralibus*), a sort of ministry of interior of the Monarchy.[168] This "divorce" between the engineering school and the military authorities was short-lived. In 1760, Ferdinand Philipp Count Harsch took over the position of deputy director of the corps of engineers and the same year, Maria Theresa moved the engineering school under the direction of this army unit. Harsch became the *Ober-Director* of the school and major Hirschenhan received the position of School Director. For the following decades, the military authorities considered the Gumpendorf engineering school as one of the best recruiting places for future military engineers. In 1760, seven graduates of this school became cadets in the imperial engineering corps.[169] Indeed, experience showed that the individuals recruited from the engineering school in Gumpendorf became, with time, the best

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[166] The new institution opened its gates on May 1, 1755. Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 88, 110. The "Chaos Foundation" provided education for talented noble orphans, and since 1715 included a military-technical school. Rothenberg, "Some Observations on the Evolution of Technical and Scientific Education in the Austrian Army during the Eighteenth Century," 77.
[167] Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 125.
[168] Ibid., 110. Following the advice of Haugwitz, Maria Theresa created the *Directorium in Publicis et Cameralibus* in 1749, in an effort to centralize the administration of her empire, after the disastrous War of the Austrian Succession. Ingrao, *The Habsburg Monarchy*, 161.
[169] Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1, 38.

officers of the corps of engineers.[170] The Gumpendorf curricula showed similarities with the earlier Academy of Engineering. In 1760 students took classes in foreign languages (French and Latin), history, geography, drawing, mathematics with a strong focus on geometry and trigonometry, civil and military architecture, military exercises, fencing and dancing.[171] Based on this schedule, military mapmakers could have developed good cartographic skills during the school years.

A report Harsch prepared in the late 1760s illustrates the role of the engineering school in relationship to the imperial engineering brigades. From 1755 until 1767, out of more than 600 students who passed through the Gumpendorf school, 79 joined the corps of engineers. Harsch believed that the engineering corps should only be composed of the Monarchy's own subjects, and not rely on foreigners, as such people could change their allegiance anytime. Therefore, in Harsch's opinion, the Gumpendorf School was the only way to create a trustworthy engineering corps for the Monarchy, and he envisioned a recruitment rate of 10-15 graduates from the school every year.[172] Even after the school was transferred in 1769 to Laimgrube, it remained under the strict control of the corps of engineers and constituted the main recruiting base for this military unit.[173]

As shown by the creation of the imperial engineering corps, Maria Theresa and her advisers took the French case as a model. Indeed, the Habsburgs tried to recruit people who had served in the French engineering corps and learn from their experience. In 1757, an experienced French officer recommended that the Habsburg empress open another engineering school in Vienna to train the students in mathematics, mechanics and hydraulics. In this way, the graduates

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[170] Schröder, *Beiträge zur Geschichte des k.k. österr Génie-Corps*, 89.
[171] Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 116.
[172] Ibid., 161-164. Rothenberg, "Some Observations on the Evolution of Technical and Scientific Education in the Austrian Army during the Eighteenth Century," 78.
[173] Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 244.

of such an educational establishment could serve the Monarchy not only during war, but also by draining swamps or building channels to improve the waterways network.[174]

Another example showing the importance of the French model for the Habsburg engineering education was the hiring of Johann d'Arnal (1729-1793) at the Engineering Academy in Vienna during the 1770s. Earlier in his career, D'Arnal had served under the French banner as a captain engineer.[175] In 1773, he developed a new method for teaching the science of fortifications and included in his proposal for the class a list of the skills all members of the engineering corps should gain during their training. In d'Arnal's opinion, the Academy in Vienna had to impart to students knowledge of mathematics, physics, topography, geometrical drawing, levelling, civil architecture, hydraulics, tactics, artillery, the art of encamping and underground war.[176] As the various examples from the late seventeenth and eighteenth centuries showed, the knowledge required of military engineers involved surveying and map drawing. The curriculum of the engineering school in Vienna reflected the international trend of this profession's mathematization, which also impacted the development of eighteenth century cartography.

Developing engineering educational institutions in Vienna was part of a larger attempt to centralize the training of military officers at the scale of the Monarchy.[177] However, an imperial army could not rely on training military experts in only one center. In the case of the Habsburg

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[174] Unsigned report. SHD, AAT, 1 M 1582, vol. 3, 26-27.

[175] Hector Rivoire, *Statistique du département du Gard* (Nîmes: Ballivet et Fabre, 1842), 424; Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 258.

[176] SHD, AAT, 1 M 1750, document "Idée générale de la nouvelle méthode d'instruction," 5.

[177] The creation of Engineering Academies was not an isolated effort to improve the training of Habsburg officers. The disasters suffered during the War of the Austrian Succession (1740-1748) motivated Count Friedrich von Haugwitz to suggest in 1747 the creation of a school for training noble cadets in the castle at Wiener Neustadt. In 1752, this cadet school opened its gates and marked for the imperial army an important transition. Instead of relying only on the officer training offered by local schools, the army could count on a new generation trained in an imperial, centralized institution. Johann Christoph Allmayer-Beck, "The Establishment of the Theresian Military Academy in Wiener Neustadt," in *Essays on Pre-Revolutionary Eighteenth Century East Central European Society and War*, eds. Béla Király, Gunther Rothenberg, and Peter Sugar (New York: Columbia University Press, 1982), 116-121.

Monarchy, the cities of Brussels and Milan also had a strong tradition in preparing highly qualified engineers. The westernmost Habsburg province, the Austrian Netherlands, was the home of two schools where engineers could develop their mapmaking skills: the Engineering Academy in Brussels and the Mathematic School of the Artillery Corps in Malines.

Inherited from the Spanish regime, the Engineering Academy in Brussels initially functioned under the name Military Academy for the Study of Fortifications and Mathematics (*Académie militaire de fortification et de mathématique*) and was open to all the regiments from the Spanish and then the Austrian Netherlands. During the same decade when the deputy director of the engineering corps triggered the restructuring of the Engineering Academy in Vienna, the director of the Belgian engineering brigade, Jacques Robert Spalart, initiated a similar reform in Brussels. On January 4, 1752, Spalart wrote a memoir discussing the following principles for the reforming of the Engineering Academy in Brussels: subordinating this school to the corps of engineers by ensuring that the main professor was an officer in this army's body, and encouraging promising civilian students to join the imperial army.

Governor Charles de Lorraine's new regulation for the Engineering Academy in Brussels implemented Spalart's suggestions and created a curriculum organized around three years of study, and encompassing mathematics, mechanics, cosmography, geography, mapmaking, notions of fortifications and artillery. Moreover, Lorraine named as the new director of the school a captain from the Belgian engineering corps, Nicolas Bernard de Hucher.[178] In this way, just as in the case of the Engineering Academy in Vienna, the military authorities supervised closely the training of potential future recruits. The Academy in Brussels educated not only experts in fortifications, but also some of the main mapmakers of the province. The graduates of

[178] Claire Lemoine-Isabeau, "La Carte de Ferraris: les écoles militaires aux Pays-Bas et l'Ecole d'hydraulique à Bruxelles," *Revue belge d'histoire militaire* 18 (June 1969): 76-78.

this Academy contributed to the first detailed topographic map of Belgium, the Ferraris Map, and worked on the border demarcations of the province during the second half of the eighteenth century.[179] However, despite their pivotal role, these engineers were not the only contributors to the development of Habsburg cartography in the province: the majority of military-men who contributed to the Ferraris map studied at the Malines school and belonged to the artillery corps.

The school of the artillery corps, probably founded around 1763 by F.L.Cogeur, was a later educational institution in the Austrian Netherlands. Cogeur and most of the other professors teaching in Malines were graduates of the Military Academy in Brussels. In 1767, around a dozen students were pursuing their first year of studies in Malines, and by 1770 this school included sixty students. As the commander of the corps of artillery of this province, Ferraris also coordinated the first detailed topographic survey of the Austrian Netherlands; he used students from this school as mapmakers.[180] This school closed down around 1777 or 1778, after the Ferraris Map had been finalized and the corps of artillery of the Austrian Netherlands was united with the main imperial artillery unit.[181] Despite its short existence, the Malines School proved instrumental in furthering the Habsburg cartographic projects in the Austrian Netherlands.

The existence of training institutions in the Austrian Netherlands did not stop people from pursuing their engineering education abroad. In December 1759, the central government of this province refused the request of Joseph de Villers de Strasbourg, an official from Agimont, to send his son to serve in a French regiment for two years in order to improve his engineering skills. The argument used by the Privy Council to deny this claim was that Habsburg recruits had

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[179] It seems this institution ceased its activity by 1783. Claire Lemoine-Isabeau, *La Cartographie du Territoire Belge de 1780 à 1830 entre Ferraris et le Dépôt de la Guerre de Belgique* (Brussels: Musée Royal de l'Armée, 1997), 27.
[180] Lemoine-Isabeau, *La Carte de Ferraris*, 74-75. In 1767 the artillery corps of the Austrian Netherlands included 813 men, out of which eighteen formed the staff and the rest were divided in twelve companies. Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas*, 62-63.
[181] Lemoine-Isabeau, *La Cartographie du Territoire Belge*, 28.

enough opportunities in the province to study mathematics, a clear reference to the educational institutions functioning in the region. Interestingly, the governor of the Austrian Netherlands, Charles of Lorraine, intervened in the favor of the Agimont official and granted his request.[182] France was only one of the destinations for students of military engineering. In 1767, Charles of Lorraine approved the petition of Jean Ignace d'Handel, who wished to send his 16-year old son to study with his maternal uncle, the chief of the engineering corps of Bavaria.[183] One possible reason for continuing to send officers abroad to become military engineers might have been the desire to keep the Habsburg military in tune with foreign developments.

The Austrian Netherlands was not the only province with a strong pre-eighteenth century engineering tradition. The State of Milan, annexed in 1713, was the home of the famous *Collegio* of engineers (*Collegio degli Ingegneri)*, a centuries-old corporation, which dominated the surveying and fortification operations in the area.[184] The first conflict between Habsburg military engineers and the Milanese *Collegio* occurred right after the conquest of this province. In the first stages of the surveying operations for the cadaster of Lombardy, the local engineers opposed the methodology the imperial agent, Marinoni, proposed in 1719. Although Italian himself, by the time of the *Censimento* he had been living in Vienna for a significant amount of time, and had recently become the director of the Engineering Academy. Marinoni desired to measure the

[182] AGR Conseil Privé (hereafter CP), Box 967 B, December 22, 1759.
[183] Ibid., letter from Charles de Lorraine, September 29, 1767.
[184] In the Italian states free professions, such as the engineers, architects and surveyors, were organized in institutions called *Collegi*, similar to the trade guilds. These urban institutions regulated the access of individuals to a certain profession. The *Collegio* of the engineers accepted only male students born in Milan whose parents had not practiced any mechanical arts or trades at least for two generations. Elena Brambilla, "Scientific and Professional Education in Lombardy, 1760-1803: Physics between Medicine and Engineering," in *Nuova Voltiana. Studies on Volta and his Times*, eds. F. Bevilacqua, L. Fregonese, vol. 1 (Milan: Università degli Studi di Pavia-Hoepli, 2000), 52-54.

territory of the State of Milan in a way that would offer the Habsburg Court an accurate appraisal of the territory and a detailed map of Lombardy.[185]

The resistance of local engineers and surveyors revealed how the training offered in Milan contrasted with that in Vienna. The engineers sent from Vienna had a more scientific training and understood the advantages of using the plane table. In contrast, the traditional *Collegio*, which licensed the engineers from Milan, privileged practical over theoretical instruction and had very strict membership requirements. Moreover, as many of the local engineers were intrinsically connected to the interests of Milanese elites, Vienna could not trust them in the process of taxation reform.[186] The experience of the cadastral work encouraged the government in Vienna to subordinate the engineers from the State of Milan to imperial authorities. This process of centralization involved the following aspects: reforming the structure and regulation of the *Collegio* of engineers, introducing educational institutions for engineers, and bringing to this province military engineers from other parts of the Habsburg Monarchy.

The government in Vienna tried to subordinate fortifications and mapmaking projects under strict military authority. The creation of the Italian brigade of engineers in 1748 eroded the centuries-old monopoly the local authorities of the Duchies of Milan and Mantua had over the maintenance of fortifications. Before this date, non-military engineers affiliated with the *Collegio* of engineers in Milan had the responsibility of maintaining this province's military structures.[187] However, one of the main obstacles the Habsburg soon encountered in their efforts to centralize the control of fortifications and military mapmaking was the lack of sufficiently trained military engineers. Despite the existence of a number of institutions training and

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[185] Zaninelli, *Il Nuovo Censo dello Stato di Milano*, 42-46.
[186] Giovanni Liva, "Il Collegio degli ingegneri architteti e agrimensori di Milano," in *Il Collegio degli ingegneri e architetti di Milano: gli archivi e la storia*, eds. Giorgio Bigatti and Maria Canella (Milan: F. Angeli, 2008), 17-18. Carlo Capra, *La Lombardia Austriaca Nell'Età delle Riforme (1706-1796)* (Turin: Utet Libreria, 1987), 70-71.
[187] Dattero, "Ingegneri militari Italiani, austriaci e belgi in Lombardia nel XVIII secolo," 180-181.

organizing civil engineers in Lombardy, no similar framework existed at the provincial level for their military counterpart.[188] Therefore, initially the engineers enrolled in the Habsburg army and deployed in Austrian Lombardy were, for the most part, not from the province. As a result, the Habsburg authorities repeatedly had to entrust sensitive military projects, such as the preparation of border maps, to non-military engineers. This necessity explains why the Viennese Court devoted a lot of attention to the regulation of the Milanese *Collegio*.

Indeed, in the imperial order for the reform of the *Collegio* of engineers that Maria Theresa issued on May 29, 1771, she mentioned her desire to create a group of engineers whose work would serve both civilian and military objectives. Furthermore, the government in Vienna suspended the certifying of new engineers for the State of Milan until the complete reform of the licensing process. In addition to requesting suggestions for such a reform from the *Collegio* of Milan, the central authorities gathered reports from Count Carli, the president of *Magistrato Camerale* in charge of supervising waterways and canals, as well as Giuseppe Pecis, member of the council for the waters, roads and borders, and the recently hired mathematics professors of the *Scuole Palatine* (Palatine School), Paolo Frisi and Francesco Luino.[189] In his detailed answer dated December 9, 1771, Paolo Frisi included a discussion of the licensing system for engineers, architects and surveyors in Tuscany, Bologna, Venice and Piedmont.[190] Frisi's report reveals that various Italian states, including the Habsburg province of Tuscany, developed a standard procedure for educating and licensing engineers. In this sense, the Habsburg government was not innovative, but representative of a more general trend.

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[188] Brambilla, "Scientific and Professional Education in Lombardy," 56.
[189] State Archive of Milan (hereafter ASM), Dispacci Reali (hereafter DR), box 245, May 29, 1771. The *Magistrato Camerale* employed engineers belonging to the *Collegio* in Milan for the projects related to waterways and canals. Brambilla, "Scientific and Professional Education in Lombardy," 55.
[190] ASM Autografi, box 129, folder 16 (Paolo Frisi). All the places Frisi discussed had either an internship- or exam-based system, or a combination of the two. The main subjects engineers and surveyors studied were mathematics, geometry, physics and hydraulics.

Based on these suggestions and the comments of the plenipotentiary minister, Firmian, in 1775, the Viennese authorities issued a General Regulation for Engineers, Architects, Geometers and Surveyors from the State of Milan. The government created a standard procedure for obtaining the license of engineer, architect or surveyor, which involved a clear educational curriculum, and a series of exams and practical training under licensed professionals.[191] The subjects of study included mathematics, physics, hydraulics and architecture, therefore a course list similar to the engineering institutions in Vienna and Brussels. As a result of suggestions from local Habsburg bureaucrats, such as Frisi, the new 1775 regulation for obtaining the license of engineer made mandatory a two-year course in mathematics and hydraulics, which could be taken at the schools in Milan, but also at other institutions. Proving a certain financial stability in order to join the *Collegio* replaced the earlier condition of having Milanese citizenship and a certain family background.[192] Because military engineers proved insufficient to provide for Lombardy's surveying and fortification building needs, the Habsburgs tried to rein in the skills of the *Collegio* engineers.

If we examine the centralization of military mapmaking based on the creation of educational institutions and special military units, it seems the Habsburg imperial decision-makers managed to concentrate the production of and maintain control of all cartographic material. The standardization of engineering education and the organization of engineers into special army units suggest the triumph of Enlightened Absolutism in controlling this branch of scientific production. However, some of the main supervisors and contributors to the production of large topographic surveys within the Habsburg Monarchy did not follow a streamlined educational and institutional path. Additionally, the Habsburg military engineers organized in the

[191] ASM DR, box 253, May 15, 1775.
[192] Brambilla, "Scientific and Professional Education in Lombardy," 63.

engineering brigades and the general quartermaster's staff controlled only part of the imperial cartographic production, as the case of the Milano *Collegio* shows. Centralizing Habsburg imperial mapmaking was a gradual process and only partially successful, as the careers of the following cartographers reveal.

2.3 CAREER STORIES OF MILITARY ENGINEERS

The nationalization of Habsburg science from the second half of the nineteenth century onwards owed a lot to the institutionalization done at imperial level by the Viennese rulers during the eighteenth century.[193] Additionally, the obvious tensions towards the end of the nineteenth century between imperial programs and nationalistic politics can be traced back to the incomplete control from Vienna of scientific practices, such as cartography. As military maps became a priority for the eighteenth-century Habsburg rulers, they tried to address the lack of qualified personnel. As described in the preceding sections, by the 1760s, the central authorities in Vienna had developed an institutional framework for training and organizing military engineers with mapmaking responsibilities.[194] However, this centralized system was far from all-pervading, and did not exclude the role of apprenticeship at the local level or the recruitment of capable officers trained abroad. Indeed, some of the best military mapmakers of the eighteenth

[193] See the studies in *The Nationalization of Scientific Knowledge in the Habsburg Empire, 1848-1918*, eds. Mitchell G. Ash, and Jan Surman (Basingstoke, England: Palgrave Macmillan, 2012).

[194] Alessandra Dattero argues that in eighteenth century Austrian Lombardy the corps of engineers developed from an apprenticeship-based profession into a group of experts trained in special government institutions. This historian considers such an evolution typical for the reform of the military organization in the eighteenth century European states, as the foundation of technical schools for the military and the rise of technical corps accelerated. However, the case of Lombardy and the Austrian Netherlands were exceptional within the Habsburg lands, as they had a much-richer tradition of training and organizing engineers. Therefore, this analysis includes the eastern Habsburg province of Transylvania, in which training through apprenticeship in the field of military engineering, especially in connection with surveying and mapmaking, remained very influential throughout the eighteenth century. Dattero, "Ingegneri militari Italiani, austriaci e belgi in Lombardia nel XVIII secolo," 177-194.

century did not attend the courses of the engineering schools in Vienna, Brussels or Milan, and until the 1760s they were not necessarily integrated as part of the engineering corps, artillery corps or the general quartermaster's staff.[195] Such unorthodox careers reveal the importance of putting the story of Habsburg cartography in a larger context, and acknowledging the role of provincial and trans-imperial influences.

Mapping the geography of imperial biographies brings into the spotlight connections within and across imperial borders, which impacted the development of scientific practices, such as cartography.[196] Although the current literature on early-modern empires addresses imperial development by focusing on the careers of particular individuals, more work of this nature has to be done for the Habsburg Monarchy.[197] Therefore, this section presents details about the careers of military officers that did not follow the *cursus honorum* of Habsburg institutions. Stephan Lutsch von Luchsenstein served in the Habsburg army for more than fifty years and became one of the best mapmakers of the province of Transylvania without having studied in Vienna or having been part of the imperial engineering corps. Dominic and Michel Angelo de Blasco started their careers in Sicily right after the Habsburgs took over the island in 1720. Whereas Dominic died as part of the Italian Brigade of the engineering corps, Michel Angelo entered the Portuguese service in 1750 and spent most of the late 1760s trying unsuccessfully to again become a Habsburg officer. During his career, Mihály Jeney served at least three powerful states, France, Prussia and the Habsburg Monarchy, and was probably trained in the art of mapmaking

[195] In the 1760s the genie and artillery corps were still young institutions and the general quartermaster's staff became a permanent military institution only in 1758. Zeinar, *Geschichte des österreichischen Generalstabes*, 110.
[196] Introduction to *Colonial Lives Across the British Empire: Imperial Careering in the Long Nineteenth Century*, eds. David Lambert and Alan Lester (Cambridge: Cambridge University Press, 2006), 1-2.
[197] For the British Empire see Linda Colley, *The Ordeal of Elizabeth Marsh: a Woman in World History* (New York: Pantheon Books, 2007); Lambert and Lester, *Colonial Lives Across the British Empire*; Emma Rothschild, *The inner life of empires: an eighteenth-century history* (Princeton, NJ: Princeton University Press, 2011). For the Ottoman Empire see Virginia Aksan, *An Ottoman Statesman in War and Peace. Ahmed Resmi Efendi 1700-1783* (Leiden: E.J.Brill, 1995).

on the job. The stories of these men intersect the imperial institutions discussed in the earlier sections in an unpredictable manner and bring to the forefront the role of provincial and trans-imperial influences in structuring Habsburg cartography as an imperial science.

2.3.1 Stephan Lutsch von Luchsenstein

Born in 1707 as the son of a Transylvanian Lutheran priest, Stephan Lutsch von Luchsenstein had the fortune of becoming acquainted during his early years with the experienced Habsburg engineer Johann Conrad Weiss. At the time, Weiss was the commander of the Carlsburg (Alba-Iulia) fortress in Transylvania and had established himself as an important provincial figure due to his work on the construction of the fortress and the drawing of what was considered the first accurate geographical map of this province.[198] Once Weiss took Luchsenstein under his wing, he ensured that the youngster received training both at the Hermanstadt (Sibiu) gymnasium and under his direct guidance.[199] From Weiss, Luchsenstein learned mathematics, drawing, French and the art of fortifications; he also became the inheritor of Weiss's library and instruments. The professional training Weiss offered to Luchsenstein mirrored the curriculum of the engineering schools in Vienna, Brussels and Milan. From the early stages of his career, Luchsenstein learned how to assist in fortification construction and maintenance, while also improving his mapmaking technique. All of these skills were compatible with the instructions for engineers as issued both before and during Maria Theresa's time.

[198] As a reward for his contributions, Weiss received in 1736 the rank of colonel. Being a Lutheran, Weiss attended the services at the church where Stephan Lutsch's father preached. The biographical information about Weiss and Luchsenstein comes from the following sources: Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1, 19; Rieger, "Prinz Eugen und das Fürstenthum Siebenbürgen," 300-301; G.D.Teutsch, "Lutsch, Stephan," in *Allgemeine Deutsche Biographie* 19 (1884), 707, http://www.deutsche-biographie.de/pnd137892810.html?anchor=adb, last accessed on March 10, 2013.

[199] I use the name Luchsenstein to refer to Stephan Lutsch von Luchsenstein, as this became his most common identifier after Maria Theresa ennobled him in 1753 and conferred to him the title "von Luchsenstein." Raisz, "Colonel Stefan Lutsch von Luchsenstein," 122.

During his career, Luchsenstein met other military engineers skilled in the art of mapmaking, such as Jacob Zultner, who had contributed to the mapping of Austrian Wallachia and the Weiss map of Transylvania.[200] In 1733 the Aulic War Council commissioned Weiss together with lieutenant Schwentner and First Lieutenant Zultner to go into a reconnaissance mission over the Vulcan Pass, connecting Transylvania and Austrian Wallachia. The goal of this inspection was to prepare a plan for the construction of a new road going through the Carpathian Mountains, and Stephan Lutsch compiled the journal Weiss kept as part of this mission.[201] Therefore, we can assume that Luchsenstein accompanied his mentor during this reconnaissance journey and worked together with some of the top Habsburg mapmakers in the area. Once the engineers completed their mission, they returned to Carlsburg, where Schwentner and Zultner offered to prepare the maps accompanying the plans for the road construction. Luchsenstein probably had plenty of opportunities to learn from these experienced mapmakers, especially as Zultner worked in Carlsburg from 1726 until his death in 1755.[202]

As part of his training, Luchsenstein worked under the guidance of Weiss and Zultner, and learned from them the art of surveying and map drawing. For example, the War Archive in Vienna houses a copy of the 1735 Weiss Map of Transylvania, which Luchsenstein probably prepared before 1750.[203] In addition to the geography of Transylvania, the Weiss Map and the copy made by Luchsenstein included information about part of Austrian Wallachia. As Zultner

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[200] Between 1718 and 1739, the Habsburgs occupied the western section of the Danubian Principality Wallachia. Friedrich Schwantz coordinated the survey of Austrian Wallachia between 1720 and 1722. See Şerban Papacostea, *Oltenia sub stăpânirea austriacă (1718 - 1739)* (Bucharest: Editura Enciclopedică, 1998); Ana Toşa Turdeanu, *Oltenia. Geografie Istorică în Hărțile Secolului XVIII* (Craiova: Editura Scrisul Românesc, 1975), 23-29.
[201] KA KPS, K VII k 322 ½ F.
[202] Gustav Dietrich von Hermannsthal, "Unter Oesterreichs Doppeladler. Kriegsgeschichtliche Erinnerungen an und für seine Landsleute," *Archiv des Vereines für Siebenbürgische Landeskunde*. Neue Folge 17, no. 1 (Hermannstadt [Sibiu, Romania]: Franz Michaelis, 1882), 224.
[203] KA KPS, B IXa 713.

had worked on the Schwantz map of Austrian Wallachia before coming to Carlsburg, his geographical knowledge probably impacted the final form of the Weiss map.

Luchsenstein's work, inspired by Weiss's map and entitled *New and accurate geometric map of Mediterranean Dacia or the modern Principality of Transylvania* (*Nova et accurata Geometrica Mappa Daciae Mediterraneae seu Moderni Principatus Transilvaniae),* includes the location of fortresses, castles, various types of settlements, monasteries, ruins, mines, main roads, and the provincial administrative subdivisions. However, the density of toponyms for the Austrian part of Wallachia (Figure 2.1) was far greater than that for the part of Wallachia outside Habsburg rule (Figure 2.2). The Habsburg cartographic gaze did not stray far from the empire's borders, at least for the first half of the eighteenth century.

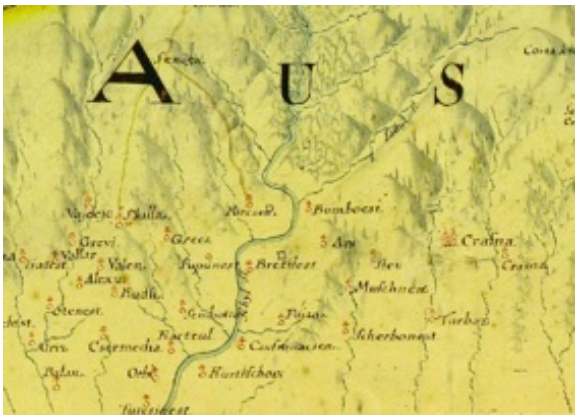

Figure 2.1 Austrian Wallachia on Luchsenstein's *New and accurate geometric map of Mediterranean Dacia or the modern Principality of Transylvania*

Figure 2.2 Ottoman Wallachia on Luchsenstein's *New and accurate geometric map of Mediterranean Dacia or the modern Principality of Transylvania*

In 1734, Luchsenstein joined the Habsburg army and accumulated extensive campaign experience by fighting in Italy, Bavaria, Silesia, Bohemia and Moravia as part of the Regiment

Roth.[204] With his extensive knowledge of both the art of fortifications and mapmaking, Luchsenstein would have been a suitable candidate for the imperial engineering corps or the permanent general quartermaster's staff created after 1758. However, rather than pursuing a career as part of the top imperial institutions, by the late 1740s Luchsenstein had returned to Transylvania and served in this province until his death in 1792.[205] The role of Transylvania as a Habsburg border province in the close vicinity of both the Ottoman and Russian empires, most likely impacted Luchsenstein's career. As the wars of the first half of the eighteenth century taught the Habsburgs, their southeastern border was very unstable.[206] Skilled local military engineers like Luchsenstein were instrumental in preserving the Habsburg upper hand in the region. Therefore, the Habsburg military authorities valued the mapmaker's presence in the province.

Luchsenstein's biography is not exceptional, as the story of one of his mentors, Zultner, reveals. Zultner was also the son of a Transylvanian priest, and studied mathematics and drawing from an early age. He trained under the direction of the military engineer Friedrich Schwanz von Springfels from 1713 until 1726. Until his death in 1755, Zultner participated in various mapmaking campaigns: the survey of Austrian Wallachia in the early 1720s, the surveys of Transylvania and Austrian Wallachia under the direction of Conrad Weiss finalized in 1735 and 1740 respectively. Moreover, Zultner also had extensive knowledge of fortifications and even

[204] Raisz, "Colonel Stefan Lutsch von Luchsenstein," 123.

[205] By 1760 Luchsenstein became the commander of the Transylvanian *Sanitätswächtercorps* (quarantine line troops) with the rank of Major. When the Habsburg Military Border was extended to Transylvania, Luchsenstein received the rank of lieutenant colonel and became the commander of the First Wallach Regiment with headquarters in Orlat. Under the entry for Siebenbürgen, in *Lexikon zur Geschichte der Kartographie: von den Anfängen bis zum ersten Weltkrieg*, eds. Johannes Dörflinger, Franz Wawrik, E. Tomasi, and Ingrid Kretschmer (Vienna: F. Deuticke, 1986), 742.

[206] The 1718 Peace of Belgrade conceded to the Habsburgs the western part of Wallachia, but the 1739 Peace of Belgrade undid this cession.

served as the director of fortifications at Carlsburg (Alba-Iulia) from 1747.[207] From these two cases of Transylvanian mapmakers, we can infer that not all capable military engineers were trained within the walls of engineering academies. Local promising youngsters coming from modest backgrounds could also rise in the ranks of the Habsburg army.

Even in the case of Austrian Lombardy, a province with a strong tradition of training engineers, the lack of enough military engineers motivated proposals for implementing an apprenticeship-based system. On September 1, 1768, the lieutenant colonel engineer Nicolo Baschiera suggested recruiting young people from Lombardy who already had some knowledge of arithmetic, drawing and writing, and developing their engineering skills on the job.[208] Whereas in Transylvania the authorities had no option but to tolerate the existence of the apprenticeship-based system, in the case of Lombardy, the plenipotentiary minister declined Baschiera's suggestion and, as per the Viennese government's orders, coopted non-military engineers to work with the military. For example, during the late 1770s campaigns of mapmaking on the borders of Lombardy with the Duchy of Parma, the Habsburg authorities delegated as their representative the civilian engineer Cesare Quarantino, member of the Milan *Collegio*.[209]

Military authorities did not have the luxury to appeal to experienced civilian engineers in provinces such as Transylvania, so they had to preserve the apprenticeship tradition. For their easternmost province, the Habsburgs assigned military officers for the border mapping

[207] Constantin Wurzbach, *Biographisches Lexikon des Kaisertums Österreich*, vol. 60 (Vienna: Druck und Verlag der k.k. Hof- und Staatsdruckerei, 1891), 306-307. Joseph Trausch, *Schriftsteller-Lexikon oder biographisch-literärische Denk-Blätter der Siebenbürger Deutschen* (Kronstadt[Braşov]: Johann Gött & Sohn Heinrich, 1871), 543-545.
[208] Dattero, "Ingegneri militari Italiani, austriaci e belgi in Lombardia nel XVIII secolo," 189-190, footnote 33.
[209] See numerous documents about Quarantini's commission in Milan, ASM Confini parte antica (hereafter Confini p.a.), box 76.

commissions, and Luchsenstein was one of the mapmakers they relied on the most.[210] It is interesting to note that both Luchsenstein's ennoblement in 1753 and his promotion to the rank of colonel in 1777 happened shortly after the military officer prepared maps of Transylvania's eastern borders. As addressed in later chapters, during the second half of the eighteenth century, the Viennese rulers invested time and resources in stabilizing their imperial borders. In the case of Transylvania's eastern border, the neighboring Principality of Moldavia contested the Habsburg desires. With the help of Luchsenstein, who prepared a series of border maps and historical memoirs, the Habsburgs managed to gain the upper hand in the border negotiations.[211] Therefore, Maria Theresa repeatedly rewarded the Transylvanian mapmaker for his imperial service.[212]

An expert in fortifications and military mapping, Luchsenstein developed another important skill during his time in the service of the Habsburgs: gathering historical documents and organizing them in an archive. On May 3, 1769, the Aulic War Council ordered the General Commander in Transylvania to ensure the preparation of written memoirs supporting Transylvanian claims in the border areas towards Moldavia and Wallachia. As he was the renowned expert on Transylvanian geography and border disputes, Luchsenstein travelled during 1770 to gather documents from Transylvanian archives in Bistritza (Bistriţa), Marusvásárhely (Târgu Mureş), Udvarhely (Odorheiu Secuiesc), Clausenburg (Cluj-Napoca) and Carlsburg

[210] Whereas Luchsenstein helped regularize the Transylvania/Moldavia border in the Habsburg advantage, Zultner participated in 1741 to the border demarcation between Transylvania and Wallachia. Trausch, *Schriftsteller-Lexikon*, 543-545; Wurzbach, *Biographisches Lexikon des Kaisertums Österreich*, vol. 60, 306-307.

[211] Madalina Valeria Veres, "Redefining Imperial Borders: Marking the Eastern Border of the Habsburg Monarchy in the Second Half of the Eighteenth Century," *History of Cartography, Lecture Notes in Geoinformation and Cartography 7*, eds. Elri Liebenberg, Peter Collier, Zsolt Török (Heidelberg: Springer-Verlag, 2014), 6-8.

[212] Raisz, "Colonel Stefan Lutsch von Luchsenstein," 122-123. Luchsenstein's case was not exceptional in this sense. The military mapmaker of Austrian Wallachia, Friedrich Schwantz, was also ennobled as a result of his cartographic work and received the title von Springfels. Ileana Cazan, "Spațiul românesc în hărți şi atlase germane de uz curent, în secolul al XVIII-lea" *Studii şi materiale de Istorie Modernă* 19 (2006): 100.

(Alba Iulia).[213] Moreover, he also received a series of original documents or old authentic copies from the Military District of Rodna and he also organized papers from the War Chancellery.[214] In addition to his maps and memoirs, one of Luchsenstein's most impressive achievements remains his organization of the collection of all documents he had gathered during his life regarding the disputed borders between Transylvania and the Danubian Principalities.[215]

Luchsenstein's career demonstrates how the Habsburg central authorities had to coopt local elites in the process of provincial integration. Not only was Luchsenstein born, raised and trained in Transylvania, but he also became the geographical expert of the region. However, towards the end of his career, Luchsenstein worked together with a new generation of military engineers who had served the Habsburgs in different provinces and had coordinated cartographic projects at the scale of the empire. After Maria Theresa ordered the beginning of the work on the Great Military Map of Transylvania in 1768, Luchsenstein's name does not appear on any of the lists of engineers working on this project. The authorities in Vienna preferred to delegate an Italian engineer, and later a Transylvanian officer with international experience, as coordinators of the provincial survey. Dominik Camiotti de Fabris had already supervised the mapping of Bohemia, Moravia and Silesia, and Mihály Lajos Jeney had served in the French and Prussian armies.

[213] I am using the toponyms as they appear in Luchsenstein's memoir. However I am also adding in brackets the current name of those towns.
[214] AN, series Brukenthal, 106/L 1-8, 366, 7-7 verso.
[215] On October 29, 1781, Luchsenstein wrote a report in which he explains how he has organized 851 documents in 29 fascicles in order to avoid any future confusions or loss of documents. The archive in Sibiu still preserves 27 of these fascicles organized by Luchsenstein in the early 1780s. AN, Brukenthal, 106/L 1-8, 216. The documents are preserved in AN, Brukenthal, 108/M 1-5, 1-6.

2.3.2 Dominic and Michel Angelo de Blasco

Luchsenstein provided an example of an engineer born, trained and deployed in the same province. On the other hand, the two brothers, Dominic and Michel Angelo de Blasco, exemplify another path through which Habsburg authorities strived to integrate capable military engineers as part of their imperial army. The Habsburg occupation in the second decade of the eighteenth century of Sicily and Naples proved short-lived, but some of the military engineers originally from these regions followed their new rulers and found employment in other provinces of the Monarchy.[216] Michel Angelo and Dominic de Blasco belonged to an old Spanish family who moved to Sicily during the thirteenth century. Both of them joined the Habsburg army in the 1720s.[217] Michel Angelo distinguished himself during the work on the fortifications of Messina as an able military engineer. Dominic contributed in the early 1720s to the preparation of a detailed topographic map of Sicily. After the loss of Sicily in 1735, the de Blascos gave up all their properties on this island, and continued their service as part of the Habsburg army.[218]

The Wars of the Spanish and Polish Successions included battlefronts in Italy and thus brought an influx of non-Italian military engineers in the area. Likewise, by 1748 the Habsburg Monarchy had lost all of their Italian possessions with the exception of Lombardy and Tuscany,

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[216] In 1720 Charles VI took over Sicily in return for the cession of Sardinia to Savoy. Hochedlinger, *Austria's Wars of Emergence*, 199.

[217] The de Blasco brothers might have been very suitable recruits for the Habsburg army also because of their family background. Their father, Diego Francesco was born in Messina and travelled a lot during his youth. Diego Francesco met his wife, Anna Kock, in Genoa. Anna was the daughter of an infantry captain originally from Bohemia, a Habsburg province. Biblioteca Ambrosiana (hereafter BA), Archivio Beccaria (hereafter Beccaria), B 234, 6.

[218] ASM, Atti di Governo (hereafter AG), Araldica parte antica (hereafter Araldica p.a.), 54, Blasco. Document from July 29, 1735, through which the emperor offered Michel Angelo de Blasco the position of imperial captain of engineers. Document from January 18, 1736, increase in salary for Michel Angelo de Blasco. Document from September 18, 1722, with which the Aulic War Council conferred Dominic de Blasco the rank of imperial captain of engineers. Two other de Blasco brothers, Bartolomeo and Giovanni Giorgio, who had joined the Church were exiled by the Spanish Government from Messina and lost all their property because Dominic and Michel Angelo served as military in the Habsburg army. Ibid., May 24, 1735, document signed by Lobkowitz.

so the military authorities relocated engineers from the lost territories.[219] After the loss of Sicily in 1735, Dominic and Michel Angelo de Blasco continued their careers in the lands of Lombardy.[220] Similar to Stephan Lutsch von Luchsenstein, the de Blasco brothers possessed a good knowledge of the art of fortifications and mapmaking. The first commission Dominic de Blasco received outside his homeland was related to the redevelopment of a fortification system in the Tuscan Presidii ports, on the coast of the Tyrrhenian Sea.[221] After spending around four years working on this project, especially in Porto Ercole, Dominic travelled back to Sicily around 1727 and climbed through the army ranks to the position of captain.[222] During the War of the Polish Succession (1733-1738) this engineer contributed to the fortification constructions in the eastern part of the Monarchy, in Belgrade, Peterwardein (today Petrovaradin) or Carlstad.[223] Dominic's work impressed the supreme commander of the artillery Otto Ferdinand Count of Abensberg and Traun, who, on August 21, 1736, personally requested, the deployment of Major Dominic de Blasco under his command in Lombardy.[224]

On July 11, 1744, Maria Theresa promoted Dominic de Blasco to the rank of lieutenant colonel as a result of his work in Sicily, and his inspection of fortresses in Hungary and the Italian lands. Additionally, this promotion was possible due to the recommendation of Maria Theresa's brother in law, Charles of Lorraine (the director of the engineering corps) and Count

[219] Dattero, "Ingegneri militari Italiani, austriaci e belgi in Lombardia nel XVIII secolo," 181.
[220] In 1736 Dominic had the rank of major, and Michel Angelo the rank of captain. ASM AG, Araldica p.a., 54, Blasco, documents from August 21 and August 31, 1736.
[221] On September 19, 1722, Dominic de Blasco was ordered to travel to Naples, where he would receive further instructions regarding his mission on the coast of Tuscany. However, after his arrival in Naples, Dominic waited for more than three months to receive any further orders and had to compete for the leadership of this mission with a captain from the regiment Seckendorf. Ibid., order from September 19, 1722; Vienna, Haus-, Hof- und Staatsarchiv (hereafter HHStA), Große Korrespondenz, box 76a, February 5, 1723.
[222] ASM AG, Araldica p.a., Blasco, May 2, 1727, letter from the commander of Porto Ercole, and a lettter from February 24, 1731.
[223] On March 14, 1735, Dominic de Blasco received the order to travel to Peterwardein, but there are no identified documents regarding his activity there. Ibid., order from March 14, 1735 to Domenic de Blasco.
[224] Ibid., August 21, 1736

Traun, who described Dominic de Blasco as an expert in military architecture.[225] Although Dominic received his accolades in the early 1720s for his work as a surveyor and mapmaker, later in life he specialized in fortification works.[226] This career path shows that during their youth, many military engineers had solid knowledge in both the fields of mapmaking and fortifications, but ended up specializing in one of these branches. As the engineering corps of the Monarchy took over the responsibility of maintaining the fortifications, it is not surprising that Dominic de Blasco became a key figure in the Italian engineering brigade after its creation in 1748.[227] He died in the service of the Habsburgs in 1768.

Whereas after he entered the Habsburg service Dominic de Blasco was loyal to Vienna throughout his life, his brother, Michel Angelo, pursued an international career. Younger than Dominic, this engineer remained one step behind his brother in military rank until the late 1740s. Originally acclaimed by his supervisors due to his experience regarding fortifications, Michel Angelo soon emerged as one of the leading military mapmakers of the Italian Peninsula. During the War of the Austrian Succession (1740-1748) he served in northern Italy and drew very detailed battle maps, which show the opposing sides' camps and organization, while also representing the geographical characteristics of the territory in which the battles took place. His most famous cartographic contribution from those days, proven by the multiple copies in which it survives, was the *Geometrical Map of the Mountains, Valleys, Waters and neighboring*

[225] Ibid., July 11, 1744.
[226] Based on the original survey of Sicily Dominic de Blasco prepared two smaller copies: one for the emperor Charles VI and one for the Aulic War Council. Vladimiro Valerio, *Societa, uomini e istituzioni cartografiche nel Mezzogiorno d'Italia* (Florence: Istituto Geografico Militare, 1993), 317.
[227] Although he did inspection of various fortresses in Lombardy, Dominic's work was connected especially with the fortress of Pizzighettone. ASM AG, Militare p.a., 16, Maria Theresa's imperial order to the general Harrach on September 4, 1748 and Dominic de Blasco report from March 18, 1767.

Regions of the City of Genoa (*Mappa Geometrica delle Montagne, Valli, Acque, e Situazioni Circonvicini Alla Citta di Genova*).[228]

This map was the result of cooperation between de Blasco, at the time lieutenant colonel, and Carmine de Beaumont, the captain of the Sprecher Regiment. The map shows not only a static position of the entrenchments of the Austrian-Piedmontese troops and their enemies, but also the troops' movements during the 1747 siege of Genoa.[229] During the spring and summer of 1747, the Austrian-Piedmontese troops sieged the city of Genoa but failed to capture it.[230] The latest date included on the map's legend is an attack led by General St. André on June 13, 1747, so it is clear that the map was completed sometime after this date. In addition to the troops' movements, the map includes a representation of Genoa with all of its fortifications and gates, and also a detailed depiction of the surrounding landscape. Figure 2.3 shows the port of Genoa on a 1769 copy of de Blasco's map. The letters from A to Z mark the different gates of the city and the gates of the newer surrounding wall built in 1632.[231]

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[228] Some copies of this map: Österreichische Nationalbibliothek (hereafter ÖNB), Kartensammlung, ALB Port 14b, 18; Ibid., ALB kleinPort 43,1; Ibid., ALB Port 154,8 Kar; KA KPS, HIII e 952.

[229] During the spring and summer of 1747, the Austrian-Piedmontese troops sieged the city of Genoa but failed to capture it. The latest date included on the map's legend is an attack led by General St. André on June 13th, 1747, so the map was done after this date. In addition to the troops' movements the map includes a representation of Genoa with all its fortifications and gates, and also a detailed depiction of the surrounding landscape. Reed Browning, *The War of the Austrian Succession* (New York: St. Martin's Press, 1993), 297.

[230] Ibid., 297.

[231] KA KPS, H III e 952. Copy of the 1747 Genoa map made in 1769 by Senior Lieutenant Hirsch.

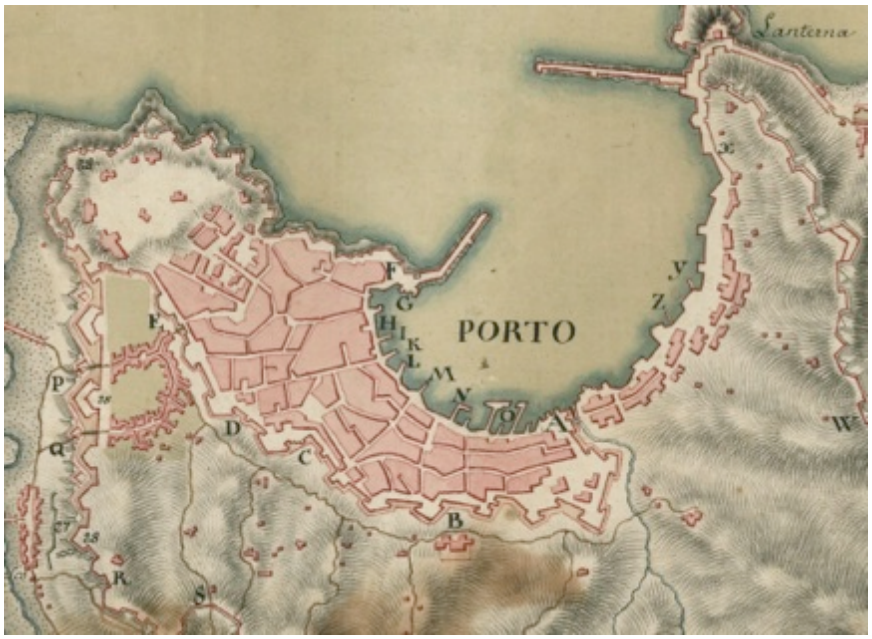

Figure 2.3 Detail from a 1769 copy of de Blasco's and de Beaumont's *Geometrical Map of the Mountains, Valleys, Waters and neighboring Regions of the City of Genoa*

Together with his maps of the battles of Camp Santo and Veletri, de Blasco's contribution to the map of Genoa impressed his military commanders, who continued to foster his career after the end of the War of the Austrian Succession.[232]

Throughout his career, Michel Angelo cultivated his network of military patrons and asked them for recommendations to obtain a better rank in the army. One of his strongest supporters in the 1730s and 1740s was Prince Lobkowicz, the commander of imperial troops in Italy. Michel Angelo de Blasco served under the command of prince Lobkowicz during the battle for Sicily against Spain (1734-1735).[233] After the Habsburgs yielded the fortress of Messina in 1735 and lost Sicily this same year to the Spanish crown, Michel Angelo followed his protector

[232] Ibid., H III e 710 (Campo Santo); Ibid., H III e 751 (Veletri).
[233] During the 1734-1735 siege of Messina, Syracuse and Trapani, de Blasco served under the command of Prince Lobkowitz. The engineers Obristlieutenant Pelthier and Lieutenant Beaumont prepared Messina for the Siege, while Lieutenant Michel Angelo de Blasco prepared Syracuse. Raimund Gerba, *Polnischer Thronfolge-Krieg: Feldzug 1735: Nach den Feld-Acten und anderen authentischen Quellen* (Vienna: Verlag des K. K. Generalstabes, 1891), 19.

to Italy and received the position of captain.[234] Furthermore, even after his transfer to Transylvania, Lobkowicz continued encouraging Michel Angelo's career. In 1737, immediately after the death of the Director of Engineers of Transylvania, Conrad Weiss, the protector of Stephen Lutsch von Luchsenstein, Lobkowicz nominated Michel Angelo de Blasco for this vacant position.[235] There is no documentary proof to suggest why de Blasco did not accept or obtain this promotion. However, this example shows the important role of patronage networks in obtaining promotions within the imperial army ranks.

After his participation in military campaigns in Italy during the early 1740s, as documented both by imperial orders and the maps de Blasco produced during this time, Michel Angelo hoped to receive the rank of colonel. In his effort to obtain this coveted promotion, he wrote to another of his patrons, commander Schulenburg-Oeynhausen, and asked him to interfere in his favor at the Viennese Court.[236] Shortly after Schulenburg-Oeynhausen's recommendation, in August 1745, Maria Theresa conferred on de Blasco the rank of lieutenant colonel and thus partially satisfied de Blasco's ambition.[237] After the creation of the Italian brigade in 1748, just as his brother, Michel Angelo also became part of this unit.[238] However, none of these promotions seemed to satisfy the younger de Blasco's desire for a better position and he soon looked for employment across imperial borders.

The dynastic alliance between the Austrian and Portuguese crown helps explain how de Blasco, an experienced Habsburg military engineer, could be discharged from Vienna's service

[234] Michel Angelo de Blasco received the rank of Engineer Captain at the recommendation of Prince Lobkowitz and because of his service during the siege of Messina. ASM AG, Araldica p. a., Blasco, Order from June 29, 1735.
[235] Ibid., letter from Lobkowicz to Michel Angelo de Blasco, December 24, 1737.
[236] Ibid., letter signed by Schulenburg-Oeynhausen, from May 29, probably 1745.
[237] Ibid., order from August 18. 1745.
[238] ASM AG, Militare p.a., 16, Maria Theresa's imperial order to the general Harrach , September 4, 1748.

and moved under the Portuguese banner.[239] Whereas the dynastic alliance framework eased the transfer of the engineer, the decision seems to have also been influenced by the Portuguese émigré, the Duke Silva-Tarouca, president of the council of the Netherlands and Italy in Vienna,[240] and de Bohn, the deputy director of the corps of engineers.[241] The Portuguese king named de Blasco the leader of the Portuguese border demarcation commission, sent to Brazil to implement the Treaty of Madrid signed with Spain in 1750.[242]

Despite the extensive amount of time de Blasco worked for the Portuguese crown and his important advisory role during the reconstruction of Lisbon after the 1755 earthquake, due to Lisbon's decision-makers' desire to keep all sensitive cartographic material secret, de Blasco was perceived as a foreigner and a potential threat.[243] Clearly, de Blasco's earlier allegiance to the Habsburg monarchs in Vienna blocked the development of his career in Lisbon. Therefore, it should not be surprising that in the mid-1760s, de Blasco contacted the court in Vienna and expressed his desire to return under the command of Maria Theresa. De Blasco's request

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[239] Joao V of Portugal married Maria Anna of Austria, daughter of emperor Leopold I, and aunt of Empress Maria Theresa. Jonathan Dewald, *Europe 1450 to 1789: encyclopedia of the early modern world* (New York: Charles Scribner's Sons, 2004), 26.

[240] Kenneth Maxwell, *Pombal. Paradox of the Enlightenment* (Cambridge: Cambridge University Press, 1995), 8.

[241] HHStA Staatskanzlei (hereafter StK), Noten vom Hofkriegsrat (hereafter Noten vom HKR), box 78, fascicle 2, 84.

[242] By signing the Treaty of Madrid, the kings of Portugal and Spain redrew the border line between their possessions in Brazil. Portugal gave up its outpost Colônia do Sacramento on the Río de la Plata, while Spain handed over the lands demarcated by the Uruguay and Ibicui rivers. However, these lands between the rivers were occupied by seven Jesuit missions and sheltered around 30,000 Amerindian converts. The Jesuits and the Guaraní Indians refused to relinquish their use of this territory and to relocate, thus starting open warfare against the joint Portuguese and Spanish troops. The conflict lasted until 1756 and complicated the work of the special border commissions sent from Europe to mark the Treaty of Madrid border. Mark A. Burkholder and Lyman L. Johnson, *Colonial Latin America* (Oxford: Oxford University Press, 2004), 281-301; Maxwell, *Pombal*, 52-55.

[243] In July 1750, Sebastião José de Carvalho e Melo, known as the Marquis of Pombal, became the secretary of state for foreign affairs and dominated the Portuguese political life until 1777. He regarded foreign engineers with suspicion and introduced a lot of restrictions against them. Foreign engineers could not preserve copies of any maps or geographical descriptions of the interior of Brazil, not even maps of their own creation. De Blasco's return to Lisbon in 1758 led to the confiscation of his prospects, maps, annotations, and measurements, because, as directed by Pombal, the foreigners could not keep any other documentation in their possession except the information preserved in their memory. Maxwell, *Pombal*, 51; Burkholder and Johnson, *Colonial Latin America*, 291-292. Luiz Carlos Tau Golin, *A Guerra Guaranítica: como os exércitos de Portugal e Espanha destruíram os Sete Povos dos jesuítas e índios guaranis no Rio Grande do Sul* (Porto Alegre: Editora da Universidade Federal do Rio Grande do Sul, 1998), 220, footnote 255; 362, footnote 515.

initiated more than five years of correspondence between chancellor Kaunitz and other State Chancellery representatives, Maria Theresa, the Aulic War Council in Vienna, and de Blasco himself, in order to decide on the feasibility of the cartographer's return to Vienna.

To convince the Habsburg authorities of his value as a mapmaker, de Blasco defied the Portuguese censorship. In 1769, the mapmaker sent two of his works to Vienna: a detailed map of the Italian Peninsula entitled *Geographical, Geometrical, Nautical, Military and Historical Map of Italy* (*Italia Geografica Geometrica Nautica Militare ed Istorica*) and the drawing *Prospect of the Big Waterfall of Paraná* (*Prospetto Del Salto Grande del Paraná*) showing a Brazilian landscape decorated with various plants and animals from the region. Examining the few details we have about the production of these maps and their sources reveals how de Blasco used the circumstances of his trans-imperial career to access geographical knowledge produced in various scientific centers.

The 28 sections of De Blasco's map of Italy, out of which two are reproduced in Figure 2.4, include a discussion of the sources used to prepare the map.[244] The engineer placed a special emphasis on d'Anville's *Analyse Geografique d'Italie*, work published in 1744. Additionally, de Blasco mentioned the use of a series of maps surveyed with the help of the "pretorian table" or with the help of a compass and therefore worthy, in his opinion, of being considered geographical maps. The mapmaker did not include in this bibliographical paragraph the authors or the titles of the maps he accessed; he simply listed the geographical areas these sources covered and mentioned the existence of a separate document offering all the details about the source maps. Unfortunately the additional document de Blasco refers to was not preserved together with the map, and its location evades us.

[244] ÖNB, Kartensammlung, K III 113230, sections 9 and 10.

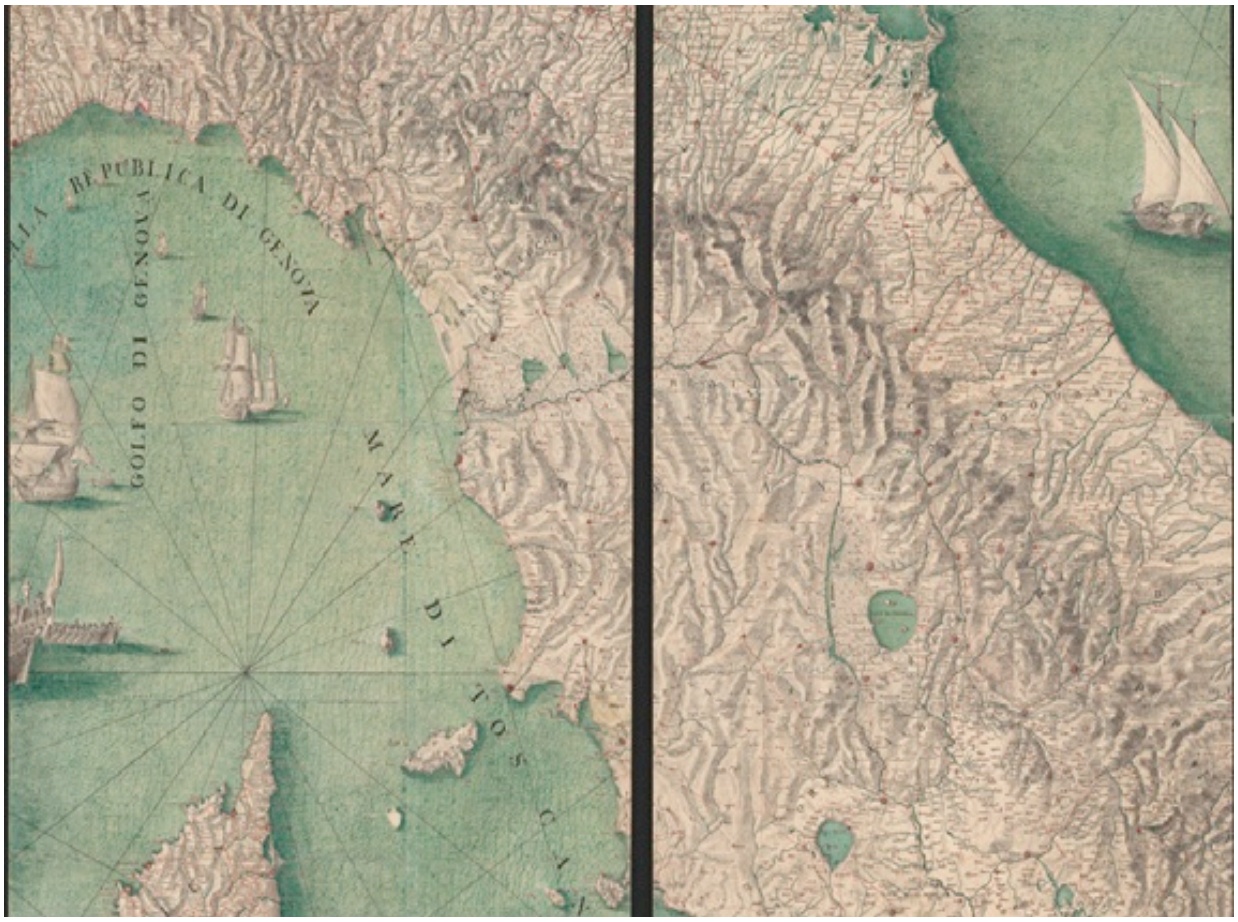

Figure 2.4 Detail from de Blasco's *Geographical, Geometrical, Nautical, Military and Historical Map of Italy*

Even without having a complete list of manuscript sources, we can infer de Blasco had access to the maps of Sicily prepared by his brother in the 1720s. In the 1740s, the mapmaker had prepared a map of Lombardy based on the manuscript maps of the Milanese cadaster, so we can safely assume he used part of that governmental cartographic information. Figure 2.5 reproduces a small detail of de Blasco's map, showing the surrounding area of the Sicilian town of Messina.[245] The cartographer played especially close attention to the position of the settlements, the main roads and water-bodies. However, the rest of the landscape is just sketched and is far from being at the same level of detail as the Great Military Maps of the Habsburg provinces surveyed between 1763 and 1787.

Figure 2.5 The area nearby Messina on de Blasco's *Geographical, Geometrical, Nautical, Military and Historical Map of Italy*

[245] Ibid., section 26.

The de Blasco drawing sent to Vienna and entitled *Prospect of the Big Waterfall of Paraná* includes a variety of drawings of animals and plants from the Portuguese possessions in Brazil (Figure 2.6).[246] Maria Theresa and Joseph II were interested in information from colonial domains such as the Americas, or India, even though they had no actual possessions in those areas. When sending his materials to Vienna, de Blasco clearly took into account the Habsburgs' efforts to bring to the botanical garden and menagerie at their imperial palace at Schönbrunn a variety of specimens from the whole world.[247]The engineer tried to present himself as a desirable employee not only because of his mapmaking abilities, but also his first-hand experience in the Portuguese colonial lands.

What de Blasco conveniently omitted from the description of this drawing was that the *Prospect* was a modified version of a plan prepared by a Portuguese engineer, João Bento Python.[248] De Blasco and Python worked together as part of the commission sent to implement the Treaty of Madrid, so it is hard to establish who the actual author of the drawing was. However, one thing is certain: de Blasco had access to secret geographic plans and decided to risk sharing some of that information with the Habsburg authorities in order to convince them of his desirability as an employee.

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[246] The explanation that most likely accompanied the map and included a description of the types of animals, insects and plants represented was not preserved together with the map. ÖNB, Kartensammlung, K III 103848.

[247] Marianne Klemun, "Space, State, Territory, Region and Habitat: Alpine Gardens in the Habsburg Countries," *Studies in the History of Gardens & Designed Landscapes. An International Quarterly* 20, no. 3-4, (2008): 414-415; Yonan, *Empress Maria Theresa and the Politics of Habsburg Imperial Art*, 160-161. In his letter from 30 April 1782 to Joseph II, Philippe Cobenzl mentioned some small birds from the Indies that the emperor had bought and also suggested to Joseph II acquiring a zebra. Sebastien Brunner, *Correspondances Intimes de L'Empereur Joseph II avec son ami le Comte de Cobenzl et son Premier Ministre le Prince de Kaunitz* (Mayence: F. Kirchheim, 1871).

[248] This representation is discussed and reproduced in *A terra de Vera Cruz: viagens descrições e mapas do século XVIII: exposição integrada nas comemorações do V Centenário da Descoberta do Brasil* eds. Jorge Costa, João Carlos Garcia, and André Ferrand de Almeida (Porto: Biblioteca Pública Municipal do Porto, 2000), 26-27, 85. I am grateful to Renata Malcher de Araujo for identifying the de Blasco drawing as a modified version of Python's work.

Figure 2.6 De Blasco's *Prospect of the Big Waterfall of Paraná*

Chancellor Kaunitz forwarded the de Blasco maps to the Aulic War Council for an evaluation, which reveals that the Habsburg Monarchy had centralized mechanisms for assessing the value of cartographic material.[249] Despite the high quality of de Blasco's work, Maria Theresa and her advisers decided that he should be rewarded only financially and not with a long-term position in the Habsburg army. The implications of de Blasco's transfer would have led to too many political complications, and the engineer's advanced age did not seem to justify risking a diplomatic incident.[250]

The story of de Blasco's efforts to return into the service of Maria Theresa brings to the forefront the importance of trans-imperial approaches for the study of the history of cartography.

[249] KA HKR, 1770 57 107.
[250] HHStA StK, Wissenschaft, Kunst und Literatur (hereafter WKL), box 5, Michel Angelo de Blasco.

Experts such as de Blasco played an essential part in knowledge transfer, and their stories show the strong ties between the history of science and empires in early modern Europe. Likewise, the timing of de Blasco's campaign to return in the service of Vienna was not accidental; in the early 1760s Maria Theresa ordered a detailed topographical survey of her domains and there were also initiatives from provinces such as the Austrian Netherlands for starting a variety of mapmaking projects. Moreover, border demarcations campaigns and treaties regularizing the Habsburg frontiers were numerous, starting with the 1750s and 1760s. If one was a military engineer with mapmaking expertise in Europe during the 1760s and was looking for a job, Vienna was an attractive employer.

The de Blasco brothers did not participate in the whirlwind of cartographic activities that took over the Habsburg Monarchy in the second half of the eighteenth century. Luchsenstein's career as a mapmaker also slowed down by the 1760s. A new generation of military engineers affiliated with the general quartermaster's staff came to the forefront and coordinated topographic surveys for the empire's provinces.

2.3.3 Mihály Lajos Jeney

As the engineering schools of the Habsburg Monarchy produced more and more graduates, the military authorities integrated these experts either as part of the imperial engineering corps, the artillery corps or the general quartermaster's staff. The existence of a larger trained group of engineers allowed Viennese rulers to plan ambitious cartographic projects. The first general map of the Habsburg Monarchy published in the 1720s by Homann in Nüremberg (*Tabula Geographica Europae Austriacae Generalis*) had quickly become an outdated image of the

empire.[251] Starting around the year 1759, Maria Theresa had been inquiring on ways to obtain a geographic map of her lands. The empress's order of the first detailed military topographic survey of the Monarchy in 1763 is part of the same cartographic impulse.[252] Managing a detailed mapmaking campaign at the scale of an empire required astute and devoted military engineers who could adapt to various provincial circumstances and work with local personnel. The general quartermaster's staff provided qualified personnel, steeled by their contribution to the Seven Years' War campaigns. Additionally, as mentioned earlier, there was a conscious campaign after 1763 in recruiting for this army unit skilled mapmakers.[253]

Although the imperial authorities in Vienna considered Stephan Lutsch von Luchsenstein the best mapmaker of Transylvania and its borders, he did not coordinate the military topographic survey of this region. Instead of him, the Aulic War Council preferred to delegate a colonel from the general quartermaster's staff: Dominik Camiotti de Fabris Count of Cassano (1725-1789). Although local officers performed most of the ground measurements and copying for the Great Military Map, the success of the project hinged on this imperial coordinator. Having successfully completed the mapping of Bohemia and Moravia by 1768, Fabris used his prior experience in preparing the military survey of Transylvania.[254] As he was promoted to the rank of general major before the completion of the map of Transylvania, the military authorities

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[251] This map is reproduced in *Descriptio Austriae. Österreich und seine Nachbarn im Kartenbild von der Spätantike bis ins 19. Jahrhundert*, eds. Johannes Dörflinger, Robert Wagner, and Franz Wawrik (Vienna: Tusch-Druck GesmbH, 1977), 159.

[252] In 1759 Maria Theresa contacted Charles Lorraine and revealed her intention to order a general map of her domains. AGR Secrétairerie d'Etat et de Guerre (hereafter SEG), box 2273, 11-14. Also mentioned in Louis-Prosper Gachard, "Notice historique sur la rédaction et la publication de la carte des Pays-Bas Autrichiens par le général comte de Ferraris," *Nouveaux mémoires de l'Académie royale des sciences et de belles-lettres de Bruxelles* 16 (1843): 5.

[253] Lund, *War for the Every Day*, 152-153.

[254] On October 29, 1778, during the War of the Bavarian Succession, the Aulic War Council informed the corps of engineers and fortifications, that Maria Theresia had named Fabris to the rank of Fieldmarshall Lieutenant and gave him the position of Quartermaster of the army. KA GHA, 1778 10 152. For some biographical information on Fabris see Ludwig Rona, *Geschichte des K.U.K. Infanterie-Regimentes Adolf Grossherzog von Luxembourg Herzog zu Nassau, Nr. 15, 1701-1901* (Prague: Karl Bellmann Verlag des Regimentes, 1901), 248. Wurzbach, *Biographisches Lexikon des Kaisertums Oesterreich*, vol. 46 (Vienna: Druck und Verlag der k.k. Hof- und Staatsdruckerei, 1882).

in Vienna named a new director for this project in 1772. Again, they found the replacement within the ranks of the general quartermaster's staff, and chose an individual with both international experience and of Transylvanian origin: Mihály Lajos Jeney (1723/1724-1797). This military engineer supervised a variety of cartographic operations within Transylvania during the early 1770s and contributed to numerous mapmaking campaigns within the Habsburg lands until the end of his career.

Jeney was born into a protestant, noble Transylvanian family and had a tumultuous life. His earlier participation in war was as a hussar during the 1737-1739 Habsburg-Ottoman conflict and during the War of the Austrian Succession (1740-1748).[255] As European states such as France admired the effectiveness of small-units waging what tacticians called the *petite guerre*, it is not surprising that Jeney found a place in the French army. Between 1747 and 1753, Jeney served as part of the Bercsényi Hussar-Regiment.[256] As a result of his vast experience with this type of warfare, in 1759 Jeney published the first tactics manual for conducting irregular operations, *Le Partisan ou l'art de faire la petite-guerre avec succés selon le génie de nos jours* (an English edition with the title *The Partisan: Or, The Art of Making War in Detachment* appeared in 1760).[257]

The preface of Jeney's book reveals that by 1759, this officer had served in twenty-four campaigns in various geographic areas such as the Ottoman lands, Hungary, Silesia, the Italian and German states, Flanders and Westphalia. Jeney included seven maps of small geographical

[255] Biographical information on Jeney was taken from Jankó, "An Outstanding Person of the 1st Military Survey," 201-207.
[256] The Bercsényi Hussar Regiment was founded in France by supporters of the early eighteenth century Rákoczi rebellion against the Habsburgs. Ferenc Tóth, "Emigrated or exiled?: Francis Rákóczi II and his exile in France and Turkey," in *Monarchy and exile: the politics of legitimacy from Marie de Médicis to Wilhelm II*, eds. Philip Mansel and Torsten Riotte (Basingstoke, England: Palgrave Macmillan, 2011), 100. For a discussion of the meaning of "petite guerre" see Bruce Buchan, "Pandours, Partisans and Petite Guerre: Two dimensions of Enlightenment Discourse on War," *Intellectual History Review* 23, no. 3 (September 2013): 12-15.
[257] John Grenier, *The First Way of War: American War Making on the Frontier, 1607-1814* (Cambridge: Cambridge University Press, 2005), 95, 100-102.

areas to further illustrate his discussion of how partisan troops should wage war. Moreover, he stressed that the inclusion of such maps made his work better than earlier, similar books on this topic.[258] When listing the qualities of partisan troops, Jeney included the ability of fast territorial reconnaissance and preparation of accurate maps.[259] Whereas there is no evidence regarding his early training as a military engineer, Jeney's book reveals this officer's ability to draw maps and use them as part of the war effort. Additionally, it is known that from 1754 Jeney worked as a geographer-engineer officer at the French Army of the Rhine, and between 1758 and 1763 he served as captain of engineers in the Prussian army.[260] The career of Jeney needs to be put into a larger context: the rise in importance of military reconnaissance during the Seven Years' War and the increase in value of the officers belonging to the general quartermaster staff.[261]

Similar to the Habsburg monarchs, the Prussian kings relied on the services of foreign engineers, especially French or with training in France, for the improvement of their fortifications system and cartographic projects. Peter de Montargue (1660-1733), Jean de Bodt (1670-1745) and Charles Louis de Lecoq (1754-1829) were representative of a larger group of protestants who had to flee from France due to religious persecutions and found employment in the Prussian army.[262] Jeney, with his training in the French army, probably fit right in with the other military engineers serving in the Prussian army. Although the details of his time in Prussia

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[258] Mr. de Jeney, *Le Partisan ou l'Art de faire la Petite-Guerre avec Succès selon le Génie de nos Jours* (The Hague: H. Constapel, 1759), Preface.
[259] Ibid., 1, 8.
[260] Jankó, "An Outstanding Person of the 1st Military Survey," 203.
[261] Ewa Anklam, "*Battre l'Estrade*: Military Reconnaisance, in the German Theatre of War," in *The Seven Years' War: Global Views*, eds. Mark H. Danley and Patrick J. Speelman (Boston: Brill, 2013), 214. Another example of a similar eighteenth century career is the Welshman Henry Humphrey Evans Lloyd. Lloyd served as part of the Habsburg general quartermaster's staff during the Seven Year's War. Patrick J. Speelman, *Henry Lloyd and the Military Enlightenment of Eighteenth-Century Europe* (Westport, CT: Greenwood Press, 2002).
[262] Wolfgang Hans Stein, "Les atlas militaires topographiques, une spécificité de la cartographie militaire allemande," in *Atlas militaires manuscrits européens (XVI-XVIIIe siècles)*, eds. Isabelle Warmoes, Emilie d' Orgeix, and Charles van den Heuvel (Paris: Musée des plans-reliefs, 2003), 209. David Buisseret, *The Mapmakers' Quest. Depicting New Worlds in Renaissance Europe* (Oxford: Oxford University Press, 2003), 136.

elude us for the moment, we can safely infer that Jeney improved his cartographic skills and participated to mapmaking campaigns under Frederick II.[263]

For Joseph II to re-hire Jeney after he had served the Prussian king must have been quite a diplomatic coup, although the details of this transfer remain unknown. The skill of military engineers to capture strategic information on maps and plans made them important participants to the war effort. It was not unusual in the eighteenth century for the Habsburgs to delay the exchange of military engineers and cartographers captured by the Prussians in conflicts such as the Seven Years' War. These captives had the skill to bring back to the Habsburg lands reliable topographic information about enemy territory.[264] Therefore, the transfer of a military engineer from the service of Prussia meant for Frederick II not only the loss of a skilled employee, but also a possible leak of strategic information.

Regardless of Jeney's motivation to re-join the Habsburg army, on April 15, 1768 he was in Vienna. Jeney received the rank of major and contacted the Governor of Transylvania, Samuel Brukenthal, to inform him of the beginning of his journey towards Transylvania.[265] This officer was surely not the first and not the last military engineer that Habsburg rulers hired from a rival or ally state in the second half of the eighteenth century. In 1778, Joseph II hired the French engineer d'Abrange, who had left his homeland for the Ottoman lands to avoid punishment for breaking French law. D'Abrange changed his name and was dispatched to Transylvania to avoid

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[263] Frederick II encouraged numerous topographic surveys such as Wreder's survey of Silesia (1746-1753). Klaus Lindner, "Wredes "Krieges Carte von Schlesien" – die erste preußische Landesaufnahme Schlesiens," in *Kartographiehistorisches Colloquium Lüneburg '84, 15.-17. März 1984: Vorträge*, eds. Wolfgang Scharfe, and Eckhard Jäger (Berlin: Dietrich Reimer, 1985), 39-53.

[264] Jan Mokre, "Geheimhaltung, Spionage und Kartenverfälschung: Aspekte des Verhältnisses zwischen Militär und Kartographie zur Zeit Maria Theresias," in *Aspekte der Kartographie im Wandel der Zeit. Festschrift für Ingrid Kretschmer*, eds. Wolfgang Kainz, Karel Kriz, and Andreas Riedl (Vienna: Institut für Geographie und Regionalforschung der Universität Wien, Kartographie und Geoinformation, 2004), 87-88; Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol 1, 613.

[265] "Dem Andenken des vor hundert Jahren gestorbenen Gubernators von Siebenbürgen Freiherrn Samuel von Brukenthal," *Archiv des Vereines für siebenbürgische Landeskunde* 31, no 1 (1903): 60.

being identified and reclaimed by the French authorities.[266] Joseph II understood the importance of having skilled military engineers under his banners and took every opportunity to achieve this goal, even at the risk of going against his allies' interests. The cases of Jeney and d'Abrange reveal that highly qualified military engineers often worked under different banners and contributed to the circulation of knowledge over imperial borders.

Soon after his arrival to Transylvania, Jeney was sent to inspect the mountain passes connecting the province with the Danubian Principalities. This sensitive mission needs to be seen in the context of the 1768-1774 Russo-Ottoman war, which was plaguing the area. The presence of Russian troops on Moldavian territory had brought the war to the Habsburg borders. Although the Aulic War Council was hoping to use Jeney's skills for the ongoing mapping of the region, Jeney's first mission was the inspection of mountain passes in order to offer suggestions to improve the defenses.[267] Just like the earlier generation of military engineers, Luchsenstein and the de Blasco brothers, Jeney had in-depth knowledge of the art of fortifications.

A closer examination of Jeney's inspection of the Rodna pass, located in the northeastern mountainous part of the province, illustrates the type of work this major did at the borders of Transylvania.[268] Jeney's map (figure 2.7) brings to the forefront the numerous waterways and paths connecting Transylvania with Moldavia. Such a variety of access points made the Principality vulnerable, and Jeney uses this map to illustrate suggestions for defending the pass. Jeney took into consideration the layout of the land and saw the fortification points as pieces of a larger topography. For example, he suggested adding an encampment for troops close to Szent György, village located in the rightmost part of the map, and recommended four to ten battalions

[266] Ibid., 264.
[267] AN CC, Document 6 (1768), November 26, 1768.
[268] AN CC, Document 1 (1769), April 2, 1769.

for its defense. He gave clear guidelines on where the detachments should be placed around the area to keep the numerous footpaths under supervision.

Figure 2.7 Jeney's map of the Rodna Pass

Jeney's report on the situation of the Rodna Pass exemplifies his understanding of using maps as military planning tools. In 1772, the Aulic War Council rewarded his service and named him the new coordinator of the military survey of Transylvania. Additionally, Jeney directed a similar project into the Moldavian and Wallachian borderlands.[269] This officer's career after 1770s was not restricted to Transylvania, although he was often recalled to this province to offer advice on

[269] During his tour of the Transylvanian province in 1773, Emperor Joseph II ordered the surveying personnel to improve the accuracy of the cartographic representation of the border between Transylvania and its neighboring provinces Moldavia and Wallachia. The emperor desired not only the mapping of the frontier-line, but hoped to obtain accurate representations of a significant segment of these Danubian Principalities. Veres, "Redefining Imperial Borders," 13-16.

different projects. By the end of the 1780s, Jeney had coordinated or actively surveyed approximately 930 sheets, so more than a quarter of the total number of sections for the Great Military Map.[270]

[270] Jankó, "An Outstanding Person of the 1st Military Survey," 207.

Figure 2.8 Habsburg territories surveyed under Jeney's direction[271]

[271] This map has been inspired from Ibid., 203.

People played an essential part in trans-imperial technology transfer openly or secretly, and by tracing personal journeys we can analyze how people impacted the "contents and the paths of knowledge."[272] Jeney's experiences in France and Prussia contributed to his development as a skilled mapmaker, and the Habsburg rulers benefitted from his foreign expertise. The product of the Habsburg military, the Great Military Map of Transylvania was indirectly a trans-imperial work. Jeney, and probably some of the other military engineers, had learned mapmaking skills as part of an international dialogue. In understanding the development of Habsburg cartography in the second half of the eighteenth century we need to examine both trans-provincial and trans-imperial threads.

2.4 THE MAP ARCHIVE OF THE AULIC WAR COUNCIL

Centralizing the production of military cartographic material involved both creating mapmaking specialists and managing the circulation of their work. The eighteenth century Habsburg rulers were not the first ones faced with the dilemma of how to control access to maps. Centuries before, the Spanish Habsburgs had already developed an impressive framework for the protection of cartographic material. In the sixteenth century, the Council of Indies and the House of Trade in Seville collected and controlled access to geographic material related to Spain's

[272] Liliane Hilaire-Perez, Catherine Verna, "Dissemination of Technical Knowledge in the Middle Ages and the Early Modern Era: New Approaches and Methodological Issues," *Technology and Culture* 47, no. 3 (2006): 536-565. See the introduction to *The Brokered World. Go-Betweens and Global Intelligence, 1770-1820*, eds. Simon Schaffer, Lissa Roberts, Kapil Raj, and James Delbourgo (Sagamore Beach, MA: Science History Publications, 2009).

overseas lands.[273] The lands encompassed by the Habsburgs by the eighteenth century also had a strong tradition of secrecy towards sensitive cartographic material.[274] For example, the 1673 Montecuccoli instruction for all military engineers in Habsburg service required them to send a copy of all the maps they produced to the Aulic War Council. Moreover, the engineers were banned from sharing the product of their work with anyone else except their commanding general.[275]

As the number of military engineers and maps increased substantially in the eighteenth century, the presidents of the Aulic War Council introduced a series of measures to organize this institution's archive. After the Seven Years' War, Lacy ensured that all original sheets of the Military Maps of various provinces were preserved in this archive. A decade later, in 1776, Andreas Hadik ordered the merging of the map and plans archive of the corps of engineers with the archive of the Aulic War Council. These centralizing measures culminated in 1781, when Emperor Joseph II ordered a re-organization of the War Council's map archive together with a list of all its holdings.[276] This inventory is, to our knowledge, the oldest surviving catalogue of this imperial collection. As the Aulic War Council controlled the main mapmaking institutions of the empire, the corps of engineers and the quartermaster general's staff, the early 1780s inventory is an indispensable primary source for historians of cartography studying Habsburg mapping enterprises in the eighteenth century.

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[273] Portuondo, *Secret Science*, 103-107.

[274] Zsolt G. Török, "Renaissance Cartography in East-Central Europe, ca. 1450-1650," in *The History of Cartography*, ed. David Woodward, vol. 3, part 2, *Cartography in the European Renaissance* (Chicago: University of Chicago Press, 2007), 1806-1851.

[275] Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1, 8-9, 217-218, 221-222.

[276] Oskar Regele, *Der österreichische Hofskriegsrat, 1556-1848* (Vienna: Verlag der Österreichischen Staatsdruckerei, 1949), 44; Ernst Nischer-Falkenhof discusses Joseph II's order but does not analyze the resulting inventory. Ernst Nischer-Falkenhof, "Die Kartensammlung des österreichischen Kriegsarchiv," *Archivalische Zeitschrift* 36 (1926): 98-101.

On April 28th, 1781, Joseph II sent a letter to Hadik, the president of the Aulic War Council, and ordered the reorganization of this institution's archive. The emperor wanted the best maps selected and organized in separate chests based on geographical regions. He also expected inventories for each chest.[277] By May 5, 1783, the emperor had received a total number of twelve inventories, organized geographically, and describing the map collection of the Aulic War Council.[278] Joseph II played an active part in the process of preparing these lists and provided detailed feedback after receiving the first inventories. For example he suggested that the compilers of these inventories should leave more space between the various headings, so that new additions to the War Archive could easily be recorded in the same tables.[279]

Table 2.2 List of Inventories of the Aulic War Council's Map Collection

Protocol number	Region	Finalized on
1	Kindom of Hungary	March 31, 1782
2	Kingdoms of Croatia and Dalmatia	May 29, 1782
3	Kingdom of Slavonia and Duchy of Syrmia	August 6, 1782
4	Banat of Temeswar	August 6, 1782
5	Great Principality of Transylvania	August 6, 1782
6	Kingdom of Galicia and District of Bukovina	August 6, 1782
7	Kingdom of Bohemia	October 28, 1782
8	Margraviate of Moravia and Habsburg Silesia	October 28, 1782
9	Archduchy of Austria, Duchies of Styria, Carinthia and Carniola, Princely County of Tyrol and the Austrian Forelands	October 28, 1782
10	Habsburg Italy	October 28, 1782
11	Austrian Netherlands	October 28, 1782
12	Foreign Lands	May 5, 1783

[277] KA HKR, 1781 34 54; KA HKR, 1781 34 128/2.
[278] KA HKR, 1782 34 52; KA HKR, 1782 34 76; KA HKR, 1782 34 105; KA HKR, 1782 34 135; KA HKR, 1783 34 60.
[279] KA HKR, 1782 34 52. The inventories are: KA HKR, 1782 34 52; KA HKR, 1782 34 76; KA HKR, 1782 34 105; KA HKR, 1782 34 135; KA HKR, 1783 34 60.

The inventories numbered from one to eleven included Habsburg provinces. The foreign lands list included the following subdivisions in this particular order: Portugal and Spain, France, Great Britain and Ireland, the Dutch Republic, Switzerland, Italy, Denmark and Norway, Sweden, the Prussian States, Westphalia, Upper Saxony and Lower Saxony, the Holy Roman Empire, Poland and Lithuania, Russia, Turkey, Asia, Africa and America.

All twelve inventories were divided in the same three main categories: maps of specific settlements or small landmarks (such as fortifications, churches, mines, castles, post stations, military buildings), maps of large territories, and maps representing bodies of water. There are 14,899 map units of specific settlements or landmarks, 742 map units of larger territories and 285 map units showing bodies of water. In some cases, one map unit contained more copies of the same map, a multi-section map, or a group of related maps.

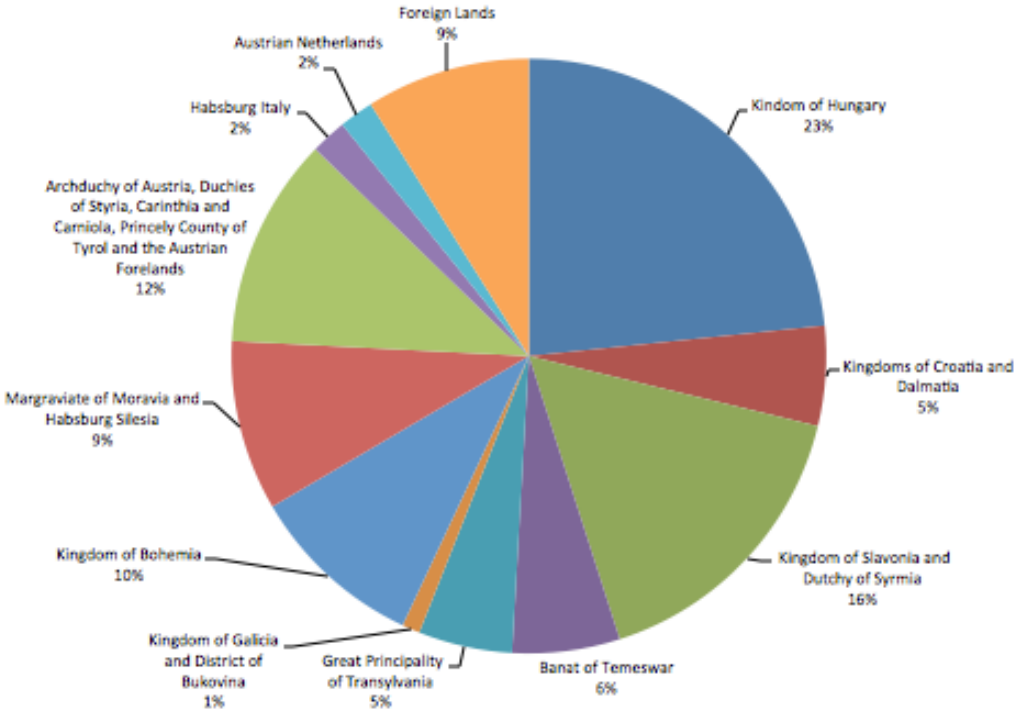

Figure 2.9 Distribution of maps of specific landmarks

Figure 2.9 shows a graphical distribution of the maps of specific settlements or landmarks per inventory. In 1780 the map collection of the Aulic War Council had the highest number of maps devoted to particular settlements or landmarks associated with cities, villages, castles, fortifications and mountain passes for the Kingdom of Hungary. It is not surpring that for the most recent acquisitions, Galicia and Bukovina, the Habsburgs had a very limited number of maps in their archive. However, in the case of maps of larger territories, as shown in Figure 2.10, almost 35% of the maps contained in the Aulic War Council's archives represent non-Habsburg lands.

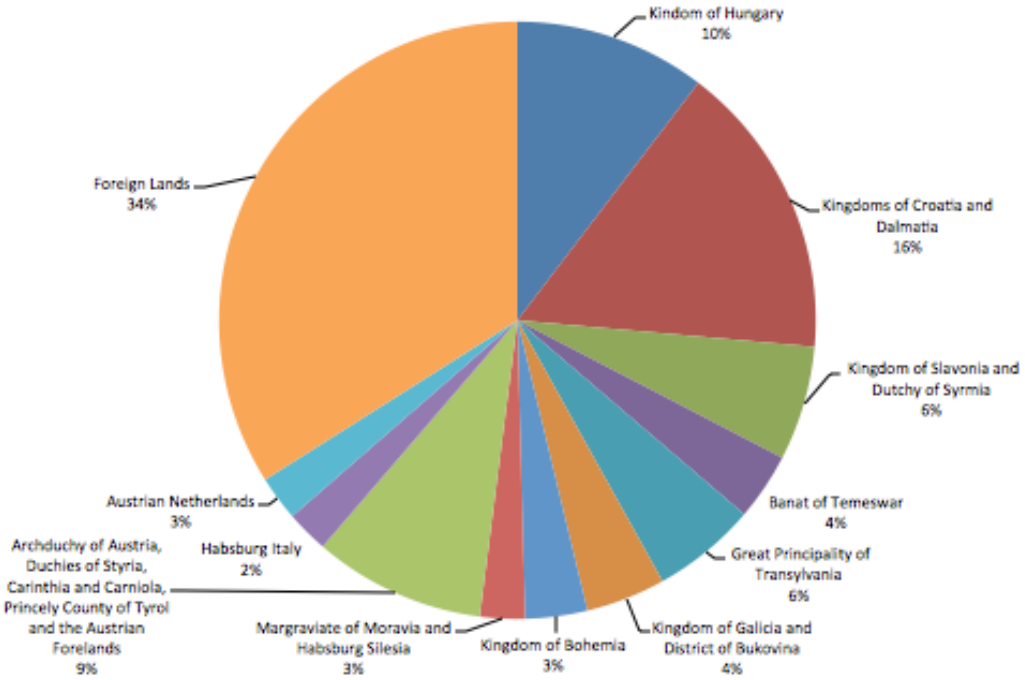

Figure 2.10 Distribution of map units of larger territories

Examining closer the number of foreign lands' maps the Habsburgs had gathered in their Military Archives reveal that the regions of special interest were Prussia, the Ottoman Empire,

Italy and the Holy Roman Empire. This distribution of maps, presented in Figures 2.11 and 2.12, is a direct reflection of the Habsburg military priorities. During the reigns of Maria Theresa and Joseph II, the Habsburg armies waged exhausting wars against Prussia and Frederick II's German allies. Although the only direct Habsburg-Ottoman military confrontation occurred in the late 1780s, the Viennese rulers started seeing the Ottoman lands as a possible direction for territorial expansion and tried to gather local knowledge about those territories. A similar connection between familiarity with the territorial layout and expansionist goals also helps explain the high number of maps representing the non-Habsburg Italian lands.

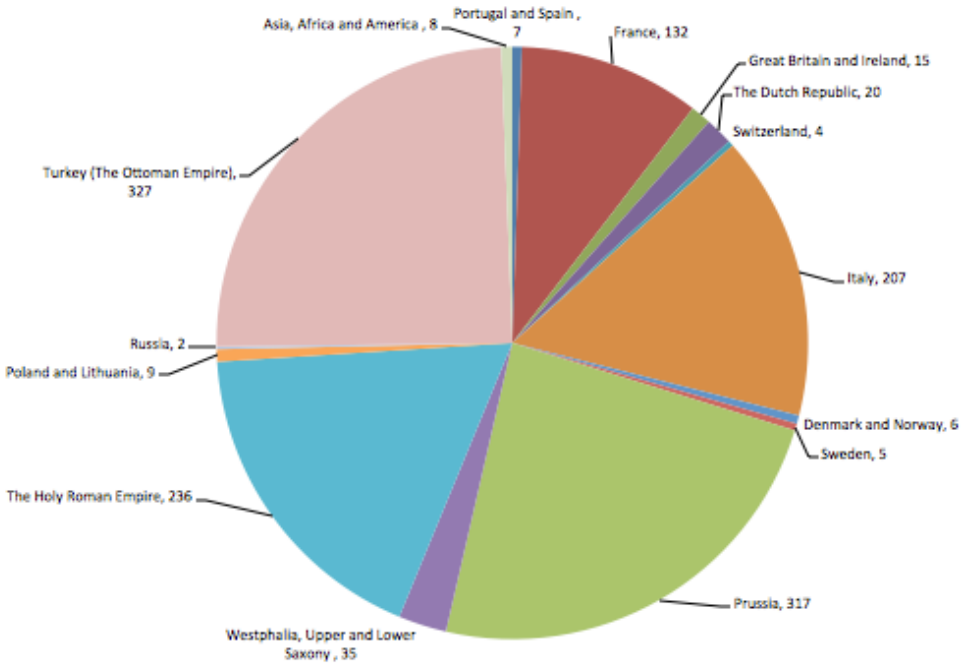

Figure 2.11 Distribution of foreign lands' maps of specific landmarks

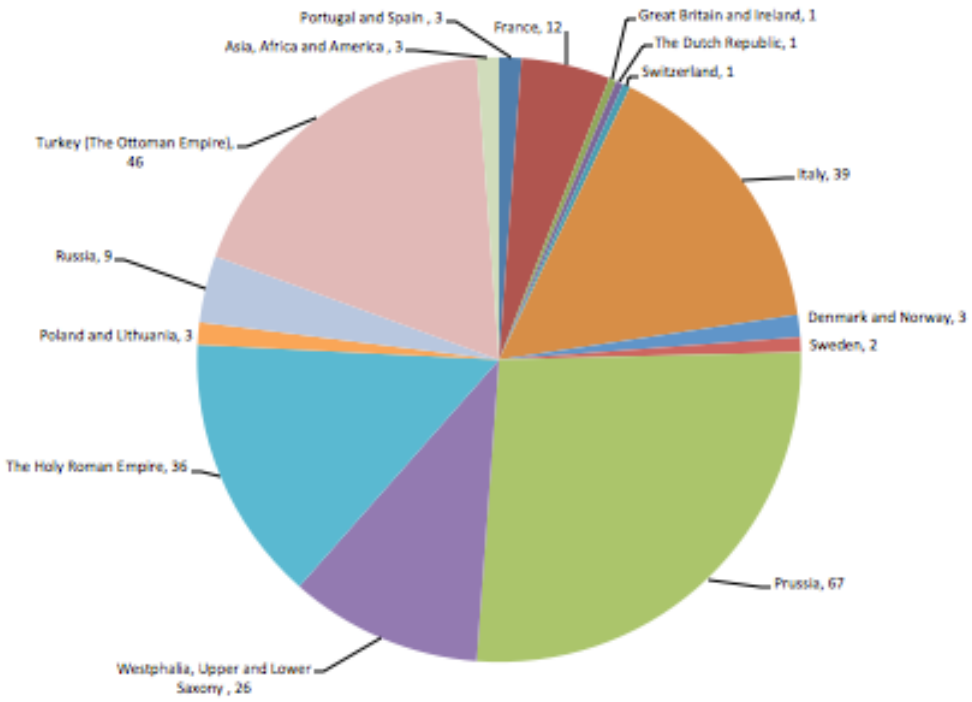

Figure 2.12 Distribution of foreign lands' map units of larger territories

This impressive collection of almost 16,000 maps was not the only cartographic repository of the Habsburg rulers, but was the most important one with respect to manuscripts maps containing sensitive information.[280] Therefore, the composition of this archive illuminates somewhat how the Habsburg rulers and their military advisers used cartography in the service of their empire. Gathering maps and geographical descriptions in one central archive limited access to these resources to a select group of military commanders and top administrators. For example, during the Austrian-Russian-Ottoman War (1787-1792), Emperor Joseph II and the President of the Aulic War Council, Hadik, had the final say in utilizing cartographic material as part of the war effort. In October 1787, Joseph II ordered the production of 150 engraved copies of the so-

[280] The Court Library also included a map collection, which is today part of the Austrian National Library. Ernst Trenkler, "History of the Austrian Nationalbibliothek," *Library Quarterly* 17, no. 3 (1947): 230.

called *Hungarischen Grossen Charte* (Large Map of Hungary). These maps were distributed among the regiment commanders deployed in the eastern parts of the Monarchy.[281]

However, the army commanders knew that in addition to Müller's map, the general quartermaster's staff had spent the 1760s to 1780s surveying in great detail most of the provinces of the Monarchy. Therefore, in November 1787, general major Zechenter suggested to the emperor that the army would benefit from receiving copies of the great military map's sections for Croatia, Slavonia, Banat of Temesvár, Transylvania and Galicia. Joseph II gave this permission for the commanding generals of the imperial army, but also warned them to show extreme caution and avoid at all costs any loss of such sensitive material.[282] Maps could not leave the Aulic War Council's archive without leaving a trail of paperwork behind, which demonstrates the high value they had in the eyes of Habsburg authorities.

The standard procedure of recovering maps and geographic descriptions from deceased officers also exemplifies the authorities' consistent effort to direct all precious maps towards this archive. When the Transylvanian mapmaker Stephan Lutsch von Luchsenstein died in 1792, the provincial commanders found in his possession 103 maps and drawings. This collection included numerous representations of Transylvania, Moldavia and Wallachia, but also segments of the Rhine River, plans of Luxembourg, Naples, Prague, and maps of other areas of the empire.

The order of the Aulic War Council was clear: the Transylvanian general commander had to send to Vienna all hand-drawn maps and plans together with some other war diaries and geographic descriptions of what used to be Austrian Wallachia.[283] For some of these maps, the

[281] KA HKR, 1787 34 191. The "Big Map of Hungary" probably refers to Ignaz Müller's Map engraved in 1769 and showing both the counties of Hungary and the Great Principality of Transylvania. Each military officer who received a copy of the map had to send a confirmation receipt. For example, the Governor of Transylvania, Count Banffy, confirmed the reception of his copy through a note sent to Vienna by Count Carl Palffy. KA HKR, 1787 34 205.
[282] KA HKR, 1787 34 200.
[283] KA HKR, 1792 34 39.

Aulic War Council already had copies. However, they still desired to minimize the risk of sensitive information falling into unauthorized hands. Luchsenstein's case was not singular and the Military Archive in Vienna preserves many other inventories summarizing the possessions of defunct officers.[284]

Recovering maps and geographic descriptions from defunct Habsburg officers, and ordering surveys of lands within the boundaries of the Monarchy were not the only ways to enrich the Aulic War Council's archive. Military engineers sometimes served as part of reconnaissance missions outside the Habsburg territories. For example, during the 1768-1774 Russo-Ottoman conflict, the Aulic War Council in Vienna sent some officers to serve under the banners of both belligerent states. Whereas the officers fighting alongside the Russian troops could due to a prior agreement between Vienna and St. Petersburg reveal their identity, the Habsburg agents enrolled in the Ottoman ranks had to keep their background secret to avoid capture as spies. In both cases, the Aulic War Council instructed the officers to write detailed journals of the war operations and prepare maps and plans of marches, encampments and the geography of the land they were travelling through.[285]

Vienna's decision was not unheard-of during this age. One decade before, during the Seven Years' War, all combatant sides had used similar techniques. The foreigners serving as part of short-distance reconnaissance units were especially prone to switching sides once their mission had been accomplished.[286] All military commanders were aware of this danger and in a continuous state of alert regarding spies. Therefore, Vienna cautioned its officers to gather information about the armies involved in the war and the territories in secret, and send it

[284] See for example KA HKR, 1789 34 58 (the general commander of Transylvania, Fabris), KA HKR, 1781 34 39 (the military engineers from Lombardy Baschiera and Cristiani).
[285] HHStA StK, Vortrage, box 104, 302-308 verso.
[286] Anklam, "*Battre l'Estrade*," 216.

whenever possible to the Aulic War Council. Examining the early 1780s inventory of this institution's map archive reveals such documents that survived all the way to Vienna. For example, this collection contained a description of the status quo for the Ottoman controlled lands between Belgrade and Constantinople, together with a diary of the 1769 Ottoman campaign, which included observations about the situation of the Ottoman army, its technique of gathering, marching and encampment.[287] Clearly, at least one of the Habsburg officers fighting undercover alongside the Ottoman troops was successful in his mission.

Through the example of the Indian Army Intelligence Branch, James Hevia has recently argued that military intelligence, including the development of cartography, "was a product of the new mechanisms of state formation, the disciplinary and regulatory regimes [...] that transformed European states in the second half of the nineteenth century into militarized polities."[288] However, the professionalization of the military and the formation of special army corps for gathering military intelligence were not nineteenth century inventions, as the case of military mapmakers in the service of the Habsburgs shows. The Aulic War Council in Vienna had, by the end of the eighteenth century, access to a rich resource of cartographic information.

[287] KA HKR, 1783 34 60, under the category Türkei, the entry: "Situations Beschreibung der Türkey von den Gegenden zwischen Belgrad und Constantinopol bis Hantepe am Bruht Fluß, dann Journal von der Türkischen Campagne de anno 1769, sammt anmerkungen über die beschaffenheit einer Türkischen Armée, derselben Art sich zu versammlen, zu marchiren, und sich zu laagern, in einem Band."

[288] James Louis Hevia, *The Imperial Security State: British Colonial Knowledge and Empire-Building in Asia* (Cambridge: Cambridge University Press, 2012), 5.

2.5 CONCLUSION

In 1779, one year before the end of Maria Theresa's reign, the Aulic War Council ordered the General Commander in Transylvania to gather all the plans, descriptions, or war diaries regarding military conflicts from 1740 onwards and send them to Vienna. The president of the Aulic War Council anticipated that many of these documents were either in the hands of military personnel or their families, but hoped he could retrieve a significant number.[289] This order represents just one of the instances through which the Viennese authorities tried to control access to geographic information.

At the same time, the protection of maps and geographic descriptions from enemies' eyes implied controlling not only the circulation of cartographic artifacts, but also the movements of their makers. By standardizing the training and organization of military engineers the Habsburg monarchs desired to centralize the production and preservation of maps, in the same way that they dreamed to consolidate their empire. However, these imperial designs often conflicted with the lack of sufficient trained personnel, provincial traditions of training and controlling access to official bodies of engineers, and the trans-imperial careers of elite mapmakers.

[289] AN CC, Document 7 (1779), November 24, 1779, 11.

3.0 MASTERING SPACE: THE GREAT MILITARY MAP OF TRANSYLVANIA

> Because of its location, strong colonization and many bounties of nature, the mentioned Principality [of Transylvania] is of great importance [for the Monarchy]; through orderly organization and just administration it is, could and should remain one of the most flourishing imperial lands. [Transylvania] is surrounded by high mountains, which separate this whole region not only from enemy lands, namely Wallachia and Moldavia, but also from the Banat of Temesvar and part of Hungary; [this province] is accessible during winter through few places and fortified with a perpetual natural wall.[290] (1740 Description of Transylvania)

> The Great Principality of Transylvania is enclosed on all sides by a chain of high mountains, through which, for the most part, there are rugged passes. Next to these passes there are other side-roads called *Playen*, which are more rugged and can only be considered footpaths. This mountain chain is only clearly interrupted where the Alt River flows into Wallachia and where the Buzau Pass seems to cut through the mountains.[291] (1773 Description of Transylvania's Passes and Fortresses)

A land surrounded by mountains from all sides, Transylvania constituted an almost natural southeastern corner for the Habsburg Monarchy. In 1740, the Habsburg military applauded the "natural wall" defending Transylvania, and thus the Habsburg dominions, as an almost impenetrable barrier in front of any enemies. However, by 1773, after an extensive campaign of

[290] Original text: Bedachtes Fürstenthums ist wegen seiner Lage, starcken impopulation, und vieler gaben der Natur, von solcher wichtigkeit, das selbes bey wohl geordneter einrichtung, und gerechter administration eines deren florissantesten Kayserlichen Erblanden seyn, und verbleiben könte, und müste. Es ist dessen ganzer Bezirck nicht allein gegen die feindlicher Lande, nehmlich Wallachey und Moldau, sondern auch gegen das Temesvarer Bannat, und zum Tail gegen Hungarn selbstmit einen hohen Gebürg umbgeben, von wenigen Ohrten, forderist in der Winterzeit, accessible, und folgsam mit einer Beständig-natürlichen Mauer gleichsam befestiget. From an unsigned 1740 description of Transylvania. KA KPS, K VII K 329 F, 1-1verso.

[291] Original text: Das Groß-Fürstenthum Siebenbürgen ist von einer Ketten hoher Gebürgen aufallen Seiten eingeschlossen, durch welche nachstehende meistentheils aber unbequeme Passagen vorhanden sind. Nebst diesen finden sich einigen andere Seiten Weege so Playen genamet werden, die noch unbequemer, und nur als beschwerliche Fußsteige anzusehen seynd. Diese Ketten ist nur sichtbahr unterbrochen, wo der Alt Fluß in die Wallachey fliesset, und bey dem Paß Buzau scheinet auch das Gebürg in etwas sich zu vereienderen. From a 1773 description of the Transylvanian passes and fortifications prepared by the General and Commander of the Genie Corps, Count Karl Clemens Pellegrini. KA KPS, K VII K 338 F.

mapping and describing the geography of this province, the Transylvanian border did not seem so impermeable anymore. More geographic descriptions of the area presented the numerous mountain passes connecting Transylvania with the Danubian Principalities as dangerous passages, through which armies, diseases, illegal trade and migrants could circulate freely. As Transylvania's topography became visible for the political authorities in Vienna, this region became more tightly integrated into the larger imperial fabric. This chapter examines how cartography became an essential tool in collecting an impressive array of information about this easternmost Habsburg province. Examining the production process of the Great Military Map of Transylvania shows that these cartographic operations involved both imperial and provincial agents. Although Habsburg officials directed the mapmaking work in the region, they relied heavily on the help of local officers and inhabitants.

The chapter will first offer historical background of the political integration of Transylvania into the Habsburg Monarchy, as the cartographic initiatives in the area were an intrinsic part of this larger political context. Next, this chapter examines the Habsburgs' determination to gather geographic information about the key border points connecting Transylvania with non-Habsburg lands: the passes of the Carpathian Mountains. Controlling access to these passes enabled the empire to protect itself from enemy armies and dangerous contagious diseases, while also assisting the policing of trade and the circulation of people.

Thirdly, this chapter explores aspects related to the production process of the Great Military Map of Transylvania. Scrutinizing the production of this map reveals that this cartographic project was more ambitious than it turned out to be in the end. Examining the various types of mapmakers involved in the cartographic production elucidates the role of imperial agents in the processes of provincial integration, imperial state-building and building

trans-imperial connections. Around the mid-eighteenth century, the most accomplished mapmaker in the region was the Transylvanian officer Stephan Lutsch von Luchsenstein. By the 1770s, Dominik Camiotti de Fabris Count of Cassano and Mihály Lajos Jeney had become significant mapmakers of this province as the coordinators of the Great Military Map. Whereas Luchsenstein spent his career working only in Transylvania, both Fabris and Jeney worked for the Habsburgs in various provinces, and Jeney had also pursued an international career in the service of France and Prussia. People like Fabris and Jeney had a clearer understanding of the mechanisms of the empire as a whole than provincial figures like Luchsenstein. This generational shift did not exclude the importance of provincial agents in the process of empire building; it simply added an extra layer that strengthened the connection of Transylvania with the larger empire. To complete the surveying and mapping of the province, Fabris and Jeney relied on the contribution of local officers belonging to the military border's regiments. In the end, I will bring to the forefront the tensions that emerged between imperial and provincial agents, due to the unauthorized circulation of cartographic material. Specifically, with the help of local mapmakers, provincial Transylvanian authorities obtained copies of high quality topographic maps, subverting the desire of Viennese authorities to keep cartographic information secret.

3.1 TRANSYLVANIA WITHIN THE CONTEXT OF THE HABSBURG MONARCHY

In the sixteenth and seventeenth centuries, Ottoman control over Transylvania posed a significant threat to the security of the Habsburg Monarchy. Therefore, in this period, the principality maintained a high geopolitical value as part of the Habsburg-Ottoman

confrontation.[292] The Transylvanian political elites used the province's position as a buffer between the Habsburgs and the Ottomans to enforce freedom of worship for Christians of various denominations and to impose at times the principle of freely electing their prince.[293] Repeatedly, Hungarian nobles residing in Transylvania joined anti-Habsburg coalitions as, for example, when they supported the Protestant armies' war against Vienna during the Thirty Years' War.[294]

As the end of the seventeenth century approached, the Austrians prevailed over their Ottoman rivals. The House of Habsburg accelerated negotiations for an alliance with the principality of Transylvania and in the spring of 1685, Vienna sent a mission led by the Jesuit diplomat Antide Dunod. When the Transylvanian Estates refused to allow the Habsburg military forces to enter the principality, the diplomat summed up Vienna's intentions: "Like it or not, you will still come under His Majesty's protection."[295] The Ottoman danger motivated the Habsburg government to consolidate their conquests. After capturing the fortress of Oradea from the Turks in 1692, they sent eight thousand soldiers to the principality of Transylvania.[296] By signing the 1699 Treaty of Karlowitz, the Ottoman Empire confirmed the Habsburg rule in Hungary and Transylvania.[297]

The Principality of Transylvania was the launching pad for anti-Habsburg Hungarian rebellions throughout the seventeenth and early eighteenth centuries, as Hungarian elites

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[292] Ingrao, *The Habsburg Monarchy*, 65.
[293] Graeme Murdock, "'Freely elected in fear': Princely elections and political power in early seventeenth-century Transylvania," *Journal of Early Modern History* 7 (2003): 213-44.
[294] Hochedlinger, *Austria's Wars of Emergence*, 66.
[295] *Nolens volens proteget vos Sua Majestat*. Magyari András, "The Beginnings and the Consolidation of the Habsburg Rule in Transylvania", in *The History of Transylvania*, eds. Ioan-Aurel Pop, Thomas Nägler, and Magyari András, vol. 2 (Cluj-Napoca: Romanian Academy, Center for Transylvanian Studies, 2009), 345.
[296] Ágnes R. Várkonyi, "The End of Turkish Rule in Transylvania and the Reunification of Hungary (1660-1711)", in *History of Transylvania*, ed. Gábor Barta et al. (Budapest: Akadémiai Kiadó, 1994), 372.
[297] For a detailed discussion of the conquest of Transylvania during the 1680s and 1690s see András, "The Beginnings and the Consolidation of the Habsburg Rule in Transylvania," 343-355.

dominated the political life of this Principality.[298] Therefore, although Transylvania used to be integral part of the medieval Kingdom of Hungary, Chancellor Kaunitz and Maria Theresa decided to maintain the Principality as a separate political entity. Indeed, in 1767, Maria Theresa raised Transylvania to the rank of a Great Principality.[299] Clearly, Vienna desired to keep the troublesome Hungarian nobility divided between two provinces. Additionally, despite the Habsburgs' conquest of Transylvania, Russo-Ottoman-Habsburg confrontations continued to threaten the region throughout the eighteenth century. Therefore, the Habsburg rulers tried to build a fast chain of command from Vienna to this eastern province, circumventing provincial levels of authority.

As part of this centralization process, for most of the eighteenth century the Habsburg monarchs refused to convene the traditional Transylvanian legislative institution, the Diet. Instead of relying on this provincial institution, the imperial authorities ran the province with the help of normative laws, namely diplomas and patents.[300] Furthermore, the provincial Treasury was subordinated to the Imperial Treasury in Vienna, and the Transylvanian Chancellery was moved to Vienna.[301] Finally, during the 1760s, the following non-Transylvanian imperial officials cumulated the positions of military commander and governor of this province: Baron Adolf Nicolaus von Buccow (1762-64), Count Andreas Hadik of Futak (1764-1767) and Count Karl Claudius O'Donnel-Tyrconnel (1767-1770).[302] Along with other responsibilities, the

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[298] For a discussion of the kuruc Rebellion led by Francisc II Rákoczi (1703-1711) see Ingrao, *The Habsburg Monarchy*, 111, 115-117.

[299] Szabo, *Kaunitz and Enlightened Absolutism*, 314; Evans, "Maria Theresa and Hungary," in *Austria, Hungary, and the Habsburgs*, 33.

[300] The Diet was convened in extraordinary instances, such as when in 1722 Charles VI needed the confirmation of the Pragmatic Sanction. The Diet was no longer convened after 1762.

[301] These radical measures of subordination proved successful; by 1764 Transylvania's annual contribution reached 1,365,000 florins, among the highest per capita collected anywhere in the Monarchy. Ingrao, *The Habsburg Monarchy*, 163.

[302] Anton Dörner, "Transylvania's Legal Status" and "Central and Local Institutions," in *The History of Transylvania*, vol. 3, 17-18, 33-40.

military governor of Transylvania coordinated the implementation of the extensive mapmaking operations and the border demarcations of the late 1760s and early 1770s.

Cartography needs to be seen as part of a larger package of measures directed at defending the south-eastern Habsburg border, such as the extension of the Military Border to Transylvania in the early 1760s.[303] Beginning in the sixteenth century, the Habsburgs relied on the communities of peasant-soldiers, known as *gränzer*, in their confrontation with the Ottomans. These local peasants, who received lands and confessional rights in exchange for their military service, helped decrease Habsburg military expenses in the region.[304] In the case of Transylvania, the *gränzer* were organized initially into four infantry regiments (First Szekler, Second Szekler, First Wallach, Second Wallach) and two cavalry regiments (First Szekler Hussars and First Wallach Dragons) that were merged into only one cavalry regiment in 1764.[305] The term "military border" designated a geographic region with fluctuating limits. Nonetheless, the Transylvanian *gränzer* helped map and implement what became a more fixed borderline marked with standard indicators, called Imperial Eagles (*Kaiserliche Adler*).[306]

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[303] Ingrao, *The Habsburg Monarchy*, 164. For a discussion of the Habsburg Military Border, with a focus on Croatia, see Gunther E. Rothenberg, *The Austrian Military Border in Croatia, 1522-1747* (Urbana: University of Illinois Press, 1960) and Gunther E. Rothenberg, *The Military Border in Croatia, 1740-1881: A Study of an Imperial Institution* (Chicago: University of Chicago Press, 1966). For a discussion of the Habsburg Military Border in Transylvania see Carol Göllner, *Regimentele grănicereşti din Transilvania 1764-1851* [The Border Regiments from Transylvania 1764-1851] (Bucureşti: Editura Militară, 1973).
[304] Szabo, *Kaunitz and Enlightened Absolutism*, 281.
[305] Göllner, *Regimentele grănicereşti din Transilvania*, 47, 57.
[306] See Rothenberg's definition of the "military border," in Rothenberg, *The Military Border in Croatia, 1740-1881*, 1.

Figure 3.1 The Habsburg Monarchy's Military Border in 1764

In creating the new Transylvanian border regiments, the Habsburg authorities reorganized the province's geography to fit their larger imperial strategy: extending the military border in order to obtain a continuous defended line from the Adriatic Sea to the northern part of Transylvania (Figure 3.1).[307] For the province of Transylvania, this imperial vision inevitably clashed with the local administration; the land that the Habsburg authorities divided among the newly created border regiments along the Carpathian Mountains was taken from Saxon towns such as Braşov, Sibiu and Bistriţa.[308] Moreover, the establishment of Border Regiments in the 1760s defied the traditional administrative organization of Transylvania, as the *gränzer* became free men and their feudal ties to the local noblemen were cut.[309]

Local authorities did not yield easily to the desires of the empire. For example, the Magistrate of the town of Bistriţa fought the confiscation of the twenty-three villages intended to form the military border district of Rodna Valley, headquarters for the Second Wallach Infantry Regiment. In the end, the imperial authorities had to provide a monetary compensation of 38,481 florins and 43 kreutzers and also offer certain taxation rights for Bistriţa's authorities.[310] Emperor Joseph II recorded another instance of local defiance during his 1773 journey to Transylvania. On June 18, 1773, Joseph II met the mayor of the community of Bârgău, located in the northeastern part of the province, and two local serfs. These, at first glance, insignificant local actors told the emperor about the punitive actions of Count Bethlen, the lord of the domains, taken against the mayor. The administrator of Count Bethlen had imprisoned the mayor for having mentioned to a Habsburg officer that the inhabitants of Bârgău would have gladly

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[307] This figure is based on Hofstätter, *Beiträge zur Geschichte der Österreichischen Landesaufnahmen*, vol. 1, 37.
[308] Ioan Pop, "La Position des états privilégiés de la Transylvanie à l'égard de l'institution de la Frontière Militaire," in *The Austrian Military Border. Its political and Cultural Impact*, eds. Liviu Maior, Nicolae Bocşan, and Ioan Bolovan. (Iaşi: Glasul Bucovinei, 1994), 21.
[309] Katherine Verdery, *Transylvanian Villagers: Three Centuries of Political, Economic, and Ethnic Change* (Berkeley: University of California Press, 1983), 94-95.
[310] Pop, "La Position des états privilégiés de la Transylvanie," 21; Göllner, *Regimentele grănicereşti din Transilvania*, 34-40.

joined border regiments if this institution had been extended to the area.[311] This incident shows that provincial elites did not always welcome imperial plans for the region. At the same time, the Habsburg authorities could count on the alliance of some of the local inhabitants, who hoped that joining the *gränzer* group would bring them economic advantages and protection from their landlords.

The extension of the Military Border into Transylvania was more than a purely military measure; the existence of this institution eased the introduction of reforms through the Aulic War Council and thus the circumvention of Transylvania's provincial authorities.[312] On November 13, 1766, the Regulation issued by Maria Theresa for the Second Wallach Infantry Regiment made it clear that the *gränzer* were free men who had as their main goal defending the borders of the empire. In addition to foreign invasions, among possible dangers threatening the Habsburg dominions Maria Theresa listed criminals, unauthorized migrants, contraband and diseases such as the plague.[313]

Indeed, the *gränzer* spent 52 days, namely one third of their yearly service, ensuring the enforcement of the Habsburg sanitary cordon.[314] This important Habsburg institution had been in place as a permanent cordon since the time of Charles VI, who on October 22, 1728 justified its creation on the borders with the Ottomans in order to fight epidemic diseases, especially the

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[311] Pop, "La Position des états privilégiés de la Transylvanie," 24. The Bârgău valley was militarized only in 1783.
[312] Szabo, *Kaunitz and Enlightened Absolutism*, 335.
[313] Vasile Bichigean, "Statutul Grăniceresc," *Arhiva Someşană*, no. 8 (1928): 75-92; Vasile Bichigean, Statutul Grăniceresc, *Arhiva Someşană*, no. 9 (1928): 104-121.
[314] Jovan Pešalj, "Some Observations on the Habsburg-Ottoman Border and Mobility Control Policies," in *Transgressing Boundaries: Humanities in Flux*, eds. Marija Wakounig and Markus Peter Beham (Vienna: LIT, 2013), 250. For more information about the Habsburg sanitary policies in Transylvania see Bogdan-Florin Popovici and Emil Stoian, *Carantina Branului (sec. XVIII-XIX)* (Bucharest: Editura Sigma, 2002); Teodora Daniela Sechel, *Healthcare Policy and the Social Discipline Promoted by the Habsburgs in Transylvania (1740-1830)* (PhD diss., Babes-Bolyai University, 2008); for a summary of Teodora Daniela Sechel's PhD dissertation see "Healtchare Policy and the Social Discipline Promoted by the Habsburgs in Transylvania (1740-1830)," in *Multiple kulturelle Referenzen in der Habsburgermonarchie des 18. Jahrhunderts*, 231-247.

plague.[315] Imperial orders from August 25, 1766, stated that anyone using counterfeit health documents or giving false declarations regarding their origin or their goods would be sentenced to death.[316] However, despite the severity of these protective measures, during the reigns of Maria Theresa and Joseph II four major plague epidemics spread into Transylvania (1742/43, 1755/56, 1770/71, 1786).[317] Clearly, the sanitary cordon was not a perfect seal for the Monarchy's provinces; people managed to avoid the controls by bribing guards[318] or circumventing the quarantine points.[319]

Controlling migration was another priority for the Habsburg authorities. Transylvanian subjects often crossed the border and settled in the neighboring Danubian Principalities without authorization from Vienna. For example, in 1738 and 1739 fifteen inhabitants from the Rodna Valley, together with their wives and children, left this area for Moldavia or neighboring counties.[320] A report from 1760 revealed that the runaways would usually gather at a designated site, and after they organized themselves, would continue together the journey towards Moldavia.[321] The extension of the Military Border to Transylvania did not put a stop to these illegal migrations and even some of the *gränzer* left the Monarchy. For example, between 1771 and 1777, 659 soldiers belonging to the First Wallach Infantry Regiment defected.[322]

The extradition of deserters became one of the main concerns of the Viennese Court with respect to its policy towards Moldavia and Wallachia during the eighteenth century. And even after the 1776 border convention signed between the Habsburgs and the Ottomans that

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[315] Pešalj, "Some Observations on the Habsburg-Ottoman Border and Mobility Control Policies," 250.
[316] Popovici, *Carantina Branului*, 47.
[317] Sechel, "Healtchare Policy and the Social Discipline Promoted by the Habsburgs in Transylvania," 232.
[318] Gunther Rothenberg, "The Austrian Sanitary Cordon and the Control of Bubonic Plague: 1710-1871," *Journal of the History of Medicine and Allied Sciences* 28, no. 1 (1973): 20.
[319] In 1786 a shepherd from Wallachia who avoided the Bran quarantine point triggered a new plague epidemic. Bogdan-Popovici, *Carantina Branului*, 53.
[320] Virgil Şotropa, "Bejenii în secolul XVIII," *Arhiva Somesana* 16 (1932): 57.
[321] Ibid., 64-65
[322] Göllner, *Regimentele grănicereşti din Transilvania*, 115-117.

consecrated the trajectory of the Transylvanian-Moldavian borderline and included a specific article regarding the extradition of deserters by the Moldavian prince, the situation was not ameliorated.[323] The desertion of *gränzer* was especially dangerous because these people possessed sensitive knowledge of the Habsburg borders' defenses. For example, a 1785 report from the Habsburg representative in Constantinople mentions that a deserter going by the name of Kotzi had gained the protection of the Ottoman Court in exchange for the preparation of an accurate description of the Habsburg-Ottoman border. This deserter had brought with him "numerous plans and maps," and thus endangered the security of the Habsburg border.[324] Given all of these examples, it is not surprising that in his 1773 report about Transylvania to Maria Theresa, Joseph II expressed his disappointment with the *gränzer* and labeled them a simple *land militz* (territorial militia) that could barely enforce even the quarantine regulations.

Despite the yearly expense of 220,000 florins, the Transylvanian Military Border appeared discontinuous, and Joseph II prepared a list of additional settlements that should be militarized to improve this dire situation. The emperor planned to redraw a segment of the imperial border based on his personal geographical knowledge of the province. Whereas part of this knowledge came from the emperor's inspection of the border areas, the role of maps cannot be neglected. Indeed, Joseph II ended his 1773 report to Maria Theresa on the Military Border with a note ensuring the empress, that after his return to Vienna "I will explain my thoughts more precisely and more surely based on my notes and on the map."[325]

Despite Joseph II's harsh criticism of the efficacy of the military border regiments to defend Transylvania from enemy attacks, diseases, contraband or illegal migrants, some of these

[323] February 10, 1785, Herbert (Internuntio) to the Prince of Moldavia. Eudoxiu Hurmuzaki, *Documente privitoare la istoria românilor*, vol. 7, *1750-1818* (Bucharest: Ministerul Cultelor si Instructiunii Publice, 1876), 432.
[324] February 11, 1785, Herbert to Kaunitz. Hurmuzaki, *Documente*, vol. 7, 434.
[325] Original text: "Diesen Gedanken könnte ich nach meinen Notatis und auf der Charte noch viel genauer und sicherer auslegen." Bozac and Pavel, *Călătoria împăratului Iosif al II-lea în Transilvania la 1773*, vol. 1, 727-737.

regiments' officers contributed significantly to the gathering of geographic information about this province. The *gränzer* mapmaking work influenced how decision-makers in Vienna imagined and organized the southeastern border of the Monarchy.

For a long time scholars have been studying the impact of the creation of border regiments on the elimination of serfdom, the promotion of education and the conversion of the local population to the Greek-Catholic church. Moreover, the literature about the border regiments in Transylvania connected these institutions to the formation of an ethnic Romanian and Szekler identity in the region.[326] However, the contribution of border regiment officers to the mapping of Transylvania has remained unexplored.

3.2 THE CONTROL OF TRANSYLVANIAN MOUNTAIN PASSES

Gathering detailed geographic descriptions and maps of Transylvania preoccupied the Habsburg military throughout the eighteenth century. This geographic production focused especially on the Carpathian Mountains' passes, which connected Transylvania to the Danubian Principalities. In 1780, the Aulic War Council's archives contained around 150 maps and plans showing the topography of specific Transylvanian mountain passes, projects for their defense, the road and pathway network connecting them with the neighboring Danubian Principalities, or elements belonging to the Sanitary Cordon and the customs. Most of these maps and plans date from the

[326] See for example Mathias Bernath, "Die Errichtung der siebenbürgischen Militärgrenze und die Wiener Rumänenpolitik in der frühjosephinischen Zeit," *Südostforschungen* 19 (1960): 164-192; Vasile Bichigean, "Poemation de secunda legione Valachica," *Arhiva Someşană*, no. 3 (1925): 39-65; Alexandru Bucur, Cornel Lupea, *Ofiţerii români din Regimentul 1 Grăniceresc român de la Orlat* (Sibiu, Romania: Etape, 2001); Göllner, *Regimentele grănicereşti din Transilvania*; *Die Szekler in Siebenbürgen. Von der privilegierten Sondergemeinschaft zur ethnischen Gruppe*, ed. Harald Roth (Cologne: Böhlau, 2009); Lazăr Ureche, "The Frontier Funds From Năsăud," in *The Austrian Military Border*, 105-117.

second half of the eighteenth century, thus revealing Vienna's strong interest during this time in obtaining detailed geographic information about mountain passes and developing plans for their defense.[327] Figure 3.2 shows a map of the main passes connecting Transylvania with Moldavia and Wallachia.

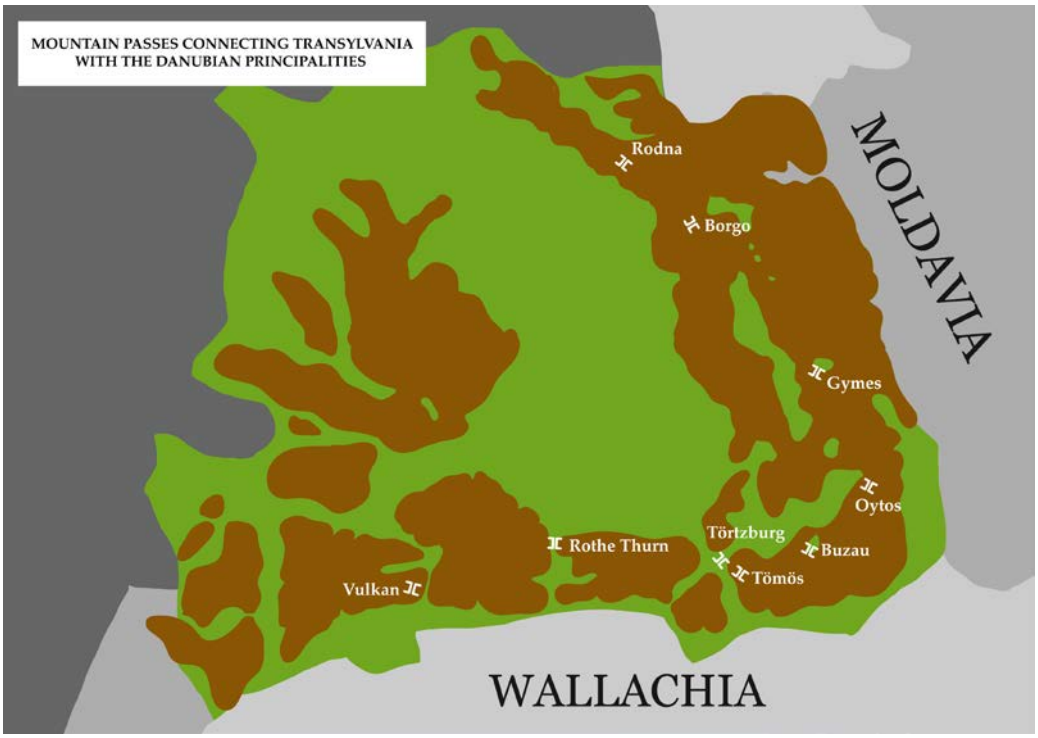

Figure 3.2 Principal mountain passes connecting Transylvania with the Danubian Principalities

The devotion of such attention to the topography of the mountain passes was connected to their strategic importance. These passes made Transylvania vulnerable to foreign invasions, unwanted migrants, contraband and the plague. Therefore, as the ones living on this vulnerable frontier, the Military Border regiments played leading roles in collecting geographic information about Transylvania and its borders in the form of maps and narrative descriptions.

[327] This number is based on an inventory of all Transylvanian plans, maps and geographic descriptions, created at Joseph II's order in 1782. KA HKR, 1782 34 105

The first significant wave of maps, plans and geographic descriptions dates from the early 1750s. After the disastrous War of the Austrian Succession (1740-1748), during which the Habsburgs lost most of the prosperous province of Silesia, Maria Theresa prioritized a series of military reforms, including the creation of an imperial corps of engineers[328] and the construction and improvement of fortifications in border provinces, including Transylvania.[329] The War Archives in Vienna has preserved a series of plans from the early 1750s prepared at the order of the General Commander of Transylvania under the direction of the engineer Major Rebain. The early 1750s plans I located in Vienna represent the following border passes: Eisernen Thors (Iron Gates on the Danube), Rothe Thurn, Törtzburg, Tömös, Oytos, Rodna, and the road going through the Fagaras Mountains from Transylvania to Wallachia.[330]

In addition to concern for the state of the fortifications guarding the mountain passes connecting Transylvania with Moldavia and Wallachia, another priority of the Viennese Court in the early 1750s was asserting without any doubt their territorial pretentions in the border areas. Therefore, starting with 1750, the Transylvanian officer Stephan Lutsch von Luchsenstein spent almost a decade preparing maps of Transylvania's borders and detailed reports to support the Habsburg claims.[331] The contribution of these border maps to further Habsburg territorial claims is discussed in chapter 5.

Mountain passes were one of the key elements Luchsenstein represented on his border maps. For example, during 1753 and 1754, Luchsenstein prepared a representation of the borderline between Transylvania and Wallachia entitled *Map of Transylvania's borders towards*

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[328] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 29; Hochedlinger, *Austria's Wars of Emergence*, 309; Lustig, "Zur Geschichte der k.k. Genie-Waffe," 71.
[329] AN CC, Document 3 (1752) and Document 3 (1753).
[330] KA GPA Inland C VI: Eiserner Thor Pass. Nr. 1; Ennvelope D/1 Rhoten Thurm Nr 5; Envelope E. Törzburg Paß. Nr 2; Envelope D. Ojtoss Pass No 3. KA KPS, B IX c 729; Ibid., K VII K 419 E.
[331] I discuss in detail the process of mapping and marking the border between Transylvania and Moldavia in the paper "Redefining Imperial Borders."

Walachia (*Siebenbürgische Gräntz-Carte gegen der Walachey*).[332] Luchsenstein captured on this document information about the location of all roads and paths crossing over the border between Transylvania and Wallachia, especially the lesser-known ones. The Habsburg authorities were interested in policing the people's circulation on these footpaths. Therefore, we can infer that Luchsenstein's border map was to not only help support Habsburg claims against their neighbors, but was also supposed to assist the Habsburg border officers to control movement of the population and to put a stop to contraband, illegal migration and the spread of diseases.

Figures 3.3 and 3.4 show the area nearby the mountain passes Buzau and Tömös. In the case of the Bozauer Pass, Luchsenstein marked the position of a fortification (red rectangle surrounded by a sketch representing walls, in the center of Figure 3.3.). For the Tömös Pass, the officer added the location of the *Vor-Contumatz*, a quarantine and customs station (in the center of Figure 3.4.). Moreover, as seen in these figures, Luchsenstein marked numerous roads and footpaths, making this map invaluable for the *gränzer* patrolling these regions.

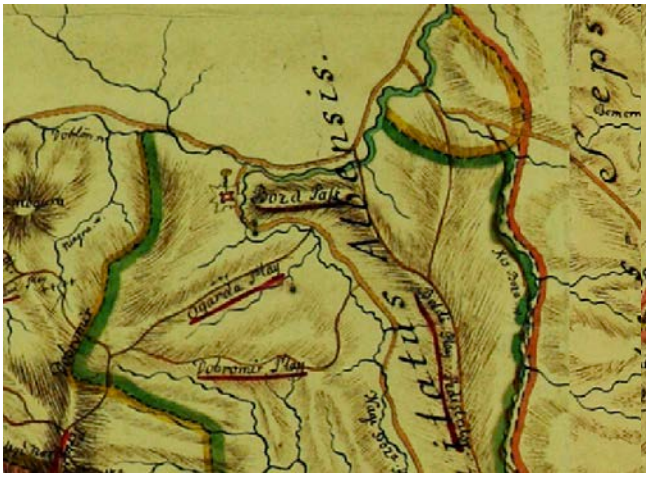

Figure 3.3 Bozauer Pass on Luchsenstein's *Map of Transylvania's borders towards Walachia*

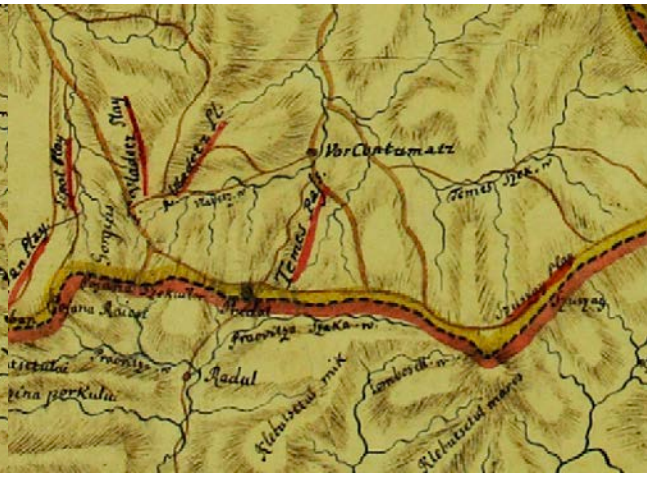

Figure 3.4 Tömes Pass on Luchsenstein's *Map of Transylvania's borders towards Walachia*

[332] KA KPS, B IX c 749.

Luchsenstein was not merely an officer with mapmaking abilities. By 1760 he had become the commander of the Transylvanian quarantine line troops and, when the Habsburg Military Border was extended to Transylvania, Luchsenstein became the commander of the First Wallach Regiment.[333] This engineer's professional trajectory demonstrates that his broad geographic knowledge regarding Transylvania's borderlands made him essential in enforcing the Habsburg sanitary and military policies in this province.

After the first wave of detailed mapping of Transylvania's mountain passes in the 1750s, the Habsburg authorities continued to send high officers to inspect these areas and prepare descriptions with suggestions for the improvement of the province's defense. In 1763, Lieutenant General Ferdinand Philipp von Harsch visited all significant Transylvanian fortresses, castles and mountain passes and wrote a memoir.[334] As a supplement to this document Harsch prepared a series of plans and maps showing these interest points and suggesting improvements to their defensive structures. Although the location of these drawings in Viennese archives eluded me, I located a second copy of Harsch's description in Sibiu. This copy included six plans showing the area nearby the mountain passes Borgo, Gymes, Oytos, Buzau, Tömös and Törtzburg.[335]

In his memoir, Harsch underscored that in addition to the main passes connecting Transylvania with the Danubian Principalities, there existed hundreds of other paths accessible only on foot or on horse. He considered these smaller paths dangerous not because of the possibility of an enemy invasion, but because they constituted outlets for the inhabitants of Moldavia and Wallachia to circulate freely between their lands and Transylvania, thus promoting robberies and movement of contraband. For a better protection of Transylvania's borders, Harsch

[333] Under the entry for Siebenbürgen, in *Lexikon zur Geschichte der Kartographie*, eds. Johannes Dörflinger, Franz Wawrik, E. Tomasi, and Ingrid Kretschmer, vol. 2 (Vienna: F. Deuticke, 1986), 742.
[334] KA KPS, K VII K 333 F. In 1760, Ferdinand Philipp von Harsch was named the deputy director of the imperial corps of engineers. Blasek and Rieger, *Beiträge zur Geschichte der K. u. K. Genie-Waffe*, vol. 1, 35-36.
[335] AN, series Brukenthal 80/A 1-5.

proposed the preparation of a detailed map displaying all footpaths and the topography of the mountains. Furthermore, this officer expressed his concern that imperial troops deployed in Transylvania had no chance to ensure the protection of the border, due to its length and the existence of these numerous passages.[336] Harsch's inspection and suggestions probably constituted one of the factors that supported the creation of Transylvanian Military Border regiments. Recruited from among local peasants, the *gränzer* had a good knowledge of the province's topography and provided much needed manpower to police the borderlands.

In his report, Harsch also described in detail the main mountain passes and their defenses at the time of his visit and offered suggestions for further improvements. For example, when describing the Borgo Pas, this officer mentioned the existence of a road going all the way to the foot of the mountains and continuing across the border, in the form of a difficult road that could be travelled on horse or by foot. The entrance to the Borgo pass was located between two heights, and Harsch suggested building two fortresses at those sites and protecting them with an abatis, i.e. an obstacle composed from the branches of trees.[337]

Figure 3.5 Map of Borgo Pass accompanying the 1763 Harsch Memoir

[336] KA KPS, K VII K 333 F, part II.
[337] Ibid., part III.

Figure 3.5. shows details from the map Harsch prepared for the area nearby Borgo.[338] In the left side image, the letter A represents the custom and quarantine point, and the letter B indicates the presence of an inn. In the right side image, the two letters E show the position of the fortifications Harsch proposed as new defenses for this pass, and the letter F marks the location he suggested for the abatis. Harsch's map reveals that the mountain pass represented both an important strategic military point and also helped enforce customs fees and sanitary measures.

The Habsburg desire to accumulate what they considered accurate representations of Transylvania's borders, especially the mountain passes, improved the defense of the Monarchy's borders both from foreign troops and peacetime invaders, including germs and different types of criminals. The efforts of Viennese rulers to learn as much as possible about the geography of the province guided Maria Theresa and Joseph II's military, sanitary and population control policies in the Carpathian Mountains.

3.3 INVENTORYING TRANSYLVANIA'S GEOGRAPHY

The Habsburgs desired not only to obtain good maps of their empire's strategic points on the borderline, but also to acquire accurate representations of their dominions. Before the expansion of the Military Border into Transylvania and the *gränzers*' contributions to mapping the province, Stephan Lutsch von Luchsenstein's 1751 map of Transylvania, *Principatus Transylvaniae* (*The Principality of Transylvania*) remained the most coveted cartographic work

[338] AN, series Brukenthal 80/A 1-5.

for this area. Known as the Luchsenstein Map, this representation of Transylania has survived in multiple copies both in archives in Vienna and Romania (Figure 3.6).[339]

The map's legend includes a variety of interest points, such as fortresses, settlements, churches, mills, mines, post stations, customs stations, roads, ruins, famous battle points and administrative subdivisions. For example, Figure 3.7 includes a detail from Figure 3.6, centered on the Saxon seat Mühlenbach (Sebeş), for which Luchsenstein prefers to use the Latin toponym, *Sabesiensis*.[340] The red circles mark villages, while the main town of this Saxon seat appears as a series of red squares surrounded by walls. Above the main town, we encounter the symbol for a post office station. On the left side of this fragment star-shaped signs mark the presence of gold in the gravel bed of the river. The image includes two types of border: the yellow line marks the border of the Saxon seat, while the light green contour delimitates the neighboring Hungarian county.

[339] See for example KA KPS, BIX a 702; Ibid., BIX a 716; Ibid., BIX a 717; ÖNB, Kartensammlung, FKB C.105.1a-v; Ibid., FKB C.107.A.1-4; Ibid., FKB C.107.3, Cluj-Napoca, Biblioteca Centrală Universitară (BCU), Special Collections, H 70/1; Sibiu, Biblioteca Brukenthal, Harti, No 5731. Figure 3.6 is a reproduction of ÖNB, Kartensammlung, FKB C.107.5a-d.
[340] ÖNB, Kartensammlung, FKB C.107.5a-d.

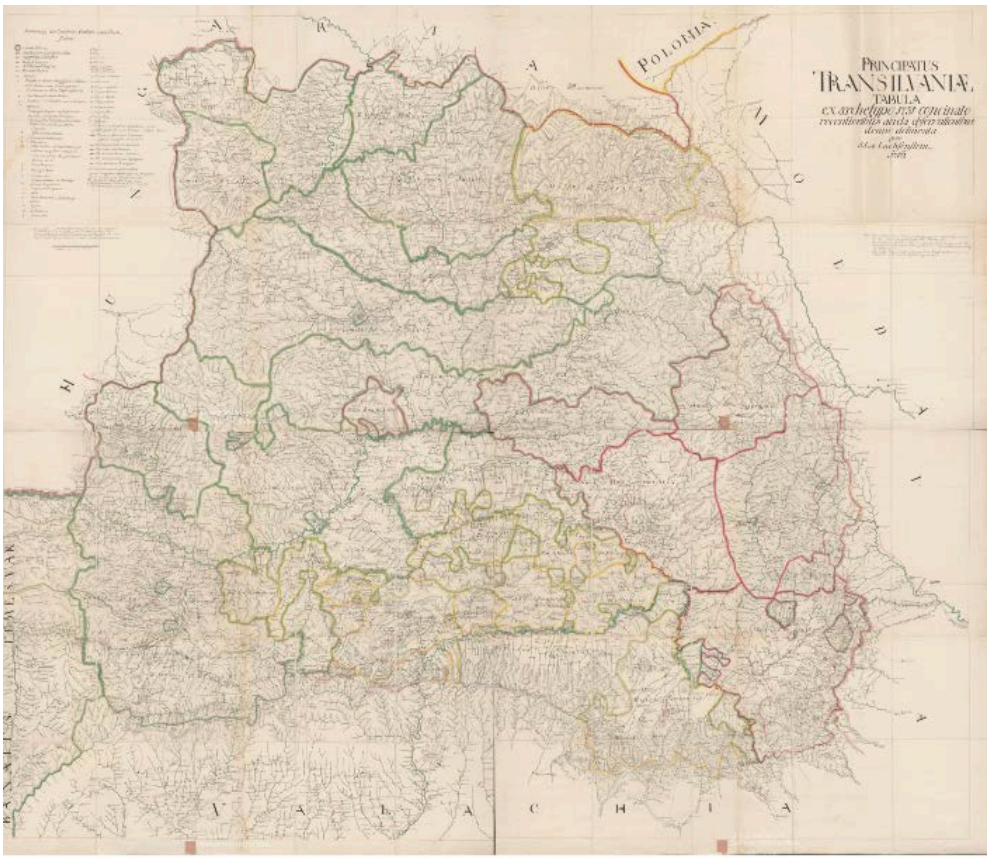

Figure 3.6 Luchsenstein's *Principality of Transylvania* (1762)

Figure 3.7 The Saxon seat Mühlenbach on Luchsenstein's *Principality of Transylvania* (1762)

Luchsenstein's Map demonstrates the complex situation of Transylvania's administrative subdivisions. For centuries, Transylvania had been divided among eleven Hungarian counties and two districts, five Szekler seats, and nine Saxon seats and two districts.[341] The creation of the Military Border in the early 1760s only added to the complexity of the administrative geography of this province. The Transylvanian elites and town inhabitants defended the maintenance of their traditional counties and seats, as this system conferred them political and economic advantages.

Luchsenstein's career, discussed in detail in chapter 2, demonstrates how the Habsburg central authorities co-opted local elites in the process of provincial integration. Not only was Luchsenstein born, raised and trained in Transylvania, but he also became the geographical expert of the region. However, towards the end of his military service, Luchsenstein worked together with a new generation of military engineers who had served the Habsburgs in various provinces and had coordinated cartographic projects that encompassed more than one of Vienna's domions. After Maria Theresa ordered the beginning of the work on the Great Military Map of Transylvania, Luchsenstein's name does not appear on any of the lists of engineers working on this project. Instead, the Aulic War Council commissioned two officers of the general quartermaster's staff, Dominik Camiotti de Fabris Count of Cassano and Mihály Lajos Jeney, to coordinate this enterprise.

Luchsenstein's maps offered the authorities in Vienna an image of Transylvania that brought to the forefront the position of settlements, the larger roads and waterways, a series of economic interest points and the complex administrative division of the province. However, Luchsenstein's work did not offer detailed representations of each of the settlements and did not convey well enough the complexity of the natural and human landscape. Moreover, projects such

[341] Elke Josupeit-Neitzel, *Die Reformen Josephs II. in Siebenbürgen* (Munich: Rudolf Trofenik, 1986), 99.

as Luchsestein's map could not compete with larger topographic works, such as the famous Cassini Map of France. Therefore, it did not take long for the Habsburg rulers to commission a series of large-scale topographic maps accompanied by detailed geographic descriptions, known in the literature as the *Josephine Survey* (*Josephinische Aufnahme*), but called in eighteenth century documents the Great Military Map.[342]

The order for a comprehensive mapping project of the Monarchy was linked to the disastrous defeats at the hands of the Prussian armies during the Seven Years' War (1756-1763). After the Peace of Hubertusburg, signed on February 15, 1763, the President of the Aulic War Council, Count Leopold Joseph Daun, convinced Maria Theresa to order a detailed topographic map of her vast dominions.[343] The proposal for such a cartographic project came initially from the Lieutenant Field Marshal Count Franz Moritz Lacy, who had served for most of the Seven Years' War as the first Quartermaster General of the Habsburg Monarchy and thus had been in charge of preparing military operation plans.[344] No one knew better than Lacy the disadvantage Habsburg troops suffered on the field because of the lack of maps. In her detailed biography of Lacy, Edith Kotasek makes clear this officer's interest in cartography as a government tool, especially after his appointment in 1766 as the Aulic War Council's President.[345] Lacy's proposal resonated with the prior President, Daun, who agreed that the Aulic War Council's efficiency relied on knowing very well "the location of all borders and the situation of territory

[342] The *Great Military Map* of Transylvania is known in the literature as the *Josephinische Aufnahme* due to Joseph II's important part in the development of cartography and the continuation of this mapping project throughout his reign. Moreover, after Joseph II's promotion to the rank of co-regent in 1765, the emperor became responsible for imperial military matters, which included map-making. Dörflinger, *Die Österreichische Kartographie*, vol. 1, 63.
[343] Ibid., 63.
[344] Hochedlinger, *Austria's Wars of Emergence*, 307. Kotasek, *Feldmarschall Graf Lacy*, 24-27.
[345] For example, in the early 1780s Lacy sent officers undercover into Ottoman territories to gather information about those territories and their inhabitants. Kotasek, *Feldmarschall Graf Lacy*, 169-170.

of the [Monarchy's] own polities." Therefore, Daun also believed in the need to collect maps and geographic descriptions of the Habsburg Monarchy's domains.[346]

Initially, Maria Theresa approved a trial mapping of the fragment of Austrian Silesia that had survived the Prussian conquest. This territory had been the entry point for Prussian troops during the War for the Austrian Succession and the Seven Years' War. Therefore, Maria Theresa's decision to start the mapping in Silesia demonstrates the primarily military purpose of this cartographic project. The success of the mapping of Silesia, together with Lacy's proposal from May 2, 1764, convinced her to extend the map to the rest of the Habsburg dominions. As a result, the surveying work for the Great Military Map started in border provinces and moved inwards. Between 1763 and 1787, the Habsburg officers surveyed 570,000 square kilometers, an estimate that does not include the territory of the Austrian Netherlands mapped under the direction of Count Ferraris.[347] As can be seen in Figure 3.8, Lombardy and Tyrol, were not included in this project.[348] Moreover, in the case of the Austrian Netherlands, instead of using the scale of 1:28,800 preferred for all the other sections of these maps, the survey was done at 1:11,520 and a smaller version of this map (1:86,400) was engraved and sold to the public.[349]

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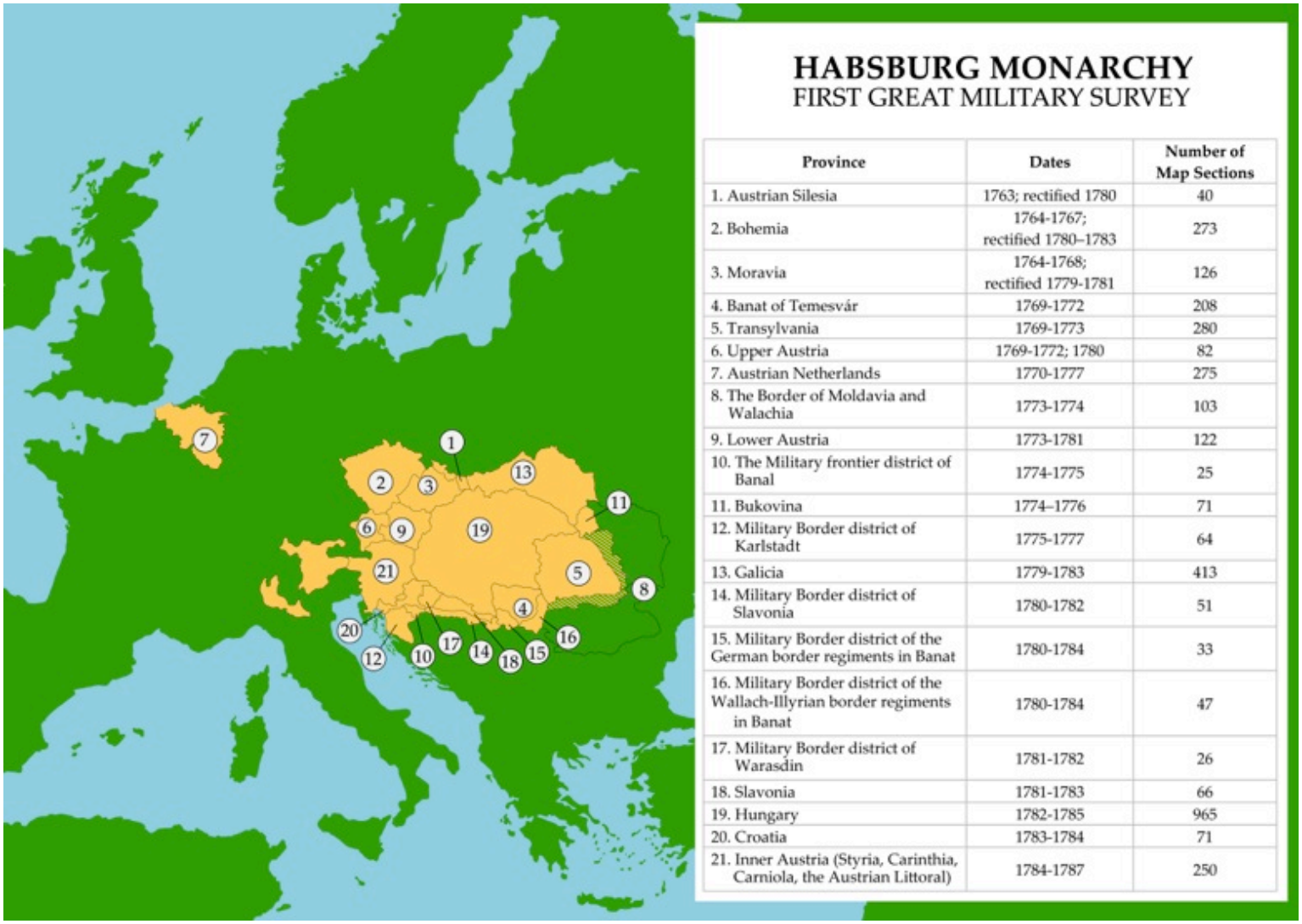
[346] Original: "von der lage aller gränzen und von der situation deren landen des eigenen staates." Cited in Claudio Donati, "L'organizzazione Militare della Monarchia Austriaca nel secolo XVIII e i suoi rapporti con i territori e le popolazioni italiane. Prime Ricerche," in *Osterreichisches Italien – Italienisches Osterreich? Interkulturelle Gemeinsamkeiten und nationale Differenzen vom 18. Jahrhundert bis zum Ende des Ersten Weltkrieges*, ed. Brigitte Mazohl-Wallnig, and Marco Meriggi (Vienna: Verlag der Osterreichischen Akademie der Wissenschaften, 1999), 310.

[347] Johannes Dörflinger, "Vom Aufstieg der Militärkartographie (nach 1683) bis zum Wiener Kongress (1815)," in *Österreichische Kartographie: von den Anfängen im 15. Jahrhundert bis zum 21. Jahrhundert*, eds. Ingrid Kretschmer, Johannes Dörflinger, and Franz Wawrik (Vienna: Inst. für Geographie und Regionalforschung, 2004), 78.

[348] The information included in this figure has been adapted based on: Ernst von Nischer-Falkenhof, "The Survey by the Austrian General Staff under the Empress Maria Theresia and the Emperor Joseph II, and the Subsequent Initial Surveys of Neighbouring Territories during the Years 1749-1854," *Imago Mundi* 2 (1937): 83-88; Jankó, "An Outstanding person of the 1st Military Survey," 202; Karen De Coene, Thérèse Ongena, Frederic Stragier, Soetkin Vervust, Wouter Bracke and Philippe De Maeyer, "Ferraris, the Legend," *Cartographic Journal* 49, no. 1 (February 2012): 30-42. A detailed discussion of this military survey is included in Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II.*

[349] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 64.



Province	Dates	Number of Map Sections
1. Austrian Silesia	1763; rectified 1780	40
2. Bohemia	1764-1767; rectified 1780–1783	273
3. Moravia	1764-1768; rectified 1779-1781	126
4. Banat of Temesvár	1769-1772	208
5. Transylvania	1769-1773	280
6. Upper Austria	1769-1772; 1780	82
7. Austrian Netherlands	1770-1777	275
8. The Border of Moldavia and Walachia	1773-1774	103
9. Lower Austria	1773-1781	122
10. The Military frontier district of Banal	1774-1775	25
11. Bukovina	1774–1776	71
12. Military Border district of Karlstadt	1775-1777	64
13. Galicia	1779-1783	413
14. Military Border district of Slavonia	1780-1782	51
15. Military Border district of the German border regiments in Banat	1780-1784	33
16. Military Border district of the Wallach-Illyrian border regiments in Banat	1780-1784	47
17. Military Border district of Warasdin	1781-1782	26
18. Slavonia	1781-1783	66
19. Hungary	1782-1785	965
20. Croatia	1783-1784	71
21. Inner Austria (Styria, Carinthia, Carniola, the Austrian Littoral)	1784-1787	250

Figure 3.8 The Habsburg Provinces and the Great Military Map (1763-1787)

An exhaustive study of the Great Military Maps of the Habsburg lands is beyond my scope. Here, I discuss, the southeastern border of the Monarchy, Transylvania. The cartographic production, in this focal point for military confrontations among Russians, Ottomans and Habsburgs in the eighteenth century, exemplifies the importance of inter-imperial and trans-imperial connections and negotiations the Viennese rulers faced in order to preserve their control of Transylvania. However, the richness of objectives included on this map suggests the influence of cameralist economic thought and the impact this map probably had on more than military measures. That is, the Great Military Map of Transylvania served a variety of military purposes, but also encompassed numerous economic objectives such as mines, types of crops, and a detailed layout of all settlements.[350] Moreover, this project did not remain limited to the imperial southeastern borders. Emperor Joseph II ordered the extension of the map into the border areas of the neighboring Danubian Principalities, Moldavia and Wallachia, as a preparatory step for a possible Habsburg expansion.[351] The following section aims to uncover some of the details of the mapping process such as the survey techniques, the costs, the personnel and the continuous effort to jealously guard this detailed cartographic information to help it remain in the hands of the central authorities. The whirlwind of cartographic activities that engulfed Transylvania in the eighteenth century demonstrates the importance of geographical knowledge for the imperial strategy of consolidation and possible expansion.

The cartographic work of Habsburg military officers should not be seen as having importance only for the army or the defense of the province. The Habsburg authorities envisioned the Great Military Map of Transylvania in conjunction with other projects that would have described the economic potential of the region. On September 10, 1768, the president of the

[350] Madalina-Valeria Veres, "Putting Transylvania on the Map: Cartography and Enlightened Absolutism in the Habsburg Monarchy," *Austrian History Yearbook* 43 (2012): 141-164.
[351] Veres, "Redefining Imperial Borders," 1-21.

Aulic War Council in Vienna informed Transylvania's military commander, O'Donnell, that in addition to the mapping of Transylvania, the Habsburg rulers desired detailed information about all the settlements. In preparation for this project, O'Donnell had to use instructions and templates similar to those that had been used for the earlier work in Bohemia.[352] O'Donnell conveyed this order, together with a standard form for gathering data, to the commanders of regiments and battalions from Transylvania on January 7, 1769.[353] Each commander had to send one or more officers in their district's settlements to gather information about the numbers of houses and stables, the capacity of each place to accomodate troops and horses during war or peace, the distances between various settlements in "hours," an estimate of cattle and other provisions, and a complete list of all cities, market towns and villages. The officers had to collect the information in a peaceful manner, avoiding conflicts with the local authorities. According to O'Donnell, the project was not extremely urgent and could be finished by 1770.

Whereas for the provinces of Bohemia, Moravia, and Silesia, the great military map was accompanied only by a description of the land and a list of all the settlements, Maria Theresa had different plans for Transylvania. On January 4, 1769 the imperial order sent from Vienna to O'Donnell stated that in addition to the mapping of the province, the description of the land and a list of all settlements, the military engineers should also prepare an *öconomische Conscription* (economic survey). The template of this economic survey included sections for the amount of cultivated and uncultivated fields; the size of meadows, vineyards, forests, swamps and lakes; the types and number of mills, inns, distilleries, breweries, tanners, abattoirs, lime ovens; and additional information about the best crops for each settlement and the occupations of the

[352]AN CC, Document 6 (1768), November 26, 1768.
[353] AN CC, Document 1 (1769), January 7, 1769

inhabitants.[354] This project exemplifies the Habsburg authorities' desire to inventory and quantify the economic potential of Transylvania.

The aspiration to map and quantify the Transylvanian territory was part of the larger eighteenth century *esprit géometrique* (quantifying spirit) that had pervaded various branches of knowledge and the practice of state-government.[355] In the case of the Habsburg Monarchy, land surveying and mapping bolstered the development of this state's fiscal and military power.[356] The need to build a strong army in the context of eighteenth century military competitiveness triggered the innovative administrative, economic, religious and social measures introduced by Maria Theresa and Joseph II, known in the [recent] literature as Enlightened Absolutism.[357] Studies focusing on these two rulers have repeatedly looked for the origins of their Enlightened Absolutism in the emergence of cameralist policies, influential in numerous German states from the seventeenth century onwards.[358]

Cameralists, or the servants of the treasure chamber of the prince (*Kammer*), emerged as a specific bureaucratic class and developed plans to increase the princes' revenue all over the German world.[359] Cameralist writings argue that the power of political rulers was based on economic prosperity that relied on the state's ability to raise revenue from its domains and subjects. Two influential eighteenth-century cameralists, Johann von Justi and Joseph von

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[354] Ibid., April 1, 1769.
[355] J.L. Heilbron, introduction to *The Quantifying Spirit in the Eighteenth Century*, eds. Tore Frangsmyr, J. L. Heilbron, and Robin E. Rider (Berkeley: University of California Press 1990), 2.
[356] Dickson analyzed in great detail the development of government during Maria Theresa, with a special focus on the variety of economic mechanisms used to increase the revenue of the Habsburg Monarchy. Dickson, *Finance and Government under Maria Theresia*.
[357] Hochedlinger, "The Habsburg Monarchy," 55-94.
[358] Szabo, *Kaunitz and Enlightened Absolutism*, 5
[359] For works on cameralism see Albion Small, *The Cameralists: The Pioneers of German Social Polity* (Chicago: University of Chicago Press, 1909); Keith Tribe, *Governing Economy: The Reformation of German Economic Discourse, 1750–1840* (Cambridge: Cambridge University Press, 1988); Andre Wakefield, *The Disordered Police State: German Cameralism as Science and Practice* (Chicago: University of Chicago Press, 2009).

Sonnenfels, received teaching positions at the University of Vienna in the 1760s.[360] Under the influence of cameralist thinkers, such as Justi and Sonnenfels, the Habsburg political authorities strived to transplant the cameralist ordinances' ability to gather revenues to the scale of their empire.[361] As part of this effort, the political authorities in Vienna relied on territorial knowledge compiled in the form of maps, geographic and economic descriptions. The economic survey Maria Theresa envisioned for Transylvania was no different in that sense.

At first, O'Donnell was not sure what the term "economic survey" entailed and why it was so urgent, so he asked for further clarification from the president of the Aulic War Council, Lacy.[362] In his answer, Lacy explained that the province of Transylvania encompassed many undeveloped and uncultivated areas. Moreover, the taxation system did not reflect the actual distribution of land ownership and revenue as the authorities had no clear record of all the land pieces. Lacy warned O'Donnell to proceed with caution and to instruct the officers in charge of the economic survey to avoid starting any conflicts with the local inhabitants of the surveyed lands. The imperial authorities wanted to keep the economic survey operations secret from the locals and therefore they ordered the Transylvanian authorities to combine the surveying work with the process of mapping the province.[363] In his query to Vienna from January 25, 1769 O'Donnell inquired whether the economic survey would precede a new taxation system.[364] This should not be surprising, as even during the surveying for the Cassini Map of France, peasants regarded the work of surveyors with suspicion, as possible precursors to an increase in

[360] Tribe, *Governing Economy*, 19, 55, 78-79.
[361] Charles Ingrao, "The Problem of "Enlightened Absolutism" and the German States," *The Journal of Modern History* 58 (1986): 161-180; Grete Klingenstein, "Between Mercantilism and Physiocracy. Stages, Modes, and Functions of Economic Theory in the Habsburg Monarchy, 1748-63," in *State and society in early modern Austria*, ed. Charles Ingrao (West Lafayette, IN: Purdue University Press, 1994), 200.
[362] AN CC, Document 1 (1769), January 25, 1769.
[363] AN CC, Document 1 (1769), March 16, 1769.
[364] AN CC, Document 1 (1769), January 25, 1769

taxation.[365] Moreover, we also know that for the mapping of Bohemia and Moravia, which preceded the Transylvanian survey, the imperial orders had prohibited the disclosure of information about the detailed land description to the local political authorities. The mapping officers had to describe the survey operations to the locals as focusing on the names of the settlements, the main rivers, mountains, forests, and the distance between various settlements.[366] In theory, these precautionary measures helped protect the surveyors from possible aggressive and uncooperative reactions from local authorities and inhabitants.

Aware of the complexity of joining a mapping project with a detailed economic survey for the Transylvanian territory, the Habsburg military authorities first ordered a trial for the small Saxon seat of Mühlenbach (Sebeş). Therefore, on May 8, 1769, the coordinator of the mapping project, Fabris, and his subordinates left for Mühlenbach to start the survey.[367] The choice of the Mühlenbach seat was not accidental; the Viennese authorities suspected the Saxon Nation living in Transylvania for trying to evade paying all their taxes. Therefore, surveying in detail the small Saxon seat of Mühlenbach could provide evidence to support such a suspicion and justify a detailed economic survey of all Saxon lands. Indeed, the results of the economic survey of Mühlenbach confirmed that the community owed 10,800 florins more than they had paid in taxes.[368]

This measure to obtain an accurate estimation of the capacity of Mühlenbach's inhabitants to pay land taxes was part of a more general package of economic measures the Habsburg rulers implemented from the 1750s onwards. In 1754, the authorities approved the plan of Court Chancellor Graf Bethlen to introduce a new fiscal system for Transylvania, which

[365] Konvitz, *Cartography in France*, 14.
[366] Rill, "Die Anfänge der Militärkartographie in den Habsburgischen Erblanden," 183-202, 188.
[367] AN CC, Document 1 (1769), May 10, 1769.
[368] KA HKR, 1769 66 137, 13, November 4, 1769, O'Donnell.

moved from collective towards individual fiscal responsibility with respect to taxes.[369] However, Bethlen's system was not equitable, and soon gave way to governor Adolf von Buccow's 1763 reform and later to future governor Samuel Brukenthal's 1770 system.[370] Clearly, the 1769 plans for an economic survey have to be seen in the context of these imperial taxation reforms that relied on statistical information from the province. In 1767, just a couple of years before the Mühlenbach experiment, Chancellor Kaunitz had presented to Maria Teresa a plan for agrarian reform in order to increase the amount of taxes; Kaunitz's plan stressed the importance of gathering accurate economic statistics.[371] Therefore, the Mühlenbach economic survey fit the chancellor's vision perfectly.

The results Fabris and his subordinates gathered, in the form of maps and a detailed economic inventory, underwent an evaluation process in Vienna. Anton Koczian, a junior treasury official and former estate steward for Count Harrach, was chosen to analyze the results of this economic survey.[372] For the Mühlenbach map and economic survey, Koczian recommended a clearer representation of the borders between villages, a clearer identification of the imperial estates, the addition of a list of represented settlements on each of the map sections, and the insertion of information about schools and their religious affiliation.[373] Whereas the first three points would have contributed to preparing the immediate taxation reform, the last point

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[369] Ioan Lumperdean, Rudolf Gräf, Thomas Nägler, "Economy and Social Structures," in *The History of Transylvania*, vol 3, 78.
[370] Josupeit-Neitzel, *Die Reformen Josephs II. in Siebenbürgen*, 162-174; Angelika Schaser, *Reformele Iosefine în Transilvania şi Urmările lor în Viaţa Socială: Importanta Edictului de Concivilitate pentru orasul Sibiu* (Sibiu, Romania: Hora, 2000), 36-37.
[371] Szabo, *Kaunitz and Enlightened Absolutism*, 163.
[372] Ibid., 162-163. Probably also because of his comments on the plan for an economic survey of Transylvania, he fast became one of Kaunitz's trusted advisers. After 1773, Koczian played an important role in developing the administration in Galicia shortly after its annexation to the Habsburg domains. Franz Szabo, "Austrian First Impressions of Ethnic Relations in Galicia: the Case of Governor Anton von Pergen," in *Focusing on Galicia: Jews, Poles and Ukrainians, 1772-1918*, eds. Israel Bartal, and Antony Polonsky (London: Littman Library of Jewish Civilization, 1999), 52.
[373] KA HKR, 1769 66 137, 3-3 verso, 15-15 verso.

regarding schools demonstrates that cartographic projects served as repositories of information for both current and possible future reforms.

Figure 3.9 shows a fragment of the Mühlenbach map displaying the village Petersdorf (Petreşti, Péterfalva) and its neighboring area.[374] The mapmakers paid special attention to the position of the buildings and their gardens, the road network and the waterways. However, just by itself, the map does not capture fully the value of the domains and does not offer all of the necessary information that could have helped assess or reform taxation for this area.

Figure 3.9 Petersdorf on the map of the Mühlenbach seat (1769)

Both Koczian and the imperial authorities were satisfied with the result of the Mühlenbach trial, as it revealed the existence of significant amounts of land that had escaped the tax collectors. However, probably because of time and resources limitations, the Aulic War Council ordered on February 19, 1770, that the mapping of the rest of Transylvania should not

[374] KA KPS, BIX a 741, section 11.

involve all the operations done for Mühlenbach, namely the addition of the economic survey. Nonetheless, the authorities encouraged all military engineers to include on their maps information useful for both military and economic purposes.[375]

A close examination of the commissioning and results of the Mühlenbach surveying operations clarifies how Vienna hoped to use maps as instruments in the process of centralization. The Habsburg authorities decided to gather geographic information in the form of maps, descriptions and economic surveys in order to use it against local groups who repeatedly tried to evade paying taxes. The lack of sufficient financial resources and trained personnel hampered the Habsburgs from extending this complete package of knowledge-gathering mechanisms at the scale of the whole province. The commissioning of a detailed inventory of all the land plots, in the form of an imperial cadaster, had to wait until the Josephine cadaster of the late 1780s. The Great Military Map of Transylvania, together with its accompanying description, became in this context the most important official repository of both military and economic information.

3.4 IMPERIAL AND PROVINCIAL MAPMAKERS

Examining in detail the personnel who worked on the Great Military Map of Transylvania allows us to shed new light on the development of the concept of surveying and mapmaking expertise. The Habsburg authorities co-opted different groups to contribute to the implementation of their cartographic projects. Military officers that had worked on similar surveying enterprises on the scale of the empire, and sometimes even had an international experience, conceptualized and

[375] KA HKR, Protokoll 1037, Rubric 57, entry 19; AN Brukenthal, 120; RR 1-68, folios 108-108 verso.

supervised the mapping of Transylvania. Secondly, officers belonging to the regiments stationed in Transylvania carried on the basic surveying work and the copying of drafts into clean copies. Thirdly, all the surveyors relied on the help of locals in gathering information about the toponymy and the layout of the land. Members of the local Hussar regiments, fluent in the local languages, assisted the process of communication between the mapmaking engineers and the local population. Chapter 2 discussed the institutionalization and training of military engineers in the eighteenth century and offered information about the careers of Stephan Lutsch von Luchsenstein and Mihály Lajos Jeney, both of whom prepared cartographic material for Transylvania. Military engineers subordinate to the Aulic War Council collected geographic information about Transylvania from the local inhabitants. The maps prepared for the Habsburg government travelled to Vienna and helped the rulers centralize their dominions, frequently against the interests of the Transylvanians who had provided the geographic information.

Initially, in order to ensure a consistent high quality for this ambitious mapping enterprise, the imperial authorities planned to use only personnel attached to the centralized quartermaster general's staff and so sent to Transylvania Colonel Fabris, Captains Stadler and Bienner, and Cadets Bromig and Fischer.[376] Furthermore, Captain Hohenhausen and Major Jeney[377] were already working on military projects in this region.[378] However, the prior mapping of Bohemia and Moravia (1764-1768) had demonstrated the insufficiency of trained personnel attached to the quartermaster general's staff for the efficient completion of these provincial Great Military Maps. Even though initially imperial authorities had planned for the mapping of Bohemia and the Military Border of Transylvania to start concomitantly, by 1765 it became clear

[376] Although initially some of the personnel were supposed to help only with copying, some did more. For example, Fabris insisted that due to lack of personnel Cadets Fischer and Bromig also had to assist with the surveying process. AN CC, Document 1 (1769), May 10, 1769.
[377] Spelled in many documents as "Geneyne."
[378] AN CC, Document 6 (1768), August 20, 1768.

that this was not a viable option.[379] Although the mapping of Bohemia and Moravia had been finalized before starting the work in Transylvania, the lack of sufficient officers affiliated to the Quartermaster General Staff persisted. Therefore, the Aulic War Council ordered the general commander of Transylvania to enlist from the local regiments all officers specialized in the art of land surveying and mapmaking.[380] On August 20, 1768, O'Donnell forwarded this command to all the commanders of regiments deployed in Transylvania, asking for lists of all the officers that could help with the mapping of the province.[381]

For three summer and three winter campaigns, from the summer of 1769 until the winter of 1771-1772, around twenty-five officers from the regiments deployed in Transylvania contributed to the completion of the Great Military Map.[382] The *gränzer* became a key component in mapping the region, and at least twelve border officers contributed to this enterprise. Some of them, such as Captain Gärtner, Senior Lieutenant Benselini/Penzolini and Second Lieutenant Brunetz, took part in the mapping operations for the duration of this project. Moreover, they were involved in both the surveying and copying operations. The prevalence of *gränzer* names demonstrates the importance of the Military Border regiments to mapping the region. Some of their strong points included their familiarity with this province and their ability to communicate with the local population.

[379] Rill, "Die Anfänge der Militärkartographie in den Habsburgischen Erblanden," 185.
[380] AN CC, Document 6 (1768).
[381] Ibid.; August 20, 1768.
[382] The twenty-five names I retrieved from the subset of surviving lists of officers proposed and approved by the Aulic War Council to help Fabris and Jeney with the mapping of the province are probably not a complete record of all the officers that worked on this project. My sources include the list of the officers Fabris proposed for the summers of 1769 and 1771 and the winter of 1769-1770, together with the lists sent from the Aulic War Council with the names of approved officers for the summers of 1770 and 1771 and the winters of 1770-1771 and 1771-1772. KA HKR, 1769 66 69; KA HKR, 1770 57 113; KA HKR, 1771 57 37; KA HKR, Protocoll 1037, Rubric 57, no. 44 and 113; KA HKR, Protocoll 1070, Rubric 57, no. 37 and 61; AN CC, Document 1 (1769).

Table 3.1 Table of Military Border regiments' officers who contributed to the Great Military Map of Transylvania

Regiment	Rank	Name	Summer Operations	Winter Operations
First Szekler Infantry	Captain	A Sole	1770-1771	1771-1772
First Wallach Infantry	Captain	Gärtner	1769-1771	1769-1772
First Wallach Infantry	Captain	Teseo	1769-1771	
Second Szekler Infantry	Senior Lieutenant	Benselini/Penzolini	1769-1771	1771-1772
Second Wallach Infantry	Cadet	Bedeus	1771	1771-1772
Second Wallach Infantry	Second Lieutenant	Brunetz	1769-1771	1769-1772
Second Wallach Infantry	Cadet	Mieg	1771	1771-1772
Second Wallach Infantry	Captain	Schnitter	1770	
Second Wallach Infantry	Second Lieutenant	Schotenstein	1770	
Second Wallach Infantry	Second Lieutenant	Schuller	1770	
Wallach Dragoner	Captain	Kraus	1770-1771	
Wallach Dragoner	Second Lieutenant	Rauchmüller	1770	

Although local officers performed most of the ground measurements and copying for the Great Military Map, the success of the project hinged on the imperial coordinator, Dominik Camiotti de Fabris, Count of Cassano. Having successfully completed the mapping of Bohemia and Moravia, Fabris used this prior experience in preparing the survey of Transylvania. In his report regarding the beginning of the mapping operations in this province, Fabris asked that each officer should travel together with a local Hussar (member of the light cavalry) who knew German and the other languages of the land (Hungarian and Romanian).[383] These local intermediaries were essential as more than half of the mapping officers came from outside the province and could not communicate easily with the locals. The Transylvanian authorities were also active agents in other aspects of the surveying process; Fabris requested his superiors ensure that each administrative sub-unit send a report of the state of their lands and the local toponyms for settlements, mountains, forests, waters and other important geographical units.[384] Although the archival documents have not preserved the name of the Hussars and the local officials, their work contributed significantly to the final military map of Transylvania.

As the project's coordinator, Fabris was also responsible for the payment of wages and other financial expenses. Already during the planning phase, the military authorities in Vienna had suggested ways to keep the cost of the survey operations low. For example, the officers recruited from the regiments deployed in Transylvania to help with the mapping received 30 florins per month during the summer and 20 florins during the winter. On the other hand, the members of the staff with no officer rank received 20 florins per month during the summer and 15 florins during the winter. From this allowance, the army personnel paid for their

[383] AN CC, Document 1 (1769), April 1, 1769.
[384] Ibid.

transportation, paper, colors and other materials needed for the map-making operations.[385] The Habsburg military authorities hoped to find free accommodation for the surveying officers, especially during their summer travels. Moreover, Fabris requested good winter accommodations for himself and his personnel so that the officers could turn the map drafts into clean copies.[386] Local institutions such as the provincial *Gubernium* (Government) and the *Aerario* (Treasury) had to offer these officers transportation vehicles, provisions for men and horses at a fair price and free accommodation.[387]

Fabris had an important role in deciding not only the composition of the surveying teams and their payment, but also in choosing the surveying technique used. In order to accelerate the work, the Habsburg military authorities decided to disregard correlating geodetic measurements with astronomic ones. However, the final result had to be precise enough to serve military purposes. Therefore, using the plane table as part of the survey process became an important element that differentiated the work done in Transylvania from the earlier mapping of Bohemia and Moravia.[388] Lacy gave O'Donnell the option to either combine the *à la vue* technique used for Bohemia and Moravia with some measurements done with the plane table or to prioritize the use of plane tables.[389] After consulting with colonel Fabris, O'Donnell informed Lacy that he preferred performing a geometrical survey with the help of the plane table. At Fabris's suggestion, O'Donnell adopted this technique for Transylvania because, in addition to military interest points, the final map could incorporate information about the quality of the land and the precise dimensions of the domains. In the military commander's words, a map surveyed in this

[385] AN CC, Document 6 (1768), November 26, 1768
[386] AN CC, Document 1 (1769), April 1, 1769.
[387] AN CC, Document 1 (1769), January 18, 1769.
[388] The plane table was a wooden plank mounted on a tripod that served as a drawing surface for the surveyor. In addition to the plane table, the surveyor used a straight edge called an "alidade" to draw his sight lines. Edney, *Mapping an Empire*, 108.
[389] AN CC, Document 1 (1769), March 16, 1769.

manner would offer the Habsburg rulers "one of the most complete maps through which the knowledge of this Great Principality can be used for various goals," such as a future taxation reform.[390]

From the planning phases and throughout the implementation of this project, Fabris influenced the personnel choices and techniques used for the mapping of Transylvania. Due to his prior experience in coordinating similar projects in other parts of the empire, Fabris had a larger vision than the local military officers. However, the Great Military Map of Transylvania and its accompanying geographic description could have not been finalized without the help of more than twenty military engineers, local administrators, the Hussars who eased the communication between imperial and local agents, and the local population, who offered essential information such as the toponymy of all settlements and landscape features. The Great Military Map of Transylvania embodies the imperial center-province collaboration that took place in the process of state consolidation.

[390] "Ihre Mayt eine der vollkommeste Carten getiefert werden kann mittelst welcher allerhoechst dieselbe in die Kanntnußdieses Groß Fuerstenthums in verschiedenen Betracht kommen können, und worzu sich etwa niemahlen mehr eine so bequeme Gelegenheit, wie die dermählige ist, fügen dörfte." AN CC, Document 1 (1769), April 18, 1769.

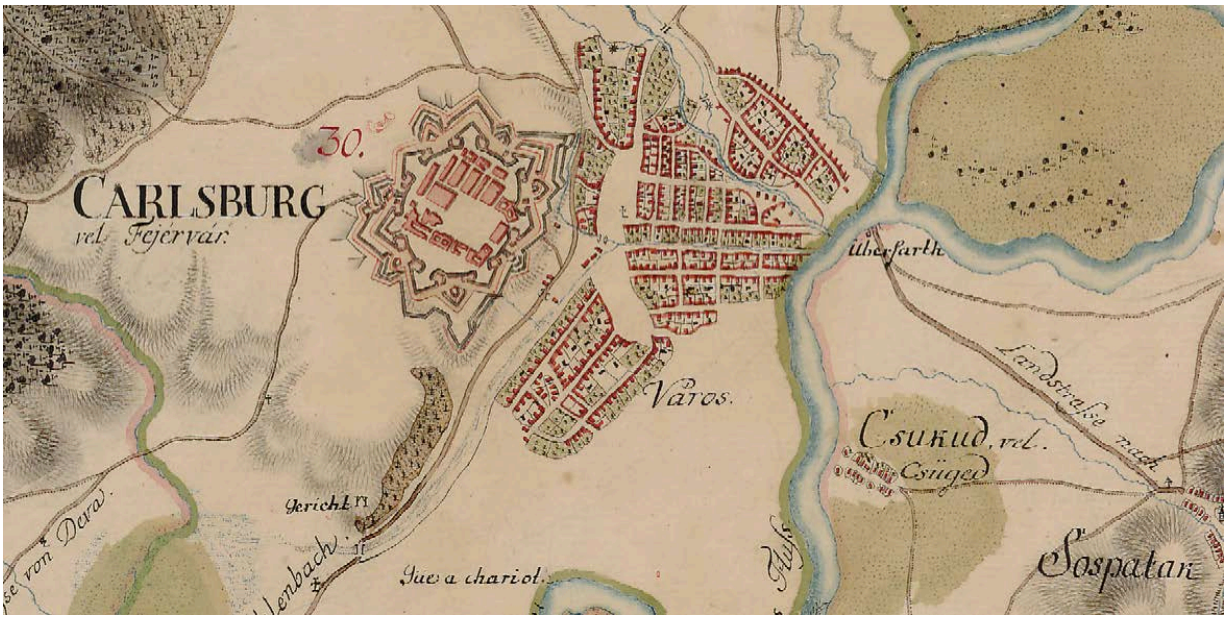

Figure 3.10 Carlsburg and its surroundings on the Great Military Map of Transylvania

The immense detail incorporated in the final map sheets is impressive. Figure 3.10 reproduces a very small fragment from section 170, showing the town of Carlsburg and its surroundings.[391] The officers captured the layout of the town, the structure of the fortification, the road network and the waterways. The word *Gericht* close to the bottom left of the image marks an execution place. The number 30 indicates a customs point, and the horn symbol next to this number represents a postal station. In addition to these elements included in figure 3.10, the mapmakers paid special attention to the location of mines and mills, crops, monasteries, ruins and famous battlefields. In general, the scrutinizing Habsburg cartographic gaze tried to incorporate all significant economic, military, religious and social sites. Due to this project's ambition to categorize the Transylvanian landscape and represent it with precision and accuracy, the Great Military Map can be considered part of the Habsburg Enlightenment.[392]

[391] *Az Elsö Katonai Félméres Erdély és a Temesi Bánság*, section 170.
[392] For a detailed analysis of the elements incorporated on this map accompanied by graphs highlighting the main elements' frequency, see Veres, "Putting Transylvania on the Map."

In 1772, as Colonel Fabris received the rank of general-major, Mihály Lajos Jeney (1723-1797) became the new supervisor of the military map of Transylvania. In the summer of 1772 and the following winter, Jeney coordinated around one third of the total survey and the preparation of the corresponding map sheets.[393] Starting in 1773, at Joseph II's order Jeney extended the mapmaking operations to the borderlands of Moldavia and Wallachia.[394] Figure 3.11 reproduces a fragment from the 1774 Jeney map entitled *New Situation Map of the Great Principality of Transylvania together with the borderlands of Moldavia and Wallachia* (*Neue Situations Charte de Gros Fürstenthums Siebenbürgen nebst angraenzenden Theilen der Moldau und Walachey*). As its title indicates, this map shows the Transylvanian province alongside part of Moldavia's and Wallachia's territory, and it was a reduced version of the Great Military Map.[395]

[393] Each map section covered an area of 2 x 1.75 Austrian square miles or 15.16 x 13.27 square kilometers. We know that Jeney coordinated the survey of more than 300 Austrian square miles in the summer of 1772. Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II.*, 76-77. One Austrian mile equals 4,000 Austrian *klafter*s or 7.584 meters. Cardarelli, *Encyclopaedia of Scientific Units, Weights, and Measures*, 99

[394] Veres, "Putting Transylvania on the Map," 154.

[395] I have found two copies of this map. KA KPS, B IX a 715 and ÖNB, Kartensammlung, FKB AA.8.1-4. Figure 3.11 is a reproduction from KA KPS, B IX a 715, section 4. Annamaria Jankó dates this map to 1775, but a document from the Austrian National Library mentions an earlier date (1774). Jankó, "An Outstanding Person of the 1st Military Survey," 204.

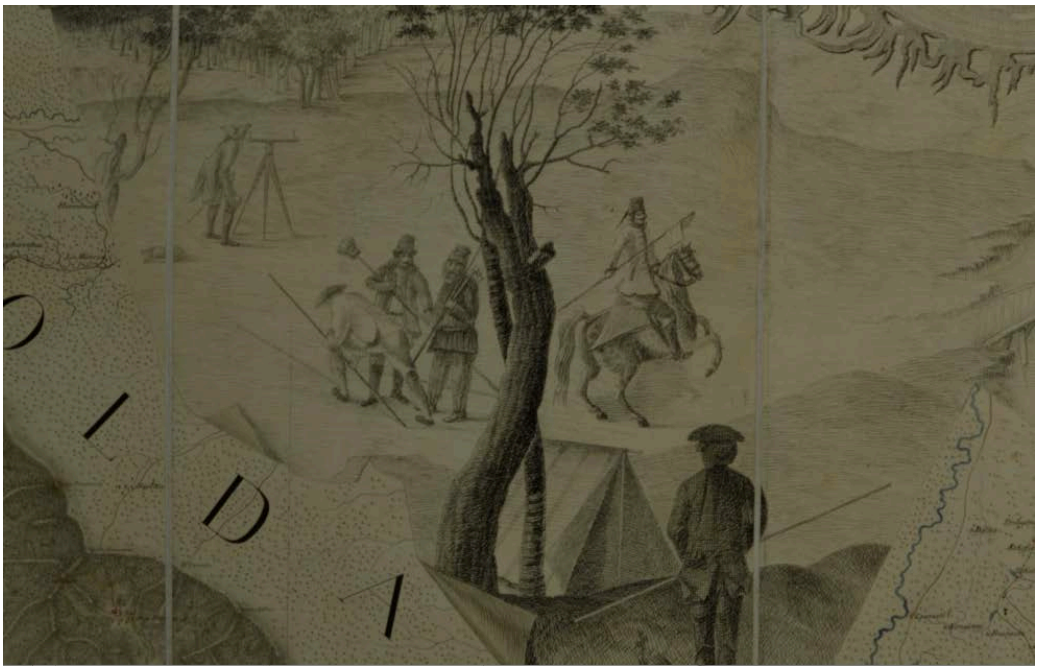

Figure 3.11 Cartouche from Jeney's *New Situation Map of the Great Principality of Transylvania together with the borderlands of Moldavia and Wallachia* (1774)

The mapmaker included in the rightmost corner a scene showing the team of surveyors at work. The different hats and clothes distinguish among what I identify as the three categories of mapmaking personnel. Dominating the scene are three military engineers who are using surveying instruments, such as the plane table (the bottom left corner of the figure), to measure and represent the landscape. They are represented as engrossed in the process of surveying. The horseman is probably a Hussar in charge of helping the military engineers communicate with the locals. The two standing figures in the middle of the image are most likely local officers belonging to the border regiments. Whereas one of them is actively participating in the measurement process, the other one is simply standing and carrying the engineers' instruments, a clear sign of their inferior position with respect to the officers from the general quartermaster's staff. Missing from the image are the inhabitants of Transylvania whom these officers encountered during their surveying operation and who offered information about toponymy and

provided lodgment, food and other types of support for the mapmaking operations. Although their names have not survived in the imperial archives and their presence has been erased from the Habsburg maps, Transylvania's inhabitants did participate in the surveying of their province.

The participants in the surveying process influenced the circulation of the cartographic information. On one hand, the official Habsburg policy was keeping the Great Military Map of Transylvania secret, even from the eyes of provincial authorities. As shown in the next section, due to the involvement of local officers in all the phases of this cartographic enterprise, Vienna's authority was subverted, as some of the *gränzer* reused the information acquired during their surveying efforts for their own projects.

3.5 THE LIMITATIONS OF CARTOGRAPHIC CENSORSHIP

It might be surprising that a map drawn to help authorities govern their state more efficiently was kept out of the reach of the state's top bureaucrats. However, at a time when border provinces often changed masters and the loyalty of provincial elites remained uncertain, this was a logical action as the Viennese authorities wanted to avoid the dissemination of strategic information. Vienna's attitude towards cartography stressed the importance of keeping military maps secret. This is consistent with the experience of other early-modern empires such as the Spanish Habsburgs' protection of maps.[396] Although some historians have argued that by the eighteenth

[396] The Spanish monarchs kept their cartographic enterprises secret, a detail which explains why many of their maps have never been printed. Indeed, the two main institutions involved with mapmaking worked closely with the government to administer the New World. The Casa de Contratación in Seville had, among other responsibilities, the task of maintaining accurate maps of the coastal areas and routes to the New World, information constantly updated by royal pilots. The Council of Indies worked closely with the king and played a key part in initiating projects such as the 1572 initiative to obtain accurate information about all the Spanish colonies. Centralization and secrecy characterized the Spanish crown's cartographic projects. See Portuondo, *Secret Science*.

century the printing industry had made cartographic information available to a wider public,[397] the results of the *Great Military Map* of the Monarchy (*Josephinische Aufnahme*) were kept secret until the 1850s. Nevertheless, rumors about illicit copies of this map led to thorough inquiries shortly after the finalizing of this cartographic project.

In December 1774, Chancellor Kaunitz ordered the Military Commander of Transylvania, General Preiss, to investigate a disturbing rumor: whether the President of the Transylvanian Gubernium, the Baron of Brukenthal, had obtained a copy of the smaller scale version of the Great Military Map of Transylvania.[398] Kaunitz was most likely afraid that Brukenthal had obtained a copy of the map Jeney prepared for Emperor Joseph II in 1774, which included information about part of the Moldavian and Wallachian territory. In this work Jeney had combined and reduced to a smaller scale the two large projects he had worked on: the Great Military Map of Transylvania and the Map of the Moldavian and Wallachian borderlands. Figure 3.12 reproduces one of the twelfth sections of this 1774 map, and shows territory belonging to Moldavia (Moldau on the map) and Wallachia.[399] Jeney had highlighted the position of settlements, the road network and the waterways.

[397] Pedley, *The Commerce of Cartography*.
[398] KA HKR, 1775 57 6.
[399] ÖNB, Kartensammlung, FKB AA.8.1-4, section 12.

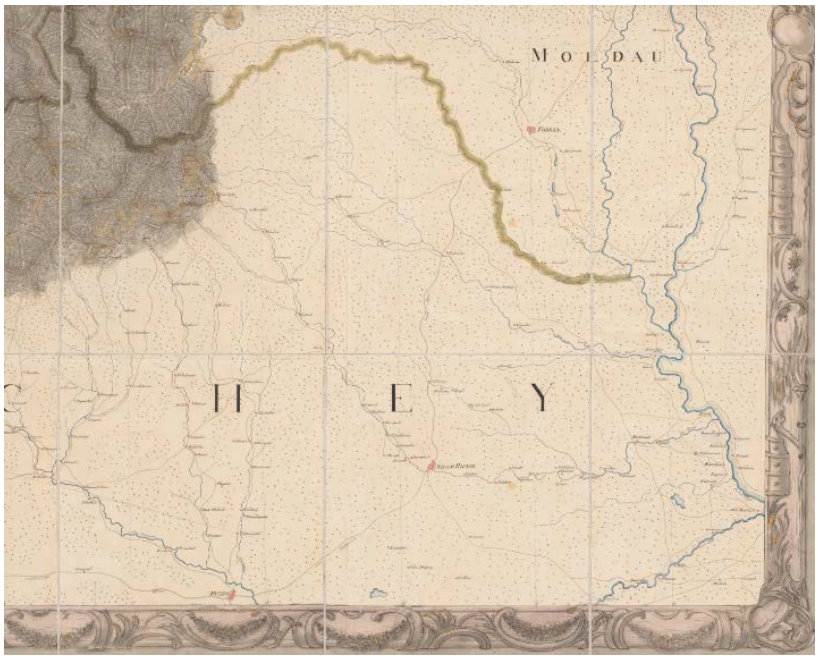

Figure 3.12 Section 12 of Jeney's *New Situation Map of the Great Principality of Transylvania together with the borderlands of Moldavia and Wallachia* (1774)

As per Kaunitz's request, Preiss interrogated Major Jeney and Captain Turati. However, both officers assured the commander of Transylvania that the military engineers working on the survey had not been allowed to preserve any drafts or clean copies of the map sections; furthermore, nine military engineers gave written declarations accompanied by their seals that they had not kept any drafts or clean copies of the Great Military Map sections, nor made copies for anyone else. Indeed, Major Jeney kept all maps under lock and key and no one could access them without his knowledge. In the end, however, Jeney informed Preiss that some of the personnel working under him spent some of their free time making copies of the well-known Luchsenstein Map of Transylvania. Preiss also confessed to Kaunitz that he had heard once about the circulation within Transylvania of some copies of the Luchsenstein Map. Therefore, it seemed plausible that Brukenthal did not possess the 1774 Jeney map but a copy of the

Luchsenstein map. Jeney defended his subordinates and stressed in his report to Preiss that there had been no imperial orders prohibiting making copies of the Luchsenstein map.[400]

To the report he sent to Vienna on January 10, 1775, Preiss annexed a list of all the copies of the Luchsenstein map that Jeney's subordinates had made or were working on; this report also included the names of the final recipients of these copies. The nine officers who made the copies prepared them either for their army superiors or other high bureaucrats from the province of Transylvania and even Vienna. Brukenthal's name does not appear in this table and probably these fifteen declared copies were only some of the copies made throughout the second half of the eighteenth century.

The reaction of the Aulic War Council was prompt: Preiss was ordered to put a stop to the dissemination of the Luchsenstein map.[401] The archives in Vienna, Cluj and Sibiu house some copies of this map. Therefore, we can infer that the Aulic War Council in Vienna tried to recover this highly sensitive cartographic material.[402] Moreover, an examination of some of the Luchsenstein map copies reveal that, despite their claims, the officers did not simply replicate this map of Transylvania, but also added elements or changed the dimensions of the representation. For example, Captain Kraus[403] from the Second Szekler Infantry regiment declared as part of the 1774-1775 investigation that he had made one copy of Luchsenstein's map for himself and was in the process of executing a second copy. It is plausible that Kraus did not want to disclose the patrons for which he was executing these copies, especially as one of these maps ended up in the Aulic War Council's Map Archive, probably as a result of the official

[400] KA HKR, 1775 57 6.
[401] Ibid.
[402] See for example KA KPS, BIX a 702; Ibid., BIX a 716; Ibid., BIX a 717; ÖNB, Kartensammlung, FKB C.105.1a-v; Ibid., FKB C.107.A.1-4; Ibid., FKB C.107.3, BCU, Special Collections, H 70/1; Sibiu, Biblioteca Brukenthal, Harti, No 5731.
[403] I was unable to identify the first name of Captain Kraus.

enquiry. What Kraus concealed from his superiors was the extent to which his map incorporated geographic information gathered during the work for the Great Military Map.

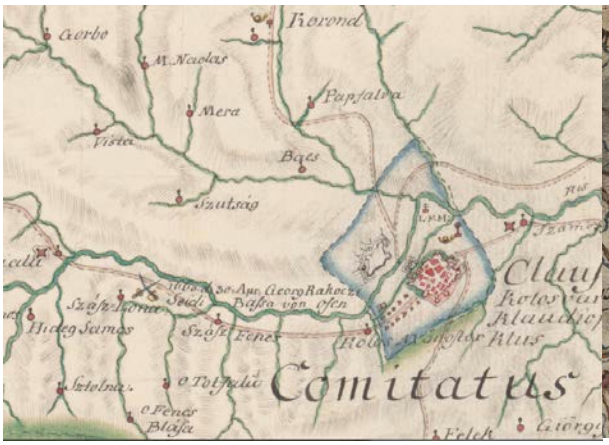

Figure 3.13 The area around Clausenburg on Luchsenstein's *Principality of Transylvania* (1762)

Figure 3.14 The area around Clausenburg on Kraus' Map of Transylvania (1774)

One can see the additions that Kraus made from Figures 3.13 and 3.14, which display the area around the city of Clausenburg (Cluj-Napoca) as it appears on the 1762 Luchsenstein version of the map and on the 1774 Kraus copy.[404] One major change is the richness of the road network as represented on the later map. Moreover, Kraus omits the borders delimiting the privileged Clausenburg jurisdiction and marked with light blue on the Luchsenstein map. This absence is coherent with the tendency of the Habsburg authorities to promote the elimination of local privileges, and anticipates on paper the drive towards administrative uniformity promoted by Joseph II in the 1780s. Nevertheless, although he eliminated smaller local jurisdictions, Kraus marked with Roman numerals the Hungarian, Szekler and Saxon counties, seats and districts.

[404] Luchsenstein's map: ÖNB, Kartensammlung, FKB C.107.5a-d. The copy finalized in 1774 by Captain Kraus from the Second Szekler Infantry Regiment: KA KPS, B IX a 702.

In calling his version of Luchsenstein's map an improved one, Kraus probably also referred to his inclusion of details from the Moldavian and Wallachian territory. As one of the officers working under Jeney on the Border Maps of Moldavia and Wallachia, Kraus had access to this information. The fragments reproduced below demonstrate the detailed territorial representation of the Moldavian territory as it appears on Kraus's map, in contrast to Luchsenstein's earlier work. The area around the Gymes Pass, located in the eastern Carpathian Mountains between Transylvania and Moldavia, appears barely sketched on the 1762 map (Figure 3.15).[405] Moreover, with the exception of some waterways, there is no indication of the Moldavian territory, east of the red line marking the imperial border. However, on Kraus's map (Figure 3.16), the Gymes Pass is a small point in the upper-left corner of the map fragment.[406] The mapmaker reproduced numerous settlements, roads and waterways across the imperial border. This detailed representation of the communication network connecting the Habsburg province of Transylvania with Moldavia was exactly the sort of information the Habsburg military authorities strived to control. In the wrong hands, Kraus's map could have facilitated an enemy invasion, contraband and illegal migration.

[405] ÖNB, Kartensammlung, FKB C.107.5a-d.
[406] KA KPS, B IX a 702.

Figure 3.15 The Gymes Pass on Luchsenstein's *Principality of Transylvania* (1762)

Figure 3.16 The Gymes Pass on the Kraus' Map of Transylvania (1774)

The military officers' motivation for copying and modifying the Luchsenstein map of Transylvania cannot be clearly determined from the information available. Still, their use of their scarce spare time to work on these copies reveals the local officers and authorities stringent need for detailed maps of this province. As revealed in this chapter, the Habsburg authorities could not have implemented the mapping of Transylvania without the help of local officers. On the other hand, as shown by the scandal of the Luchsenstein map's copies, these officers were the main channel for disseminating unauthorized information. Therefore, the central authorities' desire to preserve imperial maps for their own use clashed with actual practices.

In some cases, local authorities used proper outlets to obtain copies of classified cartographic information. For example, in his report to Vienna about the unauthorized copies of the Luchsenstein map, Preiss referred to some extracts based on the new Military Map done at the order of the *Thesaurariatus in Montanisticis et Monetariis*.[407] This copy was supposed to help the department for mining and monetary issues, subordinate to the Transylvanian Treasury, with the development of mining enterprises.[408] Indeed, starting at the end of 1773, the Transylvanian Treasury, which already had in its possession a copy of the Luchsenstein map, had begun trying to obtain extracts from the Great Military Map of Transylvania that would help with the expansion of the mining enterprises. Furthermore, on September 28, 1774, the same institution asked for a copy of the small-scale version of the Military Map of Transylvania and for additional map excerpts that included the land recently enclosed by the Habsburg border markers in Moldavia.[409] Advised by Jeney regarding the risk of possible leakage of sensitive information, the General Commander of Transylvania recommended to the Aulic War Council

[407] In 1746, the Transylvanian Treasury was split into two different departments: Thesaurariatus in Cameralibus (in charge of cameral issues) and Thesaurariatus in Montanisticis et Monetariis (in charge of monetary and mining aspects). Anton Dörner, "Central and Local Institutions," 39.
[408] KA HKR, 1775 57 6, January 10, 1775.
[409] They probably asked for a copy of the map Jeney prepared for Joseph II in 1775.

that the Thesaurariat should only receive a copy of the reduced-scale map of Transylvania that did not include the key defense points.[410] Emperor Joseph II decided that the Thesaurariat could use the Luchsenstein Map together with extracts from the Great Military Map of Transylvania for the sections where the mines were located and that they could receive complete details for the gold sources at Bezedmezö.[411]

What these two examples reveal is that access to sensitive cartographic information was not automatically granted to provincial institutions. Not even the governors of certain provinces, such as the case of Samuel Brukenthal revealed, received copies of classified maps. However, provincial employees often found ways to circumvent the official channels of communication. With the help of military engineers, such as the local officers from the Military Border regiments, sensitive cartographic information circulated within, and maybe even outside, the province.

3.6 CONCLUSION

On March 2, 1786, Emperor Joseph II wrote to his brother, future Emperor Leopold II, about the beginning of a new cadastral survey in Transylvania. The emperor mentioned how "all the engineers and sub-commissions are en route to measure all the counties at the same time." Moreover, in this same letter he added the following with respect to his newly introduced measures of centralization throughout the Monarchy: "In Italy, my new system [...] has just been implemented. I am introducing the same arrangements for the [Austrian] Netherlands, and after

[410] KA HKR, 1774 57 117, 8.
[411] KA HKR, 1774 57 117, 1.

that the whole Monarchy will be an entity ruled uniformly."[412] More than a decade after the completion of the Great Military Map of Transylvania, a project that failed to integrate a detailed economic survey of this province, Joseph II was optimistic with respect to the success of his centralizing measures. However, this emperor's confidence proved unfounded. The drive for uniformity came to a sudden halt in 1787, when elites in Lombardy, the Netherlands and Hungary all revolted against Joseph II's reforms, forcing him to reconsider most of his policies. Clearly, although the Monarchy's provinces had been represented on the Great Military Map as integral parts of one political entity, this imperial map did not represent a reality, but a Habsburg aspiration.

The analysis of imperial cartographic projects in this chapter shows how both imperial and provincial agents contributed to the accumulation of geographic information about Transylvania. The Habsburg desire to accumulate what they considered accurate representations helped improve the defense of the Monarchy's borders both from foreign troops and peacetime invaders, including germs and different types of criminals. Although the Carpathian Mountains surrounding Transylvania were never an impenetrable barrier, the efforts of Viennese rulers to learn as much as possible about the geography of the province guided Maria Theresa and Joseph II's military, sanitary and population control policies in the area. Although Viennese authorities tried to restrict the access of locals to these maps, military engineers belonging to the Transylvanian regiments thwarted such intentions. At the same time that these centrifugal, insubordinate tendencies manifested within the province, another group of military officers

[412] Original quotes: "tous les ingénieurs et sous-commissions sont en mouvement pour mesurer dans tous les comitats à la fois;" "En Italie, mon nouveau système [...] vient de commencer aussi. Je suis après pour les mêmes arrangemens aux Pays-Bas, et alors toute la monarchie ne fera qu'une masse dirigée également." Alfred Ritter von Arneth, *Joseph II. und Leopold von Toscana: ihr Briefwechsel von 1781 bis 1790*, vol. 2, *1786-1790* (Vienna: Wilhelm Braumüller, 1872), 17.

strived to solidify the process of centralization. Fabris and Jeney, together with the officers from the general quartermaster's staff, served the Habsburg rulers in various parts of their empire. Through their assiduous collection of information about the southeastern border of the Monarchy, these military engineers helped strengthen the fabric tying Transylvania to Vienna. The analysis of Habsburg cartographic production for the province of Transylvania reveals the tensions between provincial and imperial interests at an important crossroad in the destiny of this empire.

4.0 A PRIVATE INITIATIVE? THE FERRARIS MAPS OF THE AUSTRIAN NETHERLANDS

On December 10, 1777, in Vienna, Joseph Jean François, Count of Ferraris (1726-1814) presented to Emperor Joseph II his printed map of the Austrian Netherlands, known as the *Carte marchande*.[413] Joseph II had been one of the main champions for the mapping of this Habsburg province under the leadership of Ferraris, and the map's cartouche testifies to the emperor's unwavering support. As seen in Figure 4.1, the scene included in the map's cartouche shows Ferraris offering to Joseph II a map sheet showing the entire Austrian Netherlands.[414] The emperor appears very satisfied with the final result and smiles benevolently at Ferraris.

The image of the Austrian Netherlands as a united Habsburg province, as represented on the cartouche, was, sadly, a mere aspiration. In fact, Ferraris's effort to survey the geography of this province brought to the forefront the complexity of a political system composed of overlapping provincial and local authorities. The artillerymen working with Ferraris on this survey encountered a lack of cooperation, ignorance and even resistance from the local officials. Moreover, the Austrian Netherlands' territory included the intermingling of many political political entities, such as the Bishopric of Liège, the Principality of Stavelot-Malmedy, the Duchy of Bouillon and French enclaves. The Ferraris survey revealed to Habsburg authorities the

[413] Peter Barber, "Maps and monarchs in Europe 1500-1800," in *Royal and Republican Sovereignty in Early Modern Europe: Essays in Memory of Ragnhild Hatton*, eds. Ragnhild Marie Hatton, Robert Oresko, G. C. Gibbs, and H. M. Scott (Cambridge: Cambridge University Press, 1997), 117.

[414] Koninklijke Bibliotheek van België (Royal Library of Belgium) (KBR), s. III 622-646, section 16. http://lucia.kbr.be/mapview/index.php?image=/CM/1627904.imgf, last accessed on February 18, 2015.

urgency of establishing clear borderlines with the province's neighbors and promoting territorial exchanges in order to eliminate political enclaves.

Figure 4.1 Cartouche of the Ferraris *Carte marchande* of the Austrian Netherlands

Figure 4.2 shows the composition of the Austrian Netherlands and its neighbors during the time Vienna controlled the area.[415] This map does not include all the small French and Habsburg enclaves located in the borderlands of these two states before the border treaties signed among France, the Austrian Netherlands and the Bishopric of Liège from 1769 onwards. Chapter 5 includes a detailed discussion of the treaties concluded between Versailles and Vienna in an effort to eliminate these enclaves and a map showing the border's situation in the late 1760s. The

[415] This map is based on Léon van der Essen, *Atlas de géographie historique de la Belgique* (Brussels: G. Van Oest et Cie, 1919), "Carte X. La Belgique en 1786 (Pays-Bas Autrichiens)."

purpose of figure 4.2 is to convey the intermingling of the various political entities and the complex composition of the Austrian Netherlands.

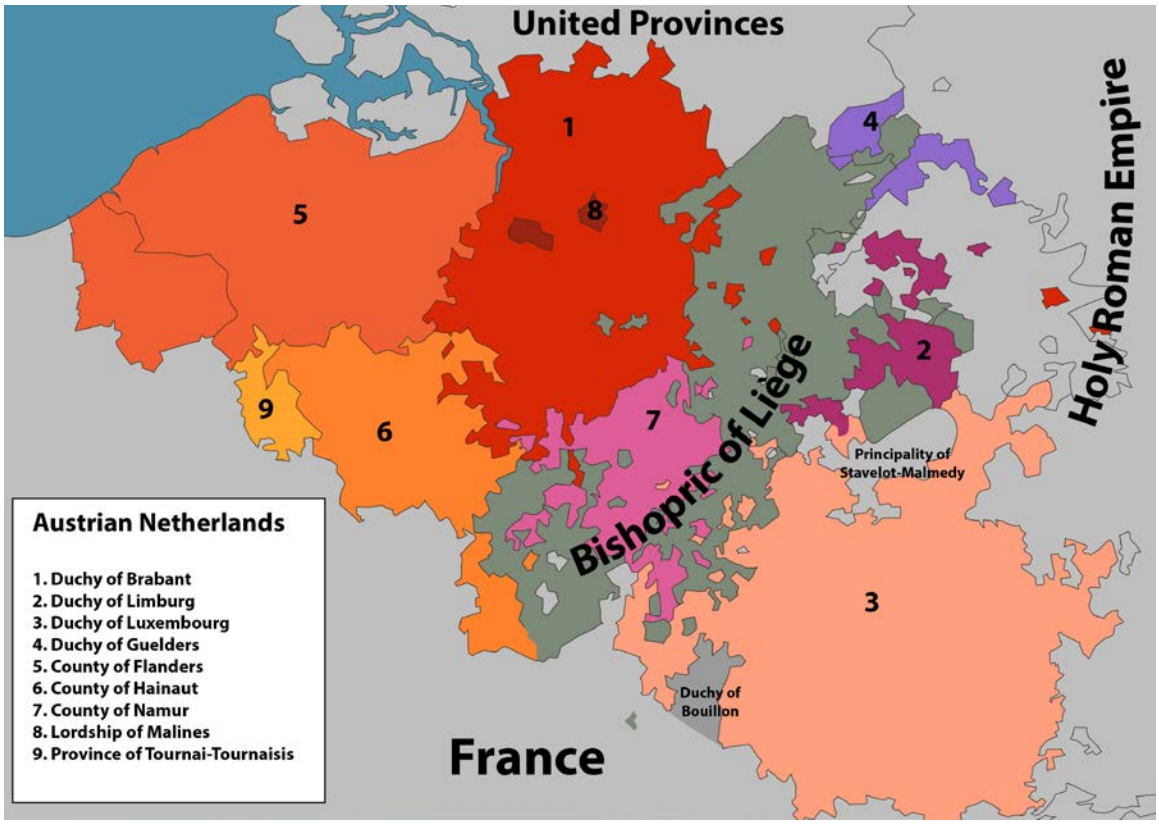

Figure 4.2 The Austrian Netherlands

The 1713 Treaty of Utrecht had confirmed the transformation of the Spanish Netherlands into the Austrian Netherlands. As seen on the map included in figure 4.2, this province was not one single entity, but consisted of nine principalities: the duchies of Brabant, Limburg and Luxembourg, the counties of Flanders, Hainaut and Namur, the province of Tournai-Tournaisis, the lordship of Malines and the upper quarter of the duchy of Guelders.[416] The unity and the integrity of this territory was based on the orders of Holy Roman Emperor and Habsburg ruler

[416] Helma Houtman-De Smedt, "Living Apart Together. Socio-Economic Changes in the Southern Netherlands within the Habsburg Monarchy in the 18th century," in *Social Change in the Habsburg Monarchy*, eds. Harald Heppner, Peter Urbanitsch, and Renate Zedinger (Bochum: Dr. Dieter Winkler, 2011), 37-39.

Charles V (1519-1556), who introduced the same orders of succession for all the subdivisions of the Netherlands, and the international treaties that had transformed the Spanish into the Austrian Netherlands with the condition that this province would continue to form an indivisible and inalienable domain. Charles VI's Pragmatic Sanction, published in Brussels in 1725, confirmed the unity of the Austrian Netherlands.[417] Despite the existence of these documents, the composite nature of this Habsburg province seriously impeded Vienna's efforts to raise taxes without the intervention of the provincial estates.[418] Whereas the government could successfully collect the regular grants and subsidies, it encountered problems requesting the additional financial help that became essential during wartime.[419]

In order to promote better the imperial interests, after 1725, the governor general of the Austrian Netherlands was always a member of the royal family. The person having this function directed the Council of State, the Privy and Finance Councils, and worked together with Vienna's representative in Brussels, the Minister Plenipotentiary.[420] Maria Theresa had to respect the rights of the estates regarding taxation, some of them originating in the fourteenth century; however, during her reign, governmental centralization slowly led to the nobility's loss of control in real policy-making decisions.[421] For example, in 1764, the Habsburg government created a commission in charge of administration and grants in order to prepare an overview of local and regional finances and supervise bookkeeping at the local level. Implementing the

[417] Sébastien Dubois, *L'invention de la Belgique: Genèse d'un État-Nation* (Brussels: Racine, 2005), 224.
[418] Houtman-De Smedt, "Living Apart Together," 39.
[419] Paul Janssens, "The Spanish and Austrian Netherlands, 1579-1780", in *History of the Low Countries*, eds. J. C. H. Blom, and Emiel Lamberts (New York: Berghahn Books, 2006), 240.
[420] Walter Davis, *Joseph II: An Imperial Reformer for the Austrian Netherlands* (The Hague: Martinus Nijhoff, 1974), 24-25.
[421] Ibid., 14, 28-29.

functions of this commission proved harder than anticipated and this incident revealed the limits of the central power in Vienna.[422]

Throughout her rule, Maria Theresa warned her co-regent and successor, Joseph II, that the Austrian Netherlands' constitutions and administration should be respected in exchange for their generous financial contribution.[423] Moreover, the empress disagreed with Joseph II regarding the possible exchange of the Austrian Netherlands for the lands of Bavaria. That is, after the death in 1777 of Max Joseph, the elector of Bavaria, Joseph II put forward a claim to succession, as the emperor had been married to a Bavarian princess. The Habsburgs promised to compensate the other pretender, Elector Palatine Charles Theodore (1742-1799), by offering him the territory of the Austrian Netherlands. The plan would probably have worked were it not for Vienna's refusal to also compensate Frederick II of Prussia with some territories. In the end, the King of Prussia invaded Bohemia and supported the claim of Duke Charles of Zweibrücken to the Bavarian succession. The 1779 Treaty of Teschen, which Maria Theresa signed without Joseph II's approval, confirmed Vienna's defeat in the War of the Bavarian Succession.[424] However, Joseph II did not give up on a potential exchange between Belgium and Bavaria until the mid-1780s. Once his plans proved futile, he embarked on a program of major reforms in the Austrian Netherlands.[425]

Although he did not travel to the Austrian Netherlands until 1781, Joseph II had begun the acquisition of information related to this Habsburg province long before.[426] During the

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[422] Paul Janssens, "Taxation in the Habsburg Low Countries and Belgium, 1579-1914," in *The Rise of Fiscal States*, 69; Janssens, "The Spanish and Austrian Netherlands," 238.
[423] Davis, *Joseph II*, 114.
[424] Derek Beales, *Joseph II*, vol. 2, 386-414; Ingrao, *The Habsburg Monarchy*, 195-196. For a detailed discussion of the War of the Bavarian Succession see Bernard, *Joseph II and Bavaria*, chaps. 3-8.
[425] Davis, *Joseph II*, 126-130. For a detailed discussion of Joseph II's reforms in the Austrian Netherlands see Ibid.; Szántay, *Regionalpolitik im Alten Europa*, 148-202; 284-304.
[426] For a description of Joseph II's journey to the Austrian Netherlands see Hubert, *Le voyage de l'empereur Joseph II dans les Pays-Bas*.

1770s, he was a strong supporter of the first detailed topographic survey of the Austrian Netherlands, coordinated by Count Joseph Ferraris (1726-1814), between 1771 and 1778. This cartographic enterprise offered an in-depth image of the province that possibly influenced some of Joseph II's reforms, such as the administrative reorganization of the area. Yet, the unitary image of the Austrian Netherlands as displayed on the Ferraris map is misleading and conceals the challenges the mapmakers faced in surveying the province.

The commander of the artillery corps in the Austrian Netherlands, Count Joseph Ferraris, presented the results of his topographic survey in two formats: three copies of a manuscript map with a scale of 1:11,520 prepared for the imperial authorities and a printed commercial version of this map at a smaller scale of 1:86,400.[427] For more than a century and a half, historians of cartography have applauded the Ferraris maps as a turning point in the representation of what became the territory of Belgium.[428] Recent research has also underscored the interest of the Habsburg government in the success of this project, the influence of French surveys performed in the area during the War of the Austrian Succession (1740-1748) and the implementation of the Ferraris project at a local level.[429]

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[427] Ferraris planned to utilize the revenue resulting from the sale of the printed version of his map to cover part of the costs of this cartographic enterprise.

[428] See for example: Gachard, "Notice historique sur la rédaction et la publication de la carte des Pays-Bas Autrichiens par le général comte de Ferraris"; N. Hennequin, "Étude historique sur l'exécution de la carte de Ferraris," *Bulletin de la Société Royale Belge de Géographie* 15 (1891): 177-296; Ernst von Nischer, "Die Karte der österreichischen Niederlande des Generals Grafen Ferraris (1770-1777)," [Vienna: 1921-1936], KA KPS, K VI 17-100 F. Antoine de Smet, "Le général-comte de Ferraris et la carte des Pays-Bas autrichiens," *Industrie* 20 (1966): 475-487; Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 61-73.

[429] G. Despy, "Les opérations des artilleurs de Ferraris dans le comté de Namur en 1772-1773," *Annales de la Sociétée Archéologique de Namur* 49 (1959): 281- 296; Sébastien Dubois, *La rectification du tracé des frontières sur les cartes des Pays-Bas autrichiens de Ferraris (1777-1779)* (Brussels: Palais des Académies: 2001); Claire Lemoine-Isabeau, "L'élaboration de la carte de Ferraris," in *La Cartographie au XVIII siecle et l'oeuvre du Comte de Ferraris*, 39-52; Soetkin Vervust, "From Cartography of Conquest to Cartographic Cooperation: Cassini's Geodetic Contribution to the First Large-Scale Mapping Project of Belgium." Paper presented at the 127th Annual Meeting of the American Historical Association, New Orleans, January 3-6, 2013. For a facsimile of the Ferraris manuscript map preserved at the Royal Library of Belgium see Bracke, *Le grand atlas de Ferraris*.

My works builds on these studies devoted to the Ferraris maps by underscoring the importance of the larger imperial context. The Habsburg rulers' evaluation of the Ferraris project and involvement in its implementation was informed by their previous experiences with cartographic enterprises, such as the Great Military Map. Rather than offering an exhaustive discussion of the Ferraris survey and maps, this chapter strengthens the argument of chapter 3 and shows how Maria Theresa, Joseph II and Kaunitz utilized officers and artillerymen skilled in mapmaking to obtain a detailed image of the empire. My work takes into account the Habsburg rulers' empire-wide perspective and combines it with an assessment of trans-imperial connections and provincial-specific circumstances.

When first reading Ferraris's proposal in Vienna, Chancellor Kaunitz and Empress Maria Theresa did not anticipate the enthusiasm of later historians, quite the contrary in fact. These two decision-makers feared the high costs of such a project and did not consider it a governmental priority. The Ferraris project divided the key decision-makers into two camps: whereas Maria Theresa and Kaunitz wanted to reject the proposal, Emperor Joseph II and the governor of the Austrian Netherlands, Charles de Lorraine, were strong supporters of this enterprise. This debate should make us wary about arguing that the principal figures of the Habsburg Court had a clear master plan in their mind regarding mapping the Monarchy. Instead, if Ferraris had not convinced some key decision-makers in Vienna that his methodology and budget would allow for the preparation of an accurate map, the mapping of the Austrian Netherlands might have had to wait for decades.

After approving financial and logistical support for the project of Ferraris, the government in Vienna consistently tried to distance itself from this enterprise, claiming that this project was a private initiative. The Court's reasons for formally detaching itself from this

cartographic work had to do with the existence of enclaves and contested borderlands within this province. Fearing that their neighbors would see a government map as a preparatory step for territorial claims, Vienna tried to reduce its apparent involvement. Nonetheless, as the narrative of the Ferraris project reveals, in order for this mapmaker to complete his work successfully, he had to rely on the government both in his attempts to obtain cartographic sources from the French archives and to gather local information from provincial authorities.

This chapter explores the discussion surrounding the Ferraris project's approval, the connection of this enterprise with the process of border demarcations, and the trans-imperial and provincial hurdles that slowed down the mapping operations. The difficulties Ferraris encountered in reaching his cartographic objectives reveal the challenges of the Habsburg government in the Austrian Netherlands due to the survival of strong local institutions, foreign enclaves and contested lands. In this way, cartography offers a window into the operations of the Habsburg government at the provincial level.

Ferraris collected information for his map from a variety of sources. Topographic surveys and information from local authorities about the position of the borderlines and the toponymy was complemented with attempts to retrieve maps from French repositories and the results of astronomic measurements performed by French mapmakers on the territory of the Austrian Netherlands.[430] Unraveling the threads that led to the creation of the *Carte de cabinet* and *Carte marchande* of the Austrian Netherlands reaffirms that, just as in the case of the Great Military Map, the production of Habsburg maps involved provincial, imperial and trans-imperial forces.

[430] French troops occupied the Austrian Netherlands between 1744 and 1748 as part of the War of the Austrian Succesion (1740-1748). Janssens, "The Spanish and Austrian Netherlands," 236.

4.1 PROJECTS FOR A MAP OF THE AUSTRIAN NETHERLANDS

The Austrian Netherlands had a strong tradition in training engineers and preparing cartographic material. As discussed in chapter 2, the Engineering Academy in Brussels and the School of the Artillery Corps in Malines both functioned as preparatory institutions for mapmakers. Despite the existence of this educational infrastructure, the provincial and imperial authorities did not possess a large-scale map of the Austrian Netherlands, and by the second half of the eighteenth century this issue attracted the attention of local geographers.

Before the approval of Ferraris's plans for surveying the province, three other projects for mapping the Austrian Netherlands made their way to Vienna. In 1751, governor Charles de Lorraine forwarded to Maria Theresa the project of his chaplain, Antoine Palquois de Regnière, for surveying a topographic map of the Austrian Netherlands.[431] This geographer offered only a very general idea on how he planned to perform the survey, mentioning his desire to combine on-site measurements with a technique he called *à coup d'oeil*, which probably implied observations with the naked eye. De Regnière believed that such an approach would accelerate the implementation of the project. He planned to include on the map both the external borders of the province and the internal frontiers separating the various divisions of the Austrian Netherlands. Additionally, he envisioned the representation of imperial domains, forests and buildings, the location of favorable encampment sites and battlefields. He promised to pay special attention to smaller roads or domains and the precise trajectory of the rivers. He also expressed the hope that if this project was approved, it could later be extended to all the Habsburg dominions. This geographer planned not only on drawing a map but hoped to prepare

[431] This project is mentioned in Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 62. A copy of this project is located in AGR SEG, box 2273, 1-9 verso.

for each province a series of written documents describing the resources, the situation of the inhabitants and settlements, the trade and other significant aspects. In his words, such information would encompass "all that is necessary to know, both military aspects for the military, but also for trade and tax purposes."[432] To pay for this ample project, de Regnière suggested utilizing the taxes raised from two domains belonging to the Duchy of Luxembourg. Although he did not offer a detailed budget, de Regnière mentioned the following resources as essential for the successful completion of his project: two or three horses and a carriage to transport the instruments, boxes for the documents, food and linen for the surveyors, six surveyors, six guides and six people to carry the instruments, seven or eight draftsmen, a separate house to draw the map in secret, paper, color, tables and heating. De Regnière's project was very general, lacked a clear timeline and did not contain specific information about the expenses such an enterprise would incur. It merely suggested a very rough plan, probably in order to gauge the reaction of the government to the proposal of surveying a topographic map of the province. Nonetheless, de Regnière's proposal underscores the elements that the government would have had to consider when sponsoring such a mapmaking venture.

Even though the project was not implemented, it did not disappear without repercussions. In 1759, Maria Theresa contacted Charles Lorraine and inquired about the possibility of implementing a General Map of all the Habsburg provinces based on de Regnière's proposal.[433] Although the corps of engineers had dedicated to Maria Theresa in 1747 the *General Map of all Imperial and Royal Hereditary Lands*, that document was no longer up to date. Maria Theresa desired a map that would also include the Grand Duchy of Tuscany and all the states neighboring the Habsburg lands. Considering that Vienna's possessions were not contiguous, the project was

[432] Ibid., 3.
[433] Ibid., 11.

very challenging. Moreover, Maria Theresa desired the preparation of additional documents, discussing for each province its political and economic relationship with neighboring lands.[434]

Consulted to offer his opinion with respect to this project, plenipotentiary minister Johann Karl Philipp von Cobenzl (1712-1770) warned his superiors that if de Regnière proved incapable of coordinating this work, there was no one else working for the government qualified to implement such an ambitious enterprise. Instead, Cobenzl recommended commissioning for this project the famous Homann Heirs' publishing house located in Nuremberg. These mapmakers had published already in the 1720s a map of the Habsburg dominions (*Tabula Geographica Europae Austriacae Generalis*), and Cobenzl hoped they could adjust the plates used for that map to reflect the new political changes that had impacted the Habsburg Monarchy since then.[435] Cobenzl also suggested that if Maria Theresa did not want to advertise her desire for such a map, she could hire an intermediary to make the proposal to the heirs of Homann.[436]

Cobenzl's idea would have offered the Habsburg rulers a fast way to obtain a small-scale representation of their lands. Such an image would have advertised to the other European powers the vastness of the Habsburg Monarchy, but would not have improved Vienna's ability to govern its territories. Figure 4.3 reproduces the fragment from the Homann map showing the Austrian Netherlands.[437] Even a brief glance at this image shows the main limitations of this representation. Only a few settlements and major rivers were included, and the borders' trajectory failed to encompass the complexity of the enclaves.

[434] Ibid., 12-13 verso.
[435] This map is reproduced in Dörflinger, *Descriptio Austriae*, 159.
[436] AGR SEG, box 2273, 11-11 verso; 14, August 1, 1759, Cobenzl.
[437] ÖNB, Kartensammlung, K I 109565,157.

Figure 4.3 The Austrian Netherlands on the Homann Map (1720s)

Such a map could not assist the provincial and central Habsburg governments in their efforts to plan the military defense of the Austrian Netherlands and to introduce economic, administrative and social reforms. The Great Military Map, commissioned in the 1760s - only half a decade after Maria Theresa expressed her desire for a cartographic representation of the Monarchy - made better use of the new technological innovations and the abilities of the imperial military engineers discussed in chapter 2.

At the same time that the work on the Great Military Map started, shortly after the end of the Seven Years' War, the French engineer Colonel Baron de Bon, who had been delegated in the Austrian Netherlands during this conflict, sent a proposal for a map of the Austrian Netherlands.[438] Cobenzl forwarded this document to Chancellor Kaunitz in the summer of 1765

[438] De Bon's project is reproduced in Ibid., 186-195.

together with some comments. The plenipotentiary minister had mixed feelings regarding de Bon's request to hire French engineers for the implementation of this project. On one hand, the minister feared that the French would obtain detailed information about the Austrian Netherlands' territory; on the other hand, Cobenzl believed de Bon would gain access to prior French surveys of the area.[439] Cobenzl probably referred to French cartographic enterprises on the Austrian Netherlands' territory pursued during the 1744-1748 French occupation, as part of the War of the Austrian Succession (1740-1748).[440] At the time, French military engineers together with astronomer and mapmaker César-François Cassini de Thury had surveyed these Habsburg territories and had measured a triangulation network for the northern part of the Austrian Netherlands.[441] Convinced of the utility of de Bon's proposal and possibly hoping that he would indeed gain access to existing French maps of the Austrian Netherlands, Kaunitz approved the foreign engineer's proposal to perform a survey of the Austrian Netherlands. Yet, the Chancellor did not offer any governmental support for de Bon's initiative. [442]

Without Vienna's involvement and financial patronage, de Bon's proposal did not materialize. Still, it probably constituted one of the main sources of inspiration for the Ferraris project to map the Austrian Netherlands. De Bon, as did Ferraris later, envisioned the production of two maps: a manuscript large-scale military map and an engraved version without military

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[439] HHStA Belgien DD A, Berichte box 168, June 19, 1765, Cobenzl to Kaunitz.
[440] Janssens, "The Spanish and Austrian Netherlands," 236.
[441] Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 56-57; Vervust, "From Cartography of Conquest to Cartographic Cooperation."
[442] HHStA Belgien DD A, Weisungen, box 11, August 8, 1765, Kaunitz to Cobenzl. Kaunitz's permission for a foreigner to map parts of the Habsburg lands was not unusual for the Austrian Netherlands. In the summer of 1761, Kaunitz had approved a request submitted by three French engineers to survey the duchy of Limburg, an integral part of the Austrian Netherlands. At the time, Kaunitz gave two reasons for his approval: first, the French did not really need any permission to perform surveying work in the area as they could have used the pretext of military operations as part of the Seven Years' War; second, the French troops had occupied the lands of Limburg during earlier conflicts and probably had better maps than the Habsburg authorities for this region. Therefore, Kaunitz hoped that if he gave these French engineers an official permission to perform surveying work on Habsburg territory, Vienna could request a copy of the final maps. HHStA Belgien DD A, Weisungen, box 7, June 10, 1761, Kaunitz to Cobenzl.

details. The biggest difference in the Ferraris proposal was the total cost of the project: Ferraris promised the implementation of the project for an amount one-fifteenth that of de Bon's estimation.[443]

The third proposal predating the project of Ferraris belonged to an employee of the Finance Council, Desloges. On June 12, 1765, Desloges presented an ambitious cartographic plan: the correction of the famous map of Eugène Henri Fricx of the Austrian Netherlands and the preparation of a dictionary listing economic information about all provinces of this Habsburg dominion.[444] To achieve this goal, Desloges planned to use documentation from the Finance Council.[445] Desloges did not consider the map and the accompanying documentation an end in itself, but simply a way to gather geographic and economic information about the Austrian Netherlands that could later ease the introduction of reforms to encourage trade, expand taxation and increase the productivity of agriculture and manufacturing. For example, Desloges argued that compiling a detailed inventory of crops would help identify possible export opportunities.[446] The proposal of Desloges came only two years after Maria Theresa's commissioning of the Great Military Map. However, whereas the personnel working on the Great Military Map involved officers from the general quartermaster's staff and personnel from the provincial regiments helped by local authorities, Desloges anticipated hiring only one engineer to perform on-site

[443] For a discussion of the influence of de Bon's proposal on the Ferraris project see Karen De Coene et al., "Ferraris, the Legend," 32; Vervust, "From Cartography of Conquest to Cartographic Cooperation."
[444] Eugène-Henry Fricx (1644-1730) was a publisher from Brussels. In the early 1700s, the French authorities commissioned him to publish a map of the province based on the recent surveying work of the French military engineers. The publication of this map completed between 1704 and 1712 was not advertised, so probably the copies were reserved for the military. Claire Lemoine-Isabeau, "Genèse et étapes du levé topographique des Pays-Bas méridionaux et de la Principauté de Liège aux XVIIe et XVIIIe siècles" (PhD diss., Université Libre de Bruxelles, 1983), 85-88.
[445] For Desloges's proposal see AGR SEG, box 2273, 15-45 verso. This proposal is also mentioned in Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 61-62.
[446] AGR SEG, box 2273, 18 verso.

inspections and hoped to gather additional information from local authorities with the help of a 62-point questionnaire.

The projects of de Regnière, de Bon and Desloges failed to obtain the support of the Habsburg authorities in Vienna due to reasons such as the high cost, the lack of trained personnel and, most likely, because of the methodology these officials suggested for the drawing of the map. Whereas in 1765, de Bon proposed using French military engineers to help with the surveying operations, the implementation of de Regnière's project from 1751 and the proposal of Desloges from 1765 would have had to rely on Habsburg engineers. Furthermore, the Habsburg authorities considered the mapmaking techniques proposed by de Regnière and Desloges as inappropriate for obtaining an accurate representation of the province. De Regnière planned to combine geodetic measurements with unaided eye observations and Desloges hoped to gather most geographic information based on questionnaires submitted to local authorities. Such a mapmaking methodology had fallen out of favor with military authorities as they became able to rely on engineers trained in mathematics, surveying, drawing and the art of fortifications to prepare cartographic material based on in situ operations.

The intensification of mapping proposals for the Austrian Netherlands after 1750 reveals the provincial officials' awareness that Vienna supported such initiatives. Additionally, this type of project would have served the interests of Habsburg representatives in the Austrian Netherlands, such as the governor and the plenipotentiary minister. Maria Theresa's and Kaunitz's rejection of the three mapmaking projects did not reflect a disinterest in cartography. The empress's hope that de Regnière's proposal could be extended to all the Monarchy – along with Kaunitz's decision to acquire a map of the Austrian Netherlands if de Bon managed to prepare one - reveal the Habsburg authorities' desire for good geographic representations of their

provinces. Maria Theresa's commissioning in 1763 of the Great Military Map confirms her commitment to cartography as a tool of empire. Therefore, when Ferraris submitted his project for a map of the Austrian Netherlands, he had high hopes for an approval.

From the beginning, Governor Charles de Lorraine was a strong supporter of the Ferraris project and compared it favorably with the earlier de Bon proposal. Whereas de Bon conditioned the success of his project on the approval of a significantly high budget and did not offer a practical solution for identifying a group of individuals capable of working on the survey, Ferraris planned to use the labor of the Austrian Netherlands artillerymen and prepared an initial budget of only 12,000 German florins. Furthermore, to keep the initial expenses low, Ferraris suggested requesting, from the French crown, access to Versailles' archives, which he believed had probably preserved manuscript maps of the Austrian Netherlands. Charles de Lorraine was aware that even if the French gave this permission to Ferraris, they might limit his actual access to printed or outdated material, which would not be so valuable. However, on one point, the governor of the Austrian Netherlands felt the Habsburgs had the upper hand: asking for copies of the maps of Limburg and Luxembourg, surveyed at the end of the Seven Years' War by the French engineers with Vienna's permission.[447] Charles de Lorraine's steadfast determination to ensure the implementation of the Ferraris project can be connected with two motivations. On one hand, the governor most probably saw the advantages of having a detailed representation of the Austrian Netherlands for the provincial government. Secondly, Charles de Lorraine was an avid collector of maps, and he justly appreciated the capability of Ferraris to transform his project into reality.[448]

[447] AGR CAPB, Box 470, folder D 96 C 11, February 9, 1770, Crumpipen to Lederer.
[448] After Charles de Lorraine's death in 1780, Joseph II commissioned the Aulic War Council to prepare a detailed inventory of the Governor's collection. In addition to maps of the Austrian Netherlands, this impressive list included

Charles de Lorraine tried to underscore the differences between the de Bon and the Ferraris project in order to ensure the approval of the latest proposal. Yet Kaunitz considered that such an enterprise would have high costs regardless of the estimates of Ferraris.[449] The Chancellor did not doubt the ability of Ferraris and his subordinates to survey a precise map of the province, but expressed serious concerns about the soundness of the budget. Indeed, Kaunitz feared that, once the surveying work started, Ferraris would request additional amounts and Vienna would have to continue supporting the project since it had already invested significant funds. Additionally, Kaunitz expressed a serious concern that the work on the Ferraris map would interfere with the more stringent cartographic operations on the borders between the Austrian Netherlands and France, a corollary of the Border Treaty signed by these two Courts on May 16, 1769.[450] The Chancellor's concern was justified, especially if we take into account the limited number of trained engineers deployed in the Austrian Netherlands who had the required cartographic ability.[451]

In his recommendation that Maria Theresa deny the request of Ferraris, Kaunitz also mentioned the need to "limit ourselves at this present time to what we're already doing with respect to geographic and topographic maps."[452] Although the Chancellor did not elaborate on this point further, it is plausible that he was referring to the work on the Great Military Map, in full swing at the time in such Habsburg provinces as Transylvania. The general quartermaster's staff officers in charge of implementing the Great Military Map were always complaining about the lack of sufficient hands to finalize their work. Therefore, it is understandable that Kaunitz

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among other subjects, maps showing the Americas and numerous sheets of the Cassini map of France. KA HKR, 1781 34 128/1.

[449] AGR CAPB, box 476, folder D 98 C 11 N 19, February 22, 1770, Kaunitz to Maria Theresa,.

[450] AGR CAPB, box 470, folder D 96 C 11, February 21, 1770, Kaunitz to Charles de Lorraine; AGR CAPB, box 476, folder D 98 C 11 N 19, February 22, 1770, Kaunitz to Maria Theresa.

[451] In 1772, the Austrian Netherlands' imperial corps of engineers included 31 individuals. KA GHA, 1772 23 1.

[452] "qu'on devroit se borner dans le moment present à ce qu'en fait de Cartes Geographiques ou Topographiques." AGR CAPB, box 476, folder D 98 C 11 N 19, February 22, 1770, Kaunitz to Maria Theresa.

would fear that the imperial human resources proficient in mapmaking had been stretched too thin. Moreover, obtaining detailed manuscript maps of the Austrian Netherlands would not have given the Habsburg authorities any tactical advantage, as this region had been a war theater in recent centuries, and therefore Vienna's neighbors were familiar with the geography of the province.[453]

The Chancellor's resistance to ordering a detailed survey of the Austrian Netherlands should not be interpreted as opposition to the utility of maps. Kaunitz's opposition arose from his fear that the Ferraris project would redirect human and financial resources from other, more important cartographic enterprises: the Great Military Map of the Monarchy and the mapmaking operations on the border between the Austrian Netherlands and France. The Chancellor's preoccupation with the border demarcations explains why, initially, the only point Kaunitz found desirable in the proposal of Ferraris was requesting, from the French court, the copies of the maps of Luxembourg and Limburg. The Chancellor envisioned combining these maps obtained from France with the maps of the French-Austrian Netherlands borderlands currently being surveyed as a result of the 1769 Border Treaty.[454] In this way, Kaunitz believed, the Habsburgs would obtain a version of a map of the Austrian Netherlands, until a later time when the Ferraris project could be implemented.

Despite Maria Theresa's and Kaunitz's reluctance to approve the Ferraris project for a map of the Austrian Netherlands, Ferraris had two powerful allies in the persons of Charles de Lorraine and Joseph II. These supporters intervened successfully in the summer of 1770 and convinced the Empress to change her mind.[455] In his letter of support, the governor of the

[453] AGR CAPB, box 470, folder D 96 C 11, December 27, 1769, Neny's comments on the Ferraris project.
[454] AGR CAPB, box 476, folder D 98 C 11 N 19, February 22, 1770, Kaunitz to Maria Theresa.
[455] Ibid., July 27, 1770, Kaunitz to Joseph II; AGR CAPB, box 474, folder D 97 N 1, August 15, 1770, Kaunitz to Maria Theresa.

Austrian Netherlands insisted on the need for a precise map of the province and suggested that the project of Ferraris had a very low budget.[456] In addition, Charles de Lorraine vouched for the ability of the artillerymen to survey and represent accurately the geography of the land, as they had proven their skills during the survey of the Sonian Forest (Forêt de Soignes).[457] Moreover, the governor took full responsibility for the Ferraris project and stated: "I commissioned General Ferrari [sic] to form a Project for a survey of a General Map of the Netherlands, especially because this always seemed to me a useful and necessary thing, and I also remembered that some years ago, the late Count Cobenzl had sent here a similar project that was rejected only because it would have been too expensive."[458] In case the project were to be rejected, Charles de Lorraine warned Maria Theresa that these accomplished mapmakers belonging to the artillery corps would go in search of similar jobs in other lands, despite the Habsburg Monarchy's investment in their education.[459] Considering how hard it was to train and recruit engineers with mapmaking skills, Charles de Lorraine's fear was justified.

In his projects, Ferraris stressed the importance of using artillerymen to implement his project. Working with the artillery corps would allow the imperial military engineers to continue their mapmaking efforts at the borders with France. Moreover, the position of Ferraris as the commander of the artillery corps, together with the recent training in mathematics and surveying of the youthful artillerymen, eliminated the need for additional stipends. Ferraris understood that

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[456] AGR CAPB, box 476, folder D 98 C 11 N 19, August 11, 1770, Charles de Lorraine to Maria Theresa.

[457] Before supporting the plan of Ferraris for a survey of the Austrian Netherlands, Governor Charles de Lorraine commissioned the artillerymen to prepare a map of the Sonian forest, located at the time near Brussels. Ferraris' men finalized the map by the spring of 1770 and the governor was impressed with the final result. Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 63.

[458] "J'ai chargé le general Ferrari, de former un Projet pour la levée de la Carte Generale des Pais-Bas d'autant plus que la chose m'a toujours parue fort utile et en quelque façon necessaire, et que je me rappellois d'ailleurs, que passées quelques années, feu le Cte de Cobenzl avoit déjà envoyé ici un semblable Projet qui n'a eté rejetté, que parce qu'il auroit été trop frayeux;" AGR CAPB, box 476, folder D 98 C 11 N 19, August 11, 1770, Charles de Lorraine to Maria Theresa.

[459] Ibid.

the most important factor that deterred Kaunitz and Maria Theresa from supporting his project was their fear of the high cost of such an enterprise. Therefore, in November 1770, Ferraris argued that his plans would be approved if "one considers the excessive costs for such a work in France, and finally the amount that had been already spent in the hereditary lands for the same objective."[460] In this quote, Ferraris was surely referring to the Cassini map of France and the great military map commissioned by Maria Theresa at the end of the Seven Years' War.

In the face of the insistence of Charles de Lorraine's and Joseph II, Maria Theresa's resistance started to crumble. Nonetheless, the Empress's lukewarm support for the survey of the Austrian Netherlands stands out clearly on one of her written notes to the Chancellor, in which she states: "I confess that I find the expense for our finances to be too great, especially as it will not remain at that amount but will be higher; but the Emperor and the War Council desire to have it [the map]"[461]

The Empress was correct in expressing these fears. As soon she submitted her approval for the Ferraris project, this officer requested additional financial and logistical support for his men, including lodging and food during the cartographic operations. This additional appeal to Vienna and the reaction of the central authorities sheds additional light on how Maria Theresa, Joseph II and Kaunitz understood the role of the Ferraris project as part of their larger imperial strategy. Georges-Adam Starhemberg, the plenipotentiary minister of the Austrian Netherlands, suggested that additional funding to cover housing and food for the surveyors could come from the coffers of the Aulic War Council. This institution was interested in the production of military maps and was at the time involved in surveying some other provinces of the Habsburg

[460] "si l'on considere dis-je les frais excessifs qu'a couté cet ouvrage en France, et enfin combien l'on a déjà fait de dépense dans les Pays héréditaires pour le même objet," Ibid., November 21, 1770, Ferraris.
[461] "J'avoue je trouvaci la depense pour nos finances de trop d'autant plus que cela ne reste pas a cela et ira plus loing. l'Emp, le conseil de guerre souhaitant de l'avoir," AGR CAPB, box 474, folder D 97 N 1, August 15, 1770, Kaunitz to Maria Theresa.

Monarchy.[462] However, the President of the Aulic War Council, Lacy, refused to support the Ferraris enterprise. He argued that no military funds had been assigned for the new military maps of the Habsburg dominions and that the institution he directed had no prior involvement with the mapping of the Austrian Netherlands.[463] Lacy's answer reveals that the existence of parallel imperial mapmaking institutions, such as the artillery corps in the Austrian Netherlands and the general quartermaster's staff subordinated to the Aulic War Council, was not always beneficial for the Monarchy. Instead, it could lead to institutional rivalries and could slow down the implementation of certain projects.

In the face of the Aulic War Council's refusal, Kaunitz and Maria Theresa could have taken a hard-line approach, forcing Lacy to approve the required funds. However, on December 31, 1770, the Chancellor recommended to his Empress a conciliatory course: subsidizing these additional costs. Kaunitz mentioned in his proposal his certainty that "General Ferraris, in order to obtain approval for his project, believed he should present it in the least expensive manner for the royal finances, convinced [...] that once [the project] was accepted, the Court would pursue its execution regardless of the cost."[464] Despite this suspicion, the Chancellor recommended further financial support for Ferraris as he had come to consider obtaining a map of the Austrian Netherlands important for the government.[465]

By scrutinizing the Ferraris proposal from an imperial vantage point, we are reminded that by the 1760s the Habsburg rulers had developed a clear understanding of what made a map useful for the defense and consolidation of their empire. Additionally, the

[462] AGR CAPB, box 476, folder D 98 C 11 N 19, November 27, 1770, Starhemberg to Kaunitz.
[463] Ibid., December 24, 1770, Lacy.
[464] "Le General de Ferraris, pour faire agréer son projet a crû qu'il devoit le presenter sous le point de vue le moins onereux pour les Roiales Finances, persuadé comme-il pouvoit l'etre que dés qu'il seroit une fois accepté, la Cour en feroit toujours poursuivre l'execution quelle qu'en put etre la depense." Ibid., December 31, 1770, Kaunitz to Maria Theresa.
[465] Ibid.

hurdles encountered during the work on the Great Military Map, such as the lack of sufficient imperial mapmakers and the rising costs of the enterprise, had taught the Viennese decision-makers to make good use of provincial resources. The scientific approach of Ferraris to surveying the Austrian Netherlands and his decision to use artillerymen that he had trained himself offered the Habsburgs a feasible alternative to their mapmaking efforts in other parts of the empire.

4.2 TRANS-IMPERIAL AND PROVINCIAL CHALLENGES

From the first proposals he submitted to Vienna, Ferraris underscored the importance of obtaining access to French maps of the Austrian Netherlands in order to accelerate the survey of this province and to decrease the costs. During the War of the Austrian Succession (1740-1748), French troops invaded the Austrian Netherlands and César-François Cassini de Thury supervised a team of French military engineers in the surveying of this province. This geodetic survey had as a result a triangulation network of 26 triangles linked with the Paris meridian.[466] The French mapmaker did not share his results with the authorities in Brussels. Nonetheless, it was realistic for Ferraris to assume that because of the Vienna-Versailles alliance, the French would offer their support for his cartographic enterprise.

On September 22, 1770, Ferraris asked for Charles de Lorraine's official intervention so that he could obtain access to the maps the French engineers had surveyed in the Austrian Netherlands and to the geographical coordinates of the main border towns as calculated by the

[466] Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 56-58. For a detailed description of Cassini's work in the Austrian Netherlands see Vervust, "From Cartography of Conquest to Cartographic Cooperation."

academicians from Paris. Ferraris mentioned in his request that as the new map of the Austrian Netherlands was planned as a continuation of the Cassini Map of France, he desired to use the same measurement unit and therefore required a copy of the *pied de France* with its subdivisions.[467]

As a result of the request of Ferraris, on November 3, 1770, Vienna initiated the official discussion to obtain cartographic material from France. The Habsburg ambassador, Florimond Claude Count de Mercy-Argenteau, contacted French foreign minister Étienne François Duke de Choiseul and offered him a brief description of the Ferraris project to survey the Austrian Netherlands. Mercy asked for Choiseul's support in obtaining information from the French archives and the Academy of Sciences in Paris. Whereas the French king's *ingenieurs géographes* had prepared various manuscript maps of the Austrian Netherlands, including especially the map of Limburg and Luxembourg, the Parisian academicians had performed astronomic and geometric calculations to identify the geographic coordinates of the main cities located in the French-Austrian Netherlands borderlands.[468]

Mercy's request was fruitful and, after a brief letter offering the French king's support, Choiseul confirmed by mid-December 1770 that the French archival deposits contained numerous maps that might help with the survey of the Austrian Netherlands. In order for the Habsburg government to obtain copies of these documents, they had to send a representative to Versailles to perform the actual research. Additionally, Choiseul promised his full support for this Habsburg agent to also obtain the coordinates of the borderlands' towns.[469]

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[467] AGR SEG, box 2773, 72-72 verso, September 22, 1770, Ferraris to Charles de Lorraine. One *pied de France* equaled 6 French *toise*s or 0.32 meters. Cardarelli, *Encyclopaedia of Scientific Units, Weights, and Measures*, 79.
[468] Paris, Archives du Ministère des Affaires étrangères (hereafter MAE), Correspondence Politiques (hereafter CP), Pays Bas, box 168, 155-155 verso.
[469] Ibid., November 18, 1770, Choiseul to Mercy, 157; Ibid., December 17, 1770, Choiseul to Mercy, 176.

It should come as no surprise that the person chosen for this mission was Ferraris himself. Christian-Frédéric Pfeffel, the French commissary for the border negotiations, reported from Brussels that Ferraris had been very grateful for the French king's permission to make copies of maps located in the French war archive. Pfeffel also mentioned that the only remaining concern of Ferraris was asking for a royal authorization to ensure the copying of the maps would be done "under his eyes."[470] The officer's apprehension suggests his desire not only to ensure the accuracy of the cartographic material he would be bringing back to the Austrian Netherlands from France but also to avert the possibility that the French agents might restrict his access to some maps.

On August 7, 1771, the Duke de la Vrillière had written to Aiguillon in reply to the Foreign Affairs minister's request to help Ferraris access the works created by the French academicians to determine through astronomic observations the position of the main towns of France's northern border. The duke's advice was that the officer should contact Cassini de Thury, in charge of preparing the Map of France.[471] Although it is doubtful that Ferraris established a direct correspondence or met Cassini de Thury during his trips to France, it is probable that he relied on the French mapmaker's published materials when preparing the final version of the printed map of the Austrian Netherlands.[472] The documentary evidence surrounding the trip of Ferraris to Paris also proves that the French foreign affairs minister made efforts to obtain information relevant for the Habsburg officer.

On September 18, 1771, de Bon wrote to the Count of Aiguillon to inform him that the General Count Ferraris would be presented to him by Mercy and to ask for the minister's protection for the officer during his trip to Versailles. De Bon stressed how Joseph II appreciated

[470] MAE Limites, Pays Bas, box 128, 238 verso, April 8, 1771, Pfeffel.
[471] MAE CP, Pays Bas, box 168, 241, August 7, 1771, Duke de la Vrillière to Aiguillon.
[472] Vervust, "From Cartography of Conquest to Cartographic Cooperation."

Ferraris for his military talents, how he had the friendship of prince Charles de Lorraine, and that the Government in Brussels was very interested in the completion of the Map of the Austrian Netherlands.[473] With such a high-profile list of supporters, Ferraris hoped to obtain all possible support from the French authorities.

Ferraris started his mission in Paris in the Fall of 1771 and, on October 3, 1771, he wrote to Brussels with disappointing news. The new French foreign minister, the Duke of Aiguillon and the new war minister, the Marquis of Monteynard, failed to find the maps Choiseul had promised to Ferraris and blamed this glitch on the disorderly state of the archives. Frustrated with this situation, Ferraris decided to return to Malines and continue the work on his map until further notice from Versailles.[474]

In the same way, as the Aulic War Council in Vienna was interested in the success of mapmaking operations, the French War Minister, Monteynard, also became involved in the negotiations connected with the exchange of cartographic material. Initially, Monteynard failed to find, in his department, any traces of the promises Choiseul had made to send maps to Ferraris from the war archives' map holdings. [475] Nonetheless, the war minister gave his full support to Ferraris. On May 6, 1772, Monteynard informed Habsburg ambassador Mercy-Argenteau of the successful completion of a copy of the map of the Austrian Netherlands surveyed by the French engineers and promised to send a similar copy of a map of Limburg. In exchange for the services he provided for the Habsburg Court, Monteynard also tried to obtain some cartographic material from Brussels. He claimed that Ferraris had promised to the French court a copy of a recently

[473] MAE CP, Pays Bas, box 168, 269-269 verso, September 18, 1771, Bon to Aiguillon.
[474] AGR SEG, box 2273, 129-130. Starhemberg gave Ferraris full authority on deciding whether to return to the Austrian Netherlands or not. Ibid., 131, October 6, 1771, Starhemberg to Ferraris.
[475] Ibid., 246, August 12, 1771, Monteynard to Aiguillon, Compiegne.

surveyed map showing the surroundings of Brussels.[476] Therefore, the trips of Ferraris to France to obtain material for his map of the Austrian Netherlands became an opportunity for both Versailles and Vienna to exchange cartographic material. Regrettably, neither side was satisfied with the final results of these negotiations.

In the first stages of the discussions, Ferraris was hopeful. In early February 1773, he obtained ten maps from the French War Ministry. Unfortunately, after an analysis of these maps, Ferraris concluded they encompassed the parts of the Austrian Netherlands that his personnel had already surveyed, so they had no further utility for his project. Moreover, missing from the package were precisely the maps of Luxembourg and Limburg that Ferraris needed the most. Therefore, this officer asked the Habsburg minister, Starhemberg, to request that Versailles correct this oversight.[477]

On August 2, 1773, after another series of unsuccessful attempts to locate the maps of Luxembourg and Limburg in the archives of the French War Ministry, Ferraris concluded that those documents were probably not housed there.[478] An additional trip to Paris confirmed to Ferraris his conclusion was probably correct, as even after searching through all the maps of the Austrian Netherlands located in the archives of the War Ministry he failed to locate the material he needed. Moreover, Count de Vault, the director of these archives, suggested that the French engineers who had surveyed the areas of Luxembourg and Limburg might have worked for Cassini's Map of France; in which case, Ferraris would have to contact Cassini de Thury.[479] In response to de Vault's suggestion, Ferraris asked his superiors in Brussels to look in the governmental archives and locate the documents regarding the work of French engineers in

[476] AGR SEG, box 2273, 133.
[477] Ibid., 135-135 verso, February 17, 1773, Ferraris. The list of maps is located in Ibid., page 136.
[478] Ibid., 149 verso-150, August 2, 1773, Ferraris.
[479] Ibid., 157-157 verso, October 16, 1773, Ferraris.

Luxembourg and Limburg, in order to clarify this issue.[480] By January 1774, Ferraris had given up on obtaining cartographic material from France to help him with the mapping of Luxembourg and Limburg. Instead, he requested additional financial assistance from Vienna so he could survey these areas, together with Guelders and the bishopric of Liège.[481] The Habsburg rulers approved his request for financial help promptly.[482]

The cartographic exchange between Vienna and Versailles was disappointing not only for the Habsburgs. Monteynard's request for a map of Brussels remained unfulfilled, despite insistent appeals from Versailles. Ferraris did not deny that he had mentioned the existence of such a map during his discussions with the French representatives. Yet, in a report from May 21, 1772, Ferraris claimed that the only promise he had made was providing a copy of the map if the Habsburg government approved the French Court's request. Moreover, Ferraris made clear in the letters to his superiors that, whereas Vienna had asked the French Court for maps showing areas belonging to the Austrian Netherlands, Versailles had asked for representations of lands outside French control. Therefore, Ferraris argued that the two requests were not equivalent. Furthermore, the French officer assisting Ferraris with his work in the Versailles archives had refused to authorize copying a map of the Dutch Brabant because it was outside the Habsburg sphere of influence.[483] Clearly, Ferraris was only following the same principles.

Despite the Habsburg officials' refusal to send a copy of the map of Brussels, the French authorities persisted with their request. In 1773, Count de Vault threatened the Habsburg officer, saying that unless he sent the requested map, the French would not send any other copies from their archives. Ferraris characterized this request as inappropriate and reminded his superiors

[480] Ibid., 153 verso, October 16, 1773, Ferraris.
[481] AGR CAPB, box 403, folder D 101 C 5, February 22, 1774, Kaunitz to Joseph II.
[482] SHD, 3 M 379 (Dépôt général de la Guerre. Levé de la carte des Pays-bas par le comte de Ferraris et demande de restitution de la carte à sa fille, la comtesse de Zichy: correspondance), April 26, 1774, Mr. de Witt.
[483] AGR SEG, box 2273, 134-134 verso.

again that Brussels was a domain outside the French borders.[484] On February 18, 1775, the French War Ministry asked Foreign Minister Vergennes to intervene in their behalf and obtain from Ferraris this much-coveted map. The War Ministry's request reminded Vergennes how eight engineers working as part of this ministry had worked for six months to prepare a copy of a map of the Austrian Netherlands surveyed by the French during the 1741 military campaign. As this map lacked a representation of the area surrounding Brussels and as Ferraris surveyed this territory during his mapping of this Habsburg province, the war ministry considered that their request for a copy of this cartographic representation was more than justified. In Ferraris' repeated refusal to send the map of the area of Brussels he mentioned that he could not share this material without Emperor Joseph II's approval. Therefore, we can imply that this Habsburg ruler preferred to preserve maps of his dominions away from his political allies' prying eyes.[485]

Even though the trans-imperial connections were not as fruitful as expected for the implementation of the Ferraris project, the correspondence between the Habsburg officials and Versailles representatives exemplifies how diplomatic channels could ease the circulation of cartographic information. Ferraris did not receive significant help from across the Habsburg borders, and he also faced challenges from local authorities when gathering information from the various administrative subunits of the Austrian Netherlands.

Whereas the mapping of Transylvania was done under the direct coordination of the Aulic War Council in Vienna, the survey of the Austrian Netherlands occurred officially under the leadership of a private individual, who also received some financial support from Vienna. As the commander of the Austrian Netherlands' artillery corps, Ferraris had an official position in the Habsburg hierarchy and he used his subordinates to implement the mapping of the province.

[484] Ibid., 158, October 16, 1773, Ferraris.
[485] MAE Limites, Pays Bas, box 138, 213-214 verso.

Nonetheless, the Habsburg Court insisted repeatedly that this mapping initiative was not a governmental project. Vienna took this precautionary measure to defend itself from accusations of trying to claim contested lands in the border areas or of attempting to take over foreign enclaves.[486] On the other hand, this approach required an impressive amount of paperwork in order to ensure that the local authorities offered their full-fledged support to Ferraris' men. Therefore, if for Transylvania it is hard to retrace the involvement of locals in the process of mapping, the archives in Brussels preserve rich documentation about the mechanics of the Ferraris survey at local level.

Whenever Ferraris moved forward with his survey in a new area of the Austrian Netherlands, Governor Charles de Lorraine or Maria Theresa issued documentation authorizing the artillerymen to perform their work and ordering the local authorities to assist them in their operations, especially by showing them the borderlines of their jurisdictions.[487] In some cases, the initial order was not sufficient, and the surveyors encountered problems in some communities. For example, during the summer of 1772, when working in the area of Marche-les-Dames, part of the county of Namur, the local official did not allow Ferraris' men to perform any measurements until he received additional orders from Brussels.[488] Authorities of the town and district of Tournai did not acknowledge the orders sent to Flanders and Hainaut to assist the work of the surveyors; instead, the Estates of Tournai reaffirmed their status as a separate entity of the Austrian Netherlands, independent from Flanders and Hainaut, and therefore in need of orders directly from the Habsburg government in Brussels.[489] The fragmentation of the Austrian

[486] Dubois, *La rectification du tracé des frontières*, XIV.
[487] See for example AGR CP, box 1067, January 7, 1771, Charles de Lorraine to the Estates of Brabant; August 5, 1771, Maria Theresa's order to the Deputies of the States of Flanders and Hainaut.
[488] Ibid., June 1772, document addressed to the "procureur general" of Namur.
[489] Ibid., September 26, 1773, Gillis to Ferraris.

Netherlands into numerous administrative units and jurisdictions complicated the work of the artillerymen, who had to interact with a variety of local officials.

The situation became even more delicate when the survey moved to Habsburg enclaves surrounded by foreign dominions and the non-Habsburg bishopric of Liège. In December 1774, Lambert de Ruvigny wanted to start the survey of the areas of Kerpen and Lommersum, enclaves within the duchy of Juliers and the electorate of Cologne. De Ruvigny's plans were thwarted by the bailiff of Kerpen who asked for additional instructions from Brussels, probably to make sure that the surveyors worked for the Habsburg government.[490] The local official, Baron de Tiège, wrote to his superiors in Brussels a justification of his decision. He claimed that his predecessor, the deceased fiscal counselor de Cock, had given him orders in the past that he should pay special attention to the borders of these domains.[491] It is revelatory that de Tiège associated surveying operations with a possible threat to the integrity of his territory and only agreed to allow the continuation of the mapmaking work once Charles de Lorraine intervened.[492] In the end, the mapmakers marked the lands of Kerpen and the lands of Lummersum as belonging to the duchy of Brabant on the printed map, but preserved them as a separate entity on the manuscript large-scale version.[493]

An even more serious incident occurred on the domain Tignée, enclave of Liège. In the summer of 1774, three of Ferraris' men surveying the Bishopric of Liège got involved in a violent incident with Libotte, the lord of Tignée, who claimed that he depended only on the authority of the Holy Roman Emperor and thus his lands were not part of any other political

[490] Ibid., January 4, 1775, Lambert de Ruvigny.
[491] Ibid., February 6, 1775, de Tiège.
[492] Ibid., February 23, 1775, Charles de Lorraine.
[493] Dubois, *La rectification du tracé des frontières*, 60.

entity.[494] The fierceness with which Libotte and his men raised their weapons against the artillerymen to chase them from Tignée motivated one of the surveyors to use his handgun to intimidate their opponents; or at least that was what Ferraris claimed to defend his employees. Moreover, to defend his decision to allow the artillerymen to carry handguns when performing surveying work, Ferraris reminded his superior that his men had to defend themselves from bandits, as they had been attacked by malefactors when returning to their headquarters in the evening.[495] Although I could not retrieve more details about this attack, this occurrence reveals that as part of their mission, the artillerymen had to face a variety of foes, including outlaws and recalcitrant lords.

The lord of Tignée reacted firmly against what he perceived to be trespassers endangering his authority, probably because he feared that his lands would be stolen by one of his neighbors, either Liège or the Austrian Netherlands. The Tignée incident also reveals that, although the Habsburg authorities took preventive measures to ensure that the Ferraris survey was not perceived as a governmental initiative, foreign officials and lords considered it that way. In his complaint to Charles de Lorraine, Libotte mentioned that the artilleryman leading the surveying team, Lambert de Ruvigny, claimed they worked for the emperor. If this claim was true, it is not surprising that Libotte considered his domains threatened by the Habsburg ambitions and felt he had to contact the governor of the Austrian Netherlands.

The efforts of Ferraris and his men to prepare a comprehensive map of the Austrian Netherlands brought to the forefront the survival of administrative fragmentation and the determination of local officials to preserve the specificity of the domains within the Habsburg conglomerate. The artillerymen surveying the Austrian Netherlands had to rely on the help of

[494] Tignée passed around 1740 into the possession of the family Libotte. Ibid., XIV, footnote 42.
[495] AGR CP, box 1067, September 22, 1774, extract from the protocol of the Conseil Privé.

local authorities, especially with respect to two issues: the toponymy of the land and the position of boundaries.

The process of preparing this map of the Austrian Netherlands, as illustrated by the case of toponyms and borders, demonstrated to the Habsburg government that their local and provincial functionaries had only a vague idea of the province's geography.[496] All the subunits of the Austrian Netherlands were asked to provide a list with the correctly spelled names of cities, market towns, villages and other significant sites within their borders.[497] Obtaining these lists was not an easy task, even with the help of governmental agents. For example, on November 23, 1773, the Estates of Flanders contacted the local administrations with this query but received few replies, many incorrect and without following a coherent naming system. In the justification they wrote to their superiors in Brussels, the Estates of Flanders blamed the local authorities' inability to fulfill the order in part on their ignorance regarding the correct spelling of the names. The Estates of Flanders offered some alternative solutions to the government: sending some artillerymen on-site to gather the correct settlements' names from the locals or copying the toponyms from Sanderus's *Flandria illustrata*, published in 1641.[498] Rather than following either of these options, the authorities in Brussels preferred to commission the fiscal counselor of Flanders, Dierix, also actively involved in the process of border demarcations, to gather the information about the province's toponymy.[499] Dierix fulfilled this commission; on July 13, 1773, he sent a list with the names of all settlements both in Flemish and French, accompanied by additional observations of local magistrates.[500]

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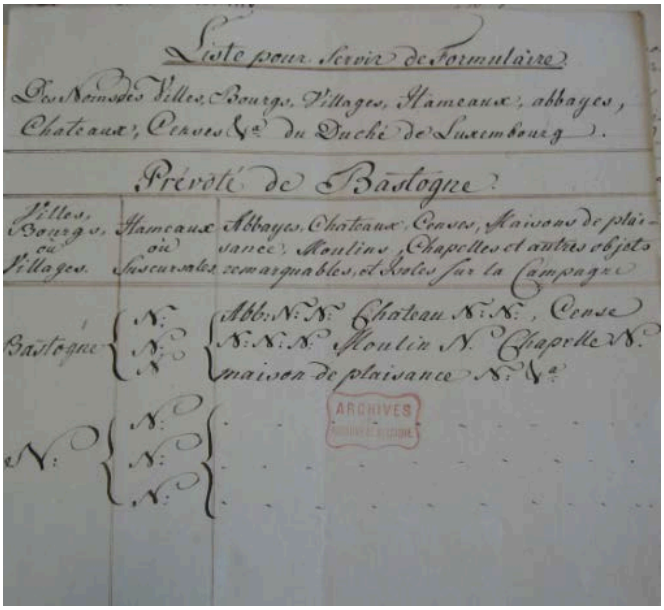
[496] Dubois, *La rectification du tracé des frontières*, IX.
[497] See for example AGR CP, box 1067, order for the Estates of Flanders and Hainaut, July 22, 1772, Cogeur; March 5, 1774, Charles de Lorraine's order to the deputies of the Estates of the Province of Luxembourg, the deputies of the Estates of the Province of Limburg, the county of Dalhem, the town of Fauquemont and the domain of Rolduc.
[498] Ibid., November 23, 1772, the Estates of Flanders.
[499] Ibid., document addressed to the Estates of Flanders.
[500] Ibid., July 22, 1773, Dierix.

Sometimes the local authorities hurried to implement the government's instructions, but failed to provide satisfactory information to the mapmakers. For example, on April 5, 1774, only one month after Charles de Lorraine's order, the authorities of Rolduc sent a three-page enumeration of all the settlements located within their dominions.[501] Although Ferraris was probably happy to receive this information so promptly, he probably would have preferred a document that was organized better. On November 20, 1774, this mapmaker sent very strict guidelines to the deputies of the duchy of Luxembourg regarding how they should format their list; he even included a template of the table he expected them to follow (Figure 4.4).[502]


Liste pour servir de formulaire

Des Noms des Villes, Bourgs, Villages, Hameaux, abbayes, Chateaux, Censes &c. du Duché de Luxembourg.

Prévoté de Bastogne

Villes, Bourgs, ou Villages.	Hameaux ou Succursales.	Abbayes, Chateaux, Censes, Maisons de plaisance, Moulins, Chapelles et autres objets remarquables, et Isolés sur la Campagne
Bastogne	N. N. N.	Abb: N. N. Chateau N. N., Cense N. N. N. Moulin N. Chapelle N. maison de plaisance N. N.
N.	N. N. N.	

Figure 4.4 Form sent by Ferraris to the Estates of Luxembourg (1774)

For each district, Ferraris wanted the table to start with the main town, followed in the same column by a list of all other towns. For each settlement listed in the first column, a second

[501] Ibid., April 5, 1774, J.J.Corneli Greff.
[502] Ibid., November 20, 1774, Ferraris.

column had to incorporate the names of all hamlets depending on it and a third column including significant sites, such as monasteries, castles, mills, chapels, and other points of interest. [503] Probably as a result of these new guidelines, Rolduc sent a new list of toponyms only on November 25, 1776.

Gathering information about the toponymy of the province was far from the effortless task that Ferraris anticipated. Even though the Austrian Netherlands had been part of the Monarchy for more than half a century, the provincial government lacked a detailed inventory of the geographic characteristics of this province. The Ferraris project brought to the forefront the problem of lack of provincial government records regarding the toponymy of the lands and offered a solution to this shortage of information.

4.3 BORDERLINES ON THE FERRARIS MAPS

The challenges encountered by Ferraris in preparing an accurate map of the Austrian Netherlands did not end once this officer completed the survey. The artillerymen had to verify on-site the map drafts and redraw the position of numerous borderlines in order to avoid diplomatic incidents or any territorial prejudices towards the Habsburg rulers. Indeed, one of the main factors that motivated Chancellor Kaunitz to recommend that Maria Theresa fund Ferraris was the importance of a new map of the Austrian Netherlands for border demarcation efforts.[504]

As discussed further in chapters 5 and 6, Maria Theresa and Joseph II strived in the second half of the eighteenth century to eliminate foreign enclaves from their territories and signed border treaties with many of their neighbors. In the case of the Austrian Netherlands, by

[503] Ibid.
[504] AGR CAPB, box 476, folder D 98 C 11 N 19, December 31, 1770, Kaunitz to Maria Theresa.

the end of 1770, when the Ferraris proposal was approved, the Habsburg-French commissions had been working for months on implementing the 1769 border convention. These officials had quickly come to the realization that the local situation on the frontier was more complex than the Courts of Vienna and Versailles had anticipated. Indeed, the context of the 1769 and 1779 Franco-Habsburg border treaties and the 1776-1780 Liège-Habsburg border negotiations helps explain why the representation of the frontiers on the Ferraris map was such a sensitive issue for the Habsburg government.[505]

From the early stages of the Ferraris project, the provincial and central Habsburg authorities considered the representation of borders to be one of the main benefits of a new, large-scale topographic map of the Austrian Netherlands. Governor Charles de Lorraine stated clearly that he desired a "general map that shows and determines correctly the borders in general, and especially those towards France that have been and will be changed."[506] The uncertain situation of the borderline with France motivated Henri Crumpipen, the state and war secretary of the province, to suggest that the government might ask Ferraris to survey the frontier with France only at the end of his project.[507]

The continuing negotiations with France and Liège also caused the Austrian Netherlands government to take a cautious stance with respect to their support of Ferraris and his artillerymen. Rather than openly admitting that Ferraris worked for Vienna, the Habsburg government desired that this mapmaking enterprise be perceived as a private enterprise, along

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[505] Sebastien Dubois uncovered, published and analyzed rich archival material related to this connection. Dubois, *La rectification du tracé des frontières*; Sébastien Dubois, *Les bornes immuables de l'état: la rationalisation du tracé des frontières au siècle des Lumières (France, Pays-Bas autrichiens et principauté de Liège)* (Heule, Belgium: UGA, 1999), 287-293. In the second half of the eighteenth century, the Austrian Netherlands signed border treaties with the principality of Stavelot-Malmédy (1755), France (1769; 1779), the United Provinces (1785) and the electorate of Trier. Dubois, *Les bornes immuables de l'état*, 160.

[506] "une Carte generale, qui exprime et determine bien les Limites en general, et notamment celles qui ont été, et vont encore etre changées du coté de la France." AGR CAPB, box 470, folder D 96 C 11, February 9, 1770, Crumpipen to Lederer.

[507] AGR CP, box 1067, July 22, 1771, Crumpipen to Neny.

the lines of the Cassini Map of France. For example, in 1773 and 1774, when Ferraris met with the prince bishop of Liège and the prince abbot of Stavelot to convince them about the utility of extending the surveying work to their dominions he did not act as a representative of the Court of Vienna.[508]

At the same time, the border negotiations with Liège made it clear to the officials in Brussels that they had to find a way to collect reliable information about the contested lands. Initially, the Habsburg government had commissioned the Council of Finance to prepare an in-depth report taking into account the trade and customs aspects of the disputed territories. In their answers, the Council complained that they possessed insufficient knowledge about these areas. Therefore, government officials hoped to use information from the Ferraris map to assist them in their negotiations.[509] As the Ferraris map drafts contained significant errors in the representation of the borderlines, it became clear that these cartographic documents had to be verified on-site so that they could assist the government reliably in its endeavors.

Even though the correction of the boundary areas on the Ferraris map became a governmental priority, the Habsburg authorities rejected the idea of sending governmental commissions on-site. Henri Delplancq, member of both the Finance Council and the Giunta of Contested Lands, insisted that if the government sent its own agents to correct the map drafts, the Ferraris enterprise would become an official document whose representation of borderlines could be challenged by the neighboring states. Moreover, sending officials to the border areas, where there were disputed lands, would attract the attention of states such as the Bishopric of Liège, which could then use this opportunity to send protests and territorial reclamations to Brussels and

[508] Dubois, *La rectification du tracé des frontières*, XIII-XV. To ensure the collaboration of the prince abbot of Stavelot, Maria Theresa also issued a declaration stating that any final errors on the map could not be used by either the Habsburg Court or the prince of Stavelot as evidence for any territorial pretentions. AGR CP, box 1067, July 6, 1774.
[509] Dubois, *La rectification du tracé des frontières*, XVI-XVIII.

Vienna. For all these reasons, Delplancq suggested selecting a couple of artillery officers working under Ferraris and sending them to the border areas to discuss the map drafts with local authorities. Rather than creating an official paper trail, the artillery officers had to collect information based on verbal consultations.[510] Delplancq contacted officials from the various administrative subdivisions of the Austrian Netherlands, including lands in the border areas, and asked them to help Ferraris' officers in their mission.[511]

As a result of this request, some of the local officials submitted in-depth reports to Brussels on their efforts to fulfill the government's desire. For example, on January 5, 1778, the alderman of the high court of Limburg, La Saulx d'Alsemberg, described his actions to assist the artillery officer Lambert de Ruvigny in this enterprise. From the d'Alsemberg report, we learn that de Ruvigny carried with him drafts of the maps. After inspecting them for one evening and one morning, d'Alsemberg identified mistakes in the names of some of the villages and found territories on the map that he considered erroneously marked as belonging to the bishopric of Liège instead of the Austrian Netherlands.[512]

Hoverlant du Carnois, *pensionnaire* of the Estates of Tournaisis (one of three administrative officers)[513] mobilized additional local personnel to review the map drafts and offer their opinions regarding the toponymy and the positioning of the borderline. The only significant error they identified was in the representation of territories adjacent to the Scarpe

[510] AGR CP, box 1067, November 9, 1777, Delplancq. The officers in charge of these verifications were Lichtenebert, Lambert de Ruvigny and Peter Wirtz. They were assisted by a corporal and a gunner. Delplancq worked alongside the artillery officers in Malines to eliminate as many errors as possible from the manuscript maps. Dubois, *La rectification du tracé des frontières*, XVIII-XIX.

[511] Brussels AGR CP, Box 1067, November 23, 1777, Delplancq to officials from various towns. For a list of the local officials that assisted Ferraris' artillerymen see Dubois, *La rectification du tracé des frontières*, XX, footnote 83.

[512] AGR CP, box 1067, January 5, 1778, Alensberg.

[513] For more details about the organization of the Estates of Tournaisis see Erik J. Hadley "Privilege and Reciprocity in Early Modern Belgium: Provincial Elites, State Power and the Franco-Belgian Frontier, 1667-1794" (PhD diss., University at Buffalo, The State University of New York, 2006), 45.

River near the villages of Maulde and Thun.[514] The archives of the Giunta of Contested Lands have preserved a map of the confluence of the Scarpe and Scheldt, probably prepared to assist with the rectification of the Ferraris map. The map, reproduced as Figure 4.5, is very schematic, and its main goal is to identify the territories of France and the Austrian Netherlands, while also clarifying which sections of the Scheldt were used jointly by the two powers.[515] The map also denotes the situation of bridges: whereas the bridge over the Scarpe (located in the upper-right of the image) belonged exclusively to France, the use of the bridge crossing the Scheldt (positioned close to the middle of the image) was shared between the two states. Knowing which parts of the Scheldt belonged to one or the other power impacted the customs duties ships had to pay.

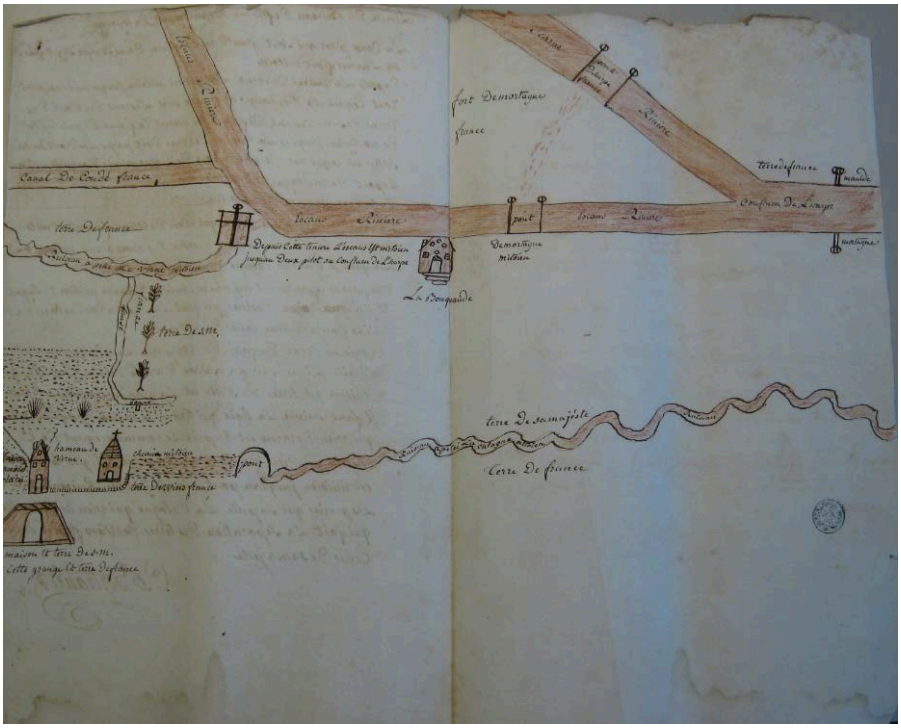

Figure 4.5 Map showing the confluence of the Scarpe and the Scheldt (1777)

[514] AGR CP, box 1067, December 17, 1777, Hoverlant-Ducarnois.
[515] AGR Jointe des Terres Contestées, box 33C. Bertrand, no date.

It is not surprising that the confluence of the Scheldt and the Scarpe attracted a lot of attention during the map-verification process. The joint Austrian-French commission that implemented the 1769 border treaty had reached an impasse in this same region. As chapter 5 will show, to clarify the situation of the lands located in the proximity of the confluence of the rivers Scarpe and Scheldt, both Vienna's and Versailles' representatives commissioned maps of the area. In the end, a series of territorial exchanges included in the 1779 border convention established a clear borderline. In 1777, du Carnois inspected the Ferraris map and offered a temporary solution to avoid any diplomatic incidents: inserting a disclaimer on the published map that would state how the tracing of the borderline did not prejudice the property rights of any sovereigns or private individuals.[516]

Du Carnois' suggestion was the same solution that the government adopted. Indeed, the Cartouche included on the *Carte marchande* incorporated a paragraph that disavowed any responsibility on the part of the Habsburg government with respect to any errors in the representation of the borderlines.[517] This declaration had a dual purpose: defending the pretentions of Vienna over contested territories, while also avoiding diplomatic incidents if the Habsburg neighbors disagreed with the position of certain segments of the borders.

In some cases, the verification of the Ferraris map drafts with the help of local authorities offered these officials the chance to submit concrete proposals for the tracing of the borderline. The baron of Beelen, auditor at the *Chambre des comptes*, was assisting artillery officer Lichtenebert with the inspection of the borders of Limburg. This official submitted to Brussels a list of observations regarding the trade, taxes and economic advantages that the Habsburg state could obtain by performing certain territorial exchanges to establish the borders of Limburg and

[516] Ibid., December 17, 1777, Hoverlant-Ducarnois.
[517] Dubois, *La rectification du tracé des frontières*, XV.

the Duchy of Guelders.[518] Although government officials decided to postpone implementing Beelen's suggestions, they preserved his document in the archive of the Giunta of Contested Lands.[519]

Writing to Chancellor Kaunitz on February 10, 1778, the plenipotentiary minister of the Austrian Netherlands, Starhemberg, commented on the challenges the Ferraris survey faced. The minister mentioned that although the general and his employees made all possible efforts to bring their work to perfection, the information they collected at local level was not always reliable and thus led to omissions and errors that required an additional examination of the map drafts and inspections on-site. Starhemberg added that he had to insist on this verification even though the map was prepared as a private enterprise, because the project coordinator was a Habsburg officer who received support from Maria Theresa; and therefore, if not done properly, the map could be used as evidence against the rights and pretentions of the Habsburg Court.[520] Starhemberg's assessment of the Ferraris map's implications denotes why a correct trajectory of the borderlines and accurate toponymy was so important for a successful completion of this project. Maps had come to represent important evidence during international negotiations and Vienna's financial and logistical support had increased the importance of the Ferraris map as a government-sanctioned document.

The survey of the Austrian Netherlands not only helped the government obtain a detailed image of the interior of its dominions but also enabled the collection of additional information about contested lands in preparation for border treaties. Ferraris had claimed from the first that one big advantage of his map over better-known enterprises, such as Cassini's, would be the

[518] AGR CP, box 1067, December 20, 1777, Beelen.
[519] Ibid., Document discussing the letter of Mr. Beelen from December 20, 1777.
[520] AGR CAPB, folder D 101 C 5, February 10, 1778, Starhemberg to Kaunitz.

inclusion of the new French-Austrian borderlines as established in 1769.[521] In this sense, the Ferraris maps proved their utility to the Habsburg government immediately from their conception.

4.4 CONCLUSION

Overcoming all local, imperial and trans-imperial hurdles, Ferraris completed both his projects successfully. The *Carte marchande* was acclaimed as the highest quality map of the Austrian Netherlands and the Bishopric of Liège of its time and as a significant addition to Cassini's map of France. Furthermore, as revealed in chapter 8, the Ferraris printed map became a model that Habsburg rulers tried to make use of in other provinces, such as Lombardy. The *Carte de cabinet*, reserved for the eyes of the Viennese decision-makers and the governor of the Austrian Netherlands, was equal in its attention to detail to the Great Military Map. Figure 4.6 reproduces a fragment from map section 111 showing the university town of Leuven (Louvain).[522] The mapmakers represented in detail the layout of the town, the main buildings, the walls surrounding this settlement, the road network and the cultivated fields in the area.[523] Based on its details, we can interpret the *Carte de cabinet* as an extension of the Great Military Map, even though the surveyors were not part of the general quartermaster's staff. The artillerymen represented on their maps the same elements that the general quartermaster's staff officers selected for their cartographic work. Moreover, the synchronous implementation of the Ferraris survey and the Great Military Map reveal a coherent imperial policy of mapping the empire.

[521] Dubois, *La rectification du tracé des frontières*, 10.
[522] KBR, *Carte de Cabinet*, section 111, http://belgica.kbr.be/nl/coll/cp/cpFerrarisCarte_nl.html, last accessed on February 18, 2015.
[523] For more information about how to interpret the symbols of the map see Coene et al., "Ferraris, the Legend."

Figure 4.6 Leuven (Louvain) on the Ferraris *Carte de Cabinet*

Despite the synchronous efforts of the general quartermaster's staff and the artillery corps from the Austrian Netherlands to map Vienna's dominions, the Habsburg government decided to support the illusion that the map of the Austrian Netherlands was the private enteprise of Ferraris. This decision helped Ferraris obtain the approval of rulers such as the bishop of Liège and the prince abbot of Stavelot to extend the cartographic operations on their lands. Moreover, in the case of any errors on the *Carte marchande*, the Habsburg government could not be held responsible. Therefore, keeping the Ferraris project apparently separate from the Great Military Map served the interests of the Court of Vienna not only because the artillerymen solved the shortage of military mapmakers.

The imperial context of the Great Military Map offers some insight about the production context for the Ferraris maps but is insufficient for understanding all factors that influenced the mapmaking operations in the Austrian Netherlands. The French astronomic and geodetic operations in the territory of this province during the War of the Austrian Succession and the

Vienna-Versailles alliance from 1756 encouraged Ferraris to search for cartographic sources across the Habsburg border. Even though this officer failed to retrieve French resources useful for his project, his attempt underscores the importance of international exchanges for cartography. The second element underscoring the importance of a trans-imperial context relates to border demarcation efforts. The Habsburg Court's determination to regulate the position of borderlines towards Liège and France encouraged them to take advantage of the Ferraris survey in order to gather detailed information about contested borderlands. Last but not least, local Habsburg and foreign officials played a crucial role in the implementation of the Ferraris survey by offering information not only about the trajectory of the borderlines, but also about the toponymy of the province. Therefore, we can state that although the Ferraris maps show mainly the territory of one Habsburg province, the Austrian Netherlands, the surveying process emerged as a result of the efforts of imperial, provincial and international agents.

5.0 SKETCHING IMPERIAL CONTOURS: MAPPING HABSBURG BORDERS IN TRANSYLVANIA AND THE AUSTRIAN NETHERLANDS

In the year 1769 Habsburg military engineers skilled in the art of mapmaking travelled to the eastern province of Transylvania to coordinate the first detailed topographic survey of the area and the installation of "imperial eagles" on the Monarchy's eastern border. This same year the Habsburgs concluded a border treaty with the French king, and by the end of the 1770s, military engineers had started installing standard border markers between the lands of France and the Austrian Netherlands. Throughout the 1770s and 1780s the provincial government of Lombardy pressured the Duke of Parma to support joint border inspections and prepare maps of the contested frontier territories in order to pave the way for a border Congress and the signing of a treaty.

It was no coincidence that provincial authorities from various Habsburg dominions labored, under the guidance of the Viennese Court, to demarcate imperial borders in the second half of the eighteenth century. As reflected in a series of documents from April 1777, Chancellor Wenzel Anton Kaunitz-Rietberg (1711-1794), the most powerful imperial adviser of the Habsburgs, submitted a request for a list of all border maps housed in the Aulic War Council's archives, thus revealing his keen interest in the state of cartographic knowledge about the

empire's frontiers.[524] The Habsburgs' increased attention to demarking clear borderlines and ensuring their inviolability emerged in the second half of the eighteenth century and led to an increase in the production of detailed border maps as essential instruments for negotiations with their political neighbors. This transformation in imperial priorities did not occur in a vacuum, but stimulated and was at its turn influenced by interactions with other European states, provincial authorities and traditions, and inhabitants of frontier areas, who often challenged the Habsburgs' definition of borders.

The current literature on the creation of international borders argues that in the eighteenth century Eurasian states signed treaties that implemented linear, clearly demarcated borderlines, enforced by state agents.[525] This new desire to regulate the situation of frontiers was not accidental. The process of border demarcation emerged at the intersection of two early-modern developments: (1) the consolidation of territorial sovereignty and (2) the changes in the technology of mapmaking.[526] Although we cannot establish a simple deterministic relationship between these two historical processes, chapters 5 and 6 will reveal how maps and their production greatly influenced the elimination of territorial enclaves and the tracing of international borderlines. As mapmakers moved "from the office to the field"[527] and military engineers skilled in performing geometric measurements and trigonometric calculations surveyed states and their borders, cartography emerged as an ally of enlightened governments.[528]

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[524] HHStA StK, Noten an den Hofkriegsrat (hereafter Noten an den HKR), box 7, April 28, 1777, Kaunitz to the Aulic War Council.
[525] Günter Vogler, "Borders and Boundaries in Early Modern Europe: Problems and Possibilities," *in Frontiers and the Writing of History, 1500-1850*, eds. Steven G. Ellis and Raingard Eßer (Hannover-Laatzen, Germany: Wehrhahn, 2006), 32.
[526] Daniel Power, "Introduction. A. Frontiers: Terms, Concepts, and the Historians of Medieval and Early Modern Europe," in *Frontiers in Question. Eurasian Borderlands, 700-1700*, eds. Daniel Power and Naomi Standen (New York: St. Martin's Press, 1999), 5-6.
[527] Edney, "Cartography's 'Scientific Reformation'", 288.
[528] Godlewska, *Geography Unbound*, 47.

Maps did not merely illustrate political developments. As political decision-makers relied on maps, which they considered accurate representations of borderlands, cartographic sources influenced diplomatic negotiations and resolutions regarding territorial transformations. Before the rise of cartography, written descriptions of boundary areas helped mediate conflicts. However, toponyms often modified over time and historical descriptions of borderlines were not always identifiable on-site. Therefore, visual territorial representations emerged as a solution to establishing the position of borders permanently. Indeed, by the middle of the eighteenth century, what came to be considered accurate border maps were the product of engineers and surveyors, who combined landscape characteristics with sufficient toponyms to eliminate any doubts regarding the location of geographical features marking imperial boundaries.

In their persistent efforts to ensure a clear demarcation of their states' borders, Bourbon, Habsburg and Ottoman rulers, to name just a few, labored towards transforming into reality the plea of famous jurists of the time. As Emmerich de Vattel wrote in his *Principles of Natural Law* (1758), "it is necessary to mark clearly and with precision the boundaries of territories in order to avoid the slightest usurpation of another's territory, which is an injustice, and in order to avoid all subjects of discord and occasions for quarrels."[529] Vattel's words demonstrate that by the 1750s territorial boundaries were perceived as essential for the territorial identity of a state, and thus rulers had to first identify these limits on the ground.[530]

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[529] Cited in Peter Sahlins, *Boundaries. The Making of France and Spain in the Pyrenees* (Berkeley: University of California Press, 1989), 93.

[530] The word "border" implies a clearly marked and stable line, as long as the context that created it remains unchanged. This is in contrast with the word "frontier" that suggests something transient in continuous transformation, an undefined area separating two political entities. However, we should not assume that from the early modern times to today there occurred a simplistic irreversible transformation of frontiers into borders, as even after the demarcation of borderlines and signing of bilateral treaties, these new boundaries expressed more of an ideal separation than an actual one. Piero Zanini, *Significati del confine. I limiti naturali, storici, mentali* (Milan: Bruno Mondadori, 2000), 14; Power, "Introduction. A. Frontiers," 3-4.

Although there is no definitive chronological global study of the evolution of early-modern borders, studies of specific eighteenth-century border regulations and the evolution of national territories suggest a synchronous effort on the part of early-modern empires to delineate and enforce the protection of their boundaries both at home and in their colonial dominions. The Treaty of Madrid (1750) signed between Spain and Portugal determined the mapping and the establishment of a borderline between these states' possessions in South America.[531] Just one year earlier, the French and the British had convened a joint boundary commission to establish the exact limits of Nova Scotia, or Acadia, a region in northeastern North America that Versailles ceded to London in 1748.[532] In the second half of the eighteenth century, the French kingdom also signed almost thirty border treaties with their European neighbors in an effort to eliminate territorial enclaves and create a continuous borderline.[533]

The French case has attracted a lot of scholarly attention in the past few past decades, especially due to Peter Sahlins's work on the French-Spanish boundary in the Pyrenees and Daniel Nordman's study of the French boundary's transformation from the sixteenth to the nineteenth century.[534] Sahlins traces the transformation from jurisdictional to territorial sovereignty and reveals the importance of cartography in the process of border delimitation and the construction of national territories.[535] In another article Sahlins demonstrates that despite their apparently natural position on mountain ranges and rivers, French borders were constructed

[531] Mário Olimpio Clemente Ferreira, *O Tratado de Madrid e o Brasil Meridional: os Trabalhos Demarcadores das Partidas do Sul e a sua Produção Cartográfica (1749-1761)* (Lisbon: Comissão Nacional para as Comemorações dos Descobrimentos Portugueses, 2001); Golin, *A Guerra Guaranítica*.
[532] Mary Pedley, "Map Wars: The Role of Maps in the Nova Scotia/Acadia Boundary Disputes of 1750," *Imago Mundi: The International Journal for the History of Cartography* 50, no. 1 (1998): 96-104.
[533] Jean-François Noël, "Les problémes de frontiéres entre la France et l'Empire dans la seconde moitie du XVII e siécle," *Revue Historique* 235, no. 2 (1966): 333-346; Peter Sahlins, "Natural Frontiers Revisited: France's Boundaries since the Seventeenth Century," *American Historical Review* 95, no. 5 (1990): 1423-1451.
[534] Sahlins, *Boundaries*; Daniel Nordman, *Frontières de France. De l'Espace au Territoire XVIe-XIXe siècle* (Paris: Gallimard, 1998).
[535] Sahlins, *Boundaries*, 7.

entities, negotiated among the central government, provincial authorities and local inhabitants.[536] Although the recent historiography prioritizing the case of France shed light on the impact of mapping on the processes of territorialization and the creation of linear borders, this was neither the first state to go through such an evolution, nor the model for all other European states.[537]

Another reason to be wary of studies claiming the French case as representative is the seemingly teleological evolution of this state's European domains into a nation state. In contrast, imperial borders of empires such as the Habsburg Monarchy have become, if still in existence as borderlines, defining features of new states formed in most cases after 1918. Although the story of eighteenth-century Habsburg border demarcations does not prefigure the emergence of a strong national territory, analogous to France, it does anticipate the construction of an alternative model.[538] During the reigns of Maria Theresa (1740-1780) and Joseph II (1780-1790) the Habsburg rulers' conceptualization of their own dominions started favoring the construction of a centralized imperial geo-body over provincial specificity.[539] Negotiations over the position of borderlines became an integral part of this process.

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[536] Peter Sahlins deconstructs the concept of French natural frontiers and reveals its history in the context of French expansionist foreign policy and state centralization from the seventeenth century onwards. Sahlins, "Natural Frontiers Revisited."

[537] In his recent book Jordan Branch argues that "mapping and its effects were necessary for a key characteristic of the sovereign state as it emerged by the early nineteenth century: namely, the purely territorial and boundary-focused character of the authority claims made by states." To demonstrate this statement Branch relies heavily on the history of cartography literature focused on France. Branch claims that "French territorialization also served as an influential model that was followed, implicitly, or explicitly, by many rulers throughout Europe." Jordan Branch, *The Cartographic State: Maps, Territory, and the Origins of Sovereignty* (Cambridge: Cambridge University Press, 2014), 5-6, 143.

[538] Robert J.W. Evans uses the term "territorial nation." In his words, the idea of nation was "not conceived at this stage, by governments or by most of their opponents, in any ethnic sense, but as the *territorial* nation, the 'national' (rather than 'international' or 'provincial' commonalty of citizens in a given geopolitical entity." R.J.W.Evans, "Essay and Reflection: Frontiers and National Identities in Central Europe," *International History Review* 14, no. 3 (August, 1992): 486-487.

[539] I use the term geo-body as defined by Thongchai Winichakul, who considers this notion a "man-made territorial definition," "an effect of modern geographical discourse whose prime technology is a map." Thongchai Winichakul, *Siam Mapped: A History of the Geo-Body of a Nation* (Honolulu: University of Hawaii Press, 1994), 17.

The Habsburgs' determination to establish fixed boundaries impacted and was influenced by their diverse political neighbors: powerful rivals such as France, the Ottoman Empire and Prussia; second-rate European powers such as the Netherlands or the Kingdom of Sardinia; and the less prominent Principalities of Moldavia and Wallachia, the Duchy of Parma, and the Prince-Bishopric of Liège. Regardless of who their negotiating counterpart was, by the middle of the eighteenth-century, the Habsburg rulers developed a standard procedure in preparation for border demarcations: gathering documentary evidence to support territorial claims, preparing maps to show the desired borderline, and using diplomatic negotiations to pave the way for internationally recognized boundary treaties.

Changing our focus from western European states such as Great Britain, France, Spain or Portugal allows us to push further back into time the earlier days of international border demarcations, as we consider the evolution of the Habsburg-Ottoman borderline and its first official demarcation in 1699.[540] Scholars have shown that the signing of the Peace Treaty of Karlowitz that year, which marked the "closure of the Ottoman frontier" towards Europe, was a key moment.[541] For the first time, the sultan agreed to a clearly marked border and sent representatives as part of a joint border demarcation commission.[542] After Karlowitz, the *triplex confinium* emerged at the intersection of three different political traditions - Habsburg, Ottoman and Venetian – and predated not only similar developments for the other Habsburg borders, but also those within other European states, such as France, Spain and Portugal. The Habsburg and

[540] Maria Pia Pedani discusses the mechanics of the border demarcation commission in charge of implementing the Treaty of Karlowitz, but the main focus of her book is especially the Ottoman-Venetian relationship and border. Maria Pia Pedani, *Dalla frontiera al Confine* (Rome: Herder, 2002), 52-58.

[541] Rifaat A. Abou-el-Haj, "The Formal Closure of the Ottoman Frontier in Europe: 1699-1703," *Journal of the American Oriental Society* 89, no. 3 (1969): 467-475.

[542] Colin Heywood, The Frontier in Ottoman History: Old Ideas and New Myths," in *Frontiers in Question*, 241-242; Evans, "Essay and Reflection," 490-491; Abou-el-Haj, "The Formal Closure of the Ottoman Frontier in Europe," 467. Many documents associated with these border demarcations were published in *Luigi Ferdinando Marsili: Relazioni dei Confini della Croazia e della Transilvania a sua maestà Cesarea (1699-1701)*, ed. Raffaella Gherardi, 2 vols. (Modena: Mucchi, 1986).

Ottoman authorities' commitment to resolve all incidents that occurred on this newly demarcated border in the first decades of the eighteenth-century proves these two empires' desire to maintain a peaceful relationship and respect a defined borderline.[543]

Despite the Habsburg Monarchy's steady effort to trace imperial borders in the second half of the eighteenth century, very few studies investigate the mechanics of boundary demarcations and no prior work discusses two or more segments of the Habsburg Monarchy's border in a comparative manner.[544] In order to understand the Habsburg rulers' campaign to transform their complex of dynastic lands into a centralized empire we need to analyze their border demarcation efforts jointly. Therefore, chapters 5 and 6 bring together stories about border conflicts, negotiations and demarcations from three Habsburg provinces: the eastern border between Transylvania and the Ottoman-dominated Principality of Moldavia, the western border between the Austrian Netherlands and the kingdom of France, and the southern border between Austrian Lombardy and the small duchy of Parma.

Taking cartography as an entry-point into the complex story of the establishment of internationally recognized borderlines allows us to isolate the provincial and trans-imperial factors that conditioned the success or failure of Habsburg operations for these three border segments. At the provincial level, the existence of civil or military institutions responsible for the

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[543] Jovan Pešalj, "Early 18th-Century Peacekeeping: How Habsburgs and Ottomans Resolved Several Border Disputes after Karlowitz," in *Empires and Peninsulas: Southeastern Europe between Karlowitz and the Peace of Adrianople, 1699-1829*, eds. Plamen Mitev, Ivan Parvev, Maria Baramova, and Vania Racheva (Berlin: Lit, 2010), 29-42.

[544] Although some scholars have examined the history of border demarcations for some of the Italian states, France and Belgium, none of them uses a comparative framework that focuses on disjoint border provinces, despite the Habsburgs' effort to coordinate their border demarcation enterprises in the eighteenth century. Nelly Girard d'Albissin, *Genèse de la frontière franco-belge; les variations des limites septentrionales de la France de 1659 à 1789* (Paris: A. & J. Picard, 1970); Dubois, *La rectification du tracé des frontières*; Antonio Stopani, *La production des frontières: état et communautés en Toscane (XVIe-XVIIIe siècles)* (Rome: Ecole française de Rome, 2008); Marina Cavallera, "I confini e gli scambi tra domini sabaudi e Stato di Milano," in *Lo spazio sabaudo. Intersezioni, frontiere e confini in età moderna*, ed. Blythe Alice Raviola (Milan: FrancoAngeli, 2007), 137-162; Raffaello Ceschi, "Ricognizioni tra frontiere e confini," in *Confini e Frontiere nell'età moderna: un confronto fra discipline*, ed. Allessandro Pastore (Milan: FrancoAngeli, 2007), 107-116; Veres, "Redefining Imperial Borders," 3-23.

protection and definition of borderlines, the presence of engineers skilled in the art of mapmaking, and the existence of historical documentation in local archives influenced the Habsburgs' ability to gather supporting evidence for their territorial claims. Changing the focus to the trans-imperial level brings to the forefront the diplomatic negotiations the Habsburgs became entangled in as part of their quest for border delimitations. The Monarchy's neighbors reacted to Habsburg pretensions with various degrees of success, depending on their political power and the interests of their allies. Whereas France forced Maria Theresa and her advisers to pursue border negotiations on equal terms, the Ottomans sacrificed part of the principality of Moldavia's territory in order to ensure Habsburg cooperation in reestablishing peace in the region. Lastly, the Duke of Parma used his dynastic affiliation to involve two powerful monarchs, the French and the Spanish Bourbon rulers, in his negotiations with Vienna. What stands out in all these trans-imperial discussions is the preponderant role maps took on in the second half of the eighteenth century, as the negotiators relied on cartographic sources not only as a way to present claims, but also to cement the final, agreed-on trajectory of the borderline.

5.1 IMPOSING AN EASTERN BORDER: THE HABSBURG BORDER DEMARCATION BETWEEN TRANSYLVANIA AND MOLDAVIA

5.1.1 The production of border maps for the Transylvanian-Moldavian frontier

In 1773 Emperor Joseph II travelled for the first time to the Habsburg province of Transylvania and spent a large part of his two-month journey inspecting this province's borders with Wallachia and Moldavia, principalities under Ottoman influence and the main scene of the

Russo-Ottoman war between 1768 and 1774. The Emperor's almost daily documentation of his Transylvanian stay reveals his preoccupation with the geography of the province, its cartographic representation, and possible ways to improve the trajectory of its mountainous frontier.[545] The imperial concern with mapping Transylvania's boundaries and tracing an advantageous borderline represented the direct culmination of more than two decades of concerted effort on the part of Habsburg authorities to ensure a better defense of their empire. As seen in chapter 4, with the help of officers who worked under the supervision of military engineers skilled in the art of mapmaking, such as Stephan Lutsch von Luchsenstein, Mihàly Jeney and Dominik Camiotti de Fabris, the Viennese authorities had obtained a series of detailed provincial and border maps. Together with additional documentation, these cartographic sources proved instrumental in defending the Habsburg abusive installation of border markers in the face of foreign challengers.

As the following pages demonstrate, starting with the early 1750s, the intensification in the production of border maps engaged not only the Habsburgs but also their Moldavian neighbors and two other empires with strategic interests in the region: the Russians and the Ottomans. Although the Habsburgs did not monopolize the cartographic production for the Transylvanian-Moldavian borderlands, they gained the upper hand because of their strong military presence in the area and their access to sufficient personnel to prepare detailed maps and to gather additional documentation that supported Vienna's territorial pretensions.

In the first half of the eighteenth century, the border between the Danubian Principality of Moldavia and the Habsburgs' easternmost province, Transylvania, constituted the scene of

[545] See for example Joseph II's journal entries from May 21, May 22, June 6, June 10, and June 14. Bozac and Pavel, *Călătoria împăratului Iosif al II-lea în Transilvania la 1773*, 583-586, 626, 643-644, 647. On May 29, 1773, the French ambassador in Vienna, Rohan, wrote to the French Foreign Affairs Minister how "the Emperor [Joseph II] travelled tirelessly by horse through the mountains and along the borders of Transylvania, and he seemed satisfied by the barriers that nature gave to this province." Original: "L'Empereur infatigable dans ses courses parcourt a cheval les montagnes et les frontieres de la Transilvanie, et que S.M.J. paroit satisfaite des barrieres que la nature a données a cette province." MAE CP, Autriche, box 321, 367.

numerous conflicts. Inhabitants from both territories repeatedly captured their neighbors' sheep and cattle, burned villages and shelters in the border area, and sent memoirs to Constantinople accusing each other of territorial violations.[546] As the Principality of Moldavia remained under Ottoman protection in the eighteenth-century and Constantinople's foreign policy shifted in the direction of stabilizing boundaries and establishing "permanent" peace, the Habsburg rulers knew that obtaining the sultan's accord was essential with respect to the Transylvanian-Moldavian border.[547] The Porte's cooperative attitude regarding other segments of the Habsburg-Ottoman border gave Vienna hopes that a long-term agreement could be reached. Indeed, after the 1699 Peace of Karlowitz and the first official joint demarcation of part of the border between the Habsburg and the Ottoman Empires, both Vienna and Constantinople made serious efforts to force provincial authorities to respect this section of the borderline and investigate any border violations.[548] The Treaties of Passarowitz (1718) and Belgrade (1739) included articles regarding the regulation of borders between Ottoman and Habsburg dominions, and thus can be seen in this sense as a continuation of the Karlowitz accord.[549]

However, the border demarcations post-Karlowitz failed to incorporate in the first phase the borderline segments separating Transylvania from Moldavia and Wallachia. In 1700 the

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[546] For example, in January 1723, as a result of a Habsburg complaint, the sultan ordered the Moldavian prince Mihail Racovita to ensure that his subjects would not trespass Transylvania's borders. Hurmuzaki, *Documente privitoare la istoria românilor*, vol. 6, *1700-1750* (Bucharest: Ministerul Cultelor si Instructiunii Publice, 1878), 367; In 1752, the Transylvanian inhabitants of the village Bereoz complained that their Moldavian neighbors captured some shepherds and their sheep in the area of the Oytos pass and did not release them until they received a significant amount of money. The Moldavians claimed their action was just because the shepherds had trespassed on their territories, while the Transylvanians argued that those meadows had always been in their possession. Hurmuzaki, *Documente privitoare la istoria românilor*, vol. 7, *1750-1818* (Bucharest: Ministerul Cultelor si Instructiunii Publice, 1876), 12.

[547] Virginia *Aksan*, "*Whose territory and whose peasants*? Ottoman boundaries on the Danube in the 1760s," in *The Ottoman Balkans, 1750-1830*, ed. Frederick Anscombe (Princeton: Markus Wiener Publishers, 2006), 76.

[548] Pešalj, "Early 18th-Century Peacekeeping," 29-42. For a discussion of the demarcation of new frontiers after the Peace of Karlowitz from the Habsburg perspective see John Stoye, *Marsigli's Europe, 1680-1730: The Life and Times of Luigi Ferdinando Marsigli, Soldier and Virtuoso* (New Haven, CT: Yale University Press, 1994), 164-215.

[549] *Aksan*, "*Whose territory and whose peasants*," 75; Harald Heppner, Daniela Schanes, "The Impact of the Treaty of Passarowitz on the Habsburg Monarchy," in *The Peace of Passarowitz, 1718*, eds. Charles Ingrao, Nikola Samardžić, and Jovan Pešalj (West Lafayette, IN: Purdue University Press, 2011), 54.

Habsburg plenipotentiary for the demarcation of borders, Luigi Ferdinando Marsigli (1658-1730) was very optimistic about the success of negotiating a clear boundary between the Habsburg domains and the Danubian Principalities. However, the repeated opposition of the Ottoman representative and the refusal of the Moldavian and Wallachian princes to accept as a guiding principle for the border demarcations the status quo preceding the beginning of the last Habsburg-Ottoman war thwarted Marsigli's strategy. In the end, the only concession the Ottomans offered to the Habsburg representative was to incorporate in the final documents a statement indicating that the Carpathian mountains marked the border between Transylvania and the lands of Moldavia and Wallachia.[550] Indeed, in the case of the border between Transylvania and the Principality of Moldavia, even by 1741 the Habsburgs had only sealed a general agreement with the Ottomans that fixed the border high in the Carpathian Mountains, on the watershed.[551] Obviously, such a vague principle did not easily translate into a clear frontier line, and it was impossible to enforce a strict separation between the inhabitants of Moldavia and Transylvania, who often trespassed into each other's lands. Moreover, the lack of an official bilateral convention supported by cartographic material made it hard to ensure the protection of this ambiguous borderline.

Due to the persistence of border incidents and the nonexistence of one accepted frontier between Transylvania and Moldavia, the early 1750s witnessed the creation of competing border maps representing the rival interests of the inhabitants of these two areas. In 1750, the Court in Constantinople, acting as a representative for the Moldavian prince, sent to Vienna a map of the border between Moldavia and Transylvania supporting Moldavian claims.[552] Vienna's reaction was prompt: an Imperial Order was sent from Vienna to the General Commander of

[550] *Luigi Ferdinando Marsili: Relazioni dei Confini*, vol. 2, 401-402, 426, 429, 436, 449, 483, 495.
[551] Florian Porcius, "Istoricul Districtului Năsăudean," *Arhiva Someşană* 9 (1928): 14.
[552] KA KPS, B IX c 744.

Transylvania, Count von Brown, to obtain an accurate survey and border map, together with other documentary proofs that would support the Transylvanian pretentions in the border regions shared with Moldavia. Brown put in charge of this mission Captain Stephen Lutsch von Luchsenstein, a military engineer from Transylvania. Though von Luchsenstein finished the required map by 1751, he took six more years to finalize a detailed memoir in which he attacked the map sent from Constantinople, while also discussing all the controversial points on the border and trying to demonstrate the Habsburg claims in the area.[553]

Specifically, Luchsenstein raised serious doubts about the accuracy of the map supporting Moldavian claims based on its inaccurate representation of the geography of the area and incongruities between the map and on-ground toponyms. Throughout his memoir, Luchstenstein gives numerous examples of such incongruities, like his claim on page two, which states that the villages Vuolidania, Pitrechun, Karavul Cskivarda and others, and the mountains Tzapaf, Arhir, and Kosder cannot be found anywhere in reality except on the Moldavian map.[554] In addition to erroneous names for villages and geographic features, the Habsburg officer also considered the Moldavian map to be closer in style to a painting than to an actual accurate land survey and accused the cartographer of having used only oral reports to draw it. Luchsenstein's assessment criteria are congruent with eighteenth-century ideas on what made a map accurate and "scientific."

The opinions that Luchsenstein presented in his memoir agreed with contemporary beliefs about maps. By the second half of the eighteenth century, maps had gained epistemological authority as European politicians and bureaucrats accepted topographical surveys based on geometrical frameworks of triangulation and the use of special instruments to

[553] Ibid.
[554] Ibid.

measure distances as the necessary prerequisites of "good" maps.[555] Knowing the represented land first-hand had become a necessary condition for the reliability of a cartographic source and, as map-making became a science, using symbols to codify the landscape had become the norm.[556]

To counteract Moldavian pretensions Luchsenstein presented an alternate representation of the border by focusing on the landscape and following the mountainous chain as a guideline (Figure 5.1). This cartographer includes on his map, *The border of the Principality of Transylvania and Moldavia* (*Principatuum Transilvaniae et Moldaviae confiniorum*), three borderlines: the so-called ancient border between Transylvania and Moldavia, the border enclosing the Transylvanian possessions of the time, and the "unlawful Moldavian pretensions."[557] The mapmaker marked in different colors the various moments of what he calls the Moldavian usurpations from 1727, 1733, 1734, 1735 and 1746.[558] Numbers from 1 to 100 mark points of interest located on the three competing borderlines. These numbers helped Luchsenstein organize his exposé, as the Habsburg officer included in the memoir more information about all these areas.

[555] Edney, *Mapping an Empire*, 26-30.
[556] Godlewska, *Geography Unbound*, 44-49.
[557] KA KPS, B IX c 744.
[558] Ibid.

Figure 5.1 Luchsenstein's *The border of the Principality of Transylvania and Moldavia* (1751)

Although the Viennese archives do not preserve any copy of the 1751 Moldavian map that triggered Luchsenstein's counter-project, a close scrutiny of the map collections of the War Archives brought to light two others maps the Moldavians prepared in the context of the border disputes. Though labeled as "Turkish" drawings or maps, the full title and explanation of these cartographic sources suggest a Moldavian origin. As the Habsburg authorities considered the principality of Moldavia under the Ottoman sphere of influence it is not surprising they used the adjective "Turkish" to denote these maps. The first example, dated to 1755, contains a bilingual explanation in German and Ottoman Turkish, which suggests that its audience was possibly the Habsburg and Ottoman Courts. The map's explanation indicates that this document is a representation of part of the contested border between Transylvania and Moldavia, and the title claims that the goal of the mapmakers was to put a stop to the Transylvanians' abuses in the area by clarifying the real position of the border.[559]

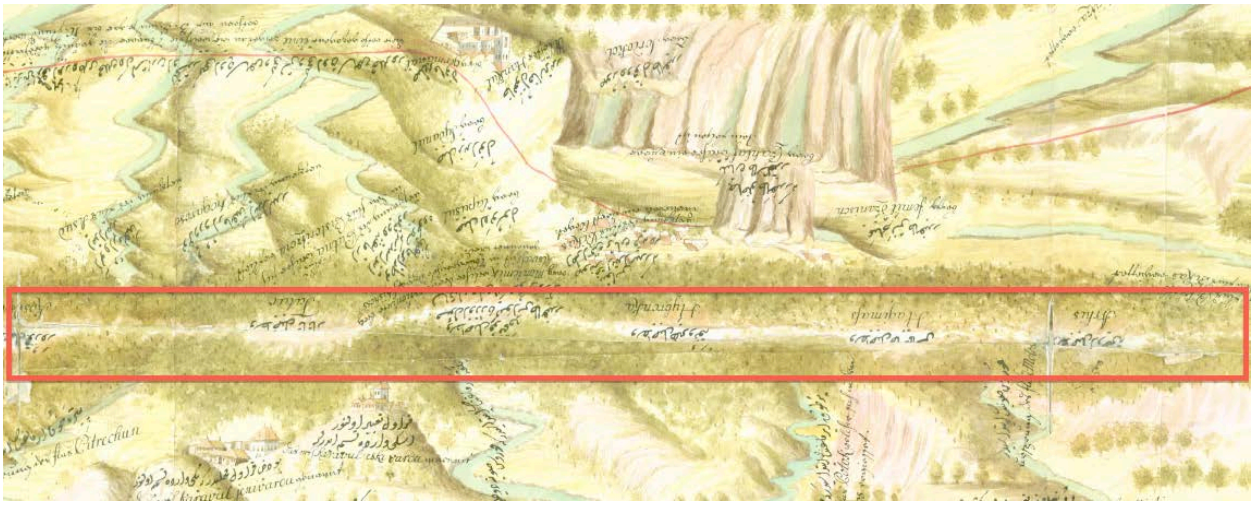

Figure 5.2 Map showing the Moldavian pretensions at the border with Transylvania (1755)

[559] KA KPS, B IX c 748.

On Figure 5.2 I have marked with a red rectangle the peak of the mountains, which the Moldavian authorities put at the center of their representation in order to demonstrate their role of ancient border between the two states. The mapmaker included a red line in the upper part of the image to indicate the extension of the land the Transylvanian inhabitants had infringed into in order to graze their cattle, thereby clearly violating the function of the watershed as the borderline. Although the Moldavians claimed the watershed as the never-changing border between their state and Transylvania, and marked on the map the flow direction of all waterways originating in the Carpathian Mountains, by the mid eighteenth-century, the Habsburgs no longer accepted this argument. Indeed, in his 1757 memoir, Luchsenstein refuted the principle according to which the border should traverse the peaks of the mountains and take into account the watershed as a geographical entity dividing the two territories. The Habsburg military's main argument against this standard was the Moldavians' inconsistency regarding the position of their borderline, as the frontier separating Moldavia from Poland and Wallachia did not enforce this watershed rule. A section of the Moldavian and Polish border followed the flow of streams, while part of the border dividing Moldavia and Wallachia was located on the Jabola Pudna River.[560]

The second map located in the Viennese archives and illustrating Moldavian claims shows a small section of the border, the area of the Oytos mountain pass connecting Transylvania and Moldavia.[561] The map does not include any documentary appendices, but the 1782 inventory of the Aulic War Council's map collection regarding the province of Transylvania includes the following explanation for an entry describing a 1768 map: a Turkish Border Map showing a contested territory, which the Moldavian ruler sent to the general

[560] KA KPS, B IX c 744.
[561] Ibid., B IX c 751.

commander of Transylvania, Count O'Donnell.[562] It is plausible that the map reproduced in Figure 5.3 was this 1768 map. Compared to the 1755 Moldavian map, this later source includes some elements that bring it closer to contemporary Habsburg maps: the cardinal directions and explanations for some of the main elements represented. For example, letter A denotes the ridge of the mountain named Mageruzi that the Moldavians claimed as the ancient border. The dotted line C indicates the borderline that the Moldavians accused the Transylvanian inhabitants of trespassing. The map also included an old Moldavian mill (B), a custom station (E) and a so-called "German" watch point (F), probably a Habsburg guard station.

A comparison of the Oytos pass area as represented on the 1768 Moldavian map with the Luchsenstein map of 1751 makes obvious the contradictory locations for the borderline. As shown on Figure 5.4, Luchsenstein accused the Moldavians of having encroached on Transylvanian lands by taking over territories in two waves: the blue-shaded domains between 1710 and 1727, and the green-colored lands between 1733 and 1735. The Transylvanian engineer clarified that the yellow line marked the contemporary borderline; however he argued that the situation did not reflect the actual right of possession the Habsburgs had in the region, and which supposedly extended on Moldavia's side all the way to the brown borderline.[563] Luchsenstein further explained in the memoir accompanying his 1751 map, that the placement of the Custom House inside the mountain pass Oytos did not confirm the ancient location of the border, but was simply the result of the authorities' desire to ease the work of the customs' officers.[564]

[562] KA HKR, 1782 34 105, 21.
[563] KA KPS, B IX c 744.
[564] Ibid.

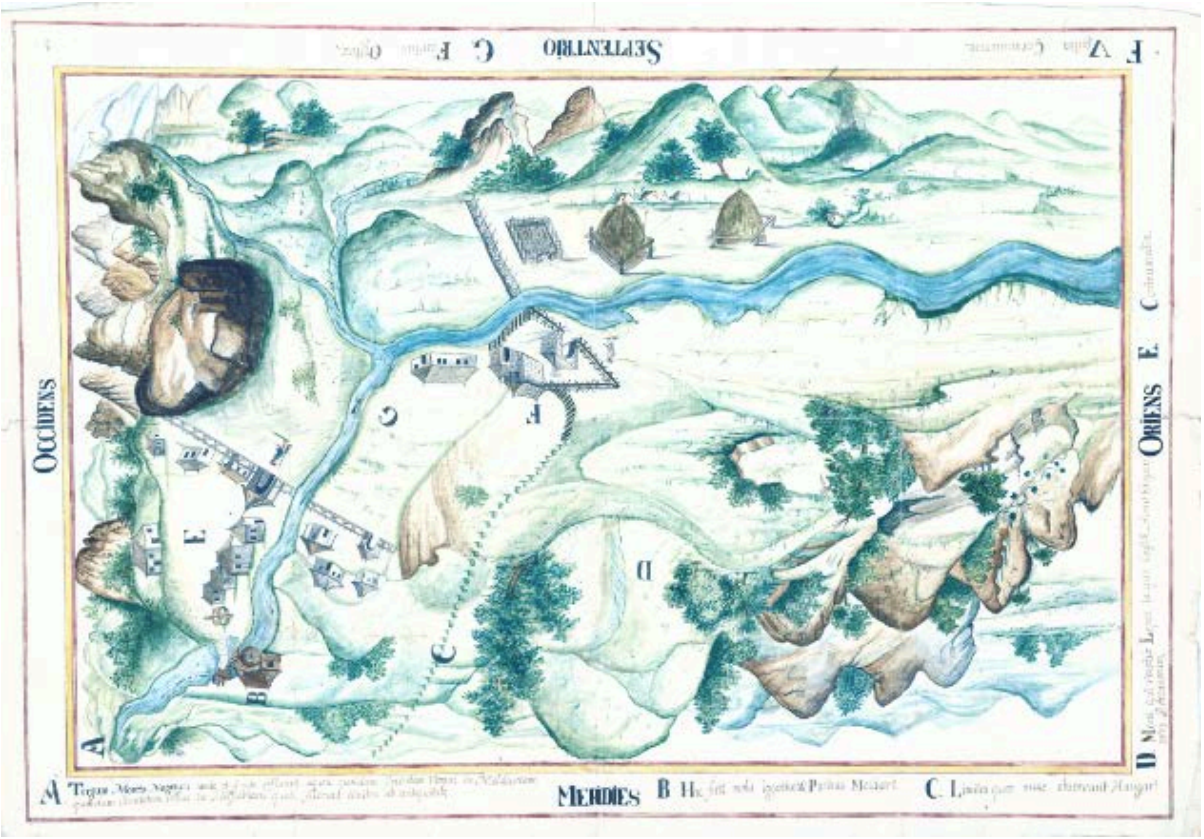

Figure 5.3 Map showing the Moldavian pretensions in the area of the pass Oytos (1768)

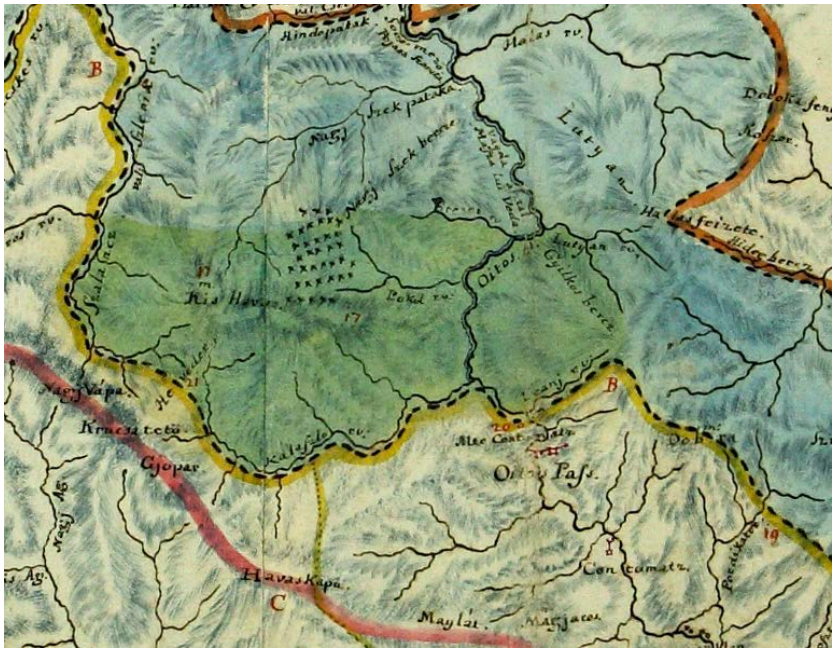

Figure 5.4 Detail from Luchsenstein's *The border of the Principality of Transylvania and Moldavia* (1751)

As shown above, both the Habsburg and the Moldavian side gathered written documentation and prepared cartographic material supporting their border claims. However, no resolution was reached until the late 1760s, as neither of the two sides would agree to any concessions or accept the other side's arguments.

5.1.2 The Habsburg imposition of a Transylvanian-Moldavian borderline

The intensification of border conflicts between the Transylvanian and Moldavian inhabitants towards the middle of the eighteenth-century convinced Vienna of the need to search for a definitive solution. Therefore, during the 1768-1774 Russo-Ottoman war, Vienna took an intransigent attitude and occupied strategic positions in the mountains, tracing this borderland with the help of boundary markers. Although the Habsburgs did not officially join the military conflict in the area, they deployed officers to fight, often undercover, as part of both armies;[565] they relied on a complex network of spies to gather information on the military developments, and in 1771, they even signed a short-lived secret convention with the Ottomans promising help against the Russians in exchange for monetary and territorial compensations.[566] Throughout this conflict, Maria Theresa and Joseph II maintained their troops in a state of preparedness and paid

[565] HHStA StK, Vortrage, box 104, 302-308 verso.

[566] On July 6, 1771, the Habsburg Court signed an agreement with the Ottomans. Constantinople promised the part of Wallachia known as Little Wallachia, a substantial amount of money (approximately 11,250,000 gulden) and a most-favored-nation status for Habsburg commerce. In exchange Vienna agreed to offer diplomatic or armed help to ensure that the Ottomans recovered the territories they had lost to Russia since 1768. Regarding the contested borderlands of Transylvania, the convention stipulated that the inhabitants of Wallachia and Moldavia had troubled the peace of Transylvania's borders and even usurped some Habsburg territories. Therefore, the two signatories of this agreement promised that at the end of the war they would establish and enforce the ancient borders between Transylvania these provinces. The convention was abrogated in the summer of 1772 as the Habsburgs realized the outrage their action would have provoked in St. Petersburg. Karl A. Roider, *Austria's Eastern Question, 1700-1790* (Princeton, NJ: Princeton University Press, 1982), 124-129. Hurmuzaki, *Documente*, vol. 7, 86-87.

special attention to the province closest to the war theater: Transylvania.[567] The French ambassador in Vienna wrote on November 16, 1769 to Versailles that "the Court of Vienna did not witness with pleasure the success of the Russians, and she [Vienna] would have even preferred if the glory of this campaign had been on the side of the Turks. It desires without any doubt that these two powers weaken each other equally without acquiring too big advantages one over the other. But if one of the two should gain a significant superiority, it is in its [Vienna's] interest that it should be the Ottoman Empire."[568]

Although the Habsburgs felt threatened by the Russians' success against Constantinople's army, they still found a silver lining: the political and military turmoil the Russian invasion sparked in Moldavia allowed Vienna's officers to install a system of border markers without signing any prior bilateral convention with their neighbors. Already on March 1, 1769, less than a year after the beginning of this conflict, the president of the Aulic War Council, Count Frantz Moritz von Lacy, had expressed his concern that a lack of clear markers on Transylvania's borders made it vulnerable in the face of the opposing Ottoman and Russian armies, especially in the case of a Russian invasion of Moldavia and Wallachia. Neither Transylvania's Military Commander, Count Carl O'Donnell, nor his superior, Lacy, predicted any immediate difficulties in positioning these border indicators, but both of them foresaw challenges at the end of the war from either the Ottoman or the Russian side. Therefore, Lacy presented a number of scenarios contingent on the unfolding of the war. In the case of a Russian invasion of Moldavia, the Habsburg troops could position the border markers without any restraint and even occupy earlier

[567] For a narrative of the 1768-1774 Russo-Ottoman conflict see: Virginia Aksan, *Ottoman Wars 1700–1870: An Empire Besieged* (Harlow: Longman/Pearson, 2007), 138-160; Hochedlinger, *Austria's Wars of Emergence*, 349-359; Roider, *Austria's Eastern Question*, 109-150.

[568] La Cour de Vienne n'a pas vu avec plaisir le succés des Russes, et qu'elle auroit même preferé que la gloire de cette campagne eut été du coté des Turcs. Elle desire sans doute que ces deux puissances s'affoiblissent egalement sans acquerir l'une sur l'autre de trop grands avantages. Mais si l'une des deux doit avoir une superiorié bien marquée, il est de son interêt que ce soit plutot l'empire Ottoman. MAE CP, Autriche, box 312, 189 verso.

controversial frontier areas. Lacy assumed the Russians would have difficulties in challenging this new status quo. However, if the principality remained in the Ottoman sphere of influence by the end of the war, the Porte would surely contest the new position of the border markers, and the Habsburgs should voice their willingness to name a joint commission to decide on the legitimate position of the border.[569]

Lacy's recommendation was rooted in the Habsburgs' earlier experiences in trying to negotiate with the Ottomans. The unfruitful diplomatic confrontations from the early 1750s had convinced the Habsburgs that in the case of an official investigation to mark the position of the border between Transylvania and Moldavia, their cartographic and detailed documentary evidence, supported by their military power, would have a good chance to counteract any pretensions from the Ottoman side. The military authorities in Vienna anticipated that a later negotiation regarding the final position of the borderline would necessitate presenting updated cartographic material. Therefore, on May 22, 1769, in preparation for the boundary demarcation operations, Luchsenstein was ordered to include signs for the border markers on his border maps.[570] This Habsburg maneuver was part of their strategy to argue in front of the Ottoman Court that the positioning of the boundary pillars in 1769 was based on documentary evidence, as illustrated on Luchsenstein's earlier border map and his memoirs.

By the end of June 1769, Emperor Joseph II had decided that the trigger to start positioning the border markers should be the Russian invasion of Moldavia. The emperor warned his military staff to claim only lands for which the Viennese Court could provide convincing evidence of ownership, in order to thwart any counter-claims at the end of the war. Moreover, if the fighting sides expressed any misgivings about the Habsburg actions, Joseph II recommended

[569] HHStA StK, Noten von dem Hofkriegsrat (hereafter Noten von dem HKR), box 81, fascicle 1, 33-34.
[570] KA KPS, B IX c 757.

that his men present the act of positioning border markers as a temporary defensive measure, simply aimed to protect the Principality of Transylvania from war devastation.[571] On August 25, 1769, the Court and State Chancellery in Vienna officially warned the General Commander of Transylvania to start positioning the border markers as soon as the Russian troops gained the upper hand over the Ottomans. At the same time, the imperial authorities urged Luchsenstein to prepare a detailed memoir detailing the controversies on the Transylvanian-Moldavian borderland.[572]

By Fall of 1769, the Habsburgs had moved more regiments into Transylvania and had reinforced the military cordon to oppose any possible incursion of the Ottoman Empire into Transylvania. As the French ambassador in Vienna, the Marquis de Durfort, wrote to the French foreign minister in Paris, Étienne François Duke de Choiseul, Chancellor Kaunitz wanted to reassure the foreign diplomats in Vienna that this was not an aggressive gesture, but simply a precautionary measure.[573] However, under the veil of protecting the Transylvanian province from an Ottoman or Russian invasion, the Habsburg troops redrew the frontier line through the positioning of border markers.[574] The officers placed most of the 24 boundary pillars at the confluence of streams and rivers, or on certain mountain ridges, in order to ensure their locations were not ambiguous.[575]

In parallel with the mapmaking efforts and the positioning of imperial border markers, the Habsburg authorities started preparations for an official diplomatic negotiation regarding the frontier's position. In order to successfully impose its vision of the borderline, Vienna collected

[571] HHStA StK, Noten von dem HKR, box 81, fascicle 1, 22-27.
[572] AN, series Brukenthal, 106/ L 1-8, 197, 147.

[573] MAE CP, Autriche, box 312, 78 verso-79; 119 verso-120 verso; 209-209 verso.
[574] HHStA StK, Noten von dem HKR, box 81, fascicle 2, 84.
[575] AN, Brukenthal, 106/L 1-8, 197, 152.

historical documentation such as medieval privileges, earlier peace treaties, testimonies from very old locals regarding the accepted position of the border by the local communities, and whenever possible, old cartographic representations of the border areas. As part of this effort, on May 3, 1769, the Aulic War Council in Vienna ordered Luchsenstein to prepare a detailed memoir discussing the Transylvanian-Moldavian border controversies. As a result of this imperial commission, Luchsenstein spent part of 1769 gathering documents from various towns in Transylvania to support the Habsburg claims.[576] On August 10, the Transylvanian engineer started a series of trips to Bistritza (Bistriţa), Marusvásárhely (Târgu Mureş), Udvarhely (Odorheiu Secuiesc), Clausenburg (Cluj-Napoca) and Carlsburg (Alba Iulia).[577] Moreover, he also received from the Habsburg authorities a series of original documents or old authentic copies from the Military District of Rodna, and obtained access to papers preserved in the War Chancellery.[578]

On March 7, 1770, Luchsenstein sent to Vienna the final version of his memoir discussing the contested border areas between Moldavia and Transylvania.[579] Luchsenstein's investigations in the archives failed to bring to the surface documents related to any successful border demarcation between Transylvania and Moldavia. Therefore, the military engineer suggested that the only way to establish a borderline had to rely on three principles: the peaceful occupation of a domain for an indeterminate amount of time (principle also known as *uti*

[576] On May 3, 1769, the Aulic War Council ordered the General Commander in Transylvania to ensure the preparation of written memoirs supporting Transylvanian claims in the border areas towards Moldavia and Wallachia. AN, Brukenthal, 106/L 1-8, 366, 7.
[577] I am using the toponyms as they appear in Luchsenstein's memoir. However I am also adding in brackets the current name of those towns.
[578] AN, Brukenthal, 106/L 1-8, 366, 7-7 verso.
[579] For the full memoir see Ibid.; for an unsigned summary of Luchsenstein's memoir see AN, Brukenthal, 106/L 1-8, 197, 183-207 verso. By December 21, 1771, Luchsenstein finalized a similar memoir for the contested border areas between Transylvania and Wallachia. AN, Brukenthal, 106/L 1-8, 367.

possidetis), the use of unbiased written documents that contained no contradictions, and the presence of uncontested border fortresses, trenches or other boundary signs.

The memoir incorporated the Moldavians' position regarding the position of the borderline and their arguments so that Luchsenstein could refute all of them. First of all, the engineer performed an in-depth analysis of the donation letters supposedly issued by the Moldavian princes to monasteries and noblemen and raised serious doubts about their authenticity. Secondly, Luchsenstein attacked the validity of the seventeenth and eighteenth century collections of testimonies from inhabitants from the borderlands, by claiming that these witnesses had their own territorial interests and their statements contained numerous contradictions. Finally, the Habsburg officer claimed that the failed border negotiations and demarcations from 1742 and the early 1750s were symptomatic of the Moldavian rulers' desire to avoid an official convention, because they lacked substantial evidence to support their claims.[580]

The second part of Luchsenstein's discussion presented the evidence supporting the Habsburg pretensions. Luchsenstein's argumentation was based on documents from Transylvanian archives that gave clues about, and even indicated the trajectory of, certain border segments. For example, fifteenth century royal privileges with the signature of the Hungarian king Sigismund revealed that the inhabitants of the district of Bistritza controlled land domains until the river Golden Bistritz, despite the Moldavians' attempt to push the border further inside Transylvanian territory.[581] Other archival documentation included more kingly and princely land donations, testimonies gathered from local witnesses on the occasion of territorial disputes, contracts signed between Transylvanian authorities and neighboring Polish officials, tax rolls,

[580] AN, Brukenthal, 106/L 1-8, 197, 183-189 verso.
[581] Ibid., 190-190 verso.

and even Moldavian documents confiscated in 1766 from the abbot of the monastery Soveja on the occasion of his attempt to enter Transylvania's territory. Furthermore, Luchsenstein relied on the Peace of Karlowitz's articles regarding the position of the border. Although the early 1700s joint border commissions did not mark the Transylvanian-Moldavian borderline, the official documents mentioned that borders possessed justly and peacefully in 1699 would preserve their position. Therefore, Luchsenstein argued that the Moldavians' eighteenth-century annexations of Transylvanian domains, such as the one in 1746, should be voided.[582]

In addition to written documents, the engineer listed the position of old artificial boundary signs and wartime Transylvanian built fortifications, locations that he had clearly verified in some cases on the ground.[583] Luchsenstein characterized the last set of arguments he included in his memoir as "plausible and illustrative" (*wahrscheinliche und erklärende*) as he tried to develop a direct relationship between toponymy and the legitimate owners of contested borderlands. The Habsburg officer claimed that mountains and rivers with Hungarian names or containing in their name variants of the word Szekler undoubtedly belonged to Transylvania's Szekler counties. His examples include a list of toponyms derived from Hungarian words, including Szoros, Magyoros, Kis Havas, Tölgyes and Bálványos.[584]

The memoir took a very strong line against all of the Moldavian arguments and documentary evidence, and the author did not betray any feelings of uncertainty regarding the Habsburg rights to the lands under disputes. This uncompromising position was a direct result of this document's importance as one of the Habsburgs' main negotiating weapons. However, in the correspondence with his army superiors, Luchsenstein took a more cautious stance regarding the

[582] Ibid., 189 verso - 195.
[583] Ibid., 195 verso-196 verso.
[584] Ibid., 199 verso-200; AN, Brukenthal, 106/L 1-8, 366, 118 verso-119. Two of the groups inhabiting Transylvania, the Hungarians and the Szeklers, spoke the Hungarian language as their native tongue. Therefore, Hungarian-derived toponyms could suggest Hungarian or Szekler control of those areas.

validity of the borderline he had suggested on his 1751 map. On February 8, 1770, the engineer wrote that the demarcation line he had suggested on his original border map was supposed to recommend only a possible solution in a border negotiation planned for 1752. However, he stressed in his letter that he had warned his superiors at the time that in order to successfully conclude any border convention, the Habsburg authorities would also have to make some territorial concessions to the Moldavian prince.[585]

Luchsenstein's 1770 letter is symptomatic not only of one officer's doubts regarding the success of the Habsburg border demarcation operations. The Habsburg military authorities in Transylvania knew that the action of installing the border pillars in 1769 would not go unchallenged. Based on the incidents the Habsburgs officers reported to Vienna in 1769 and 1770, it is clear that the imperial authorities were especially weary of the reaction of the most recent conquerors of Moldavia: the Russians. With the help of regular border inspections and a network of spies active in Moldavia, the general commander of Transylvania kept his superiors in Vienna informed of any challenges to the border's status quo and asked for guidance on how to ensure the Russians' collaboration.

Approximately a week after planting the "imperial eagles," officers belonging to the military border regiments performed on-site inspections and sent reports about the state of the markers. For example, the commander of the first Szekler Infantry Regiment, Lieutenant-Colonel Carato, wrote to his commander on December 26, 1769, that with one exception, all the border indicators had maintained their position. The exception was the marker located at Obsina Albilor, which Wallach inhabitants from Moldavia had demolished and carried away to the village Hank. Carato added in his report that the main instigator of this anti-Habsburg action,

[585] AN, Brukenthal, 120/RR 1-68, 21, 101.

Szavuka Ioun (or Szavicska Juon), had served for eight years as a Hussar in the Russian army.[586] This small piece of biographical information, deemed worthy enough to be included in the report, could have suggested that the Wallach expressed his support of the Russian occupation of Moldavia and maybe performed this action at the orders of Russian commanders. However, another piece of information Carato included in his letter indicated that other Russian officers had taken a cautious stance with respect to the border markers. For example, a Russian sergeant and two other men had inspected a boundary indicator positioned next to the stream Köszörükö and warned the locally deployed soldiers to ensure that no damage was done to this marker.[587] This decision does not mean the Russian officers accepted the Habsburg imposed status quo.

Indeed, during the month of December, First Lieutenant Philip von Möller, at the time in the service of the Russian Empire, travelled to the mountain pass Rodna and asked the Habsburg border guards about the trajectory of the northern borderline segment and the position of the newly installed boundary markers. Möller even prepared a small sketch showing some key points in the contested borderlands located in the Rodna Valley, reproduced in Figure 5.5. Whereas the engineer mentioned in his message that the Moldavians considered point A, namely the intersection of the rivers *Bistriza* (Bistriţa) and *Zibu* (Țibău), an important boundary feature, he did not express any judgments regarding the points B and C, which marked the first houses on the border and one of the Habsburg border markers, respectively. Instead, he asked the Habsburg officers whether they could indicate on his sketch the trajectory of the borderline not only for the area defined by the points A, B, and C, but also continuing from C up on the Dorna river until the Moldavian settlement Dorna.[588]

[586] HHStA StK, Noten von dem HKR, box 82, fascicle 1, 23-23 verso.
[587] Ibid.
[588] HHStA StK, Noten von dem HKR, box 82, fascicle 1, 16.

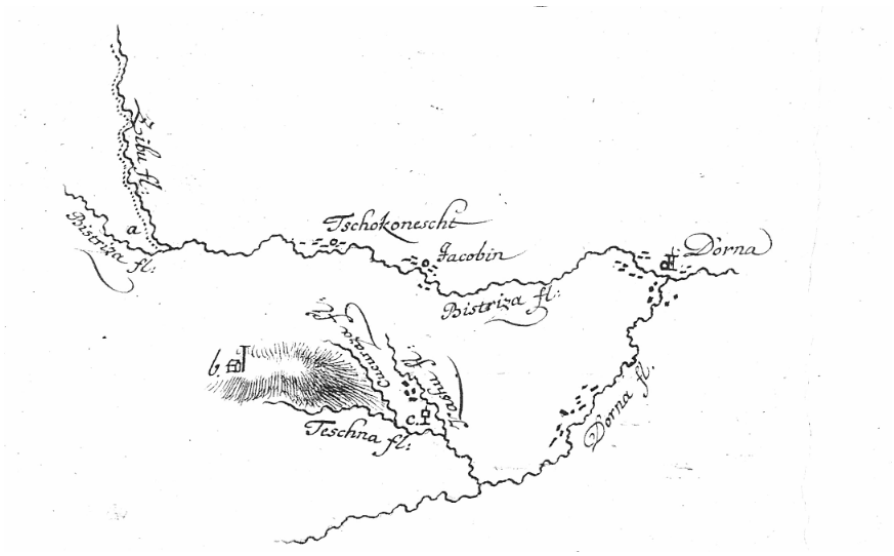

Figure 5.5 Philip von Möller's plan of the Rodna Valley and its surroundings

Möller probably hoped to force the Habsburg authorities to bring into the open their claims on these contested borderlands. However, in early January, 1770, Emperor Joseph II and Chancellor Kaunitz recommended that the military authorities in Transylvania answer all such further queries from Russian officers with the following statement: the Habsburg boundary pillars marked Transylvania's exterior border towards Moldavia and Vienna's army was authorized to use force to defend their position.[589] This seemingly insignificant incident suggests that the Habsburg mapmakers were not the only ones gathering geographic information about the Transylvanian-Moldavian borderlands. Although the new master of Moldavia, the Russian Empire, had no guarantee it would control this province at the end of the war with the Ottomans, it still asserted itself as an important rival in the region.

The Aulic War Council in Vienna took the defense of the border markers seriously, and on January 27, 1770, in addition to regular inspections, ordered the Transylvanian commander to build trenches and guard houses (*blockhäuser*) for the military regiments to use to protect the

[589] Ibid., 33 verso-34.

"imperial eagles." In less than a month, O'Donnell sent to Vienna a copy of Luchstenstein's border map, which included the current position of the border markers and the land areas the Habsburg troops had reclaimed. Transylvania's commander agreed with his superiors that frequent inspections, guardhouses and trenches would in theory help protect the boundary pillars. However, O'Donnell also warned that the rough mountainous terrain and the large distances separating villages from the borderline would impede the border regiments from performing regular inspections and even from being stationed close to the border markers. Therefore, investing resources to build guardhouses and trenches appeared a pointless tactic, especially if the later border treaty with the Ottomans did not confirm the current trajectory of the borderline.[590] O'Donnell wrote this answer to the Aulic War Council based on Luchsenstein's recommendations, proving once again the key role this engineer played in Habsburg policy regarding the regulation of the borderline.[591]

Even though he did not approve the costly project of building guardhouses to defend all individual border markers, the Transylvanian military commander maintained a close watch on the situation of the borderline and continued to report all significant news to Vienna. For example, as soon as the spring of 1770 came, O'Donnell forwarded to his superiors some worrying rumors about the Russian officers' plans regarding the frontier markers.[592] From O'Donnell's report we learn that Corporal Wittibschlager, a Habsburg spy posing as a cattle merchant, traveled into Moldavia at the end of April 1770 and met the Russian Corporal in charge of the area around the town Campolongo. Wittibschlager found out that the Russian army was repairing the road leading from Campolongo to the border markers in the area of Kosnitza. As soon as the snow in the mountains started melting, 800 Russian soldiers planned to travel into

[590] AN, Brukenthal, 120/RR 1-68, 21, 92-93 verso, February 21, 1770, letter to the Aulic War Council, February.
[591] Ibid., February 8, 1770, Luchsenstein, 99-99 verso.
[592] HHStA StK, Noten von dem HKR, box 82, fascicle 1, 411.

the Carpathians to push back the newly installed frontier markers.[593] A message coming from Peter Szilagyi, another Habsburg spy masquerading as a Russian collaborator, confirmed Wittibschlager's intelligence: the Russians were preparing to displace the border markers and challenge Vienna's pretensions.[594] Both spies suggested that this Russian initiative against the border markers was a direct response to Moldavian complaints. The Habsburg informers commented on the enthusiastic support the inhabitants from the Moldavian border town of Dorna had promised the Russian troops in their efforts to get rid of the border markers.[595]

Despite the sense of urgency such news raised from Transylvania all the way to Vienna, the Russians did not take any actions against the Habsburg border markers, possibly because they could not risk infuriating such a key ally for the sake of some border squabbles. As the war campaigns continued throughout the early 1770s, the Russian Empire's military priorities changed; the diplomatic negotiations with Prussia and the Habsburgs regarding what came to be known as the first partition of Poland and the attempt to extend the Russian Empire's influence over Crimea took center stage.[596] Moreover, the concentration of numerous Habsburg troops close to Transylvania's borders convinced St. Petersburg they could not risk a diplomatic rupture with Vienna.[597] Indeed, by the spring and summer of 1773, when Emperor Joseph II travelled to Transylvania and the newly annexed province of Galicia, the Russian forces stationed in Moldavia offered their support for Habsburg cartographic projects in the borderland areas.

The emperor's visit to his easternmost provinces was part of Joseph II's larger effort to travel almost every year to some of the Monarchy's domains and other countries, and Habsburg

[593] Ibid., 418-419.
[594] Ibid., 417.
[595] Ibid., 418-419.
[596] Roider, *Austria's Eastern Question*, 126-127, 138.
[597] Hochedlinger, *Austria's Wars of Emergence*, 351-352.

scholars have analyzed and published numerous documents related to these journeys.[598] In the case of Transylvania, the documents Joseph II wrote during his stay in the province, his itinerary, the projects he initiated, and the reports of the French ambassador in Vienna all suggest the emperor's interest in systematizing the borderline and implementing large-scale mapmaking projects in this area.[599]

The emperor's desire to map not only Transylvania's borderlands, but also a significant territory belonging to Moldavia and Wallachia, could not have become reality without the collaboration of the Russian military commanders. Aware of the importance of maintaining good relationships with the officers of Catherine the Great deployed in Moldavia, Joseph II encountered on the border some of the Russian high officers. On 29 May 1773, Louis René Édouard, Cardinal de Rohan, the French ambassador in Vienna, transmitted with evident worry to Paris the emperor's decision to pass incognito for 24 hours into Moldavia to meet the Russian army's commander, Field Marshal Romanzow. Although this encounter might have happened, Joseph II's official diary does not record such a meeting.[600] However, for June 14, 1773, the emperor recorded a meeting on the border with the Russian General Ingelstroom and a couple of other officers, who also transmitted to Joseph II Romanzow's regards. Additionally, the emperor spent time discussing the evolution of the war with the Habsburg officer Barco, who gave him insight in the Russian army's operations and the situation in Moldavia.[601] Throughout the war

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[598] Bozac and Pavel, *Călătoria împăratului Iosif al II-lea*, vols. I and II; Donnert and Reinalter, *Journal der Russlandreise Kaiser Josephs II. im Jahre 1780*; Hubert, *Le voyage de l'empereur Joseph II dans les Pays-Bas*; Hans Wagner, "Die Reise Josephs II. nach Frankreich 1977 und die Reformen in *Osterreich*," in *Osterreich und Europe*. *Festgabe* fur *Hugo Hantsch zum 70. Geburtstag, ed.* Institut für österreichische Geschichtsforschung und von der Wiener Katholischen Akademie *(*Graz*:* Verlag Styria, 1965), 221-246; Derek Beales, *Joseph II*, vol. 1, 242-271, 359-385, 432-438; Franco Valsecchi, *L'assolutismo illuminato in Austria e in Lombardia*, vol. 2 (Bologna: Nicola Zanichelli, 1931), 318-330.
[599] Veres, "Putting Transylvania on the Map," 152-155.
[600] MAE CP, Autriche, box 321, 367-369.
[601] Bozac and Pavel, *Călătoria împăratului Iosif al II-lea în Transilvania la 1773*, vol 1, 647-649.

Barco acted as one of the main informers for the Habsburg authorities, albeit not clandestinely but in an official capacity, as Vienna's representative among the ranks of the Russian troops.[602]

As part of his responsibilities as the official intermediary between the Russian commander Romanzow and the Habsburg military authorities in Transylvania and Vienna, Barco paid special attention to the process of creating and gathering maps showing the Russian-occupied lands, including Moldavia. For example, in the first half of 1773, Barco sent through First Lieutenant Mutz a map of Moldavia and Wallachia.[603] This map was one of the two cartographic sources that Joseph II analyzed in July 1773 in order to establish whether they showed the Transylvanian-Moldavian borderlands accurately. The emperor's disappointment with the existing maps of Transylvania's borderlands, which lacked a good representation of the road network, motivated him to order a new set of cartographic operations.[604]

Indeed, on July 11, 1773, the new general commander of Transylvania, Baron Johann Franz Preiss, commissioned Barco to inform the commander of the Russian troops, Romanzow, that Habsburg mapmakers would perform surveys in the borderlands and required the Russians' collaboration. In a couple of weeks Romanzow submitted his written agreement to cooperate with Vienna, but also warned Preiss that the Moldavian inhabitants might react aggressively to these border surveys, especially after the 1769 installation of the Habsburg border markers.[605] Despite this warning, taking advantage of the Russian support and prioritizing speed over

[602] During the 1768-1774 Russo-Ottoman conflict, the Aulic War Council in Vienna sent some officers to serve under the banners of both belligerent states. The officers fighting alongside the Russian troops could, due to a prior agreement between Vienna and St. Petersburg reveal their identity. Barco was probably one of these officers. HHStA StK, Vortrage, box 104, 302-308 verso.

[603] KA HKR, 1773 57 64, 1. The 1783 map inventory of the Aulic War Council includes under the category "Turkey" entries for two 1773 manuscript maps, one a representation of Moldavia and the other showing Wallachia. ("General Karte in 3 Sectionen von dem Fürstenthum Moldau und Besarabien gezeichnet" and "General Karte von dem Fürstenthum Wallachey in 3 Sectionen gezeichnet"). It is not possible to establish whether the map of Moldavia was the one Barco sent to Transylvania, but the inventory provides further proof that the Habsburg militaty authorities were gathering maps of Moldavia during the war. KA HKR, 1783 34 60.

[604] KA HKR, 1773 57 64, 2.

[605] HHStA StK, Noten von dem HKR, box 85, fascicle 2, 38-38 verso; 35-35 verso.

accurate geometric surveys, the Habsburg officers under the direction of Jeney finished mapping the borderlands of Transylvania with Moldavia and Wallachia by October 19, 1773.[606]

Even after the Habsburg officers surveyed part of Moldavia's territory, Barco continued to send additional maps of this province. For example, at the end of 1774, Barco sent to Vienna information about the existence of a Russian map, which he called "very precise" (*sehr exact*). According to Barco's communication, the map included part of Poland, Moldavia, Bessarabia, the eastern half of Wallachia and part of Bulgaria, all territory on which the Russian army had fought during the conflict with the Ottomans.[607] Barco managed to obtain a version of this map in German translation from the Russian commander, and the map arrived safely in Vienna at the end of March 1775. Joseph II, who had personally travelled through some of the lands, was not impressed by the quality of this map and commented that it had insufficient details. Nonetheless, the map remained in the Aulic War Council's archives, as attested by the 1783 inventory.[608] This instance proves that, whenever possible, the Habsburg military did not hesitate in gathering cartographic information from their allies. Moreover, the emperor showed a substantial interest in the map collection of the Aulic War Council and was skilled in assessing the value of geographic information included on these maps. Joseph II's attentiveness to enrich his empire's cartographic repository reveals the Emperor's belief that maps could codify and transmit all the way to Vienna the territorial complexity of far-away provinces, and thus assist in decision-making processes.

[606] KA HKR, 1773 57 101. For more details see Veres, "Redefining Imperial Borders," 15-18.
[607] HHStA StK, Noten von dem HKR, box 86, 950 verso, December 13, 1774, Barco to Hadik.
[608] KA HKR, 1775 57 33 per 1, March 29, 1775, Hadik to the Aulic War Council. The 1783 Protocol lists as part of the Turkish section a 1775 manuscript map entitled "General Map in ten sections of Moldavia, Wallachia und Bessarabia, next to the border parts of Poland and Bulgaria" (General Karte in 10 Sectionen von der Moldau, Wallachey und Bessarabien, nebst angränzenden Theilen von Pohlen und Bulgarien), KA HKR, 1783 34 60.

Barco's messages from Moldavia demonstrate that Vienna's officers were not the only mapmakers in the area; the Russians also used their time as temporary occupiers of Moldavia and other nearby provinces to prepare maps of these areas, documents potentially helpful both in the eventuality of a political annexation or of a future military conflict with the Ottomans. The Russians' interest in preparing maps during their military campaigns is not surprising and reflects this empire's increased reliance on cartography as a way to centralize its provinces and expand its borders, in ways reminiscent of the Habsburg Monarchy.[609]

As a trans-imperial process, the mapping of the Transylvanian-Moldavian borderlands and the borderline's demarcation involved not only Vienna and St. Petersburg, but also the Moldavian rulers and their Ottoman protectors.[610] During the spring of 1770, the president of the Aulic War Council decided to notify the Habsburg agent in Constantinople, Johann Thugut, about the border marking operations, so that this ambassador could negotiate with the Porte's representatives the final trajectory of the borderline.[611] In order to ensure he had sufficient information for these high level discussions, Thugut solicited from Vienna detailed maps of the Transylvanian-Moldavian borderlands, including a representation of the frontier line before and

[609] Two works analyzing the relationship between cartography and the evolution of the Russian empire especially for the seventeenth and the nineteenth centuries are Kivelson, *Cartographies of Tsardom*; Seegel, *Mapping Europe's Borderlands*.

[610] From 1711 and 1716, the Greek Orthodox Christian elite from Constantinople loyal to the Ottoman sultans, known as the Phanariots, held the highest positions in the political and administrative hierarchy of Moldavia and Wallachia, respectively. For further information on the Phanariots and the influence of their rulership on the Danubian Principalities see: Christine Philliou, "Communities on the Verge: Unraveling the Phanariot Ascendancy in Ottoman Governance," *Comparative Studies in Society and History* 51, no.1 (2009): 151-181; Stefania Costache, *At the end of empire: imperial governance, inter-imperial rivalry and "autonomy" in Wallachia and Moldavia (1780s-1850s)* (PhD diss., University of Illinois at Urbana-Champaign, 2013); Vasile Mihai Olaru, *Writs and Measures. Symbolic Power and the Growth of State Infrastructure in Wallachia, 1740-1800* (PhD diss., Central European University, 2013).

[611] HHStA StK, Noten von dem HKR, box 82, fascicle 1, 277-280 verso. Throughout the eighteenth century the Habsburg resident in Constantinople played the key role in Habsburg-Ottoman diplomatic discussions. The Ottomans presented their messages for Vienna to this ambassador and so did the Habsburgs. For this reason, during the negotiations regarding the border between Transylvania and Moldavia, and the cession of Bukovina, Kaunitz had to ensure Thugut had all the necessary information, documents and maps, to support the Habsburg claims. Pešalj, "Early 18th-Century Peacekeeping," 30.

after the positioning of the Habsburg border markers. Additionally, the Habsburg agent asked for a representation of the Moldavian land that remained under the Ottoman influence, and a memoir listing all the important toponyms and summarizing the Habsburg territorial priorities in the region. Thugut justified his request for all these cartographic sources because of the lack of any good quality maps in his possession and his inability to locate most of the geographic sites mentioned in his instructions from Vienna.[612]

Relying on Thugut's ability as a negotiator, the Habsburgs desired the discussions take place in Constantinople in order to circumvent the Moldavian authorities, possibly because the local rulers had a very good knowledge of the historical and geographical situation of this province and the borders' situation. Silencing the voice of the Moldavian representatives became even more important from the Habsburg perspective once Joseph II ordered the annexation of the northern part of this Danubian principality, known as Bukovina.[613] However, this did not stop the new Moldavian prince, Grigore III Ghica, from preparing maps of his dominions and sending them to Constantinople in order to counteract the Habsburg claims.[614] On January 4, 1775, the Habsburg representative in Constantinople, Thugut, wrote to Kaunitz that Grigore Ghica had sent to Constantinople a map on which he had marked the territory the Habsburgs occupied in the borderlands since 1769.[615] Furthermore, the Moldavian prince included on this map a possible territorial solution to connect the Habsburg lands in Galicia with Transylvania that would have not required the cession of Bukovina.[616] In the first months of 1775 Ghica sent at least two

[612] February 3, 1773, Thugut to Kaunitz, Hurmuzaki, *Documente*, vol 7, 99.
[613] For more details on how Joseph II's journey to Transylvania and Galicia, together with the geographical situation of the area, influenced the emperor's decision see Mihai-Ştefan Ceauşu, *Bucovina Habsburgică de la anexare la Congresul de la Viena. Iosefinism şi postiosefinism (1774-1815)* (Iaşi, Romania: Fundaţia Academică A.D.Xenopol, 1998), 52-59; Veres, "Putting Transylvania on the Map," 153-154.
[614] Grigore Ghica became the new Moldavian prince in the Fall of 1774. November 19, 1774, Grigorie Ghica to Thugut, Hurmuzaki, *Documente*, vol. 7, 108.
[615] Ibid., 114, January 4, 1775, Thugut to Kaunitz.
[616] Ibid., 130, February 3, 1775, Thugut to Kaunitz.

additional maps showing how the Habsburgs had abusively moved the border markers in order to take over Bukovina.[617]

The Habsburg representative failed to obtain copies of Ghica's maps but through one of his connections in Constantinople managed to view some of these documents and sent brief descriptions back to Vienna.[618] The efforts of Ghica to support Moldavia's territorial claims followed steps similar to those of the Habsburg side, and included the preparation of cartographic material. Thugut warned his Viennese superiors that the Aulic War Council's subordinates implementing the annexation of Bukovina were wrong in assuming that the Moldavians were ignorant with respect to the situation of the borderlands and the position of the border markers.[619] Clearly, the Habsburg eventual success in imposing their claims and annexing the northern part of Moldavia was not due to their neighbors' ignorance or inability to prepare cartographic material. Maria Theresa and her advisers prevailed because in the diplomatic game of large empires, the interests of small principalities such as Moldavia often suffered.

The final Habsburg-Ottoman convention, signed on May 7, 1775, confirmed Moldavia's cession of Bukovina and the trajectory of the Transylvanian-Moldavian borderline as desired by the Habsburgs.[620] The Convention also included under the third article the specification that "the inhabitants of Moldavia and Valachia, through their incessant usurpations, had trespassed the frontiers and the borders of Transylvania" and only recently had these lands been reunited with the Habsburg province through the placement of border markers. Therefore, the sultan ordered

[617] Ibid., 135, 142, February 17, 1775, Thugut to Kaunitz; March 4, 1775, Thugut to Kaunitz.
[618] Ibid., 142, March 4, 1775, Thugut to Kaunitz.
[619] Ibid., 136, February 17, 1775, Thugut to Kaunitz.
[620] Ceauşu, *Bucovina Habsburgică*, 56-59. Daniel Werenka published and analyzed numerous documents from Viennese archives regarding the Habsburg annexation of Bukovina. Daniel Werenka, "Bukowinas Entstehen und Aufblühen: Maria Theresias Zeit," *Archiv für Österreichische Geschichte* 78 (1892): 101-296.

the Moldavian and Wallachian princes to respect the borders marked with the imperial eagles and represented on the Habsburg map sent to Constantinople.[621]

Indeed, the Convention included an official map showing the trajectory of the borderline and the position of the boundary markers as installed by the Habsburgs at the beginning of the Russo-Ottoman war. Commissaries representing the Habsburg and Ottoman rulers were sent on the ground to verify the position of the markers in relationship with the map.[622] Figure 5.6 reproduces a fragment of a copy of this official map.[623] The red borderline shows the status quo before the Russo-Ottoman war and the land patches illuminated with green represent what the Habsburgs occupied in 1769. As shown on this map fragment, the border markers annotated with red ovals served the Habsburg expansionist goals and their position helped the Viennese rulers claim part of Moldavia's territory.

[621] "Comme les habitants de la Moldavie et de la Valachie, par des usurpations successives, ont envahi sur les frontières et les limites de la Transylvanie, le long des confins de la Moldavie et de la Valachie, différents terrains, lesquels ont été ensuite réunis, depuis quelques années, à ladite province de Transylvanie par le placement des aigles; afin d'obiver à toute dispute et contestation qui pourrait s'élever dans l'avenir et conformément à la demande faite par la Cour impériale, il a été statué sur cet objet, du commun accord des deux parties, qu'il sera adressé de la part de la Sublime-Porte aux princes de Moldavie et de Valachie ce qui est nécessaire d'ordres rigoureux pour que les limites dans les susdites parties soient observées à perpétuité telles qu'elles sont indiquées et distinguées dans la carte qu'a présenté l'internonce et ministre plénipotentiaire de LL. MM. II. Et RR. A., et comme elles se trouvent déterminées actuellement par les aigles qu'a fait placer la Cour impériale, et pour que lesdits princes s'abstiennet de toute transgression et violation qui seront contraires à ce présent règlement." Reproduced in Ignaz Testa, Alfred Testa, and Leopold Testa, *Recueil des traités de la Porte ottomane avec les puissance étrangères, depuis le premier traité conclu, en 1536, entre Suléyman I et François I jusqu'à nos jours*, vol. 9, *Autriche* (Paris: Amyot, 1898), 128-129.
[622] Ibid., 127-128, Article 1 of the May 7, 1775 Convention.
[623] KA KPS, B IX c 756.

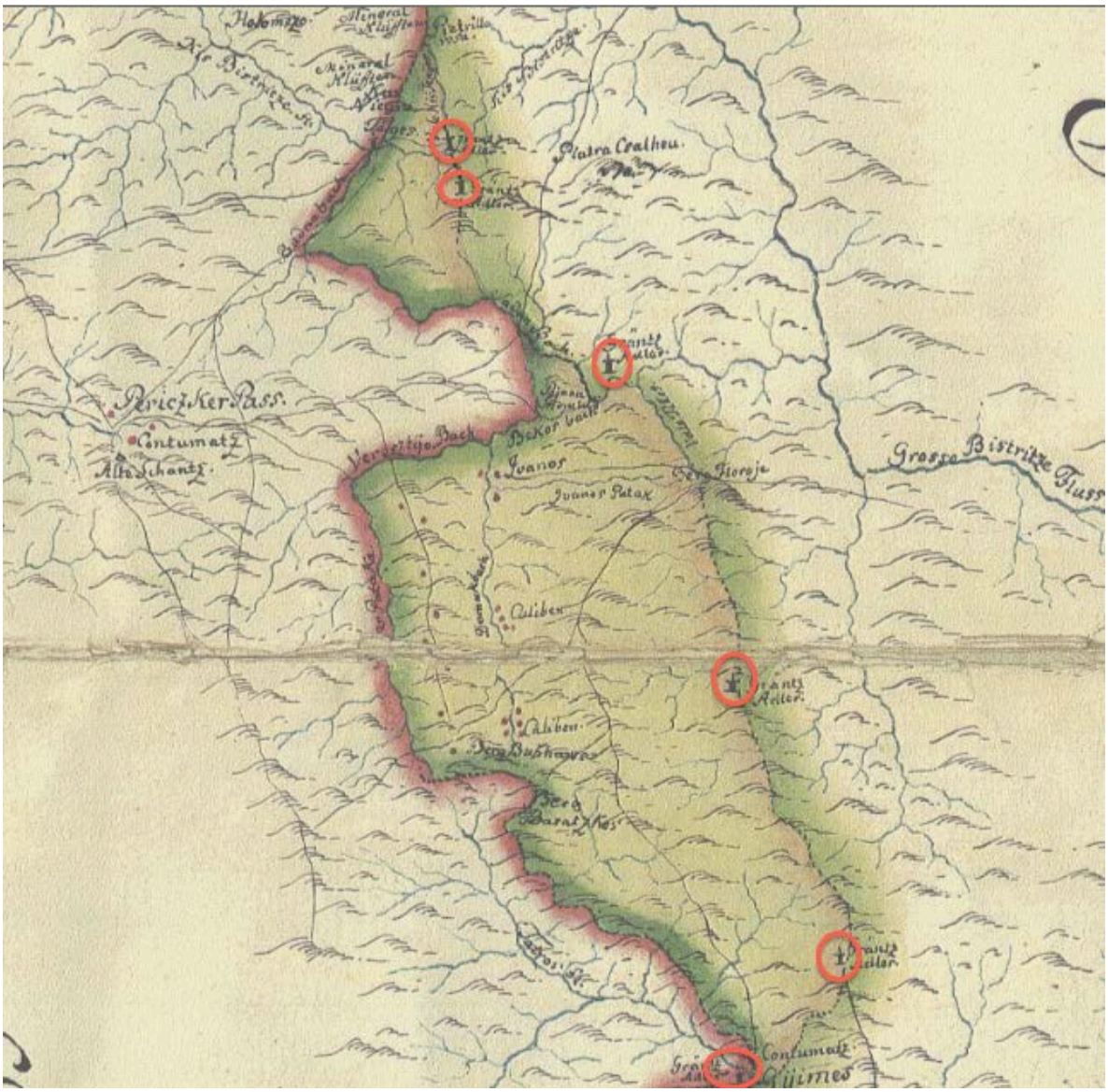

Figure 5.6 Detail from the map accompanying the 1775 Habsburg-Ottoman Convention

Looking for the cartographic sources that influenced the preparation of the 1775 convention map takes us back to Luchsenstein's border maps, which the imperial authorities had shared with their representative in Constantinople. When Thugut complained in 1773 that he had no good map showing the border between Transylvania and Moldavia, Kaunitz sent him all required materials.[624] Although Kaunitz does not specifically state in his letter that the surveyor of the border maps he was sending to Constantinople was Luchsenstein, shortly after the signing of the convention, he received back from Thugut detailed reports of Luchsenstein regarding the borders of Transylvania with the Danubian Principalities, together with three of Luchsenstein's maps.[625] Clearly, the work of the Transylvanian mapmaker had served to establish the borderline and the version of the final convention map in favor of the Habsburg rulers.

In addition to preparing maps and memoirs to support the Habsburg territorial claims in Transylvania's borderlands, Luchsenstein organized a massive collection of legal and historical documents that constituted the backbone of his argumentation that traced back in time the border incidents and negotiations between Transylvania and the Danubian Principalities. On October 29, 1781, Luchsenstein wrote a detailed report in which he explained how he organized 851 documents in 29 fascicles in order to avoid any future confusions or loss of documents.[626] It is impressive that the archives in Sibiu still have 27 of these fascicles preserved in the same way

[624] February 3, 1773, Thugut to Kaunitz, and January 6, 1775, Kaunitz to Thugut, Hurmuzaki, *Documente*, vol. 7, 98, 121.

[625] In February and March 1777 the State Chancellery in Vienna returned to the Imperial War Council Archive two Luchsenstein memoirs regarding the contentious border areas between Transylvania and the Danubian Principalities, 34 fascicules with documents defending the Transylvanian pretensions in the contested regions, and three border maps. All these documents had been used by the Habsburg representatives during the negotiations with the Ottomans regarding the new trajectory of the Transylvanian borders and the Habsburg annexation of the northern part of Moldavia, Bukovina. Based on the material I have located in the archives in Sibiu and Vienna I believe the two memoirs were the ones Luchsenstein finalized in 1770 and 1771. HHStA StK, Noten an den HKR, box 7, February 18, 1777 and March 10, 1777, State Chancellery to the Aulic War Council.

[626] AN, Brukenthal, 106/L 1-8, 216.

Luchsenstein arranged them in the early 1780s.[627] Luchsenstein's attention to building a documentary archive supporting the position of the Habsburg imperial borderline reveals that although maps had become essential during inter-state negotiations as accompanying documents, they had to rely on documentary support. However, as revealed by the case of the Habsburg annexation of Bukovina in 1775, it was primarily cartographic sources and first-hand knowledge of the territory, and not the existence of legal or historical argumentation, that convinced Emperor Joseph II of the need to occupy this area. Moreover, Luchsenstein's superiors did not possess an in-depth knowledge of the written documents, but based their decisions on the cartographical version of the argumentation as presented on this engineer's border maps.

The process of border demarcation for the frontier separating the Habsburg province of Transylvania from Moldavia had a happy ending for Vienna because of the unequal power relationship between this empire and the weak neighboring Danubian Principality. Additionally, the Russo-Ottoman war offered the perfect justification for the Habsburg deployment of additional troops in Transylvania and for taking additional measures to protect the imperial borderline, such as mapping the area and positioning border markers. However, as shown in the last two chapter sections, the Habsburg officers were not the only cartographers in the region. The Russian commander and the Moldavian princes understood the power of maps to influence the future of a territory and initiated their own cartographic projects. Whereas in the 1750s the Habsburg and Moldavian cartographic traditions used different conventions and ways of representing the borderlands, the border maps prepared as appendices to the Habsburg-Ottoman convention from 1775 had adopted Vienna's cartographic language as the accepted "scientific" method to represent territories.

[627] AN, Brukenthal, 108/M 1-5, 1-5 for the borderlands with Moldavia, and AN, Brukenthal, 108/M 1-5, 6 for the borderlands with Wallachia.

5.2 THE PURSUIT OF PRECISION: THE QUEST FOR TRACING A CLEAR BORDERLINE BETWEEN THE AUSTRIAN NETHERLANDS AND FRANCE

5.2.1 The Habsburg-Bourbon 1769 Border Treaty

In 1769, the same year that the imperial authorities in Vienna ordered unapologetically and unilaterally the installation of border markers on Transylvania's frontier, Maria Theresa signed a bilateral border treaty with French king Louis XV to initiate the regulation of the Austrian Netherlands-France borderline. Whereas in the case of Moldavia, the Habsburgs took advantage of their strong position in the area to impose a fast denouement greatly advantaging their own interests, in their negotiations with France Maria Theresa and Joseph II could not pursue the same path. Instead, bilateral commissions ensured the correct implementation of the 1769 border treaty and, in the case of conflicting interpretations of the convention's articles, safeguarded the interests of both states.

As the border demarcation between France and the Austrian Netherlands left behind thousands of documents, scholars, especially from France and Belgium, have published insightful books and articles analyzing and interpreting the process of this borderline's transformation and its political and economic implications.[628] However, although they

[628] The most informative works including an in-depth discussion of the Habsburg-Bourbon border negotiations and demarcations in the second half of the eighteenth century are d'Albissin, *Genèse de la frontière franco-belge*; Dubois, *Les Bornes Immuables de l'Etat*. Other works containing useful discussions of the 1769 and 1779 border treaties are Firmin Lentacker, *La Frontière Franco-Belge. étude géographique des effets d'une frontière internationale sur la vie de relations* (Lille: le Ministère de l'Education Nationale et la Chambre de Commerce et d'Industrie de Lille-Roubaix-Tourcoing, 1974); Claire Lemoine-Isabeau, "Limites sur les Cartes Anciennes et Cartes des Limites," in *Cartes et plans anciens. Sources pour la géographie historique des Pays-Bas méridionaux (XVIe-XVIIIe siècles)*, eds. H. Van der Haegen, F. Daelemans, and E. Van Ermen (Brussels: Archives et Bibliothèques de Belgique, 1986), 277-290; Marcel Watelet, *Paysages de Frontieres. Tracés de limites et levés topographiques XVIIe-XIXe siècle* (Paris: Duculot, 1992). Marcel Watelet also examined in another article how the cartographic material prepared in connection with the border treaties of 1769 and 1779 influenced the diplomats in their decision-making process by revealing the economic implications of the new borderline in relationship with the

sometimes briefly mention the existence of similar border demarcation enterprises in Europe at the time, all of these specialists analyze the case of the French-Austrian Netherlands frontier in isolation. In contrast to these earlier studies, I analyze the formation of this borderline in the larger context of Habsburg attempts in the second half of the eighteenth century to regulate their imperial frontiers. It is outside the scope of this chapter section to perform an exhaustive discussion of all territorial changes that occurred between the Austrian Netherlands and France as a result of the 1769 and 1779 treaties, especially because other historians have devoted in-depth studies to this topic. Instead, the next pages bring to the forefront a series of instances revealing the importance of cartography for both negotiating parties during preliminary discussions and post-treaty border demarcations. As with the already discussed delimitation of the Transylvanian-Moldavian boundary, the Viennese authorities prepared maps in order to defend their border claims and gain the upper hand in the negotiations.

In her survey of the evolution of the French-Belgian border between 1659 and 1789, Nelly Girard d'Albissin demonstrates that the 1769 and 1779 treaties signed between Versailles and Vienna consecrated the trajectory of a continuous borderline and eliminated enclaves in the borderlands. D'Albissin argues that for the first time in the history of Habsburg-Bourbon border settlements, the negotiations preceding these two bilateral agreements and the treaties' implementation relied heavily on the work of professional mapmakers.[629] D'Albissin underscores the chronological juxtaposition between new developments in the field of what she calls "cartographic science" and the establishment of a linear border with a precisely determined

road network for three cases: the road from Sedan to Liège, the road from Givet to Dinant, and the transit over the domains of Chimay and Beaumont. Marcel Watelet, "Production cartographie et enjeux diplomatiques le probleme des routes et de la frontiere entre les Pays-Bas autrichiens et la France (1769-1779), *Imago Mundi: The International Journal for the History of Cartography* 50, no.1 (1998): 84-95.

[629] D'Albissin, *Genèse de la frontière franco-belge*, especially chapter 5, "Les Traités de Limites Franco-Autrichiens et Franco-Liégeois au XVIIIe siècle," 299-363.

trajectory. Although taking a cautious stance and claiming that "the existence of maps was far from being indispensable for a precise delimitation [of the borders]," d'Albissin acknowledges that "the evolution of the borders' conceptualization and the evolution of the cartographic science reinforced each other and helped each other progress."[630] Indeed, the time frame between 1760s and the 1780s marked an increased interest in both Versailles and Brussels in using maps as an essential accessory for border negotiations.

The existence of sufficient surveyors and engineers trained in the art of mapmaking was a significant factor that allowed the two Courts the luxury of commissioning numerous cartographic representations of the boundary areas. As shown in chapter 2, during the eighteenth century, both Versailles and Vienna developed educational establishments for the training of civil and military engineers, who were then organized in special engineering corps. Therefore, it is not surprising that many of the authors of border maps for the Austrian Netherlands-France frontier belonged to the military engineering brigade of the Austrian Netherlands or the French corps of the *Ponts et Chaussées*. Whereas in the case of Transylvania the figures of Stephan Lutsch von Luchsenstein and Mihály Lajos Jeney dominated the cartographic production for the province's borderlands, the Austrian Netherlands had a more numerous corps of highly skilled mapmakers. For example, a 1772 muster list of the Austrian Netherlands engineering brigade contained 31 individuals, including Nicolas Bergé, Claude Fisco, Philippe Mahieu, and François Weess, who each signed at least one map used during the border negotiations and demarcations.[631]

[630] "l'existence de cartes était loin d'être indispensable à une délimitation precise;" "l'évolution de la conception des frontières et l'évolution de la science cartographique se sont prêtées un mutuel concours et se sont fait progresser l'une l'autre." Ibid., 314.
[631] KA GHA, 1772 23 1.

In addition to having numerous military engineers capable of drawing maps based on geodetic measurements, the Austrian Netherlands also had an institution devoted to addressing border conflicts. Created in 1740, the Giunta of Contested Lands (*Jointe des Terres Contestées*) was in charge of preparing and preserving documentation to support the Austrian Netherlands' cause in cases of territorial controversies. This institution included functionaries that already occupied key positions in the provincial administration, such as the president of the Privy Council or the chancellor of Brabant. For example, in 1749, Patrice-François de Neny, president of the Privy Council between 1758 and 1783, and one of the most significant voices in the border negotiations with France during the 1760s and 1770s, joined this institution.[632] Additionally, Henri Delplancq, in charge of customs' policies and member of the Finance Council, entered the Giunta in 1769, and thus contributed to a better understanding of the economic implications of territorial exchanges.[633] Whereas in the case of Transylvania, military officers like Stephan Lutsch von Luchsenstein, and the general military commanders of the province took charge of the border demarcation and the preparation of supporting material to justify the Habsburg actions, the Austrian Netherlands had a more complex institutional structure for addressing such issues.

For the borderline between Transylvania and Moldavia we encountered the first detailed maps in the early 1750s. However, although the cartographic tradition for the Austrian Netherlands-French frontier was seemingly richer, the maps prepared prior to the 1760s offered a misleading image of the borderline. Indeed, printed maps originating both in Paris and Brussels in the first part of the eighteenth century and including the frontier between France and the

[632] Etienne Hélin, Jozef Grauwels, Marie Rose Thielemans, *Inventaire des archives de la Jointe des Terres Contestées* (Brussels: Archives générales du Royaume, 1952), 7-8. For a biography of Patrice-François Neny see Bruno Bernard, *Patrice-François de Neny (1716-1784). Portrait d'un Homme d'Etat* (Brussels: Editions de l'Université de Bruxelles, 1993).
[633] Watelet, "Production Cartographie et Enjeux Diplomatiques," 89.

Austrian Netherlands grossly simplified the situation by showing a linear borderline and ignoring the existence of numerous enclaves.[634] Even the 1777 printed version of the first detailed topographic survey of the Austrian Netherlands directed by Ferraris included a disclaimer warning the viewer that any errors in the representation of borderlines were due to the negligence of the mapmaker and did not prejudice in any way the rights and pretensions of the Habsburg rulers or of their political neighbors.[635]

The simplification on paper of the complex situation of the borderlands did not reflect the disinterest of Vienna and Versailles, but the Courts' desire to avoid a diplomatic incident, especially as after the early 1750s they became seriously involved in negotiating border treaties and demarking a clear trajectory of the frontier. The discussions about reaching a borderline settlement had started shortly after the Viennese Habsburgs took over the Austrian Netherlands in 1714, but no agreement could be reached for decades, especially because Versailles and Vienna confronted each other in various wars.[636] The 1756 alliance between Vienna and Versailles marked a watershed in the Habsburg policy towards France and also eased the way for the success of a border treaty between these two powers.

Indeed, after the end of the Seven Years' War (1756-1763) negotiations were accelerated as both sides agreed that instead of discussing each small conflict separately, they would adopt some general principles in retracing their common borderline and would strive to eliminate all enclaves through territorial exchanges.[637] Already in 1760, Georg Adam von Starhemberg, at the

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[634] The most famous examples include the maps of Eugène-Henri Fricx (printed in Brussels) and Nicolas de Fer (printed in Paris). Lemoine-Isabeau, "Limites sur les Cartes Anciennes et Cartes des Limites," 278.
[635] Dubois, *Les Bornes Immuables de l'Etat*, 290.
[636] D'Albissin, *Genèse de la frontière franco-belge*, 292-297; Lentacker, *La Frontière Franco-Belge*, 14-16. A memoir prepared on March 12, 1752 in the Austrian Netherlands summarizes the failed attempts from the first half of the eighteenth century to reach a border convention with France. AGR SEG, box 1407, 32. For more documents related to border negotiations between 1716 and 1750 see AGR SEG, box 1406.
[637] A French memoir, probably written in 1768, summarizes the evolution of the negotiations between Vienna and Versailles and credits part of the progress of the discussions to the Habsburg ambassador in France, Count Mercy

time Habsburg ambassador in Paris and from 1770 plenipotentiary minister of the Austrian Netherlands, had transmitted his Court's hope to eliminate all enclaves from the borderlands in order to eradicate all future contestations and establish a stable frontier.[638] The Habsburg overtures had the full support of Étienne-François Duke de Choiseul, who combined in his person the positions of French Minister of War and of Foreign Affairs.

Before rising to the top of the Versailles political hierarchy, Choiseul had served as French ambassador in Vienna and had cultivated a friendly relationship with Maria Theresa and her advisers.[639] Therefore, in January 1768, when the Habsburgs approached the new French ambassador, Durfort, with a proposal to implement a clear border demarcation between Austrian Netherlands and France, Choiseul offered his full support.[640] Replying to Kaunitz's proposal from February 8, 1768 to resume the discussions for a border convention, Choiseul reconfirmed the French king's desire to shorten the negotiations by refraining from discussing each contestation independently. Instead, the French Minister suggested using a map of the area so that the two sovereigns could agree on the new trajectory of the borderline, and later phrase the articles of the treaty based on this newly established frontier.[641] It is significant that the Court of Versailles agreed to replace a discussion based on juridical arguments with one taking into the account the political interests of the two sides and that Choiseul envisioned a border map a necessary prerequisite for the negotiation.[642]

The Habsburg side disagreed with Choiseul's approach to simply draw a straight borderline on a map and then figure out the details of the treaty, as each section of the frontier

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[full name], and his ability to persuade Kaunitz and Maria Theresa of the necessity of concluding a border treaty. MAE Limites, Pays Bas, box 97.

[638] D'Albissin, *Genèse de la frontière franco-belge*, 301.

[639] Ibid., 300.

[640] MAE CP, Autriche, box 309, 11, January 6, 1768, Durfort to Choiseul.

[641] AGR CAPB, box 687, February 8, 1768, Kaunitz to Choiseul; Ibid., February 25, 1768, Choiseul to Kaunitz.

[642] MAE Limites, Pays Bas, box 97, French memoir, 1768[?].

encompassed settlements and valuable land.[643] However, Kaunitz, Maria Theresa and Joseph II most likely agreed with the idea of preparing cartographic material to help with the negotiations, as they had used this approach successfully for some of their other imperial borders. Also, the president of the Austrian Netherlands' Privy Council, Neny, complained in 1766 that the Giunta of Contested Lands had no suitable maps that could help with the negotiations.[644] Clearly, the Habsburg authorities understood the urgency of commissioning a border map for the Austrian Netherlands' southern frontier.

Although, to our knowledge, no official order commissioning such a map has survived, the archives in Vienna and Paris house at least four copies of a map entitled *Map to use for the negotiation of a border treaty between France and the [Austrian] Netherlands* (*Carte pour servir à la negotiation d'un traité de Limites entre la France et les Pays-Bas*).[645] None of this map's copies include the date of their production, but other archival documents suggest the time interval to be 1766 to 1769.[646] Moreover, if we consider this map the result of the exchange of letters between Kaunitz and Choiseul, we can assume a production date of some time after February 1768 and before May 1769, when the two Courts signed the border treaty. Military engineers belonging to the Austrian Netherlands' brigade signed three of the copies of this map. Therefore, on one hand, it would be plausible to argue that the original map was a Habsburg creation, and that Vienna sent a copy to Paris so that both Courts were on the same page regarding the status quo of the borderlands before signing a treaty. However, on the other hand,

[643] AGR CAPB, box 687, March 24, 1768, Kaunitz to Mercy.
[644] Dubois, *Les Bornes Immuables de l'Etat*, 286.
[645] Copy signed by Claude Fisco: KA KPS, BVc050-01a. Copy signed by François Weess: Paris, Archives Nationales (hereafter AN), N III Pays-Bas, 2. Unsigned copy: SHD, J 10 C 647. Copy signed by Philippe Mahieu, AGR CAPB, box 687.
[646] I compared the ranks of the authors of this map's copies with information about their careers from a 1772 muster list of the Austrian Netherlands engineering brigade. KA GHA, 1772 23 1. Claire Lemoine-Isabeau mentions the Weess map and dates it at some point between 1766 and 1769, Lemoine-Isabeau, "Limites sur les Cartes Anciennes et Cartes des Limites," 285. Marcel Watelet dated the Fisco and the Weess maps date to 1766. Watelet, *Paysages de Frontieres*, 50.

these three replicas could have been based on a French original, especially as the fourth copy of the map included no signature and is preserved in Paris today.[647] Moreover, a document forwarded by the Austrian Netherlands' government to the French representative in Brussels in November 1769 mentioned the existence of a French map, whose title started with the words *Map to use for the negotiation* (*Carte pour servir à la negociation*).[648]

A closer look at the map used to help during the negotiation process between Versailles and Vienna reveals the complexity of the borderlands situation. Not only were some of the Habsburg and French lands surrounded by their neighbors' territories, but the boundary areas also included domains belonging to the Bishopric of Liège, the Duchy of Bouillon, and a series of neutral and controversial terrains. Figure 5.7 shows two details from Claude Fisco's copy of this map that illustrate the difficulty of establishing a clear borderline without performing territorial exchanges. The left-side fragment includes a small section of the border showing only domains belonging to Versailles and Vienna; the color red marks French territories, whereas green denotes Habsburg lands. The right-side image brings to the forefront an even more intricate situation. In addition to the two negotiating Courts' territories, the mapmaker marked with blue the domains of the Bishopric of Liège, and with yellow the lands contested between the Habsburgs and the Electorate of Trier.[649]

[647] Unsigned copy: SHD, J 10 C 647.
[648] The document states that the map omitted the inclusion of the village Rumel, in the proximity of villages Neufmanil, Cons-la-Grandville, and Gernel. An examination of the Fisco and Weess maps confirms the omission of the village Rumel. MAE Limites, Pays Bas, box 110, 125 verso, November 23, 1769, the Austrian Netherlands' government to de Bon.
[649] KA KPS, BVc050-01a.

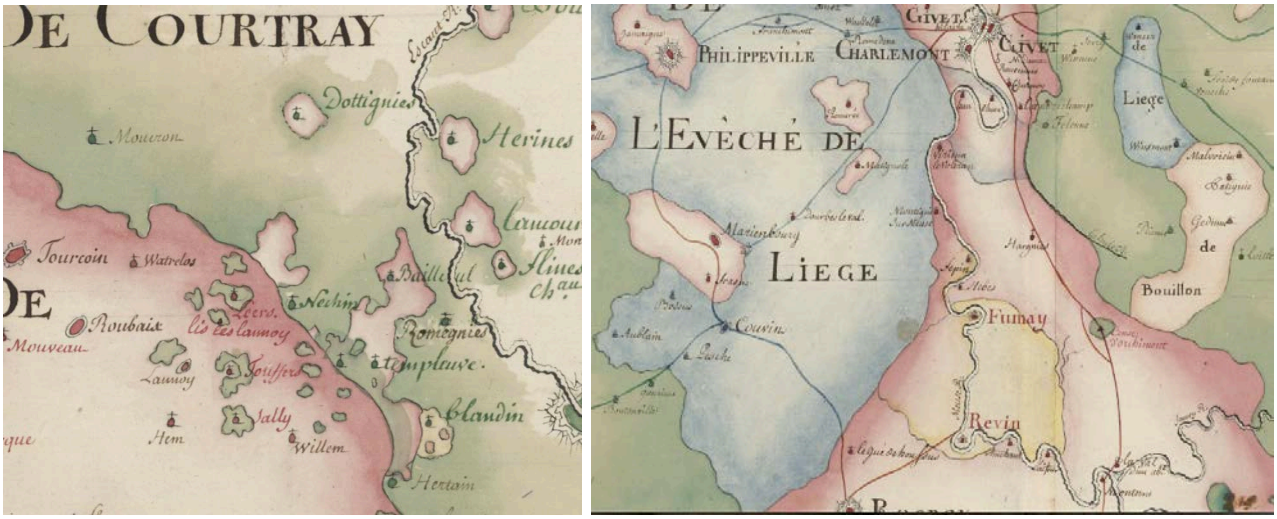

Figure 5.7 Details from Claude Fisco, *Map to use for the negotiation of a border treaty between France and the [Austrian] Netherlands*

These two small fragments reproduce only a small section of the borderline, and, as revealed during the implementation of the 1769 border treaty, failed to encompass all the settlements and enclaves in the borderlands. Nonetheless, the "Map to use for the negotiation" influenced significantly the phrasing of the articles included as part of the May 13, 1769 border treaty.[650] The map most likely helped decide a series of territorial exchanges that simplified the tracing of the borderline.[651] Moreover, the visualization of the high number of enclaves in the boundary areas between France and the Austrian Netherlands probably encouraged the negotiators' commitment to eradicating both already identified and unknown enclaves.

Indeed, article 27 consecrated the two Courts' desire to extinguish all possible territorial controversies by creating a continuous, linear borderline and eliminating all enclaves. As per the treaty's wording: "The intention of the two high signatories being to eliminate all enclaves from their possessions, from Moselle to the Sea, they have decided, in addition to what was stipulated regarding this issue by articles VII, IX, XIV and XVIII of this Convention, that they will

[650] D'Albissin, *Genèse de la frontière franco-belge*, 301.
[651] SHD, A. 3685, document 42.

reciprocally yield to each other, by means of exchanges, the enclaves unknown until the present, which might be located in their territories, outside the borderline as fixed by the above mentioned four articles."[652] This article implied that commissaries sent by the two sides to implement the exchanges of territories in the border area had to look for all enclaves unknown prior to the 1769 treaty and had to find the best way to exchange them without prejudicing the interests of any of the two Courts. [653]

This article represented a turning point in the Versailles-Vienna negotiations regarding fixing the borderline between France and the Austrian Netherlands, as it made clear the two powers' desire to eliminate all territorial overlaps, even if that meant exchanging jurisdictional rights for some of the communities. As Sahlins shows for the case of the border between France and Spain in the eighteenth century, the early modern states in this period were moving away from a jurisdictional to a territorial understanding of sovereignty.[654] Ideally, the commissaries should have also ensured the exchange of unknown enclaves. However, as the situation was more problematic on the ground and an easy understanding could not be reached, the two Courts reopened the negotiations and signed an additional treaty in 1779. Still, the work of these commissaries was important for the negotiations as they helped prepare multiple maps of the border areas, which then influenced the course of the trans-imperial discussions.

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[652] "L'intention des Hautes Parties Contractantes étant de ne laisser subsister aucun enclavement dans leurs possessions respectives, depuis la Moselle jusqu'à la Mer, Elles sont convenues expressément outre ce qui est stipulé à cet égard par les articles VII, IX, XIV et XVIII de la présente Convention, qu'elles se céderont réciproquement, moyennant des échanges, les enclaves jusqu'à présent inconnues, qui pourroient se trouver dans les territoires respectifs, hors de la ligne des limites, fixée par les quatre Articles susdits." cited in D'Albissin, *Genèse de la frontière franco-belge*, 302.

[653] The Habsburg government in Brussels delegated four commissaries for the treaty implementation: Gerden, the president of the Council of Luxembourg, for Luxembourg; Martin de Müllendorff, the president of the Council of Hainaut, for Hainaut; Louis François Vandergracht, great bailiff of Tournay and Tournaisis, for Tournaisis and Jean François Dierix, fiscal counsellor, for Flanders. September 15, 1769, the Austrian Netherlands' government to Versailles, MAE Limites, Pays Bas, box 108, page 30. The French team of commissaries included Antoine Louis François le Fevre de Caumartin, Louis Gabriel Taboureau des Réaux, and Charles Alexandre de Calonne, each in charge of ensuring the implementation of the 1769 border treaty for the French administrative subdivisions. MAE Limites, Pays Bas, box 107, 410-410 verso, August 20, 1769, Choiseul.

[654] Sahlins, *Boundaries*, 3-4

The official orders for the imperial commissaries included some instructions regarding land surveys for the implementation of the treaty. For example, Minister Choiseul ordered the French commissaries that in addition to tracing on-site the new trajectory of the borderline, they had to prepare topographic maps and eliminate all other possible contestations in the borderlands. [655] Throughout his assignment, Louis Gabriel Taboureau, the French commissary for the province of Hainaut, had access to the services of engineers and geometers deployed in the province to help him prepare with the survey and mapmaking of the boundaries. Additionally, the king authorized Taboureau to identify any enclaves unknown before the signing of the 1769 treaty and execute territorial exchanges in collaboration with the Habsburg representative.[656]

In the first stage of the treaty's implementation, though the French commissaries had full power to implement the exchange of unidentified enclaves, the Habsburg representatives had no such authority.[657] However, on November 20, 1769, after pressure from Versailles, Maria Theresa finally agreed to confer on the Habsburg commissaries full authority to implement article 27 of the 1769 treaty.[658] Despite the large prerogatives given to their commissaries, by the end of 1769 both Courts understood that article 27 was insufficient to ensure the establishment of an uncontested borderline and eliminate all enclaves. For a while, the French government still hoped to use the reports, including maps and plans that the commissaries had prepared during the treaty's implementation, to draft an addition to the border convention encompassing the new exchanges of territories without having to reopen the negotiations at top level.[659] However, the

[655] MAE Limites, Pays Bas, box 107, 410-410 verso, August 20, 1769, Choiseul.
[656] Ibid., 408-409 verso, August 20, 1769, Royal commission for Taboureau.
[657] MAE Limites, Pays Bas, box 108, 221-221 verso, October 15, 1769, Choiseul to Mercy; MAE CP, Pays-Bas, box 167, 326-327, October 23, 1769, de Bon to Choiseul.
[658] AGR CAPB, box 680, 196-199, November 20, 1769.
[659] MAE CP, Pays-Bas, box 167, 359-359 verso, December 22, 1769, Choiseul to de Bon.

Viennese Court remained adamant in refusing to perform new territorial modifications simply based on a discussion between the commissaries in charge of the 1769 treaty's implementation. Instead, the Habsburgs managed to persuade Versailles of the importance of signing an additional border convention stipulating the exchange for newly identified enclaves.[660]

5.2.2 The implementation of the 1769 Border Treaty and the discovery of new enclaves

In order to understand the reasons for which the two Courts agreed to resume the diplomatic negotiations at the highest level regarding their shared border, we need to explore some of the situations the commissaries encountered on-site during the 1769 Treaty's implementation phase. The next pages explore two such cases, one from the borderlands of the Austrian Netherlands' region of Flanders, and one from the region of Tournaisis. These two examples illustrate how cartographic material prepared on-site influenced the development of inter-governmental discussions in Brussels between the French representatives in this Habsburg province and the ministers of the Austrian Netherlands.[661]

On the borderlands of Flanders, the Habsburgs controlled some enclaves within the French territory in the area of Warneton. Looking at Figure 5.8, which shows a detail of the Fisco copy of the map used to prepare the 1769 treaty, and on which the color green marks the Habsburg domains and red denotes the French possessions, we can see the Warneton enclaves in the bottom left of the image. Versailles had been trying to obtain control of this land since at

[660] D'Albissin, *Genèse de la frontière franco-belge*, 303-304

[661] As archival material from Brussels and Paris reveals, the most significant negotiators that influenced the shape of the articles encompassed in the 1779 border treaty were on one side, the French representatives in Brussels (the Baron de Bon until 1774, Jean-Balthazar d'Adhémar from 1774 until the signing of the treaty in 1779) and until 1772 the *jurisconsulte* of the French king Christian-Frédéric Pfeffel, and on the other side, the president of the Austrian Netherlands' Privy Council, Patrice-François de Neny. These individuals worked under the tight supervision of the French foreign minister and the Habsburg Chancellor Kaunitz.

least 1716, but it took more than half a century to agree on a proper compensation to offer to Vienna. Articles 12 and 13 of the 1769 border convention finally established that in exchange for all the enclaves of Warneton, Vienna would receive the parish of Dranoutre, the town of Neuve-Église and part of the town of Nieppe. Through this exchange, the French Court attained its goal of preserving full control of the road connecting Dunkerque with Lille in order to improve the repression of contraband.[662]

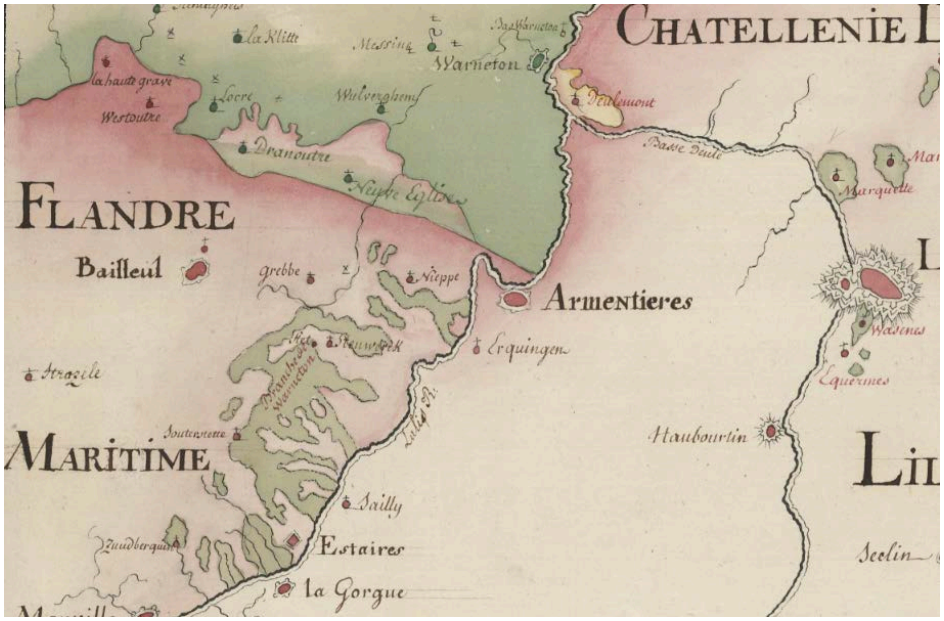

Figure 5.8 Detail from Claude Fisco, *Map to use for the negotiation of a border treaty between France and the [Austrian] Netherlands*

In the Fall of 1769, a joint commission under the direction of Jean François Dierix for the Habsburg side and Antoine Louis François Lefevre de Caumartin on the French Court's side, travelled to this area to implement the articles of the convention. As part of their work, these high commissaries hired surveyors and mapmakers who then measured and created

[662] D'Albissin, *Genèse de la frontière franco-belge*, 316-318. For the original text of these articles see SHD, A. 3685, document 42, 12-13.

representations of the new borderline.[663] The surveyors finalized on March 13, 1770 a general map of the area showing the segment of the frontier Dierix and Caumartin were responsible for implementing between Austrian Flanders and the French state.[664] The commissaries also detailed in the minutes accompanying the map the situation of all 23 pieces of land whose situation had been impacted by the new direction of the borderline.[665]

In addition to the general map of the borderline the team of surveyors prepared more detailed cartographic material for certain enclaves that underwent a change in sovereign. For example, article 13 of the 1769 treaty specified that a portion of the parish of Nieppe would pass from France to the Austrian Netherlands. Figure 5.9 reproduces a detail of the map drawn as a result of the surveyors' measurements in the area, showing the position of two of the eight border markers installed, denoted with the letters G and H.[666] The map includes details about the location of all newly installed boundary stones and describes how each marker included on one side a representation of the imperial double-headed eagle, and on the other the French monarch's heraldic symbol showing three lilies (fleur-de-lis). As per the pre-established convention incorporated in most of the official cartographic material associated with these border demarcations, the color green marked the Habsburg dominions, whereas red denoted the French lands. The surface colored with yellow represents in this map's case the part of the parish of Nieppe incorporated into the Austrian Netherlands.

[663] On November 23, 1769, Dierix wrote to Neny that the surveyor Jean François de Coninck was working with the French surveyor to prepare a plan of all enclaves from the area of Neuve Église and Dranoutre. AGR CAPB, box 680, 253. The team of surveyors consisted of Jean François de Coninck for the Habsburg side, and Jean François Ignace Tournemine (surveyor of the Lordship of Bailleul) and Thomas François Joseph Gombert (general inspector for *Ponts et Chaussées*) as the French representatives. AGR T 459, 228.
[664] AGR I 012, 2187.
[665] MAE Limites, Pays Bas, box 126, 165-174.
[666] AGR T 459, 228.

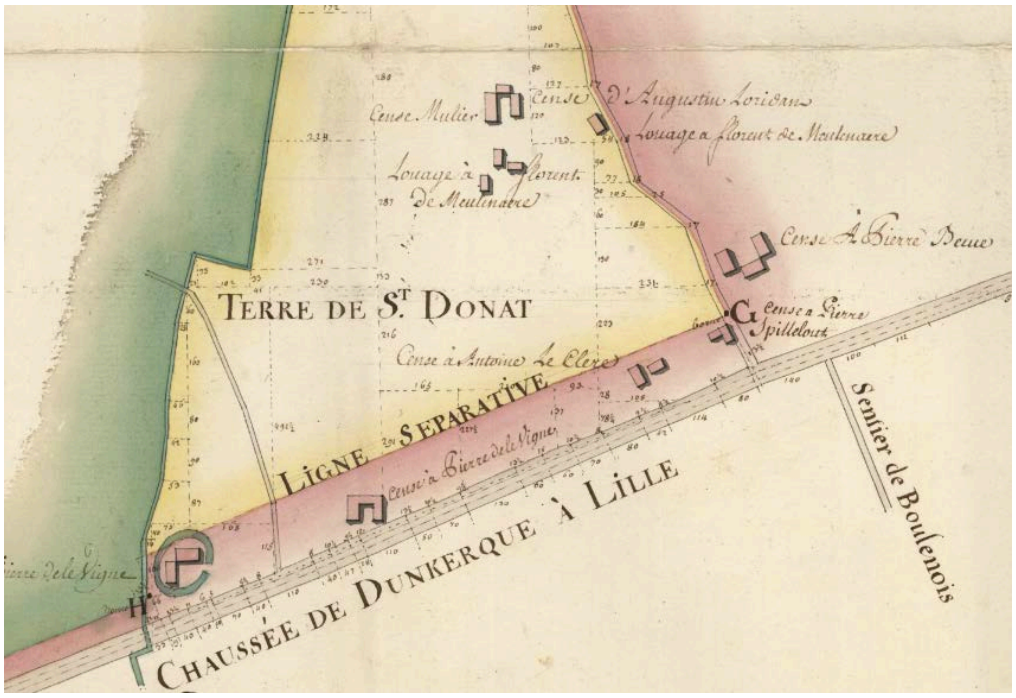

Figure 5.9 Detail from the de Coninck, Tournemine, Gombert map of part of the parish of Nieppe

In the case of the borderlands of Flanders, the commissaries executed the territorial exchanges without incident. However, the work of Dierix and Caumartin in the borderlands in 1769 consisted not only of implementing the Border Treaty, but was expanded to include suggestions for some new territorial exchanges. The importance of maps was again demonstrated here by that fact that both Courts requested from their on-site representatives detailed geographic representations of the area in order to formulate proposals for additional land swaps. For example, the Estates of Lille insisted with French foreign minister Choiseul that France would benefit from annexing the piece of land known as Le Gué de la Motte.[667] Therefore, Choiseul and de Bon asked Caumartin to send, if possible, a map of this domain.[668] On February 13, 1770, Caumartin answered the order by sending a plan of Gué La Motte and also providing his own opinion about the odds of success for the annexation. Although Caumartin saw the advantages of

[667] MAE CP, Pays-Bas, box 167, 359 verso, December 22, 1769, Choiseul to de Bon.
[668] Ibid., 361, December 29, 1769, de Bon to Choiseul.

occupying the territory, he did not believe that the 1769 Border Treaty offered enough justification for such a claim, especially as the domain paid taxes to Warneton, an integral part of the Austrian Netherlands.[669] In the instance of Gué La Motte, the decision-makers in Versailles refrained from making any decision before consulting what they perceived of as accurate representations of the territories under discussion.

The French Court was not alone in requesting more maps. On June 13, 1771, Habsburg commissary Dierix sent to Brussels his opinion about further territorial exchanges in the area of Flanders. In his report, Dierix made multiple references to maps of the region prepared together with the French commissary or solely by the Habsburg surveyor Coninck, and he even attached geographic plans of the various interest points.[670] The negotiators in Brussels relied on this rich cartographic material as revealed by the case of the villages Watou and Steenvoorde.

Figure 5.10 reproduces a fragment of a Dierix map showing part of the parish Watou that the French hoped to annex. In exchange, Versailles offered some of the domains of Steenvoorde, neighboring Watou. Two vertical black lines and one diagonal black line divide the three territorial subunits France requested from the Austrian Netherlands. Dierix included in an accompanying table an assessment of these lands' value.[671] Based on Dierix's plan, the French negotiators in Brussels insisted that this exchange was not advantageous for Versailles and identified computational errors in the accompanying table estimating the value of these lands.[672] In the end, the two sides reached a consensus rendered official in the 1779 border treaty; the French annexed the domains of Gué de la Motte and Watou.[673]

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[669] MAE Limites, Pays Bas, box 126, 81-86, February 13, 1770, Caumartin to Choiseul.
[670] AGR CAPB, box 680, 352, June 13, 1771, Gand, Dierix. The maps are located in Ibid., 440, 444, 445, 456.
[671] Ibid., 440-442.
[672] On October 7, 1771, Neny, Pfeffel and de Bon met to continue the discussions. Ibid., 495.
[673] Articles XIV and XV, "Ratification of the Convention concluded between Its Majesty and the General Government of the [Austrian] Netherlands] regarding the borders of their states" ("Ratification de la Convention

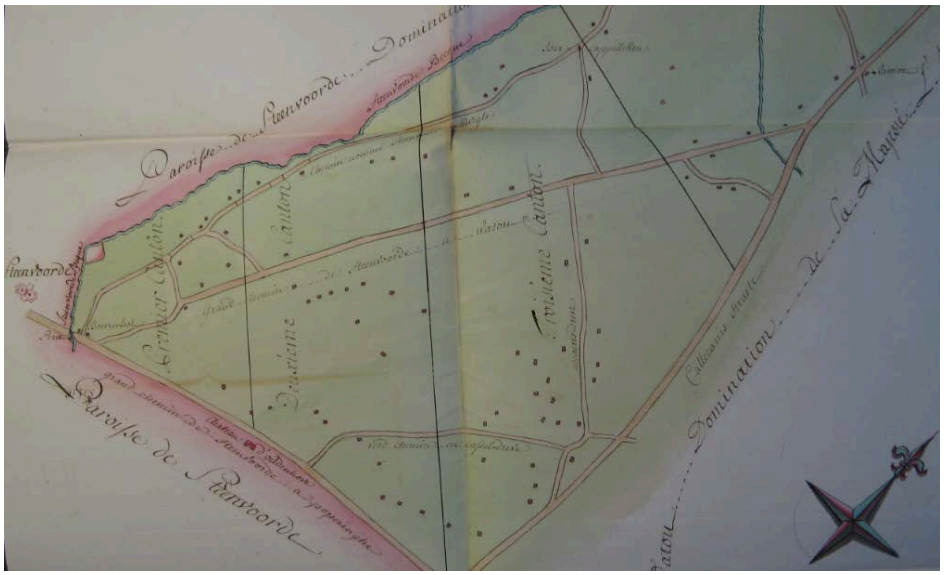

Figure 5.10 Detail from the map of the parish Watou

The case of Flanders shows how in addition to the successful execution of the 1769 articles, sending commissaries on-site triggered a new set of territorial exchanges. However, things did not always proceed uneventfully when it came to the implementation of this treaty. In the case of Tournaisis, Habsburg commissary Vandergracht and French representative Taboureau reached an impasse regarding the lands close to the confluence of the rivers Scarpe and Scheldt. The 1769 treaty had decided that France would maintain control of the land between these two rivers and the left bank of the Scarpe, whereas the Austrian Netherlands would preserve most of the right bank of the Scheldt until the confluence point and both banks of this river after this site.[674] However, in October 1769, once the two commissaries arrived on-site, they could not agree on the dimensions of the domains that had to change hands. Therefore, in November 1769, the French representative in Brussels, de Bon, sent an official complaint to the

conclue entre Sa Majesté et le Gouvernement Général des Pays Bas relativement aux limites des états respectifs), December 29, 1779. SHD, A. 3767, document 54, page 9.

[674] Control of the banks was essential not so much because of the intrinsic value of those lands, but because of the access to the rivers, which constituted important communication and trade outlets. D'Albissin, *Genèse de la frontière franco-belge*, 324-325.

Austrian Netherlands' government, claiming that defying the first six articles of the 1769 Treaty, Vandergracht had refused to implement the cession of two areas: the village and domains of Wihers, and part of the village of Maulde, on the bank of the Scarpe.[675] Both Brussels and Versailles asked for detailed maps of the area to further clarify the incident.[676]

The map prepared in 1769 under the direction of Claude Lamoral and Joseph Delannoy, both in the service of the Austrian Netherlands, displayed the lands situated on the left bank of the Scarpe and included a dotted line to indicate the suggested borderline.[677] Figure 5.11 reproduces the fragment of this map that showed the new border, which I have annotated with a red rectangle. The map's legend informs us that the French commissary imposed a new trajectory of the borderline, extending from the confluence of the Scarpe with the Scheldt until the lands of the farm Chocque, belonging to the parish of Le Celle. However, rather than simplifying the situation, this segment of the borderline divided the five territories belonging to the village of Maulde between Vienna and Versailles, without taking into account that these five territories' domains were not clearly separated one from the other.[678] The complicated situation on the ground proved a drawback to drawing an artificial line on a map as the boundary.

[675] AGR CAPB, box 680, page 172. Taboureau's royal commission ordered him to take over the village of Thun and the part of Maulde adjacent to the river Scarpe. MAE Limites, Pays Bas, box 107, 426, August 20, 1769, royal Commission for Taboureau.
[676] AGR CAPB, box 680, 180, November 16, 1769, Neny to Vandergracht. MAE Limites, Pays Bas, box 110, 156-158 verso, November 28, 1769, Taboureau to Choiseul.
[677] AGR I 012, 2198.
[678] In April 1770, the Estates of Tournasis sent a memoir to Brussels in which they explained how the village of Maulde was composed of five territories: Rongies, d'Espain-Blaheries and part of Mortagne belonging to the Austrian Netherlands and Thun and Mortagne belonging to France. MAE CP, Pays-Bas, box 168, 44-44 verso, April 18, 1770, de Bon to Choiseul.

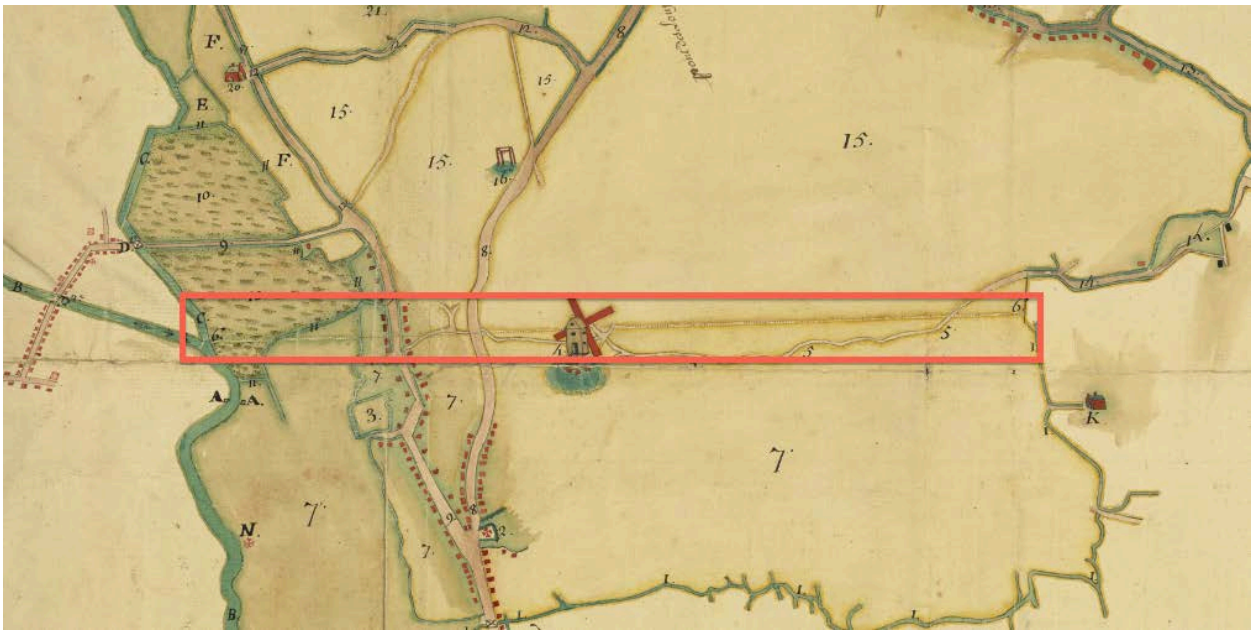

Figure 5.11 Detail from the map of Claude Lamoral and Joseph Delannoy showing the left bank of the Scarpe (1769)

The maps of the area surrounding the confluence of the rivers Scheldt and Scarpe influenced the flow of the discussions in the Austrian Netherlands between Neny and de Bon. In April 1770, as soon as the French commissary Taboureau and the Estates of Tournaisis sent their documentation to Brussels, the two statesmen compared the Estates' memoir with the Taboureau map in order to understand better the situation of the domains of Maulde.[679] As the negotiators in Brussels inspected the topographic plan of the areas located on the left bank of the Scarpe they had to acknowledge the existence of more enclaves than they had expected, including the village of Thun belonging to France, the domain of Ponthoir dependent on the Austrian Netherlands, and a domain belonging to the village Rongies but forming an enclave within Ponthoir, the last two enclaves noticeable on Figure 5.12.[680] Therefore, the statesmen realized they had to identify

[679] In addition to using the map to convey a good understanding of the geography of this contested area, Taboureau also took the liberty of suggesting a possible trajectory for the borderline. Ibid., 44-45 verso, April 18, 1770, de Bon to Choiseul.
[680] AGR I 03, 12.

some fixed geographic features that would supersede the importance of jurisdictions and ease the imposition of a new border. Two alternatives emerged: the commissaries could start from the confluence of the Scarpe and Scheldt and simply draw the boundary in a straight line to the West, or the new borderline could follow the stream known as "of the wolves" (de Loups) and the main road connecting Valenciennes with the confluence of the two rivers.[681]

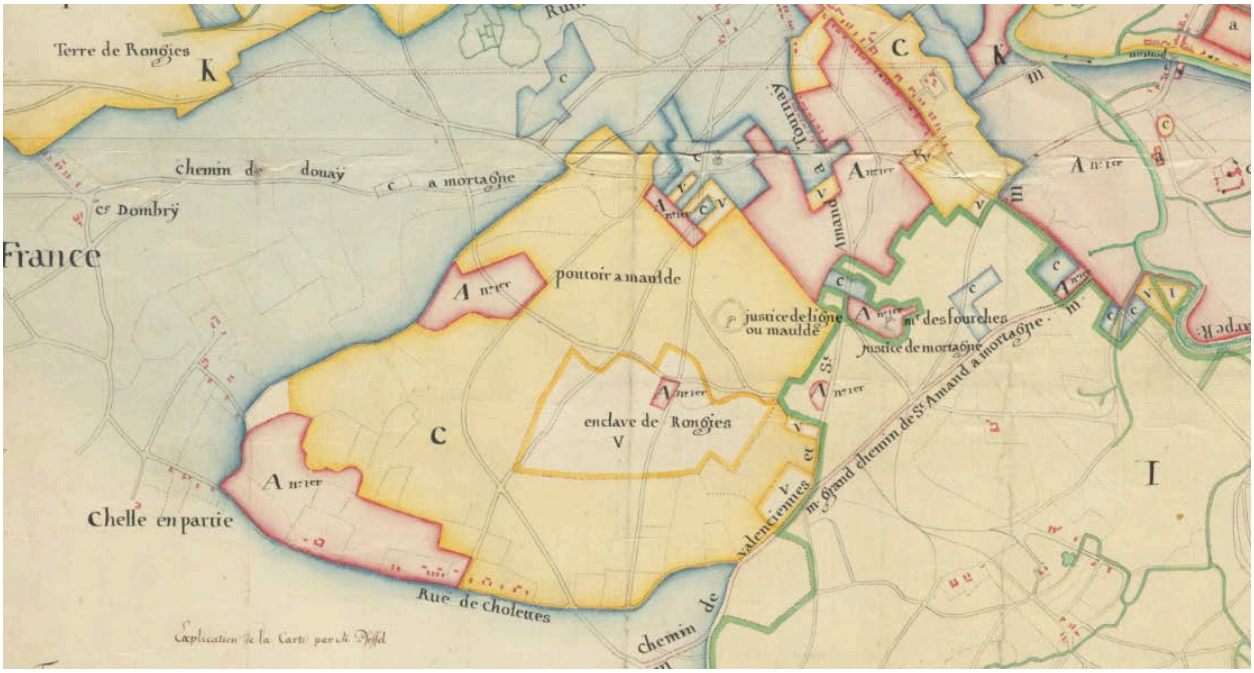

Figure 5.12 Detail from Havez's map of the border between the Austrian Netherlands and France in the area of the Scarpe and the Scheldt rivers

After French commissary Pfeffel travelled to Tournay and discussed the situation with the Estates of Tournaisis, he managed to obtain from them an agreement regarding the territories of Maulde and Mortagne. The Estates agreed to cede Maulde's domains and to accept the stream Rongies, also known as "of the wolves," as a natural border dividing the two empires, in exchange for an equivalent amount of land taken from the French domains at Léers. In addition,

[681] MAE Limites, Pays Bas, box 127, 22-33.

the Estates yielded Mortagne in order to obtain the village of Wihers.[682] The actual implementation of this decision had to wait until the signing of the second border treaty between Vienna and Versailles in 1779. And whereas the 1769 convention reflected a poor understanding of the local geography and led to on-site conflicts between the two empires' commissaries, the 1779 articles regarding the territories in the area of the Scheldt-Scarpe confluence were the result of detailed cartographic representations.

The first six articles of the 1779 treaty not only stipulated the territorial exchanges, but also required that both sides name surveyors to mark the new borderline, measure the amount of land belonging to the village Léers ceded to the Austrian Netherlands, and prepare a series of plans representing their operations.[683] Indeed, the commissaries implementing the border treaty in 1780 prepared maps as per the articles' instructions.[684] Figure 5.13 shows fragments from the December 1780 execution map of article five, showing the domains of Léers that France ceded to Vienna, together with the location of twenty two boundary markers and the owners of all pieces of land located in the proximity of this border segment.[685]

[682] Ibid., 115-118 verso, May 12, 1770, Taboureau to Choiseul; Ibid., 138-143 verso, May 14, 1770, Pfeffel to Choiseul.
[683] "Ratification of the Convention concluded between Its Majesty and the General Government of the [Austrian] Netherlands] regarding the borders of their states," SHD, A. 3767, document 54, pages 3-6.
[684] For example, they prepared a plan of the new borderline dividing the domains of Maulde from the Austrian Netherlands. The letters included on this map mark different segments of the border as described in articles corresponding to the ones mentioned in article 1 of the 1779 treaty. SHD, A. 3767, document 67.
[685] AN, N II Jemappes, 3.

Figure 5.13 The domains of Léers on the execution map of the 1779 Border Treaty, article 5 (1780)

The cases presented above illustrate in detail some of the mechanics of the 1769 border treaty implementation and reveal the increasing role of maps in shaping the borderlines' trajectory. These instances were only two of a longer list of on-site conditions that triggered a new set of intergovernmental negotiations. Indeed, by the spring of 1770 it became obvious to the representatives of Versailles that they had to seal a new accord with Vienna if they were to obtain a clear frontier, without any enclaves.

Therefore, on April 22, 1770, in an official memoir to the governor of the Austrian Netherlands, French representative de Bon reiterated the reasons for the 1769 convention, which included eliminating territorial contestations, encouraging the development of trade, and simplifying the administration of borderland provinces. However, de Bon added that due to some misunderstandings caused by the governments' lack of knowledge with respect to the detailed geography of the boundary areas, an addition to the treaty had become necessary. In some cases,

such as we saw for the area around the confluence of the Scheldt and Scarpe, a detailed topographic plan had revealed to the political authorities in Brussels and Versailles that the region contained more enclaves than had been previously assumed. De Bon listed in his memoir a series of proposed exchanges that in the French Court's opinion would strengthen the stability of the borderline.[686] After consulting with the Habsburg commissaries for the implementation of the 1769 Treaty, Neny agreed in principle with de Bon's proposal to pursue a new series of territorial exchanges in the borderlands.[687]

As shown in the previous pages, the French side was not a passive spectator to the Habsburg ambitions in the borderlands after the signing of the 1769 convention. French commissaries and engineers prepared maps of the contested areas and gathered evidence from locals, which they then shared with their superiors in Versailles and Brussels. Moreover, French representatives in Brussels, such as de Bon, convened in long sessions with the ministers of the Austrian Netherlands, in order to defend Versailles' rights. However, no one was more influential between 1770 and 1772 than Christian-Frédéric Pfeffel, one of the legal experts of the French king (*jurisconsulte du Roi*). The archives in Paris preserve the rich correspondence between Pfeffel, the French foreign minister, and the other commissaries involved in the border demarcation and negotiations. These documents underscore the importance of analyzing the process of boundary delimitation from the perspective of more than one of the states involved. Additionally, Pfeffel's contribution to the negotiations and the examples presented in the following sub-section reveal yet again the ascension of cartography as an essential element in the process of this borderline's evolution.

[686] MAE Limites, Pays Bas, box 127, 22-33, April 22, 1770, de Bon to Prince Charles de Lorraine.
[687] MAE CP, Pays-Bas, box 168, 73-73 verso, May 21, 1770, de Bon to Choiseul.

5.2.3 Christian-Frédéric Pfeffel and negotiations for a second Border Treaty

Although the work of mapmakers had a significant role in influencing the work of the negotiators in this second phase of the Bourbon-Habsburg border deliberations, no military engineer played a leading part in the actual top-level discussions in Brussels, Vienna or Versailles. Engineers in the service of the Bourbons and the Habsburgs had firsthand knowledge of the local situation and sent both maps and memoirs to help diplomats in their negotiations. However, they did not surpass their position of mere technical experts and had no decisional power. This is not surprising when compared with what had occurred in other Habsburg areas. Even in the case of Transylvania, although Luchsenstein was probably the most knowledgeable Habsburg agent of the borderlands situation, he did not travel to the negotiations in Constantinople that sealed the trajectory of the imperial borderlines for this province. Instead, his maps and legal-historical memoirs justifying the Habsburg claims served to instruct Vienna's representative in Constantinople, Thugut.

Although starting as a military engineer especially skilled as mapmaker, Luchsenstein had extended his expertise to the collection and analysis of historical and legal documents. Luchsenstein's case found a French equivalent in the person of Christian-Frédéric Pfeffel, who combined in his person the same knowledge of the Austrian Netherlands-France borderlands as Luchsenstein possessed for the Habsburg province of Transylvania. Whereas Luchsenstein had started as a military engineer expert in cartography and expanded his skills to incorporate a good knowledge of historical context and documents, Pfeffel followed the reverse course. What both these cases reveal is that by the second half of the eighteenth-century, individuals like Luchsenstein and Pfeffel, with a good knowledge of local geography, the capacity to prepare and

use maps, and the ability to employ historical and legal documents to further their employers' interests, were crucial in the negotiations preceding boundary line demarcations.

Pfeffel started his diplomatic career as the French counselor in Regensburg, the seat of the Holy Roman Empire's Imperial Diet, and then as minister of the Duke of Deux-Ponts in Munich.[688] Later, he advanced to the rank of law counselor for the French king (*jurisconsulte du Roi*). As he became more involved in the border negotiations with the Austrian Netherlands, Pfeffel started preparing maps to illustrate his argumentation and justify the French claims. In his own words, "necessity and an excess of zeal transformed me into an *ingénieur geographe* [...] a talent acquired with difficulty at my age."[689]

De Bon, the French representative in Brussels, was an enthusiastic supporter of Pfeffel, from the time of his arrival in the Austrian Netherlands at the end of 1769. Initially, Pfeffel's royal commission had only been to supervise the reciprocal extradition of documents as per the 1769 Treaty's article 38.[690] But soon after his arrival in Brussels, he proved to have a flair for the negotiations regarding the territorial exchanges in the borderlands. In de Bon's own words, he decided to "take him [Pfeffel] as a guide," and the jurist's extensive knowledge of both the local situation and the historical context and documents for each particular situation proved indispensable. Moreover, in 1770, once the Courts of Versailles and Vienna agreed on the need to open negotiations for more territorial exchanges, Pfeffel travelled to Flanders, Tournasis,

[688] Nordman, *Frontières de France*, 301.
[689] MAE Limites, Pays Bas, box 128, 205 verso, March 5, 1771, Pfeffel.
[690] Article 38 of the 1769 Convention ordered the reciprocal restitution of papers and documents referring to territories belonging to the other Court's domains. This category included documents such as the documents carried from the Austrian Netherlands to France during the War for the Austrian Succession. The role of this article was to mark the intrinsic link between a monarch's possession of a territory and the documents associated with it. Pfeffel and the Habsburg representative, Jean-Baptiste, Count of Wynants, spent approximately two years supervising the exchange of documents. Both of them travelled to various archives in the cities of Lille, Brussels, Namur, Luxembourg, Metz, Nancy, Ghent, Mons, Tournai and Douai, prepared inventories of documents, commissioned copies for some of them, and orchestrated the reciprocal extradition of papers. Nordman, *Frontières de France*, 407-412.

Hainaut and Luxembourg to discuss on-site preliminary proposals with those provincial Estates.[691] As part of this mission he also gathered and prepared cartographic material, and in the case of Luxembourg, "he surveyed himself the whole territory."[692] Even Chancellor Kaunitz in Vienna noticed that negotiating directly with Pfeffel rather than with de Bon ensured a faster approval from Versailles of the preliminary agreements, as Pfeffel had the full trust of the French foreign minister Choiseul.[693]

The *Map of the [French] Kingdom's border towards the [Austrian] Netherlands to help with the negotiation of the Second Border Treaty with the Empress Queen and the Final Treaty with the Bishopric of Liège* (*Carte de la Frontiere du Royaume vers les Pays Bas pour servir à la negociation du Second Traité de Limites avec l'Impératrice Reine et du Traité definitif avec l'Évéché de Liege*) exemplifies how Pfeffel incorporated maps as part of his arsenal as a negotiator.[694] Finalized at some point in the early 1770s, the map made visible to the decision-makers in Versailles both the already agreed upon territorial exchanges and the domains still under discussion with Vienna. By learning how to fulfill the function of a mapmaker, Pfeffel had acknowledged the power of maps to convey arguments about border negotiations.

Figure 5.14 reproduces two fragments showing the result of Pfeffel's parleys with the Estates of Tournaisis and Hainaut. Pfeffel colored with yellow and marked with a red contour the patches of land the French Court offered to the Austrian Netherlands in exchange for territories painted with red and surrounded with yellow contours.

[691] MAE CP, Pays-Bas, box 168, 212-216, June 28, 1771, Bon to Aiguillon.
[692] Ibid., 214.
[693] AGR CAPB, box 680, 408-408 verso, November 28, 1770, Kaunitz to Starhemberg.
[694] SHD, J 10 C 623.

Figure 5.14 Details from Pfeffel's *Map of the [French] Kingdom's border towards the [Austrian] Netherlands*

In May 1770 Pfeffel travelled to Tournay and had a series of meetings with the Estates of Tournaisis to settle the border controversies there. The French representative managed to obtain for his king all the domains of Maulde and the establishment of the border on the stream of Rongies, in exchange for an equivalent quantity of land from the domains of the French village Léers. The second exchange Pfeffel orchestrated was relinquishing to the Habsburgs the village of Wihers in exchange for the domains of Mortagne.[695] The left-side detail from Figure 5.14 identifies the position of the territories involved in these exchanges.

Pfeffel greatly influenced the results of the negotiations regarding territorial exchanges in the borderlands of Tournaisis because of his first-hand knowledge of both the geography and the legal-historical context of the area. However, the French representative could not simply impose his Court's desire and had to negotiate a result satisfactory for both sides, especially as the Habsburgs had also gathered detailed information about these lands. On November 27, 1770, when Kaunitz sent Vienna's final approval regarding the arrangement for the borderlands of Tournaisis, he also mentioned that he had made the decision with the help of a "figurative map"

[695] MAE Limites, Pays Bas, box 127, 138-143 verso, May 14, 1770, Pfeffel to Choiseul.

(Carte Figurative).[696] Kaunitz's comment suggests that by 1770, the two Courts made no significant decision regarding territorial exchanges in the borderlands without a prior consultation of maps.

The second map detail included on Figure 5.14 shows the controversial lands of Roisin and Meaurain, located in the borderlands of Hainaut. However, although Pfeffel's representation suggested that Vienna had accepted the cession of Roisin and Meaurain, this information was misleading and represented the French commissary's desire and not the reality, as explained below. Although the 1769 treaty did not include any modifications for this border segment located between Mortagne and Sambre, the commissaries sent on-site discovered a significant number of smaller enclaves. Moreover, as Habsburg commissary Martin de Müllendorff wrote to his superiors in Brussels, the borderline was very sinuous and many roads in the area were shared between the two states, thus facilitating the actions of contrabandists and other criminals. The situation of the forest Roisin was particularly worrying for the French Court. Enclosed between two French roads, the Habsburg domains of Roisin formed a respite island for criminals on the run from Versailles' justice. However, the French Court's desire to acquire this forest clashed with the Estates of Hainaut's need to preserve control of the land as it was the only source of wood for a large area.[697]

During a meeting on May 22, 1770, Neny mentioned to de Bon the Estates of Hainaut's attempts to disrupt the negotiations for the border of their province, as they claimed their interests did not match with imperial priorities. However, Neny reassured the French representative that Vienna would not tolerate any insubordination from the Estates of Hainaut

[696] AGR CAPB, box 680, 408, November 28, 1770, Kaunitz to Starhemberg.
[697] D'Albissin, *Genèse de la frontière franco-belge*, 330-332.

and that once agreed on by the two Courts, the territorial exchanges would happen.[698] In his letter to Choiseul, Pfeffel who had travelled to meet with the Estates of Hainaut's representatives, also referred to the recalcitrant behavior of these provincial authorities, but reassured the French minister that the Austrian Netherlands' provincial government would not tolerate such actions.[699] However, despite the Austrian Netherlands' minister's assurances, the Estates of Hainaut continued to resist the territorial exchanges. In 1771 these provincial authorities even sent a memoir supporting their refusal to accept the cession of Roisin and Meaurain.[700] The memoir of the Hainaut's Estates convinced Neny of the economic necessity for the province to preserve control of at least part of the wooded area.[701]

The archives in Brussels have preserved an undated map entitled *Map to use for clarifying the project of exchange of Roisin and Meaurain on the border of Hainaut* (*Carte pour servir d'éclaircissement au projet d'échange de Roisin et de Meaurain sur la frontière de Hainaut*).[702] It is plausible that the Habsburg authorities ordered the preparation of this cartographic document so that they could make an informed decision regarding the French Court's request. The fragment of this map reproduced in Figure 5.15 clearly reveals the situation of the forest Roisin as a Habsburg enclave between two French roads, but also its importance as the only wooded area for a significant number of Hainaut's villages. Therefore, due to the economic importance of the Habsburg territory of this forest, it is not surprising that Versailles

[698] The Estates wanted to give up Angre, Angreau, Voisin and Miaurin but requested Tarnieres, Hon, Herchies and Malplaque. However, the Habsburg government only desired to acquisition Bousignies and Malplaque, as Bousignies was considered a priority. MAE CP, Pays-Bas, box 168, 74-75, May 23, 1770, de Bon to Choiseul.
[699] MAE Limites, Pays Bas, box 127, 171-172, May 25, 1770, Pfeffel to Choiseul.
[700] MAE CP, Pays-Bas, box 168, 260 verso, September 1, 1771, de Bon to Aiguillon.
[701] In early December, Neny informed de Bon of the government's refusal to cede the villages Roisin and Meaurain, because of the high number of houses and the fertility of their domains. MAE CP, Pays-Bas, box 168, 361-361 verso, December 8, 1771, de Bon to Aiguillon.
[702] AGR I 012, 2205.

only managed to obtain a small section of the area parallel to the two roads.[703] In the case of the borderlands of Hainaut, the map Pfeffel sent to his superiors in Versailles failed to reveal the accurate stage of the negotiations and expressed a mere aspiration.

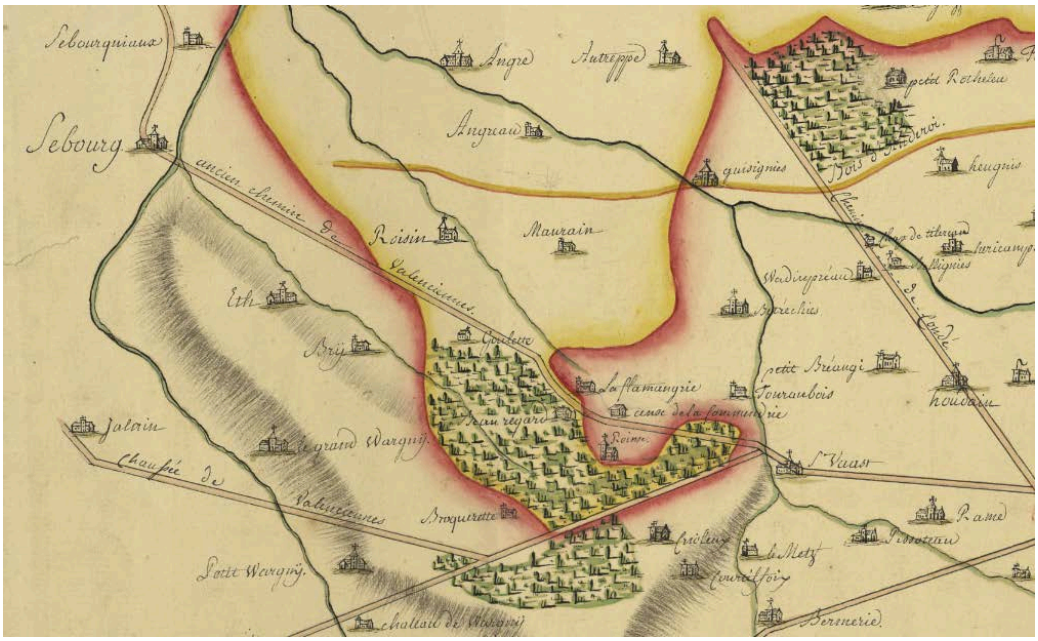

Figure 5.15 Detail from *Map to use for clarifying the project of exchange of Roisin and Meaurain on the border of Hainaut*

As demonstrated by the two examples of the borderland negotiations of Tournaisis and Hainaut, rather than pursuing a frontier settlement with France that would consider the whole borderline of the Austrian Netherlands as one unit, the government in Brussels had to take into account the interests of the four provinces with interests in the area, namely Flanders, Tournaisis, Hainaut and Luxembourg. Therefore, to obtain a secure agreement, the French government had to ensure that their offers would satisfy the Estates of all these four provinces. Indeed, French

[703] Articles 20 and 21 of the 1779 border treaty stipulated that Maria Theresa ceded 70 "bonniers" from the forest of Roisin in exchange for the same amount of land from domains of the French village Flamengrie. "Ratification of the Convention concluded between Its Majesty and the General Government of the [Austrian] Netherlands] regarding the borders of their states," SHD, A. 3767, document 54, page 12. D'Albissin, *Genèse de la frontière franco-belge*, 332.

commissary Pfeffel, travelled sequentially to all four provinces and tried to reach preliminary agreements with their representatives.[704] His undated map "to help with the negotiation of the Second Border Treaty with the Empress Queen" was probably prepared at the end of this border tour to synthesize the result of his work.

Although due to Pfeffel's efforts, on December 7, 1771, Neny and de Bon signed a preliminary agreement regarding the articles for Flanders and Tournaisis, and it looked like an agreement over Hainaut would also be reached, the province of Luxembourg raised serious problems for the two negotiating sides.[705] In the fall of 1769, both Habsburg commissary Gerden and French representative Calonne started gathering information about Luxembourg's enclaves unidentified in the 1769 Treaty and prepared topographic maps and exchange projects.[706] From the beginning of the discussions, Neny received with distrust the first set of French proposals issued on December 4, 1769. The Austrian Netherlands' minister accused the Court of Versailles of trying to take over Habsburg villages rich in iron ores, such as Halanzy, and even of going against the principle of enforcing natural borders by claiming Torgny. Additionally, Neny claimed he had no knowledge of some of the enclaves mentioned in de Bon's memoir and asked for more time to obtain additional information by sending an engineer to prepare detailed maps of the borderlands of Luxembourg.[707]

To ease the Estates of Luxembourg's and Neny's suspicions, French commissary Pfeffel travelled to the province in December 1769, and had a series of discussions with Gerden and the

[704] For example, on March 5, 1771, Pfeffel sent a report about the result of his discussions with the Estates of Tournaisis and Hainaut. MAE Limites, Pays Bas, box 128, 205-207.
[705] MAE CP, Pays-Bas, box 168, 359-359 verso, December 8, 1771, de Bon to Aiguillon. On October 19, 1771, Kaunitz notified Starhemberg, the plenipotentiary minister of the Austrian Netherlands, that Maria Theresa would ratify in the future the articles for the borderline of Flanders and Tournaisis, as established as a result of Neny's discussions with de Bon and Pfeffel. AGR CAPB, box 680, 512.
[706] AGR CAPB, box 680, 254, November 23, 1769, Gerden to Neny; Ibid., 256, November 27, 1769, Neny to Gerden; MAE Limites, Pays Bas, box 110, 208-208 verso, November 30, 1769, Calonne to Choiseul,.
[707] AGR CAPB, box 680, 267-267 verso, December 9, 1769, Neny to Gerden.

local Estates to convince them to approve the cession of the villages located on the Semois river. Although the first mission of Pfeffel in the province of Luxembourg did not yield promising results, it gave this commissary a chance to establish contacts with some of the Luxembourg Estates' deputies.[708] Indeed, by March 12, 1770, Pfeffel received from Gerden, who was also the President of Luxembourg's Council, memoirs and tables detailing the value of the revenues of the lands under discussion for a possible exchange.[709] However, no conclusion to negotiations could be reached for a while, because the decision-makers in Brussels refused to continue any discussions until the Habsburg engineers surveyed and mapped Luxembourg's borderlands.

In February 1771 the French Court decided to make another attempt at reaching a consensus with Vienna regarding Luxembourg's frontier. Minister Choiseul ordered Pfeffel to travel to Luxembourg and resume the border negotiations with Gerden. However, the French representative argued that whereas the provincial authorities in Luxembourg had employed engineers who had spent more than eight months surveying and preparing detailed maps of the area, he had not received any in-depth information from the French authorities in charge of the borderland territories.[710] Pfeffel drew his superiors' attention to the importance of having accurate maps and descriptions of the areas under discussion, and was hesitant to pursue any official negotiations simply based on the Habsburg engineers' work.[711]

De Bon supported Pfeffel's request and insisted that in order to counteract the high amount of information that Gerden possessed in the forms of cadastral registers and maps, Pfeffel needed documentation from the French representative Calonne and from the local

[708] MAE Limites, Pays Bas, box 110, 265-267, December 10, 1769, Pfeffel to Choiseul.
[709] MAE Limites, Pays Bas, box 126, 153-153 verso, March 12, 1770, Pfeffel.
[710] MAE Limites, Pays Bas, box 128, 176-177, February 3, 1771, Pfeffel.
[711] Ibid., 205-207, March 5, 1771, Pfeffel.

authorities in Mons, Sedan and Metz.[712] The approval of this request ensured that by the time Pfeffel arrived in Luxembourg he would be better equipped with respect to the local geographical knowledge and the value of the domains considered for the territorial exchange.[713]

Pfeffel's reports to Paris regarding his time in Luxembourg reveal how the negotiation took place with the help of numerous cartographic sources. The Habsburg side presented at least seven maps and Pfeffel acknowledged their high quality and accuracy. However, the French commissary could not obtain copies of all these sources and had to resort to deceptively copying fragments whenever the opportunity arose.[714] By August 22, 1771, the Habsburg maps of Luxembourg's borderlands done under the supervision of Gerden, had arrived in Brussels, and Neny started consulting them in preparation for the next stage of the negotiations.[715] The maps the engineers from the Austrian Netherlands brigade had prepared under the direction of Nicolas Bergé, member of the engineering corps of this Habsburg province, impressed the French negotiators with their level of precision and constituted the basis of the discussion.[716]

[712] Ibid., 178-178 verso, February 3, 1771, de Bon.
[713] Ibid., 214-215 verso, March 18, 1771, Pfeffel.
[714] Ibid., 229, April 2, 1771, Pfeffel, Mezieres.
[715] MAE CP, Pays-Bas, box 168, 256-256 verso, August 22, 1771, de Bon to Aiguillon.
[716] AGR SEG, box 1350, 157, August 21, 1773, Neny to Crumpipen.

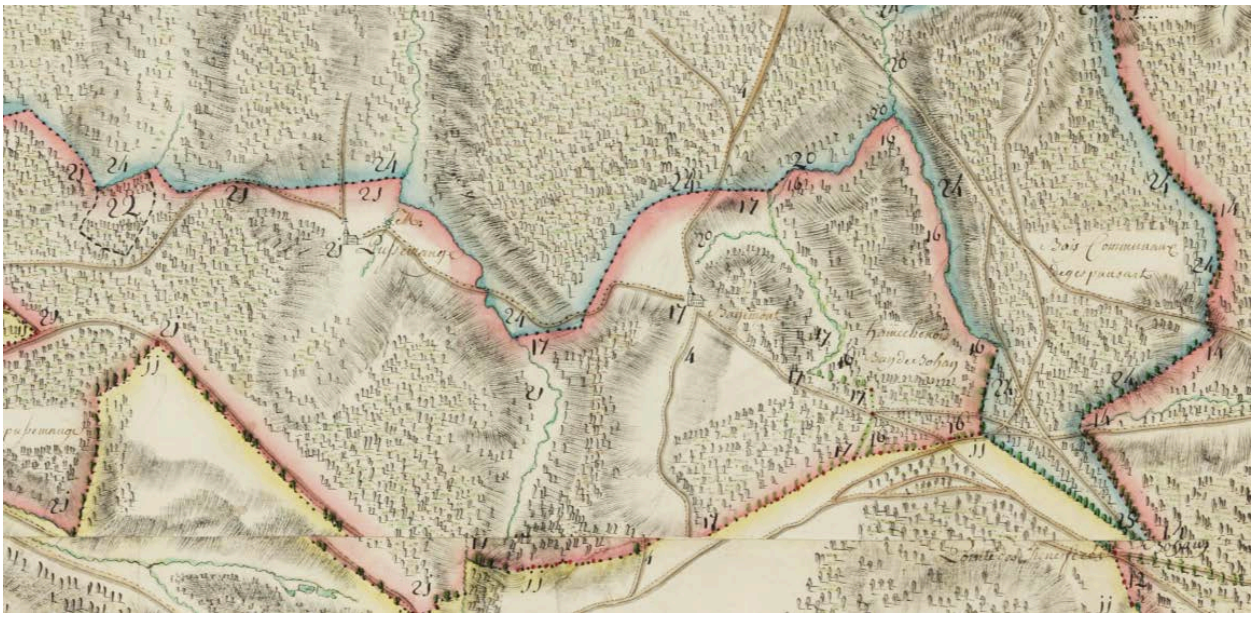

Figure 5.16 Detail from the Bergé map showing the area of the Semois River (1770)

Figure 5.16 reproduces a fragment from a copy of one of the Bergé maps showing the domains located in the area of the Semois River.[717] The mapmaker marked with red the borderline of the Habsburg dominions, with blue the lands of France, and with yellow the frontier of the Duke of Bouillon's domains. Bergé's drawing also contains 86 numbers that correspond to certain geographical features, both natural and artificial, that are further explained in the map's legend. Some of the numbers refer to the location of specific villages, roads, domains, mills, forests, chapels, or streams. For example, the instance of number 20 shown on Figure 5.16 identify the flow of the stream Mort Bon-homme; number 21 marks the position of the village Pusmange; and 22 indicates the location of a forest belonging to the county of Orchimont. All of these features helped the negotiators identify possible areas for territorial exchanges and the new trajectory of the borderline.

[717] AN, NN, 156, 130.

The Bergé maps of Luxembourg's borderlands fostered the flow of the discussions in Brussels until the rise of a new diplomatic obstacle. On September 1, 1771, de Bon wrote to Versailles that the refusal of the Habsburg government to accept the cession of the villages located on the left bank of the Semois River had put a stop to the negotiations.[718] Although the decision-makers in Vienna would have been ready to accept the French proposals and yield those territories, they were forced to take into account the desires of the Estates of Luxembourg, strong opponents of this territorial modification. As at the time the Habsburgs had initiated the mobilization of their troops in the eventuality of an intervention in the Russo-Ottoman war (1768-1774), they relied on financial help from the Austrian Netherlands, including the province of Luxembourg. Therefore, Vienna could not infuriate the provincial Estates of one of their richest dominions.[719] Despite this diplomatic impasse, by early November 1771, the two Courts reached a compromise and drafted twelve preliminary articles for Luxembourg. In one of his final reports regarding this negotiation, Austrian Netherlands' minister, Neny expressed his satisfaction that French representative Pfeffel had acknowledged the better quality of the Habsburg maps even when compared to the Cassini maps of these borderland areas and had agreed to take them as starting point for the negotiations.[720] In his reports to Versailles, Pfeffel confirmed Neny's comment, thus making clear the superiority of Habsburg cartography for this particular section of the frontier.

At the end of 1771 it looked like Pfeffel had successfully fulfilled his function of negotiating most of the preliminary articles for a second border treaty with the Habsburg representatives. However, this treaty was not signed until in 1779 because of changes in Versailles' leadership. By the end of 1771, the Duke of Choiseul, who had combined the

[718] MAE CP, Pays-Bas, box 168, 260 verso, September 1, 1771, de Bon to Aiguillon.
[719] MAE Limites, Pays Bas, box 128, 307 verso, May 3, 1771, de Bon.
[720] AGR CAPB, box 679, 60, April 15, 1779, Bruxelles, Neny.

functions of war and foreign minister, had fallen out of favor with the king. His successors, Emmanuel-Armand de Richelieu Duke d'Aiguillon as Foreign Affairs Minister, and Louis François de Monteynard as War Minister failed to follow a coherent line with respect to the border negotiations and disagreed on the priorities the government should pursue. Indeed, Monteynard tried to obtain the king's approval for a new trajectory for France's northern borderline, which although greatly advantageous from a military point of view, would have harmed the Habsburg interests in the area and could never have been accepted by Vienna.[721] To complicate the situation even further, Calonne, the French commissary in charge of negotiations in Luxembourg's borderlands, accused the Habsburg representatives of having submitted erroneous evaluations of the territories under negotiation. By 1777 the Court of Versailles officially abandoned the border negotiations and the discussions were only seriously resumed in 1779, when the the second Border Treaty was finalized.[722]

The efforts of both Versailles' and Vienna's representatives to eliminate all enclaves in the borderlands and to create a stable frontier greatly relied on the cartographic work of surveyors, military engineers, and even legal specialists such as Pfeffel. The visual language of maps brought a simplified version of the geographical reality of the Austrian Netherlands-French boundary domains into the ministerial rooms in Brussels, Versailles, and Vienna. Putting forward the interests of the newly emerging territorial French and Habsburg state, diplomats and ministers felt empowered to make decisions leading to a series of territorial exchanges and the establishment of what they hoped to be a long-lasting borderline. Commenting on the final

[721] Monteynard's project was based on the reports of Marshall Grandpré and prioritized the military interests of the French kingdom, without acknowledging the impossibility of convincing the Habsburgs to ratify the trajectory for this borderline, which would have assigned a disproportionate amount of land to France. D'Albissin, *Genèse de la frontière franco-belge*, 304-305.
[722] AGR CAPB, box 679, 60 verso-63, April 15, 1779, Neny; MAE CP, Pays-Bas, box 171, 372-372 verso, July 15, 1779, Vergennes to Adhemar.

version of the 1779 treaty, Kaunitz stated that the biggest advantage of the new borderline was that the possession of the contested borderlands was determined not based on legal documents but in a way mutually beneficial (based on *convenances réciproques*).[723] In Kaunitz's understanding the two main beneficiaries were Versailles and Vienna, and not necessarily the provincial authorities of the Austrian Netherlands or France. Imperial interests triumphed over provincial particularisms and history.

5.3 CONCLUSION

In 1771, during the time he spent in Luxembourg to negotiate a border arrangement agreeable for both Versailles and Vienna, Pfeffel travelled to some of this region's areas to compare their actual state with their representation on Habsburg maps. Pfeffel went as far as to identify on-site minor elements such as an indicator known as the "cross of Lorraine."[724] In his opinion, the value of the Habsburg maps consisted in the accurate manner they represented the landscape. At the opposite side of the Habsburg Monarchy, in the province of Transylvania, Luchsenstein also valued characteristics such as precision and accuracy in his evaluation of Moldavian maps, and his own surveys and representations of the borderlands. For example, the military engineer travelled into the Carpathian Mountains separating Transylvania from Moldavia to verify Moldavian claims about the existence of old boundary stones, as he believed that maps and geographic descriptions had to convey an exact image of a territory's situation.[725]

[723] AGR CAPB, box 679, 196 verso-197, December 11, 1779, Kaunitz to Maria Theresa.
[724] MAE Limites, Pays-Bas, box 128, 231, April 2, 1771, Pfeffel to d'Aiguillon.
[725] The Moldavians claimed the existence of a stone located on the Borda Mountain, and which had been incised with a Moldavian coat of arms. However, Luchsenstein describes the signs as the mere doodles of idle herdsmen, and in no way reminiscent of an official coat of arms KA KPS, B IX c 744.

These two instances demonstrate that state agents, such as Pfeffel and Luchsenstein, envisioned maps as an ideal medium for transposing the complexity of geographical features onto a manageable surface. These maps, understood as reduced-scale mirrors of reality, then traveled to political centers, such as Versailles, Vienna, Constantinople or Brussels, and helped emperors and ministers to decide the faith of their territories. In this sense, cartography allowed for the accumulation of geographical knowledge, which then encouraged imperial centralization and integration of the various provinces.[726]

As the Habsburg cartographic gaze turned to its frontiers, the Viennese rulers put the existing mapping practices and institutions in the service of border demarcations. In their effort to eliminate all enclaves and contestations from imperial borderlands, Vienna used negotiation tactics adapted to each political neighbor. In the case of Transylvania, Habsburg officers marked the borderline unilaterally and then managed to obtain the international recognition of their actions. However, to regulate the Austrian Netherlands' southern frontier, Vienna had to spend years negotiating with their powerful French ally. In both situations, military engineers surveyed and prepared detailed maps of the borderlands, which then served to promote the Habsburg territorial pretensions.

These cartographic sources seemingly transformed an ever-changing geography of the borderlands into fixed, clearly demarked frontiers. However, this illusion did not last long. One decade after the 1779 border treaty signed between Versailles and Vienna, the outbreak of the French Revolution and the wars that followed impacted the geography of the area, leading to the occupation of the Austrian Netherlands by the French army. In their easternmost provinces, together with their Russian allies, the Habsburgs waged a war against the Ottoman Empire,

[726] Here I rely on Bruno Latour's argument that technologies that allow for the collection and transmission of knowledge from distant lands to political centers make imperial domination at a distance feasible. Latour, *Science in Action*, 223-224.

which led at the end of 1780s, to Vienna's brief occupation of Moldavia and Wallachia. As these political developments from the end of the eighteenth-century show, linear and fixed Habsburg imperial borderlines only survived on maps, but not in reality.

The story of the Transylvanian and Austrian Netherlands borderlines' demarcation had a happy ending, even if not an everlasting one. On the other hand, the Habsburgs were not always successful in their desire to reconstruct imperial frontiers and impose fixed border markers. As the next chapter shows, in the Habsburg province of Lombardy, the second half of the eighteenth century witnessed decades long negotiations between Vienna and Parma that failed to materialize into a bilateral border treaty.

6.0 AN ELUSIVE BORDER: CARTOGRAPHIC PROJECTS IN THE CONTEXT OF THE LOMBARDY-PARMA BORDER INSPECTIONS AND NEGOTIATIONS

In the beginning of 1779, Empress Maria Theresa ordered Carlo Firmian, plenipotentiary minister of Lombardy, and Francesco Belcredi, general commissary for the borders of the State of Milan, to prepare a list of people who could notify the government of any sudden changes to the imperial frontiers in Lombardy.[727] In his final plan, Belcredi divided the borderline into fifteen segments and wrote that in selecting the personnel "I managed to restrict [the choice] as much as possible to appraisers or engineers, or at least surveyors, because in my opinion these are the most suitable for such responsibilities, and capable to prepare a more detailed report, also containing a map, making [the report] more conclusive."[728] Maria Theresa's request and Belcredi's answer suggest that, by the end of the 1770s, the Viennese Court had managed to build a system of fixed imperial borders for their lands in Lombardy and relied on maps to ensure the preservation of the status quo. Furthermore, the presence of a border commissary, engineers and surveyors, implies the existence of an advanced institutional framework capable of inspecting borderlines and preparing reports and geographic plans regarding any changes. Indeed, from the 1750s onwards the imperial court in Vienna prioritized settling clear borderlines with their neighbors and successfully negotiated a series of border treaties with states such as the

[727] ASM Confini p.a., box 3, Firmian to Belcredi, February 9, 1779.
[728] "Nella scelta hò procurato di attenermi più che mi sia stato possibile a periti o Ingegneri, o almeno Agrimensori, perche questi a mio credere sono più atti, a tali incombenze, e capaci all'occasione di fare una relazione più dettagliata anche con tipo, e perciò piu concludente." Ibid., Belcredi to Ferdinand, August 7, 1779.

Republic of Venice, the Kingdom of Sardinia or the Duchy of Modena. However, despite their vast experience in demarking boundaries not only in the Italian Peninsula, but also in provinces extending from Transylvania to the Austrian Netherlands, the Habsburgs repeatedly failed to close Lombardy's borderline towards the Duchy of Parma, Piacenza and Guastalla.

The discussions over the position of the Parmesan-Lombardy boundary referred cartographic representations of the disputed area, as both the Infant and the Habsburg rulers considered maps essential in illustrating their rivals' territorial violations and constructing a strong case for promoting their own agenda regarding the border's position. As the case of the Habsburg negotiations with Parma exemplifies, in the second half of the eighteenth century, the debate regarding the rights of sovereignty over contested borderlands relied increasingly on territorial representations. Maps made clear in the eyes of Vienna that most disputed border segments involved either the banks or the islands of the River Pò, geographic features continuously evolving because of erosions, alluvial deposits, and changes in the river's trajectory. Therefore, in the early 1780s, the topography of the Lombardy-Parmesan border as captured on maps and in geographic descriptions influenced Emperor Joseph II's commitment to impose the flow of the Pò as a definitive borderline between the two states. However, Vienna's determination to eliminate all enclaves, promote a series of territorial exchanges, and impose a fixed border on the Pò River alarmed the Infant of Parma, who feared that the Habsburgs desired to eventually engulf his small young state. Relying on his Bourbon protectors, the kings of France and Spain, the Infant managed to transform what was supposed to be a straightforward bilateral negotiation between Parma and Vienna, into a neverending trans-imperial diplomatic discussion involving four rulers.

Additionally, as the case of the border negotiations with Parma during the second half of the eighteenth century reveals, Lombardy's precarious centralization and subordination to Vienna greatly slowed down the transposal of orders from the imperial center to local level. Although maps helped Maria Theresa, Joseph II and Chancellor Kaunitz familiarize themselves with the geography of Lombardy's borders, they could not replace the lack of an efficient local administration machine that could have actually implemented the Habsburgs' borderline policies. Local authorities did not always report to their superiors border incidents; multiple provincial institutions shared responsibilities for preserving the status quo in the border areas and this led to inter-institutional rivalries; and finally, the sluggish communication lines between, on one hand, Lombardy's governor and plenipotentiary minister, and on the other, the imperial authorities in Vienna, further complicated the situation. Therefore, as shown in this chapter, the astonishing fiasco of the Habsburg-Parmesan negotiations from 1748 until 1790 exposes how provincial and trans-imperial factors sometimes did not facilitate, but actually conspired against Habsburg imperial interests.

In his masterwork on Habsburg Lombardy, Carlo Capra states: "the turning points in the history of Lombardy do not correspond to the succession of sovereigns, but with the changes of those in charge directly of Lombardy's affairs, with the replacement of bureaucrats and administrators and with the diffusion of new models and ideas among these people."[729] Although not addressed in Capra's book or other works devoted to the impact of the Habsburg enlightened reforms on their possessions in Lombardy during the eighteenth century, the influence of cartography on the province's territorial reorganization and definition constituted one of these

[729] "I momenti di scansione e di svolta non coincidono con gli avvicendamenti dei sovrani, ma piuttosto con quelli dei responsabili diretti degli affari lombardi, con il ricambio dei quadri burocratici e amministrativi e con la diffusione tra le loro file di idee nove e di nuovi modelli)," Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 6.

new ideas that pervaded the different governmental levels. In the second half of the eighteenth century the emergence of provincial institutions proficient in mapmaking, a new conceptualization of imperial borders, and the production of border maps all influenced Lombardy's centralization and integration into the Monarchy. As the new provincial bureaucrats and administrators relied more on maps to make decisions regarding border negotiations but also to prepare the province's administrative reorganization, cartography contributed both to the incorporation of Habsburg Lombardy as an essential component of the Monarchy and its territorial separation from other political neighbors located in the Italian Peninsula.

This chapter pays special attention to Lombardy's border with the Duchies of Parma and Piacenza, a dividing line that bordered both subunits of this Habsburg province: the State of Milan and the Duchy of Mantua. In 1748, the Treaty of Aix-la-Chapelle and the Congress of Nice specified that after Philip of Bourbon took over the Duchies of Parma and Piacenza, he would negotiate amicably with his Habsburg neighbors the situation of contested lands in the proximity of the border.[730] However, this seemingly easy goal remained unfulfilled for more than fifty years. In the following pages I explore the reasons why one of the most powerful European empires, the Habsburg Monarchy, failed to demarcate the border segment towards one of its weakest neighbors, the Duke of Parma. This outcome is even more puzzling if we take into account the strong cartographic tradition and trained personnel present in the Italian Peninsula in the eighteenth century.

Section one explores the Habsburg efforts in Lombardy to organize special institutions dedicated to marking the province's borders and signing bilateral treaties with all neighboring foreign states. The Monarchy's desire to accelerate the border regulation process by creating special border commissaries clashed with the province's traditional administrative organization,

[730] ASM Confini p.a., box 76, January 1, 1777, Kaunitz to the Spanish ambassador in Vienna.

which had its own mechanisms for addressing these types of issues. Vienna's attempt to infringe on the Senate of Milan's authority over incidents regarding jurisdiction in the border areas faced significant resistance. The border commissaries found themselves caught between the provincial government directly subordinate to Vienna, and the Milanese Senate who refused to cooperate with these officials. This institutional hurdle impacted the pace of border negotiations, as reflected in the case of abortive attempts to settle the frontier with Parma.

The Habsburg border-negotiation template, as shown in chapter 5 for the cases of Transylvania and the Austrian Netherlands, relied on cartography to help support imperial claims during official border negotiations. And despite his halfhearted agreement to collaborate, the Infant of Parma had no chance of eliminating a procedure consecrated by various European powers, or at least not without being accused of ill will.[731] Section two explores the unfolding of two joint border inspections along the Habsburg-Parmesan borderline and reveals the importance of cartography for such missions. Military and civil engineers, together with provincial administrators who had a thorough knowledge of Lombardy's history and geography, played an instrumental role in furthering Habsburg interests during the discussions preceding and accompanying the inspections. Whereas the 1775 inspection failed miserably due to the two Courts' different scope for this mission, the 1779 border examination produced an official map showing all the domains the two states agreed to consider contested lands. However, the 1779 inspection did not preclude a successful negotiation, as the Habsburg Monarchy changed its territorial goals once Joseph II took over the throne from Maria Theresa in 1780.

[731] Some other famous mid-eighteenth-century treaties that led to border demarcations, signed by other European states than the Habsburgs, include the Treaty of Madrid (1750; provisions regarding the border of Portuguese and Spanish possessions in South America) and the Treaty of Aix-la-Chapelle (1748; specifications regarding the border between British and French possessions in Nova Scotia), Ferreira, *O Tratado de Madrid e o Brasil Meridional*; Pedley, "Map wars."

The final section explores the extension of the Habsburg-Parmesan negotiations into a quadrilateral discussion involving the most powerful Bourbon monarchs of Europe: the French and the Spanish kings. As Joseph II insisted on his desire to impose the border on the Pò River, which would have led to a significant loss of land for the Infant of Parma, the Parmesan ruler requested the help of his more powerful relatives. The diplomatic discussions involved ambassadors and ministers from Vienna, Milan, Parma, Madrid and Versailles. In this way, the negotiation over the Habsburg-Parmesan borders became a truly trans-imperial process, and the two sides directly interested in the final result relied on cartographic material to defend their claims and arguments. Despite the acceleration in the production of borderlands' maps, the Habsburg failure to establish a clear demarcation line between Lombardy and Parma proves that maps were a necessary but not a sufficient condition for the success of such projects.

6.1 THE GENERAL COMMISSARY FOR THE BORDERS OF THE STATE OF MILAN

The War of the Austrian Succession (1740-1748) and the subsequent treaty of Aix-la-Chapelle (1748) constituted a turning point not only for the Habsburg Monarchy's possession in Italy, but for the geography of the whole Peninsula.[732] As shown in Figure 6.1, by 1748 the Habsburg Monarchy had lost control over Naples, Sicily, the Lombard territories across the Po and Ticino rivers, and the Duchies of Parma and Piacenza. However, during this same period Maria Theresa's husband, Francis Stephen, had become Grand Duke of Tuscany (5), and the Habsburgs had also consolidated their hold on the two territorial units composing Austrian Lombardy: the

[732] For a survey of the War of the Austrian Succession see Browning, *The War of the Austrian Succession*.

State of Milan (1-a) and the Duchy of Mantua (1-b).[733] Therefore, although the size of the Habsburg possessions significantly decreased, these lands were also more compact and in closer proximity to Vienna.

The seemingly provincial unity of Austrian Lombardy eluded the Habsburg authorities until the 1780s. Indeed, it took the Habsburgs most of the eighteenth century to centralize their possessions in Lombardy under the authority of Milan, because the Duchy of Mantua had a strong institutional tradition and preserved a key strategic position for the Monarchy.[734] Therefore, Vienna had to tread gently in the direction of integrating Mantua with the State of Milan.[735] Only after 1780, when Joseph II took fully the reigns of power in his hands, was the emperor able to create a unified administration for the whole of Lombardy.[736]

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[733] Carlo Capra, "Habsburg Italy in the age of reform," *Journal of Modern Italian Studies* 10, no. 2 (2005): 218-219; Ingrao, *The Habsburg Monarchy*, 147.

[734] Simona Mori's work on the Duchy of Mantua in the eighteenth century complements Carlo Capra's work on Austrian Lombardy. Mori focuses on the Duchy of Mantua and its evolution throughout the eighteenth century, whereas although Capra discusses Austrian Lombardy as a unit, he focuses especially on the State of Milan. Capra, *La Lombardia Austriaca Nell'Età delle Riforme*; Simona Mori, *Il Ducato di Mantova nell'età delle riforme (1736-1784). Governo, amministrazione, finanze* (Florence: La Nuova Italia, 1998).

[735] For a brief period, between 1744 and 1749, Maria Theresa strived to reform the administration of Mantua in order to integrate this Duchy better into Austrian Lombardy. However, as the Mantua proved loyal during the War of the Austrian Succession, and Maria Theresa knew she had to rely on this Duchy's financial help for the post-war reconstruction, she decided to revive Mantua's distinct administration in 1749. Silvia Cuccia, *La Lombardia in età Teresiana e Giuseppina* (Florence: Sansoni, 1977), 34-35; Mori, *Il Ducato di Mantova*, 58-59; 93.

[736] Ingrao, *The Habsburg Monarchy*, 204. Despite the separate administration and political institutions in the State of Milan and the Duchy of Mantua, many scholars analyzing the evolution of Austrian Lombardy under the Habsburgs excluded Mantua from most of their analyses. That is, although they use the term 'Lombardy', some historians only discuss developments in the State of Milan. See for example, Alexander Grab, "Enlightened Despotism and State Building: The Case of Austrian Lombardy," *Austrian History Yearbook* 19-20 (1983-1984): 44-45.

1. Austrian Lombardy
    a. State of Milan
    b. Duchy of Mantua
2. Kingdom of Sardinia
3. Kingdom of Naples
    c. State of Presidi
4. Papal States
5. Grand Duchy of Tuscany
6. Duchy of Modena
7. Duchy of Parma and Piacenza
8. Republic of Genoa
    d. Corsica
9. Republic of Venice
10. Republic of Lucca
11. Principality of Piombino
12. Republic of San Marino

Figure 6.1 Map of Italy after the Treaty of Aix-la-Chapelle (1748)

In 1748, after the War of the Austrian Succession, Maria Theresa and her advisers prioritized the empire's financial recovery in order to increase military expenditure and defend the Monarchy. In an effort to gather more revenue from the State of Milan, Governor Gian Luca Pallavicini spearheaded the reform of the provincial institutions and the taxation system.[737] As part of this institutional renewal, in an effort to limit the authority of provincial elites dominating the Senate, Maria Theresa also created the function of General Commissary for Borders (*Commissario Generale dè Confini*).[738] This imperial decision demonstrates Maria Theresa's commitment to defining and preserving the province's borders. Due to the political fragmentation of the Italian Peninsula in the second half of the eighteenth century, Austrian Lombardy neighbored numerous political entities, including the Kingdom of Sardinia's domains in Piedmont, the Republic of Venice, some of the Swiss cantons, the Papal States, the Duchy of Modena and the Duchies of Parma, Piacenza and Guastalla. Establishing border treatises with all of Lombardy's neighbors became a priority for the Habsburgs starting in the 1750s and initially, the imperial authorities in Vienna hoped that the General Commissary for Borders would prove instrumental in the process of borders' delimitation.

However, creating this new official clashed with the long institutional history of the State of Milan, especially the traditional role of the Senate regarding borders. Indeed, until the 1749 reforms, the Senate had reserved the authority to make decisions on how to retaliate to border violations, how to negotiate with neighboring states the position of the frontier, and how

[737] In 1749, Maria Theresa ordered the fusion of the two institutions in charge of financial matters, the *Magistrato delle entrate ordinarie* and the *Magistrato delle entrate straordinarie*, into one body, the *Magistrato Camerale*. Pallavicini supervisied the unification of all tax collection in one body, the *Ferma Generale*, and ensured the smooth completion of the Milanese cadaster (*Censimento*). Grab, "Enlightened Despotism and State Building," 46-49; Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 128-130.

[738] ASM DR, box 219, Maria Theresa to Harrach, July 26, 1749; Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 137.

to solve other border related issues.[739] However, the customary practice of naming arbiters whenever a border controversy arose proved ineffective; out of the 60 frontier incidents occurring between 1550-1700, arbiters successfully settled only seventeen.[740] Border incidents in the 1730s reconfirmed the Senate's inability to keep up with all the modifications in the border areas and to solve territorial conflicts in a satisfactory matter.[741] Additionally, the Treaty of Aix-la-Chapelle (1748) reconfigured the political configuration of the Italian Peninsula. Therefore, it became necessary in the eyes of Vienna to create the institution of a border commissary. On July 26, 1749, Maria Theresa named Count Arconati as the first border commissary, and chose Giovanni Mario Andriani as his adjunct and automatic successor.[742]

Unfortunately, the overlap of responsibilities between this new officer and the Senate paralyzed the work of Andriani. For example, the border commissary was excluded from the preparatory work for the 1752 treaty of Varese regulating the borders of Lombardy with the Republic of Venice. Moreover, throughout the early 1750s, Arconati complained repeatedly to the government that the Senate and the government of Lombardy did not share with him any border maps, border treaties or lists of territorial controversies.[743] Under these conditions, Arconati's and Andriani's titles conferred on them no real responsibilities.

Despite the inefficiency of Arconati and Andriani, Maria Theresa tolerated the situation as she relied on another important official from Lombardy to orchestrate the signing of numerous

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[739] Lombardy's situation was not unprecedented in the Italian lands. The Republic of Venice had a similar Senate-centered system for dealing with border problems. By the second half of the eighteenth century, the person filling the initially purely consultative function known as border-chamber inspector ("sopraintendente alla camera dei confini") acquired more authority over frontier conflicts and negotiations. For a discussion of the Venetian Republic's institutions in charge of border matters, see Mauro Pitteri, "I Confini della Repubblica di Venezia. Linee generali di politica confinaria, 1554-1786," in *Alle Frontiere della Lombardia. Politica, Guerra e Religione nell'età moderna*. ed. Claudio Donati (Milan: FrancoAngeli, 2006), 259-288.
[740] Vittorio Adami, "La magistratura dei confini dello Stato di Milano," *Archivio Storico Lombardo* 40 (1913): 131.
[741] In his article discussing the development of institutions in charge of border regulations in Lombardy, Vittorio Adami offers some examples about the failure of the Senate to disentangle complex border controversies. Ibid., 128-133.
[742] ASM DR, box 219, Maria Theresa to Harrach, July 26, 1749.
[743] Adami, "La magistratura dei confini dello Stato di Milano," 139-140.

border treaties: Beltrame Cristiani, who occupied from 1753 until his death in 1758 the office of Plenipotentiary Minister of Lombardy. On October 22, 1750, Maria Theresa informed Governor Pallavicini that she had decided to commission Cristiani with the secret mission of pursuing a policy to sign border treaties with neighboring states.[744] Throughout the 1750s Cristiani successfully concluded commercial and border treaties with Habsburg neighbors including the Swiss cantons, the Kingdom of Sardinia, and the Duchy of Modena. The only political ruler with which Cristiani did not manage to reach a consensus was the Infant of Parma, who controlled the Duchies of Parma and Piacenza.[745] After Cristiani's death in 1758, the government in Vienna had to rely again on the inefficient border commissary and his adjunct.

As Derek Beales, Carlo Capra and Franz Szbo have already established, the early 1760s was a propitious time for the imperial authorities in their fight against Lombardy's provincial elites and imposing centralizing reforms.[746] After becoming the new plenipotentiary minister of Lombardy in 1759, Carlo Firmian ensured the successful reform of the taxation system based on the Milanese cadaster, and remained Chancellor Kaunitz's loyal voice in the province for the next decades.[747] During his time as plenipotentiary, Firmian strived to transform Vienna's orders into reality, fighting the conservative stance of traditional Milanese institutions such as the Senate with the help of newly hired functionaries, originally from areas other than Lombardy, and thus loyal firstly to the Habsburg dynasty.[748] It is in this favorable context for the imperial authorities in Vienna that we have to analyze Maria Theresa's attempt to revitalize the powers

[744] ASM DR, box 222, Maria Theresa to Pallavicini, October 22, 1750.
[745] For a detailed list of these treaties see Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 157-159.
[746] In 1757 Chancellor Kaunitz increased his authority over the Netherlands and the Italian-Spanish Council by replacing them with Belgian and Italian Councils subordinated directly to the State Chancellery. Kaunitz's correspondence with the governors and plenipotentiary ministers in Lombardy remains one of the main sources for understanding the Habsburg policy in this province. Beales, *Joseph II*, vol. 2, 494; Capra, "Habsburg Italy in the age of reform," 223; Szabo, *Kaunitz and Enlightened Absolutism*, 50-51.
[747] Grab, "Enlightened Despotism and State Building," 55.
[748] Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 190-193, 217-220.

and responsibilities of the border commissary and his adjunct. In her April 30, 1761 imperial order, the Habsburg monarch decreed that Arconati and Adriani should pursue their activity as formulated in the 1749 decree. The empress tried to eliminate any institutional overlap of duties with respect to borders by stating that the Senate remained the institution responsible for examining the legal arguments for border disputes, whereas the border commissary addressed actual incidents. Furthermore, Maria Theresa ordered the border commissary to prepare monthly reports about the state of the borders both for the government and for the Senate.[749]

Encouraged by this new imperial interest in his office, Arconati prepared two memoirs with complaints against the Senate and suggestions for improving his position.[750] Arconati based his argumentation on Maria Theresa's decrees from 1749, 1753, and 1761, which enforced the border commissary's subordination to both the government and the Senate. In these imperial orders, the empress had urged the Senate to solicit the opinion of the border commissary and had encouraged forwarding all local reports regarding border incidents to this official.[751] In addition to his plea for the implementation of Maria Theresa's decrees, Arconati requested from the government access to cartographic material prepared for Lombardy's borders, including maps drawn as result of international treaties.[752] The border commissary was aware that obtaining copies of the latest border maps would offer him leverage against other institutional rivals, such as the Senate, as he could monitor border disputes and suggest to the central government solutions to preserving the integrity of the borderline. Arconati's request for access to border maps prepared as part of the border demarcation operations also endorses the contractual value the Habsburg government and Lombardy's neighbors conferred to these cartographic documents.

[749] ASM DR, box 234, Maria Theresa's order, December 25, 1777; ASM Confini p.a., box 16, Kaunitz to Firmian, December 25, 1777.
[750] ASM Confini p.a., box 16, Arconati to Firmian, June 20, 1761.
[751] Ibid.
[752] Ibid.

Despite Maria Theresa's interest in the position of border commissary and Arconati's memoirs, the official's efforts failed, and his death in 1763 led to another wave of governmental documents trying to regulate the position of his successor.[753] Although in theory Andriani continued to occupy the function of border commissary, his inefficiency in addressing urgent issues, especially regarding the territorial conflicts with the Court of Parma, forced the government to look for an alternative institution.[754] On June 30, 1768, Kaunitz sent to Firmian his thoughts about the qualities an ideal border commissary should have, including an in-depth topographical and historical knowledge of the province and a familiarity with the province "inch by inch." Based on these criteria, Kaunitz recommended Counsellor Giuseppe Pecis as the future lieutenant of the border commissary. Moreover, the Chancellor suggested combining this position with similar responsibilities for the inspection of waterways and roads.[755]

Although flattered by this nomination, Pecis warned Firmian about the risks of conferring so many responsibilities and honors on one person's shoulders and recommended ways to improve Andriani's position as general border commissary.[756] Firmian agreed with Kaunitz on the importance of putting in charge of borders a subject with a good knowledge of the province, its history, customs, and the evolution of its borders throughout time. The plenipotentiary

[753] Rather than eliminating the office of border commissary, Kaunitz reminded Firmian that Maria Theresa had selected Arconati's successor in the person of Andriani, already in 1749. The Chancellor urged Firmian to ensure the Senate's cooperation with Andriani in order to avoid a direct intervention from Vienna. ASM Confini p.a., box 16, Kaunitz to Firmian, June 20, 1763; Kaunitz to Firmian, June 23, 1763.

[754] After almost two decades of failing to empower first Arconati and then Andriani, in a letter to Firmian dated November 12, 1767, Kaunitz explored the reasons for this debacle. The Chancellor identified two main obstacles: the refusal of the Senate to share its border-related responsibilities, and the Treasury's denial to pay for the commissary's operations. ASM Confini p.a., box 16, Kaunitz to Firmian, November 12, 1767.

[755] ASM Confini p.a., box 17, Kaunitz to Firmian, June 30, 1768.

[756] Pecis suggested adding another person to help the commissary prepare a report of the evolution of the borders' situation from earlier times until current events. The report could be based on treaties signed throughout time with Lombardy's neighbors, other reports, undecided issues and current problems. Also, Andreani and this second person should maintain a regular correspondence with Habsburg ministers residing in the neighboring states and even with ministers of foreign states in order to gather information on border controversies and help prepare Congresses to negotiate border issues. Additionally, the border commissary would correspond with provincial authorities to collect news about any local incidents. ASM Confini p.a., box 3, Pecis to Firmian, July 11, 1768.

envisioned that such an official would devote full time to studying treaties with neighboring states, would perform local border inspections, and would maintain the government and the Senate informed. They would also have full access to the archives and would correspond with local authorities from border settlements. However, Firmian warned Kaunitz that in order to avoid the failure of this new official, he should be directly dependent on the government, and not subordinate to the Senate.[757]

By the end of August 1768, Kaunitz and Maria Theresa decided that the creation of a new Minister combining attributions over borders, waterways and roads might lead to the jealousy of the provincial elite.[758] Therefore, they suggested composing an ad-hoc committee (Giunta) under Pecis's coordination. This committee would discuss Pecis's reports and would send instructions to the border commissary and the institutions in charge of waterways and roads. Between 1764 and 1769 the government of Lombardy found ad-hoc commissions the best solution to address urgent issues and circumvent the slow bureaucratic process of Lombardy's institutions.[759] Therefore, Kaunitz's suggestion to create an ad-hoc commission in charge of borders, waterways and roads was not unprecedented. In addition to Pecis, who was in charge of setting the agenda of the commission and ensure its legitimacy and efficient functioning, this group included representatives from a variety of key provincial institutions: senator Filippo Muttoni, counselor Giuseppe Wilczek, questor Alessandro Ottolino, count Francesco d'Adda, and border commissary Giovanni Mario Andriani.[760]

Although abolished by 1770, the short-lived *Giunta* for roads, waterways and borders, had set a pattern for bringing together provincial experts on borders to address the controversies

[757] ASM Confini p.a., box 17, Firmian to Kaunitz, July 12, 1768.
[758] ASM Confini p.a., box 17, Kaunitz to Firmian, August 29, 1768.
[759] Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 273-275.
[760] ASM DR, box 241, Maria Theresa's order, October 6, 1768. Also mentioned in Capra, *La Lombardia Austriaca Nell'Età delle Riforme*.

with Parma, which continued to persist in the 1770s. On July 7, 1770, Kaunitz ordered Firmian to delegate government consultant Paolo de la Silva to convene twice a week the following group of border experts: Senator Muttoni, Counselor Pecis, the fiscal officer Bonacina (soon replaced with Martignoni due to his precarious health), and Secretary Remigio Fuentes. This group of specialists, who met regularly for the next decades, had as their first priority helping the government negotiate with the Court of Parma regarding the border contestations.[761] Kaunitz preferred summoning a commission with no actual decisional power in order to prevent a negative reaction from the Senate.[762] However, although this Giunta could not issue any governmental decrees, these advisors' reports and suggestions greatly influenced Vienna's attitudes and policies with respect to the border negotiations with Parma for most of the 1770s and 1780s. It is striking that Andriani, the border commissary, was not even included as part of this assembly. Indeed, the Habsburg authorities gave up for a while any chance to revitalize the position of border commissary and officially eliminated this function in 1772.[763]

As illustrated by the convening of this new border commission, in their effort to collaborate fruitfully with Lombardy's institutions and regulate the border with Parma, Kaunitz and Firmian relied on the work of Paolo de la Silva, government consultant (consultore di governo) between 1763 and 1782.[764] De la Silva distinguished himself with his knowledge of the legal system and his ability to write memoirs combining historical and legal arguments to defend

[761] ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meetings from January 30, 1772 and January 31, 1772. ASM Confini p.a., box 73, Firmian to de la Silva, January 30, 1772.

[762] In a letter to Firmian, Kaunitz expressed the hope that the work of these ministers would not infuriate the Senate, as they only analyzed arguments and clarified facts, without having the right to take actual decisions. ASM Confini p.a., box 73, Kaunitz to Firmian, January 16, 1772.

[763] In October 1774, Count Don Giovanni Mario Andreani died and the Habsburgs eliminated the position of "luogotenente generale dé confini" with the 1772 Plan of Reform of Lombardy's administration anyway. ASM Confini p.a., box 16, Kaunitz to Firmian, October 20, 1774; Kaunitz to Firmian, April 9, 1772.

[764] The role of the government consultant was advising the plenipotentiary minister. Before 1763 de la Silva had been the president of the Council of Justice of Mantua, and the head of the committee fulfilling the role of the Vicegovernor of Mantua. Mori, *Il Ducato di Mantova*, 173-174.

Habsburg claims against the Duke of Parma.[765] As part of his responsibilities to ensure the success of the border negotiations with Parma, de la Silva prepared instructions for Lombardy's engineers involved after 1775 in border inspections and advised Firmian regarding the correspondence with the Parmesan minister.

However, Vienna quickly realized that de la Silva's knowledge and understanding of the legal and historical framework was not sufficient to allow such a low-rank official to negotiate at the highest level with the Court of Parma. Therefore, in 1777, when the Governor of Lombardy, Archduke Ferdinand, recommended the reinstatement of the function of general commissary for borders and the promotion of Marquis Francesco Belcredi in this position, Maria Theresa and Kaunitz agreed.[766] As shown in the next sections, Belcredi took the lead in preparing for the border negotiations with Parma, and this is an example of the Habsburg success in finally transforming the function of border commissary into reality. The reforms of the early 1770s had strengthened Vienna's authority over Lombardy and as directly subordinate to the imperial central authorities Belcredi was in a stronger position than Arconati and Andriani had ever been.[767]

To ease the work of this new border commissary, Maria Theresa ordered him to supervise the creation of a special archive where documents, drawings and plans of the border areas could be amassed and stored.[768] Under Belcredi's management, the governmental official Vincenzo Molinari performed the systematization of this border archive, starting with the documents and

[765] ASM Confini p.a., box 74, Paolo de la Silva's 1775 memoir "Presentation of the borders of the Duchy of Milan and Mantua with Parma, Piacenza and Guastalla" (Dimostrazione de Confini del Ducato di Milano e di Mantova con Parma, Piacenza, e Gustalla).
[766] ASM Confini p.a., box 16, Kaunitz to Firmian, December 22, 1777; ASM DR, box 256, Maria Theresa's order from December 25, 1777.
[767] The reforms of 1771 separated the administrative and judicial competencies between the *Magistrato Camerale* and the Senate, and added a control institution, the *Camera dei Conti*; the process of bureaucratization intensified and Vienna took over the process of indirect taxation Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 281, 296-303; Grab, "Enlightened Despotism and State Building," 61-64.
[768] ASM Confini p.a., box 16, Kaunitz to Firmian, December 25, 1777.

maps related to Lombardy's frontier with Parma.[769] The laborious process of collecting documentary material from all of the provincial archives related to Lombardy's borders revealed that important cartographic material had been lost and encouraged the Habsburg government to pay closer attention to the preservation of border maps.[770] Maria Theresa's decision to create a border archive and the material included in this repository illustrate the role of maps as significant documentary sources to support territorial claims and prepare for intergovernmental negotiations.

By 1780, the State of Milan finally possessed a solid institutional framework in charge of solving border controversies and defending the territorial integrity of the province. The Senate was responsible for examining and maintaining information about controversial border segments; the border commissary was in charge of investigating new border incidents and representing the Habsburg government in international border negotiations. The provincial counselor attached to the Magistrato Camerale, an institution running almost all financial matters,[771] made regular border inspections and sent reports to the government, who shared them, based on their content, with the Senate, the Magistrato Camerale or the border commissary.[772] This complex system involving all the major institutions of the State of Milan, namely the provincial government, the Senate and the Magistrato Camerale, reveals the centrality of border affairs for the provincial and imperial Habsburg policy. The efforts of the central government in Vienna to integrate

[769]HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, Kaunitz to Firmian, April 20, 1780. ASM Confini p.a., box 3, Firmian's order from July 1, 1780.

[770] In October 1780, Belcredi suggested ways for better preservation of original border maps and reported the disappearance of three maps prepared after the 1773-1774 inspection of the frontier between the Province of Cremona and the Republic of Venice. Belcredi recommended asking for additional copies of the lost maps from the government of Venice. ASM Confini p.a., box 14, Belcredi to Ferdinand, October 16, 1780. The government of Lombardy agreed with Belcredi's suggestions. ASM Confini p.a., box 14, Firmian to Belcredi, November 11, 1780.

[771] For an in-depth discussion of the *Magistrato Camerale* see Cesare Mozzarelli, "Magistrato Camerale della Lombardia Austriaca (1771-1786)," *Römische Historische Mitteilungen* 31 (1989): 377-396.

[772] The border commissary also maintained correspondence with local authorities and representative of the Census Office in order to be informed of any border novelties. The provincial counselor also had to first consult the border commissary before raising an issue to the government. ASM DR, box 258, Maria Theresa's order from April 20.

Lombardy into the Monarchy by eliminating or at least curtailing the authority of some of its traditional institutions led to the creation and the transformation of the border commissary from an inefficient bureaucrat into an agent of imperial power in Lombardy.

The inability of Vienna to reach a consensus regarding the borderline with the Infant of Parma since 1748 forced the Habsburg rulers to continue to improve the institutional provincial mechanism in charge of defending Vienna's claims in the border areas. In their effort to reach an agreement with Parma, the Habsburgs relied substantially not only on the border commissary, but also on the cartographic production of engineers and surveyors, as the next section illustrates.

6.2 THE ROLE OF ENGINEERS AND MAPS IN SETTLING BORDER DISPUTES

On October 13, 1777, in a letter to Firmian, Kaunitz expressed his opinion on how border inspections should occur: "generally, it is advisable that the engineers chosen for tasks of this nature know well the origin, progress and current state of territorial issues, and that they are informed on the arguments and documents not only supporting their side, but also, as much as possible, for the opposing side. Such notions help observing in the field any critical circumstance and point that would support our arguments in the face of opposing pretensions."[773] As shown in the chapter 5, the chancellor's formula for frontier reconnaissance had been applied successfully in at least two other provinces: Transylvania during the border mapping and demarcation in the 1750s and 1760s, and the Austrian Netherlands after the 1769 border treaty with France. Even in

[773] Original: "Generalmente conviene che gli Ingegneri per commissioni di questa natura sieno ben instruiti dè fatti dell'origine, progresso e stato attuale delle questioni teritoriali, come pure che si trovino prevenuti dè fondamenti, e titoli non solo della loro Parte, ma ancora, per quanto riesca possibile, di quelli dell'avversa Parte. Tali nozioni servono in sulla faccia del luogo a rilevare ogni critica circostanza, e di punto d'appoggio alle nostre ragioni a fronte delle pretensioni avversarie." ASM Confini p.a., box 76, Kaunitz to Firmian, October 13, 1777.

the case of Lombardy, starting with the early 1750s, engineers and surveyors had inspected and marked all the province's borders except the one towards Parma. This section explores Habsburg attempts in the second half of the 1770s to organize, together with the Infant of Parma, border inspections in preparation for a Congress that would decide on the definitive trajectory of the borderline between Lombardy and Parma. Although the Congress never materialized, these joint inspections produced rich cartographic material that later influenced the Habsburg efforts to integrate better the two sub-units of Lombardy: the State of Milan and the Duchy of Mantua. Moreover, once the decision-makers in Vienna obtained access to a clearer image of Lombardy's geography towards Parma, their expectations regarding the ideal trajectory of the borderline changed, and the Pò River emerged in the cartographic representations as a possible long-term frontier line.

The history of the failed Lombardy-Parma border demarcations offers a counterpoint to the successful Habsburg operations in Transylvania, the Austrian Netherlands, and the other borders of Lombardy. Although the Habsburg commitment to eliminate territorial enclaves and establish fixed borderlines relied on the work of mapmakers and jurists in all these three border provinces, the success of border demarcations depended in equal part on Vienna's political neighbors' determination to reach an agreement.

In 1775, the government of Milan and the Court of Parma agreed for the first time to send two engineers, one for each side, to inspect the border between the two states and prepare maps and detailed reports for all the controversial areas.[774] The two engineers chosen for this mission, Colonel Nicolò Baschiera for the Habsburg side, and Lieutenant Colonel Gian Andrea Boldrini for Parma, failed to finalize the inspection due to an incompatibility between the two courts' understanding of the meaning of contested lands and the engineers' contradictory instructions, as

[774] ASM Confini p.a., box 74, Sacco to Firmian, February 17, 1775.

discussed below.[775] An examination of governmental documents discussing the guidelines for Baschiera's mission, the diplomatic correspondence between Milan and Parma, the reports of Baschiera after the beginning of this inspection, and the additional suggestions of Lombardy's experts on border issues discloses the Viennese Court's reliance on cartographic material both to prepare this inspection and to capture its final results. Additionally, these archival documents reveal that although Parma was far from being a serious political rival to Vienna, the Infant and his advisers had access to skilled mapmakers and jealously guarded access to geographic information about their domains.

Almost half a year before the beginning of the inspection, Chancellor Kaunitz inquired from Lombardy's plenipotentiary minister about the location of "some papers or topographic charts already prepared, even if not through the collaboration of both sides, which could meanwhile help understand the state of the disputes."[776] Kaunitz believed these older maps could educate Baschiera regarding the geographic situation of some of the controversial sites, prior to his inspection.[777] Although the Chancellor's plan seemed sensible, it quickly became clear that the provincial archives housed neither a drawing of the flow of the river Pò, nor a list of all the border controversies along the river.[778] De la Silva suggested that the Census Office was the only institution capable of preparing a map of the river, together with banks and islands.[779]

The provincial institutions' inability to locate a general map of the border with Parma must have been puzzling to the authorities in Vienna, who were aware of the strong surveying and mapmaking tradition of Lombardy. As the borderline along the Pò passed through both the

[775] Ibid. and Ibid., Firmian to Baschiera, February 28, 1775.
[776] "Vi esisteranno pure alcune Carte o Tavole topografiche già fatte, benchè non in concorso d'ambe due Parti, che possano frattanto servire per comprenderne lo stato delle questioni." Ibid., Kaunitz to Firmian, early March 1775.
[777] Ibid., Kaunitz to Firmian, April 10, 1775.
[778] Ibid., Fuentes to Paolo de la Silva, April 11, 1774.
[779] Ibid.

poorly integrated State of Milan and the Duchy of Mantua, this is not surprising. Each of these sub-units of Lombardy prioritized their own border disputes and did not exchange cartographic information with each other, unless ordered by the central government. Even the Census Office's large repository of local maps encompassed only information regarding the State of Milan.[780]

Throughout the spring and summer of 1775 employees working for the Senate, the Chancellery and the Census Office, searched through archival papers to help Baschiera,[781] who considered that although existing geographic maps "were not accurate and therefore were useless for the assignment," they could still provide guidance in understanding some of the controversies. [782] Based on the lists of maps sent to Baschiera to help him with his mission, we can recreate an inventory of the cartographic material regarding the border between Lombardy and the domains of the Infant of Parma, reflecting the state of these sources in 1775.[783]

[780] The Habsburgs only extended he cadastral measurements and taxation reforms performed in the State of Milan in the middle of the eighteenth-century to the Duchy of Mantua in the 1780s. Mori, *Il Ducato di Mantova*, 106.
[781] ASM Confini p.a., box 74, De la Silva's instructions for Baschiera, April 17, 1775.
[782] "Ordina VE di non servirsi di Carte Geografiche cosa ottima, quantunque a tutti sia noto, che tali Carte non sono esatte ed in conseguenza inutili per la commissione che si ha a fare." Ibid., Baschiera to de la Silva, April 24, 1775.
[783] Ibid., list of maps and plans from the Secret Chancellery, dated July 12, 1775; list of the maps from the Royal Archive of the Castle, July 16, 1775; list of maps from the Census Office, July 19, 1775; list of maps from the Senate, July 17, 1775.

Table 6.1 List of maps related to the Parmesan-Habsburg border located in archives of Lombardy (1775)

Institution Sending the Maps	Map Details	Date
Secret Chancellery	Drawing prepared at the order of the chief magistrate from Codogno (podestà) by Giovanni Francesco Cigognini, surveyor from Lodi, showing parts of the river Pò that include the forests and alluvial deposits at Vojera and Regona.	September 4-5, 1773
	Unsigned drawing showing the borders with Retegno, part of Lodi's territory, and with Piacenza's domains.	No date
	Plan prepared by engineer Pietro Martire Aglio, showing the segment of the Pò including the waters belonging to Cremona	June 28, 1772
	Drawing extracted from a report of Colonel Baschiera, showing the embankment built by the inhabitants of Guastalla	No date
	Drawing prepared by Marco Zavatini showing the embankment built by the inhabitants of Guastalla	September 29, 1770
	Plan sent by the chief magistrate in Codogno, prepared by surveyor Giovanni Pietro Francesco Cigognini, and showing the alluvial deposits of Lodi's Vojera.	September 22, 1774
	Similar plan to the one above, but in a larger version	No date
Royal Archive of the Castle	Drawing of the island Ballottino across Martignana, contested with Parma	1752
	Drawing of the domain contested by the communities of Corno Giovine, Lodi, and the family Casati, Piacenza	1754
	Drawing prepared by Pavia's engineer, architect Giulio Francesco Veneroni, showing the island Boscone, recently united to Pavia's territory and contested by count Lottario Scotti from Piacenza. Includes copy of the engineer's report.	February 10, 1756
	Drawing of the modifications done by Marquis Arcelli, from Piacenza, to the tributary Ancona, territory of Guardamiglio, damaging the interests of Count Antonio Somaglia and the monastery Ospitaletto. Includes a report prepared by engineer Francesco de Coutelet	February 25, 1761
	Drawing of the island Fossa Caprara and Roncadello, jurisdiction of Casalmaggiore, attacked by Parmesan inhabitants. Includes a description of	October 2, 1761

	engineer Giuseppe Meneghetti, working for the City of Cremona and surveyor of Casalmaggiore	
	Drawing of the modifications the inhabitants of Piacenza did on the border segment from Porto Morone, domain of Pavia, by destroying a wooden channel erected by family Anselmi in order to irrigate their possessions in Cassina Perranchera. Includes the original report of judge Pietro Morosini from Pavia.	May 27, 1764
Senate Archives	Plan of domains controversial between Count Camillo Stanga from Castel Nuovo, Bocca d'Adda, domain of Cremona, and the commune of Roncarolo, domain of Piacenza. Includes a report of surveyors Pietro Lissa and Marc Antonio Smeraldi	July 11, 1624
	Drawing prepared by engineer Giacomo Muttoni, showing the island between the Pò river's branches across from Colombarola, together with the banks of the river	1716
	Five plans regarding the construction of a wall done by the inhabitants of Rivarolo next to the waters of Delmoncina, belonging to Cremona. Prepared by engineers Guerrino and Combiaghi from Cremona, and Moschatelli from Rivarolo	1716
	Plan showing the modifications done by the inhabitants of Bozzolo to change the course of a channel's waters	1722
	Plans made at the discovery of the island Gerolo, close to the dam of Casalmaggiore	1724
	Two drawings prepared by engineer Piretti, showing the attack supposedly committed by the court of Casalmaggiore and usurping Parmesan jurisdiction, when transporting the body of Paolo Piapa.	1732
	Two plans prepared by engineers Duci and Malatesta, showing the territorial violation committed by Pietro Provaglio and other inhabitants of Piacenza, in the province of Cremona.	1733
	Plan done by engineer Tocchi, showing the modifications done by inhabitants of Castel Bocca d'Adda, domain of Cremona and prejudicing the territory of San Nazaro	1739
	Plan prepared by engineers Brignoli and Boldrini, showing usurpations committed by Marquis Stanga	1741
	Plan prepared by engineer Boldrini of a	1742

	construction done on the Pò by Marquis Stanga, prejudicing the jurisdiction of Piacenza	
	Plan prepared by engineer Duci, showing the controversies between Marquis Stanga and the Jesuits of Piacenza	1744
	Three plans of the island Fossa Caprara made in 1722 and rectified in 1751	1722/1751
	Plan by engineer Verdelli showing the modifications done by the Parmesans to the island of Balottino	January 14, 1752
	Plan showing the Parmesan modifications to the forest known as Voiro	1757
	Plan prepared by engineer Aglio to show the sites in need of repair after the corrosions caused by the Pò	1759
	Plan showing the island of Fossa Caprara at the moment when the Parmesans occupied it	October 15, 1761
	Plan prepared by engineer Costa showing the banks of the Pò contested between Parma and Mantua	1772
	Plan prepared by engineer Dosi at the time of the arrest of four men by the Parmesans, in the place known as Bescacino	1772
	Plan prepared by engineer Costa in 1773 showing the modifications done to the Pò by the Parmesans against the Mugnai of Cremona, forcing the Mugnai to cede grain mills	1773
	Three drawings showing territorial controversies with respect to the forests Baratt, Barattino and other sites along the Pò, on the border between Pavia and Monticelli, domain of Piacenza	1643
	Drawing of engineer Francesco Guerenzi showing the border usurpations caused by the inhabitants of Piacenza to the island Bottarona, on the territory of Court Santa Andrea Ducato	1669
	Plan prepared by engineer Monti showing Mortizza di Caselli and Chignolo, domains of the State of Milan, and Monticelli, domain of Piacenza	1728; modified in 1731
	Plan formed when the inhabitans of Piacenza caused problems on the territory of Court Santa Andrea Ducato and Court Olona Pavese	1730 and 1733
	Two drawings prepared by engineer Veneroni showing the controversies between Lombardy and Piacenza regarding some mills on the Pò, on the bank of Schiafonata towards Chignolo	1751
	Plan by engineer Capsone showing the need to repair the dams on the Pò on the domains of Pavia,	1752

	claimed by Monticelli from Piacenza	
	Three plans showing the 1756 violent attack of the inhabitants of Piacenza to take over the alluvial deposit of the Pò on the island of Boscone, belonging to Mezzano	1757
	Two plans by engineer Bossi showing the usurpation of Piacenza inhabitants cased on the site Alberone, territory of Chignolo, Pavia, when arresting two deserters	1759
	Three plans, among which one prepared by engineer Rossi from Cremona, showing the attack of armed Piacenza inhabitants on the domains of inhabitants from the commune Pieve Porto Morone	1760
	Plan done by engineer Ghisalberti from Pavia showing the 1763 controversy regarding the mills on the Pò attached to the banks of the Porto Morone, Pavia, claimed by the inhabitants of Piacenza	1763
	Plan showing the usurpation caused by the inhabitants of Piacenza on the Cassina Pezzanchera, belonging to the community of Porto Morone, Pavia.	1764
	Plan by Milanini showing the Piacenza inhabitants' usurpations on the alluvial deposits of the Pò, attached to the banks of the Pieve Porto Morone, Pavia. Includes a 1756 plan.	September 21, 1771
Census Office	Map of the River Pò's flow which contains the 1720 controversial banks inspected in 1750, and including some modifications from 1766	1775
	Four plans surveyed by engineer Carcano as part of an inspection along the Pò in the domains of Cremona, including: Motta Baluffi, Torricella del Pizzo, Motto Capriola, and Gerre dè Caprioli	1766
	Copy of a report of engineer Carcano discussing the domains controversial in 1720	1766
	Plan of part of the territory of Spinadesco located on the right side of the Pò, surveyed by the engineer Giambattista Costa and inspected by the engineer Carcano. Domain possessed by Habsburg subjects, but not taxed, as discussed in Carcano's report from 1766	December 1, 1751

A closer look at this list of more than 50 maps (Table 6.1) reveals that, with the exception of the 1775 map of the River Pò and its banks that the Census Office prepared at the request of imperial authorities, all plans and drawings show very small segments of the border area. The maps were generally prepared in connection with specific local incidents and were the product of engineers working either for provincial and municipal authorities, or for the Census Office. The inexistence of plans showing the entirety of the border between Lombardy and the Duke of Parma's domains discloses the preeminence of provincial and local interests over Habsburg imperial goals. Moreover, it reveals how the Habsburg Monarchy for most of the eighteenth century, similar to other European states, continued to prioritize jurisdictional over territorial sovereignty. The existence of a map showing a clearly demarked boundary line in Lombardy's archives would have signaled the existence of a state defined as encompassing a fixed territory and not being merely a sum of jurisdictions.[784]

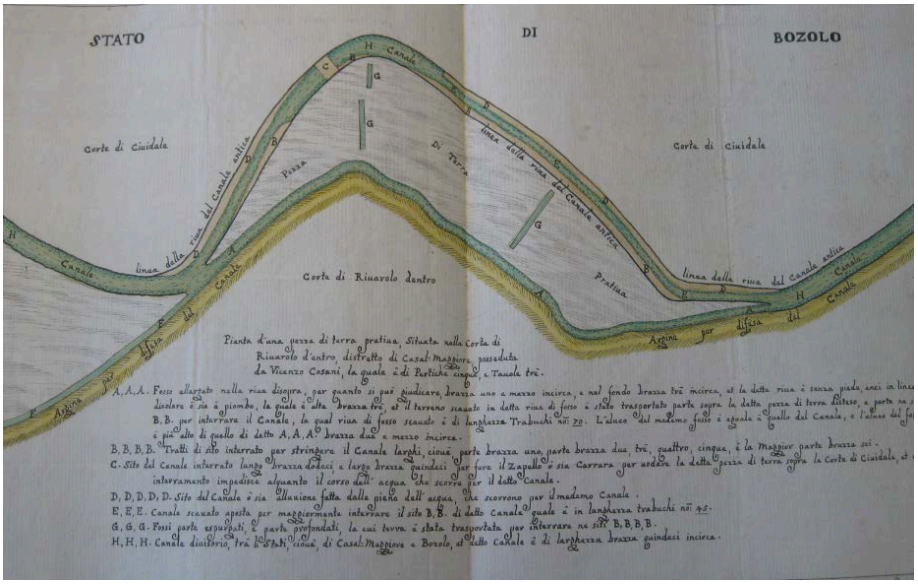

Figure 6.2 Detail from the *Plan showing the modifications done by the inhabitants of Bozzolo to change the course of a channel's waters* (1722)

[784] See for the case of France Sahlins, *Boundaries*, 28.

For example, Figure 6.2 shows a map from 1722 displaying modifications done by the inhabitants of Bozzolo to a small segment of the Pò in order to divert some of its waters into a separate channel.[785] The plan is very schematic and does not pay close attention to the geographic features of the two banks, as its goal is only to reveal the old flow of the Pò's channel and the modified trajectory. This map probably served to settle a local dispute between the inhabitants of Bozzolo and Casalmaggiore, whose revenue depended on access to the river's waters.

With one exception, all the maps display small segments of the border showing land patches or river sectors contested between neighboring communities. Preponderantly from the eighteenth century, the maps and their brief descriptions expose the widespread use of surveyors and engineers to document border incidents, as small as the destruction of a wooden channel, the contested position of a couple of mills or disputes over some forest patches. Because this cartographic material is representative for local interests and cannot offer a comprehensive image of the Habsburg imperial border, they could not satisfy Kaunitz's desire for a map grounded in an imperial territorial vision of the Habsburg lands in Lombardy.

The only attempt to show more than a local snapshot is the 1775 Census Office representation of the Pò and its banks.[786] This map was the most comprehensive image of the border with Parma, as this river actually formed the frontier for the most part. In the document accompanying the map, the Census Office employees revealed the shortcomings of their work, and claimed that although they had used all the territorial maps they had, the final map only displayed a "plausible flow of the Pò."[787] The Census Office was not able to prepare an accurate map of the whole length of the Pò because the segment from Cremona to Casalmaggiore

[785] ASM Confini p.a., box 74.
[786] Ibid.
[787] "un corso verosimile del Po". Ibid., unsigned document, July 19, 1775.

included Parmesan lands on both banks. Moreover, the map ends abruptly in the vicinity of Casalmaggiore, without encompassing the Mantovan lands. Therefore, this plan of the Pò only offered a partial image of Lombardy's border with the Parmesan domains. As the 1750 cadaster of Milan did not extend to the duchy of Mantua until 1785, the Census Office at this time could not have access to local maps of this territory.[788]

Figure 6.3 Detail from the map of the Pò and its banks (1775)

Other than the trajectory of the river and its various islands, as seen in the detail reproduced in Figure 6.3, the map shows the location of settlements and the territories occupied by the Duke of Parma, unjustly from Lombardy's point of view. Both the red-color patches and the yellow contours mark territorial subdivisions that the Census Office claimed should pay taxes to the Habsburgs; however, as the inhabitants of Parma and Piacenza had occupied them,

[788] Lombardy's engineers surveyed most of the Duchy of Mantua in preparation for the next taxation reform only in the early 1780s. Mori, *Il Ducato di Mantova*, 280-291.

Lombardy could not claim any revenue. The map does not offer any idea about the evolution of border contestations and with very few additions it reflects the situation of the river's banks and islands as it had been in 1750.

The inexistence of cartographic material that could have helped pave the way for a border Congress constituted the main motivation for the joint inspection of Milanese and Parmesan engineers. To ensure a fast progress of the operation, additional personnel accompanied the two leading engineers. Lombardy's representative, Baschiera, travelled with at least two servants, a scribe and First Lieutenant Engineer Ranger.[789] The Parmesan Court initially delegated Boldrino as their representative, but on November 1775 they replaced him with his prior adjunct, Captain Gian Pietro Regalia, who continued the work with the help of Gian Pietro Sardi.[790] The plane table constituted the most essential piece of equipment for the surveys. For the first month of the 1775 inspection Ranger and Boldrino used only one plane table to survey the banks of the Pò. However, on October 8, 1775, Baschiera requested an additional such instrument from Milan in order to speed up the operation, and his supervisors granted his request immediately.[791] In order to ensure the efficient unfolding of the inspection the Habsburg Court did not hesitate to approve any necessary personnel and instruments. However, this proved insufficient to guarantee the success of the engineers' mission.

The irreconcilability of the two courts' conceptualization of the goals of this joint inspection contributed to its failure in less than four months. The Habsburg authorities claimed that the entirety of the Pò belonged to Lombardy, and in consequence the engineers had to

[789] ASM Confini p.a., box 74, Baschiera, September 7, 1775.
[790] ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meeting from November 13, 1775.
[791] ASM Confini p.a., box 74, Baschiera, October 8, 1775; De la Silva[?] to Baschiera, October 12, 1775.

inspect and survey both banks of the river, even in areas currently under Parma's dominance. [792] Baschiera's instructions stated he should not "allow [the use of] toponyms contrary to our undertaking, such as Parmesan Pò, Piacentine Pò."[793] From the Lombardy's authorities point of view it was sufficient for their side to prove the existence of prior pretensions regarding a territory in order to transform it in a contested land. On the other hand, Parma asserted that the status quo at the time of the Treaty of Aix-la-Chapelle was incontestable. To counteract their neighbor's statement, the Habsburg authorities claimed that the documents of the Congress of Nice, convened to execute the Treaty of Aix-la-Chapelle, clearly stated that the Infant received as part of his state only the lands "that the Dukes of Parma possessed legitimately."[794]

Based on this incompatibility, it is not surprising that on November 18, 1775, Firmian complained to the Court of Parma about the behavior of their engineers, Boldrino and Regalia, during the border inspection. The main accusation Firmian brought was the refusal of the Parmesan engineers to allow the inspection of all controversial domains thus leading to the "unhappy state of this inspection, which can be said had barely, or not even, started."[795] Parma's definition of "contested" lands excluded the segments of the Pò that flowed between the Infant's domains. Therefore, the Parmesans remained suspicious of every attempt from Lombardy's side to obtain plans of these areas under the excuse of the inspection and perceived the Habsburg desire to map these areas as a preliminary step to territorial claims.[796]

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[792] Ibid., De la Silva's report of the inspection, December 30, 1775.
[793] "Si starà lontano dall'ammettere denominazioni opposte al nostro assunto, come sarebbe Pò Parmigiano, Pò Piacentino." Ibid., Instructions from de la Silva to Baschiera, April 17, 1775.
[794] "que legitimamente possesseron los Duques de Parma." See for example de la Silva's memoir from December 30, 1775, which lists again controversies dating from before 1749, and which had not be solved by the time of that Treaty. Ibid..
[795] Ibid., Firmian to Sacco, November 18, 1775.
[796] Ibid., Firmian to Baschiera, September 20, 1775. In a later letter, on July 8, 1788, the Parmesan minister Ventura wrote to the French ambassador in Vienna, that Lombardy's minsters had tried to obtain a map of the area ever since the time of the 1775 joint border inspection. MAE CP, Autriche, box 355, 19, July 8, 1788, Ventura to Noailles.

The Habsburg Court's foreign policy in other provinces such as Transylvania, justify the Parmesans' distrust. As shown in chapter 5, mapping had implications for future territorial expansion. A survey of border areas between Transylvania and the Danubian Principalities produced cartographic evidence used in political negotiations that led to the Habsburg annexation of part of Moldavia and Wallachia. Even for the case of Lombardy, although Baschiera received official instructions from Milan to "restrain himself to the simple action of description,"[797] he also received secret guidelines. Firmian ordered the engineer to use the inspection to estimate the value of land in the case of a future territorial exchange negotiation.[798] Clearly, the Parmesans were correct in doubting Lombardy's representatives.

In addition to conflicts between the two engineers regarding the object of their survey, the persistence of border incidents constituted another significant obstacle in the way of their mission. Parma's representatives refused to cooperate for almost a third of September because of a territorial controversy between the community of Corno Giovine, Province of Lodi, belonging to Lombardy, and the Duchy of Piacenza, in a forest belonging to an alluvial deposit of the Pò known as Vojara or Vojera. In early September 1775, a storm toppled numerous poplars from this forest, and inhabitants from the neighboring states hurried to collect the tree trunks. The incident degenerated into a diplomatic conflict, as both Habsburg and Parmesan authorities blamed the other side for having trespassed into a controversial domain.[799] At the order of their governments, the engineers hurried to the site to prepare a detailed plan of Vojera.[800]

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[797] "si contenesse nel puro fatto delle delineazioni." ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meeting from October 6, 1775.
[798] ASM Confini p.a., box 74, Firmian to Baschiera, October 6, 1775.
[799] Ibid., Kaunitz to Firmian, October 2, 1775; Firmian to Baschiera, October 3, 1775; De la Silva's report of the inspection, December 30, 1775. ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meeting from September 29, 1775.
[800] On September 26, 1775, Baschiera reported that the map of Vojera was almost finalized. ASM Confini p.a., box 74, Firmian to Baschiera, October 3, 1775.

The state archives in Milan preserve a map from September 27, 1775, signed by engineers Ranger and Sardi, the seconds in command to Baschiera and Regalia (Figure 6.4).[801] The mapmakers represented two competing borderlines on this plan, separating the commune of Regona, Province of Lodi, and the community Caselle Landi, belonging to the Duchy of Piacenza. AA shows the frontier from Lombardy's perspective, and BB marks the Parmesan counterclaim. Three elders from the community Caselle Landi claimed the government of Milan used military force, many years ago, to move the original borderline BB to the position AA, by digging a trench.[802] Based on the engineers' map, Lombardy's minister ordered the Habsburg subjects to return all tree trunks and arrested the people who refused to comply. The Parmesan Court also arrested the Piacentine instigator who had first started gathering the fallen poplars.[803] The map and the evidence gathered on-site helped solve this incident in a satisfactory manner for the two governments and revealed yet again the importance of preparing cartographic material prior to a border negotiation.

[801] Ibid., the 1775 Ranger and Sardi map of the border between Regona and Caselle Landi
[802] The three elders, Domenico Tussi, Giuseppe Andermani, e Giaccomo Corradi, were all more than 80 years old. Ibid.
[803] Ibid., De la Silva's report on the engineers' inspection, December 30, 1775.

Figure 6.4 The border between Regona and Caselle Landi on the Ranger and Sardi map (1775)

By the end of the Fall the engineers had only managed to survey some contested lands on the segment of the border dividing the Province of Lodi, Lombardy from the domains the Duchy of Piacenza controlled on the left bank of the Pò, namely Nosedo, Mezzano, S Rocco, Fombio, Retegno, Guardamiglio, Minuta and Botto.[804] Moreover, Baschiera's insistence that the whole flow of the Pò and its islands were controversial areas infuriated the Parmesan Court and prevented the recommencement of the project in 1776.[805] Lombardy's engineer was simply representing the position of his superiors in Milan, who continued to insist in their correspondence with Chancellor Kaunitz that they had significant evidence for their claims.

In conjunction with the engineers' mission, the Habsburg authorities commissioned de la Silva to prepare a detailed memoir to support Lombardy's claim to the entirety of the Pò River. The documents de la Silva used to support these claims and listed in his memoir's appendix did not include cartographic material. However, that does not mean the counselor did not appreciate the importance of maps -- quite the contrary. De la Silva considered his memoir complementary to the already existing plans or those currently under development being prepared by engineers to support the Habsburg claims in the upcoming border Congress with Parma.[806] Kaunitz remained unconvinced of the strength of de la Silva's evidence and warned Firmian that claiming possession of lands without documentation was a futile strategy, especially seeing as the Infant of Parma controlled both banks of the Pò in some areas.[807]

Lombardy's authorities proved unable to continue the bilateral border inspection in 1776. The Habsburg representatives insisted in their letters to Parma that the only function of the engineers was the "physical inspection and description of sites over which controversies arose

[804] Ibid., Sacco to Firmian, December 8, 1775; ASM Confini p.a., box 76, Kaunitz to Firmian, August 15, 1776.
[805] ASM Confini p.a., box 74, Sacco to Firmian, December 8, 1775.
[806] Ibid., "Dimostrazione presentata dal Segretario Consultore Silva de Confini del Ducato di Milano e di Mantova con Parma, Piacenza, e Guastalla," 1775.
[807] Ibid., Kaunitz to Firmian, November 13, 1775.

between the two Courts."[808] But by claiming that the maps prepared as a result of this border examination would constitute the starting point for future negotiations, Milan had no chance of convincing Parma to support such a mission. The Parmesan Minister made it clear in his letters that his Court refused to resume the work until they received assurance from Milan that Lombardy's engineers would not attempt to map the segments of the Pò that flowed between the Infant's domains or those river banks.[809]

The situation escalated as the Infant requested help from his uncle, the King of Spain, and his other Bourbon relative, the King of France. The Infant of Parma had wanted to involve the Bourbon Courts even before this moment, but was only fully successful in his efforts in 1776.[810] The report sent from Parma to the French and Spanish ambassadors in Vienna summarized the failed border inspection of 1775 and put the blame on the shoulders of Lombardy's government, which persisted in claiming Parmesan and Piacentine lands on the left bank of the Pò in order to subvert Parma's rights of navigation over the river. The Court of Parma attached to their report a map signed by Gian Pietro Sardi showing those territories. Moreover, to create a true sense of urgency, the report claimed that in a recent visit to Parma, Lombardy's governor, Archduke Ferdinand, persisted in his desire to survey and map the entirety of Pò's flow together with its banks.[811] As it seemed that the Habsburgs would not give up on their claims, the Court of Parma asked for assistance from France and Spain.

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[808] "doversi gli Ingegneri contenere nella materiale visita, e descrizione de luoghi, sù quali sono cadute controversie fra le due Corti" ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meeting from June 21, 1776.
[809] ASM Confini p.a., box 76, Sacco to Firmian, June 11, 1776.
[810] On December 8, 1775, Sacco wrote to Firmian insisting that the border controversies should be discussed with the participation of the guarantor powers, namely Spain and France. ASM Confini p.a., box 74, Sacco to Firmian, December 8, 1775. ASM Confini p.a., box 73, volume containing the minutes of the ad-hoc committee meetings regarding border controversies with Parma, entry for the meeting from December 14, 1775.
[811] MAE CP, Autriche, box 329, 63-69, 70-71, Breteuil, July 27, 1776.

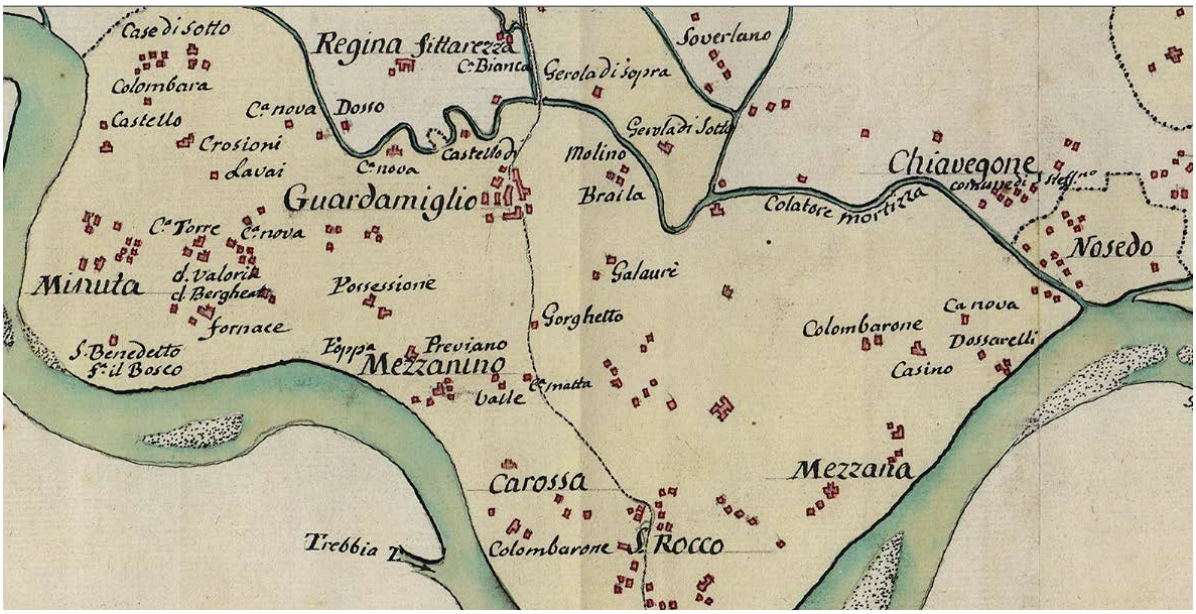

Figure 6.5 Detail from the Sardi map of the border between the State of Milan and the Duchies of Parma and Piacenza (1776)

Figure 6.6 Detail from the Census Office map of the Pò and its banks (1775)

A closer examination of Sardi's map, a detail of which is reproduced in Figure 6.5, shows striking similarities with the 1775 map prepared by the State of Milan's Census Office.[812] Both geographic representations paid special attention to the topography of the Pò River, and the position and names of settlements located on its banks. Although the Habsburg provincial authorities complained they did not possess accurate detailed information about the state of Parma's domains located on Lombardy's bank of the Pò, Sardi's map seems to confirm the correctness of most of their geographic knowledge with respect to the settlements' toponymy and location. However, if we compare the same area as represented on Sardi's work (Figure 6.5) and the Census Office's map (Figure 6.6) we notice a lower density of settlements on the map the Habsburg authorities had in their possession. Places like Colombara, Castello, S. Benedetto, or Gorghetto, to name just a few, appear only on Sardi's representation. Moreover, whereas the Census Office mapmakers failed to suggest a clear hierarchy based on the size of the settlements included on their work, Sardi used a varying number of red rectangles and square to suggest the size of the various villages and towns. The Sardi map, which the Parmesan Court shared with the French and Spanish ambassadors in Vienna, proves the Habsburgs did not have the monopoly over cartographic production with respect to the borderlands. The Infant of Parma and his advisers astutely used geographic representations of their domains adjacent to the river Pò to convince their Bourbon allies that Habsburg expansionism in the Italian Peninsula constituted a real threat for the balance of powers in the area.

In response to the Infant's cry for help, the Spanish ambassador in Vienna, Count Demetrio O'Mahony, wrote a declaration to defend Parma's territorial integrity in the face of Habsburg pretensions. The Spanish Ambassador suggested that the Habsburg engineer's

[812] The Sardi map: MAE CP, Autriche, box 329, 70-71. The State of Milan's Census Office's map: ASM Confini p.a., box 74.

insistence to map Parmesan territory could be equaled to a hypothetical request of the Bavarian Court to map the Danube all the way to Vienna or even Bratislava (Pressburg) in order to settle the Danubian border with the Habsburgs.[813] O'Mahony's gross exaggeration suggests that even European powers who shared no borders with the Habsburgs kept a close eye on Vienna's attempts to further its territories in any direction. And although not stated in this memoir, the 1775 Habsburg annexation of the northern part of Moldavia, Bukovina, preceded by cartographic operations, could be interpreted as a template for Vienna's actions in Italy.

In preparing his reply to O'Mahony's memoir Kaunitz relied again on Counselor de la Silva's expertise.[814] The Chancellor argued that the State of Milan had never given up on their rightly possessions and had unsuccessfully claimed Pò's islands and alluvial deposits ever since the 1556 concession to the House of Farnese. However, in order to resume the negotiations, Kaunitz offered a compromise: restricting the border inspection and the negotiations to the post-1748 contestations.[815] Maria Theresa confirmed this decision in an order sent on January 13, 1777 to her son, Ferdinand.[816] The conciliatory approach of the Habsburg Court arose probably not only due to the Court of Parma's able diplomatic game, but also because the evidence in Lombardy's favor was not so convincing. Maria Theresa expressed her hope to "reestablish

[813] ASM Confini p.a., box 76, Kaunitz to Firmian, August 15, 1776.
[814] By early 1777, the counselor finalized another report defending the government of Milan's claim to the entirety of the Pò. The main narrative, supported by documents included in the appendix of this report, claimed that in 1396, an imperial investiture conferred to Gian Galeazzo Visconti his domains in Lombardy, including the Pò and its banks. In 1556, the Spanish King Philip II transferred some of these lands to the House of Farnese, but de la Silva claimed this transfer did not include the rights over the Pò. The counselor attacked the Infant's assertion that for certain segments the Pò flows between domains belonging to the Infant of Parma, by stressing that the Farnese princes had occupied those lands abusively. In the second part of his report, de la Silva offered evidence to show that Lombardy's authorities had never given up on any domains, and that both the Senate and the Government had repeatedly sent complaints against Parmesan usurpations. ASM Confini p.a., box 76, De la Silva to Ferdinand, October 24, 1776.
[815] Kaunitz tried to underscore how throughout the first half of eighteenth-century, during peace negotiations and treaty signings, Charles VI and Maria Theresa always referred to the importance of clarifying border controversies, and the Habsburg Court never gave up on territories under controversy before 1748. Ibid., Kaunitz to the Spanish ambassador in Vienna, January 11, 1777.
[816] ASM DR, box 256, Maria Theresa to Ferdinand, January 13, 1777.

among neighbors the peace disturbed by recent contestations due to the uncertainty of the dividing line."[817] However, the empress's order is not an expression of defeatism in the face of the Infant of Parma's stubbornness, as she also authorized the use of violent acts against any Parmesan aggressions.[818] This decision is reminiscent of Joseph II's determined approach in January 1770 to defend the position of border markers dividing Transylvanian and Moldavian land at all costs, even if the Habsburg troops had to use violence to achieve this goal. Both in the case of Lombardy and Transylvania, the imperial decision to take an intransigent attitude with respect to the trajectory of the borderline is symptomatic of the Habsburg rulers' reimagining of their dynastic lands into a clearly defined territory that had to be defended at all costs.

The determined position of the Habsburg empress and Vienna's concessions made an impact in Parma. By the summer of 1777, the Infant agreed to resume the engineers' border inspection to mark all domains that became controversial after 1748.[819] However, the Parmesan ruler also expressed his desire to base the engineers' inspection on a pre-established list of contested territories.[820] In this way, the Infant hoped to pressure the Habsburg Court to agree on a common list of controversies before the actual Congress.[821] De la Silva's first version of this document went through a series of revisions due to Parmesan pressure, as the Infant desired to keep the number of controversies as low as possible.[822] The discussions almost reached a

[817] "ristabilire la tranquillità tra i Confinanti, turbata dalle recenti Contestazioni per l'incertezza della Linea divisoria." Ibid..
[818] Ibid.
[819] ASM Confini p.a., box 76, Sacco to Firmian, June 10, 1777; Firmian to Sacco, July 8, 1777.
[820] Ibid., Sacco to Firmian, July 15, 1777.
[821] The numerous disputes caused by Parmesan inhabitants at a time when the State of Milan did not have sufficient armed forces motivated the Habsburg authorities to pursue this project with determination, even though that might lead to more concessions on their part. Kaunitz recommended that Firmian suggest to Sacco that the engineers were only inspecting and mapping disputed sites, but the actual decision regarding the ownership of those lands was reserved for a ministerial discussion. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 131, Kaunitz to Firmian, July 16, 1778.
[822] Paolo de la Silva divided the controversial lands into five groups, based on Lombardy's provinces: Pavia, Lodi, Cremona, Casalasco, and Mantua. ASM Confini p.a., box 76, de la Silva to Ferdinand, August 8, 1777; Firmian to Kaunitz, September 29, 1777, Some of the documents exchanged between Milan and Parma regarding the list of

standstill when de la Silva insisted that it was impossible to limit the list to post-1748 controversies, as many of these disputes had roots in earlier times. Additionally, the counselor stressed the importance of surveying the whole trajectory of the river Pò for a fruitful negotiation.[823] Predictably, the Infant of Parma refused to accept even most of the domains under controversy after 1748 from de la Silva's list and claimed that as the Border Archives of Parma held no documentation, those domains could not be under dispute.

In the face of Parma's stubbornness about pursuing the engineers' inspection, Kaunitz had to resort to urgent measures and involve the empress. The Chancellor ordered Firmian to share with the Parmesan minister a copy of Maria Theresa's letter from November 2, 1778, in which the Habsburg monarch expressed her disappointment in the face of the negotiations' standstill and revealed her determination to continue pursuing the engineers' inspection and the mapping of the contested domains before any negotiation could ensue.[824] At the same time, Kaunitz's son, the Habsburg ambassador in Madrid, presented to the Spanish secretary of state Count José Moñino Floridablanca a memoir justifying the Viennese position regarding the border negotiations with Parma.[825]

By January 1779, after the intervention of Maria Theresa and the agreement of the Spanish ruler with Vienna's request, the Court of Parma agreed to the inspection of controversial domains as described in Lombardy's list from February 14, 1778.[826] Parmesan minister Giuseppe Pompeo Sacco conditioned the beginning of the operations on receiving an answer from Milan to some observations he had made almost a year ago regarding the list of contested domains.[827]

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contested domains include Ibid., Sacco to Firmian, December 9, 1777; Firmian to Kaunitz, February 14, 1778; Sacco to Firmian, March 24, 1778.

[823] Ibid., de la Silva's report on Sacco's letter, April 28, 1778.

[824] Ibid., Kaunitz to Firmian, November 2, 1778.

[825] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 131, Kaunitz to Firmian, November 26, 1778.

[826] ASM Confini p.a., box 76, Sacco to Firmian, January 22, 1779.

[827] Ibid., Firmian to Kaunitz, February 6, 1779.

Kaunitz confirmed to Firmian that even though Sacco wanted more explanation, that should not impede the initiation of the engineers' inspection and mapping project. [828] The Habsburg Chancellor had successfully used the Bourbon connection to force the Infant of Parma to resume the negotiations in order to avoid the wrath of the Spanish king.

The final instructions prepared for the engineers made it clear that their mission was restricted to sites that became contested only after 1748. The engineers had to mark with different lines on the final maps the ancient and newer controversies. Regarding the flow of the Pò, Parma managed to impose its viewpoint: the segments of the river flowing between banks belonging to the same state were excluded from the final report. In addition to the controversial domains included in their instructions, the engineers had to gather from local communities information about other existing disputes. To avoid the fate of the fruitless 1775 inspection, the instructions prohibited the engineers from debating the territorial rights of their rulers and constrained their work to an accurate description of contested areas.[829]

On June 17, 1779, after the Courts had finally reached a consensus, the two engineers, Cesare Quarantini representing the Habsburg side and Gian Pietro Regalia from Parma, met and started the inspection from the border between the provinces of Pavia and Piacenza.[830] From Quarantini's reports to Milan it emerges that the work progressed at a swift pace.[831] The survey lasted approximately three months and one week, and on October 25, 1779, Quarantini and Regalia finalized both the border description and the maps attached to it. The engineers marked

[828] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 131, Kaunitz to Firmian, February 18, 1779.
[829] MAE CP, Parme, box 41, 182 verso.
[830] Quarantini was not a military engineer like Baschiera, but a member of the Milanese Collegio who worked for the Census Office. ASM DR, box 259, Maria Theresa's order from August 17, 1780; ASM Confini p.a., box 76, Quarantini to Firmian, June 17, 1779. The inspection could not start earlier because of Cesare Quarantini's unexpected sickness. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 131, Kaunitz to Firmian, June 17, 1779.
[831] See for example: HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, Kaunitz to Firmian, September 23, 1779; ASM Confini p.a., box 76, reports from Quarantini to Firmian, July 20, 1779 and August 18, 1779.

on the plans with different colors the border segments they had agreed on and the contested ones, using red to mark Lombardy's pretensions, and yellow for the Infant of Parma's domains. For uncontested segments, the red and yellow borderlines coincided. However, although at first glance the engineers' mission was a whopping success, its scope had been greatly reduced. Even though most of the territorial controversies were connected to the waters of the Pò, its islands, channels, and alluvial deposits, the engineers did not discuss the trajectory of the borderline in those areas, as the two Courts still had to make a decision regarding the Habsburg claim to the entirety of the river.[832]

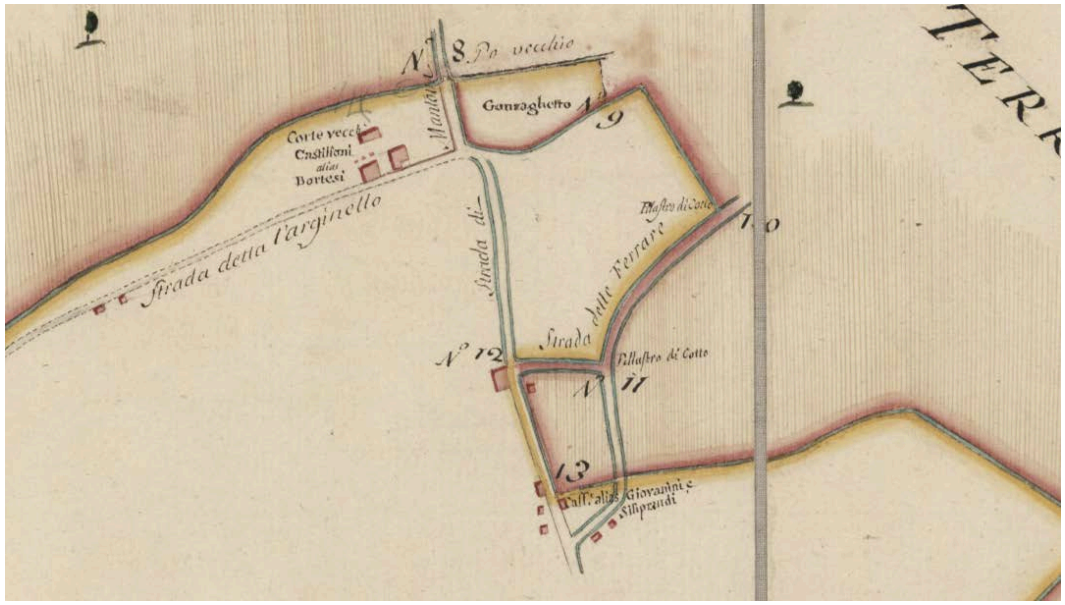

Figure 6.7 Detail from the Quarantini and Regalia map, showing the border between the Duchy of Mantua and the Duchy of Guastalla (1779)

Each number on the map referred to a segment of the border discussed in detail in the accompanying description. For example, the instructions of the Courts for the two engineers ordered them to inspect a small terrain named Gonzaghetto and establish, if possible, which state

[832] The War Archives in Vienna preserve a copy of part of this 1779 map. KA KPS, B VII C 132-10.

it belonged to.[833] Figure 6.7 includes this contested land between numbers eight and nine, but does not offer a resolution. Instead, the engineers drew two possible border trajectories: red for Lombardy's claim and yellow for Parma's. The engineers also identified on the ground older border markers and made special note of them in their description. For example, numbers ten and eleven correspond to fragments of terracotta pillars. From number eleven to twelve the uncontested borderline ran through a trench until it met the main road. The engineers mentioned in their description that the small road intersecting the border in the spot marked eleven and running parallel to the borderline from number twelve to thirteen belonged to Mantua, as supported by a 1631 document. This instance shows how the engineers combined on-site inspection with documentary evidence to produce a cartographic representation of these boundary lands.[834] These border maps transformed into a static representation, agreed-on by both negotiating parties, the transient situation of the borderlands. Additionally, the preparation of such cartographic sources envisioned to serve as starting point for the intergovernmental discussions, reduced the scope of the negotiations to the sites drawn on the maps.

The work of Quarantini and Regalia was the first successful joint inspection of the border between Lombardy and Parma, and therefore essential for the preparation of the future Congress. Even after the Congress preparations failed again, the Quarantini-Regalia collaboration remained the only border inspection both parties agreed upon throughout the 1780s, and therefore remained essential in discussing any territorial controversies between Lombardy and Parma. Additionally, this 1779 map and accompanying report shaped the way authorities in Vienna defended Habsburg claims in the area. On February 5, 1780, Firmian forwarded to Vienna the report of Quarantini and Regalia, together with a de la Silva analysis of the inspection results.

[833] Instructions for the engineers, MAE CP, Parme, box 41, 187 verso.
[834] Ibid., 174-174 verso.

However, as the maps were missing from this package, Kaunitz complained he could not make any good use of the reports.[835] The Chancellor's reliance on cartographic material to analyze the status of the border confirms that maps were no longer mere accessories to such negotiations, but essential preparatory steps. Indeed, three month later, as soon as the border maps arrived in Vienna, Kaunitz was planning to "compare [the maps] with the list of controversial sites."[836]

After this initial success, the Habsburgs remained optimistic regarding the establishment of the border congress with Parma. On March 20, 1780, the chancellor ordered Lombardy's border commissary, Francesco Belcredi, to start preparing for the congress under the guidance of de la Silva. Meanwhile, Kaunitz asked Firmian to obtain from Parma information about their deputy to the congress and to make a decision on the location for this event.[837] Although formally open to the idea of convening a congress, the Court of Parma continued to stall the discussions. The Infant refused to confer full decisional power to his representative and planned to send instructions from Parma for each controversial point. Kaunitz considered the Infant's request detrimental to a speedy negotiation and argued that the commissaries should have enough decisional power to prepare a convention project that the sovereigns could approve or reject.[838] Kaunitz suggested this approach based on the Habsburg Court's earlier experience in negotiating border treaties, such as with other neighbors of Lombardy, or with France in 1769 and 1779.

Despite the Parmesans' uncooperative attitude, the preparations for the congress progressed at a good pace during 1780. The Court of Parma agreed on the town of

[835] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 132, Kaunitz to Firmian, March 20, 1780.
[836] "riservandomi di confrontarli coll'Elenco dè siti controversi" Ibid., Kaunitz to Firmian, May 18, 1780.
[837] Ibid., Kaunitz to Firmian, March 20, 1780.
[838] Ibid., Kaunitz to Firmian, May 22, 1780.

Casalmaggiore as the future site of the negotiation[839] and selected Count Anton Camillo Marazzani Visconti as their representative.[840] Meanwhile, in Lombardy, Belcredi asked for a couple of months to familiarize himself with the border controversies in preparation for the congress. He relied on help from the vice secretary Pietro Bellari, the engineer Cesare Quarantini, and the laywer Giuseppe Maroni.[841] During their meetings, Belcredi, Maroni, Quarantini and Bellari examined in detail the reports and maps of Quarantini and Regalia and gathered supporting documentation from Lombardy's archives. Belcredi prepared a list of general guidelines he planned to follow during the negotiations and sent it to Firmian for approval. Additionally, Maroni wrote a memoir containing all the border controversies related to Piacentine and Parmesan domains on the left bank of the Pò and tried to demonstrate the Habsburg claims in the area.[842] The materials gathered in preparation for the Congress with Parma parallels similar efforts that preceded the negotiation over the borderline trajectory in Transylvania and the Austrian Netherlands. Relying on a similar strategy, which had proved successful during the past decades, the Habsburg agents constructed their arguments both with the help of historical documents and maps of the area. Whereas in the case of the Transylvanian-Moldavian boundary the Habsburgs imposed their own cartographic representations as the

[839] ASM Confini p.a., box 77, Sacco to Firmian, April 28, 1780.

[840] Ibid., Sacco to Firmian, June 16, 1780. After they chose Marazzani as their representative, the Parmesan Court insisted that Lombardy's agent, Belcredi, would have the upper hand during the negotiations because of his position as border commissary. Therefore, the Infant requested that his representative Count Marazzani, should receive help from another Parmesan minister. Although Chancellor Kaunitz agreed to Parma's request, he also made it clear that the Habsburgs would not accept including on the final documents the signatures of any other representatives than the two commissaries, Belcredi and Marazzani, on the example of the border regulations with Venice. Sacco agreed with this. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 133, Kaunitz to Firmian, October 2, 1780; ASM Confini p.a., box 77, Sacco to Firmian, September 1, 1780; Sacco to Firmian, November 17, 1780.

[841] ASM Confini p.a., box 77, Belcredi, June 16, 1780; Giuseppe Maroni to Ferdinand, June 22, 1780.

[842] ASM Confini p.a., box 78, Belcredi's report, June 8, 1782. As the organization of the border archive under the coordination of Molinari advanced, Belcredi used the document inventories to solicit specific papers from local archives in order to gather solid evidence for the future congress. For example, on October 7, 1780, Belcredi asked Ferdinand to order the archive of Lodi, to send him the survey and map of the site known as Mortizza Lodigiana, across the territory of Corno Giovine. Additionally, Belcredi required from Lodi any documents created after earlier inspections of the Roads Crocile and Vallone, near Mirandola. ASM Confini p.x., box 77, Belcredi, October 7, 1780.

benchmark for the negotiations, both the French and the Parmesan Court refused to proceed with the discussions without a commonly agreed on map of the contested borderlands.

After studying in detail the preparatory material for the Congress, Belcredi requested more guidelines from Kaunitz. Examining the Chancellor's answer helps elucidate how the Habsburg Court planned to approach the border regulation with Parma during the congress. Kaunitz acknowledged that for a fruitful conclusion of a border treaty, the discussion had to be limited to the controversial domains described in the 1779 Quarantini-Regalia materials. In answer to Belcredi's concern that many recent contestations had roots in the pre-1748 period, the Chancellor offered guidelines on how to use the 1748 status quo as a reference. For domains possessed peacefully in 1748, any later change was illegal. However, for sites controversial in 1748, each court had to provide documentation to establish which side had controlled the domain for a longer time in a peaceful manner. For lands contested incessantly, the state presenting stronger arguments and original documents would prevail. If a consensus was impossible to establish, the domain could be divided or become part of a larger territorial exchange arrangement.

Kaunitz stressed in his answer to Belcredi the instability of the Pò's flow and therefore the importance of trying to transform this watercourse into the border. The Chancellor also warned Belcredi of Lombardy's inability to obtain such an arrangement because of Parma's lack of cooperation. Therefore, the Chancellor suggested to Belcredi that his priority should remain obtaining the upholding of common rights for trade and navigation on the river.[843] Kaunitz's insistence that transforming the Pò into the borderline between Lombardy and the Duchies of Parma, Piacenza and Guastalla was the most desirable option for the empire foreshadowed the official imperial policy from 1781 onwards, as discussed in the next section of this chapter.

[843] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 133, Kaunitz to Firmian, November 27, 1780.

Instead of furthering Habsburg interests in the borderlines, as happened in the case of Transylvania and the Austrian Netherlands, the engineers' inspections of the Lombardy-Parma border proved to the Viennese rulers the impossibility of reaching a profitable arrangement with the Infant if they had to address every small dispute. Moreover, the Parmesan engineers repeatedly denied access to their Habsburg counterparts to contested domains, and the Dukes of Parma, Piacenza and Guastalla refused to accept the pre-1748 documentation as valid. The futility of these discussions had a significant role in convincing Kaunitz and Joseph II in the early 1780s that rather than addressing each individual territorial dispute, the Habsburg authorities should develop a radical solution that would eliminate both present contestations and the risk of future ones. Also, as the decision-makers in Vienna obtained access to maps of these contested boundaries, they identified the flow of the River Pò as the most viable enduring borderline. In this sense, cartography influenced the shape of the negotiations during Joseph II's reign, as the emperor insisted on the need to establish the Pò as Lombardy's border. However, the decision to promote a drastic approach to the border regulation infuriated the Infant of Parma and the fear of Habsburg expansionism transformed a bilateral negotiation into a quadrilateral one, involving the Courts of France and Spain.

6.3 JOSEPH II'S CAMPAIGN TO CLAIM THE FLOW OF THE PÒ

The death of Maria Theresa at the end of 1780 and the change in leadership in Vienna created a major impediment in the convening of the Congress, as Emperor Joseph II insisted on the need to transform the Pò into the imperial border.[844] The Habsburg authorities in Lombardy felt the wave of change from Vienna in the first months of 1781. On February 8, 1781, Kaunitz informed the border commissary that rather than supporting the elimination of border controversies as discussed in the official instructions for the Casalmaggiore Congress, the Habsburg Court now desired the development of a plan that would transform the Pò's flow into the border.[845]

Indeed, by the end of the Spring of 1781, Kaunitz ordered Firmian and Governor Ferdinand to prepare a list of territories and amounts of money the Infant of Parma might accept in compensation for his domains located on the Pò's left bank. Kaunitz and Firmian knew a similar plan had failed during the negotiations that led in 1748 to the Peace of Aix-la-Chappelle. However, at the time, the Duchy of Mantua had been in a stronger position and had successfully refused to sacrifice its domains on the right side of the river just so the State of Milan could round up their possessions on the left bank.[846] Mantua's argumentation in the 1740s was characteristic to a fragmented Lombardy, in which provincial interests prevailed. During Joseph II's reign, Lombardy moved on a fast track towards integration and centralization.[847]

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[844] A couple of months after inheriting the throne, Joseph II studied information regarding the border controversies between Lombardy and Parma with the help of maps and reports, such as the 1779 work of Quarantini and Regalia, the 1775 de la Silva memoir, and the explanations Kaunitz sent to Belcredi to help him prepare for the Congress. Joseph II was not content that the Congress discussion was restrained to the contested domains described by Quarantini and Regalia and hoped that in the near future other controversies would also be approached. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 134, Kaunitz to Firmian, February 8, 1781.

[845] Ibid.

[846] With his letter from Anvers dated June 19, 1781, Joseph II approved the idea of preparing this exchange plan instead of continuing with the preparations for a border congress. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 133, Kaunitz to Firmian, July 5, 1781.

[847] In the 1780s Joseph II expanded the cadastral survey and the reform of the taxation system of the Duchy of Mantua, merged the administration of Mantua with Milan's, eliminated traditional institutions such as Mantua's

Therefore, it is not surprising that in the early 1780s, the emperor and Kaunitz became interested in obtaining detailed cartographic representations and economic information about the Duchy of Mantua's lands on the right side of the Pò, domains they planned to offer to the Infant of Parma.[848] For example, on February 1, 1783, Wilczek ordered the vice president of the Mantua's *Magistrato Camerale*, Johann de Saint Laurent to use an older memoir from July 4, 1748 and its attached plan, in order to prepare an updated assessment of the land surface that the Habsburgs hoped to offer to Parma. Wilczek expected Saint Laurent to provide an estimate of the land's value, the types of crops and amount of taxes it could yield, and the amount of livestock it could maintain.[849] From 1783 until 1786 the Mantovan authorities shared with Lombardy's minister various maps and economic data regarding more or less the same territory: the districts of Suzzara and Gonzaga.

Figure 6.8 Detail from the Corniani map (1786)

Supreme Council of Justice, and divided Lombardy into eight territorial subunits without any respect for local traditions. Mori, *Il Ducato di Mantova*, 280-291, 301-307; Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 369-372.

[848] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 133, Kaunitz to Ferdinand, July 5, 1781.

[849] ASM Confini p.a., box 78, Wilczek[?] to Saint Laurent, February 1, 1783.

In January 1786, the superintendent of the Chamber of Commerce (*sovrintendente camerale*) of Mantua, Carlo Ottavio Colloredo,[850] sent to Wilczek a map prepared by Michele Corniani showing the districts that the Habsburgs planned to offer to the Parmesan Infant.[851] The plan, a detail of which is reproduced in Figure 6.8, shows the position of the main settlements, the borders of all the administrative sub-divisions for each of the districts (marked with red), and the borders of the two districts (marked with yellow to indicate a limit with other Mantovan territories, and black to show the border with the Duchy of Parma and the Duchy of Modena).

Once in Milan, Corniani's map and the accompanying statistical table he compiled underwent an evaluation process. Maroni and Pecis, the uncontested experts on the borders between Lombardy and Parma, criticized this map harshly and contrasted the representation with an earlier map, which they considered more reliable because of the experience of its recently deceased author, Gaetano Landi. In his report to Wilczek, Maroni argued that Corniani's borderlines did not correspond to Landi's drawing of the districts and increased the size of the districts erroneously. Moreover, Maroni argued against the principles Corniani used to calculate the value of the lands.[852] Although we cannot establish whether Corniani's or Landi's map and statistical information were more accurate, it is clear that Maroni's preference for the work of Landi stems from his role as one of the key members of the Census Giunta, the institution in charge of assessing the value of land and reforming taxation for the Duchy of Mantua in the early 1780s. As such, Gaetano Landi had been involved firsthand in surveying this territory.[853] The fact that so much discussion revolved around Corniani's map reveals the desire of Habsburg

[850] On November 5, 1784, Joseph II replaced the "Magistrato Camerale" and the Chamber of Accounts with the position of superintendent of the chamber of commerce, directly subordinated to the Milanese "Magistrato Camerale." Mori, *Il Ducato di Mantova*, 306
[851] ASM Confini p.a., box 79, Carlo Ottavio Colloredo to Wilczek, January 16, 1786.
[852] Ibid., Giuseppe Maroni, March 27, 1786.
[853] Mori, *Il Ducato di Mantova*, 280; ASM Confini p.a., box 78, Odoardo Zenetti, January 8, 1784.

authorities during the 1780s to finally familiarize themselves with the geography of the Duchy of Mantua, especially the lands they prepared to offer to the Infant of Parma in exchange for the domains adjacent to the State of Milan.

Rather than waiting for their Parmesan neighbors to share information about the lands they coveted on the banks of the Pò, the Habsburg authorities started their own investigations. Based on preliminary information describing the Duchy of Mantua and the State of Milan, the royal deputy inspector (regio vice-visitatore), Carlo Bellerio, prepared an in-depth description of the Parmesan domains on the Habsburg bank of the Pò.[854] Bellerio considered himself perfect for this assignment due to the useful personal connections he had formed in Parma in 1773 during his time there as a Habsburg representative. In addition to reading documentation sent from Mantua and using his Parmesan informants, because of his function as royal deputy inspector, Bellerio had gathered material from local archives in the border areas and had supervised the work of the royal overseers (regi cancellieri). To complement his description of Parmesan domains from the left bank of the Pò, Bellerio worked with Belcredi and some geometers to prepare a topographic and hydrographic map of those territories.[855]

This map, like the examples discussed in the previous sections, was not based on a detailed topographical survey, but simply showed the approximate position of settlements and the contours of controversial domains located on the left bank of the Pò. The lack of detail is not unexpected if we take into account Parma's efforts to prohibit Habsburg access to their domains, as shown during the 1775 border inspection. The Infant and his ministers prohibited any agents working for Lombardy's Census Office to trespass their borders, and whenever surveyors entered contested domains, Parma issued official protests. For example, on April 15, 1783, the

[854] ASM Confini p.a., box 78, Carlo Bellerio to Ferdinand, February 15, 1784.
[855] Ibid.

Minister of Parma complained that Habsburg surveyors violated the Infant's domains in October 1782 and early April 1783.[856] Border commissary Belcredi coordinated an official investigation and concluded that the accused surveyors, Ciocca, Bonfante, Torrelli and Pianca, all working for the Census Office, had been extremely cautious and had limited their operations to the Habsburg borderline as marked on the 1779 Quarantini-Regalia map. Belcredi admitted that in some cases the surveyors had extended their work to include some of the islands on the Pò, but he claimed that these domains belonged to Lombardy.[857] In the face of what they perceived as Habsburg transgressions of the border and attempts to inspect and map their territories, the Parmesan Court cannot be faulted for its vigilant attitude.

The Infant displayed the same cautious behavior regarding the circulation of sensitive cartographic information. In 1788, the Minister of Parma sent a general map of the borders towards Lombardy to the French ambassador in Vienna, warning him about the risks of showing this document to any Habsburg representatives.[858] Therefore, Bellerio's inability to do on-site inspections in preparation for his report and map was a direct consequence of Parmesan official policy.

[856] Ibid., Belcredi to Ferdinand, May 6, 1783.

[857] The only action the border commissary considered as potentially disruptive was the decision of the surveyor Torrelli to cross the Pò and investigate the situation of some domains that supposedly paid taxes to the commune Spinadesco, part of Austrian Lombardy's province of Cremona. Despite Torelli's impulse, Belcredi praised the surveyor for his decision to describe lands across the Pò, as they had not been included on the 1750 general map of the Census Office. This surveying campaign might have been part of the Census Office's effort to update their records known as the "Gallarati rectification." Gian Giuseppe Gallarati was an engineer working for the Census Office in Milan. Ibid., Belcredi to Ferdinand, May 6, 1783; Memoir from December 23, 1783. ASM DR, box 259, Maria Theresa's order from August 17, 1780.

[858]MAE CP, Autriche, box 355, Ventura to Noailles, July 8, 1788, 19; MAE CP, Parme, box 44, 390, Ventura to Noailles, September 5, 1788.

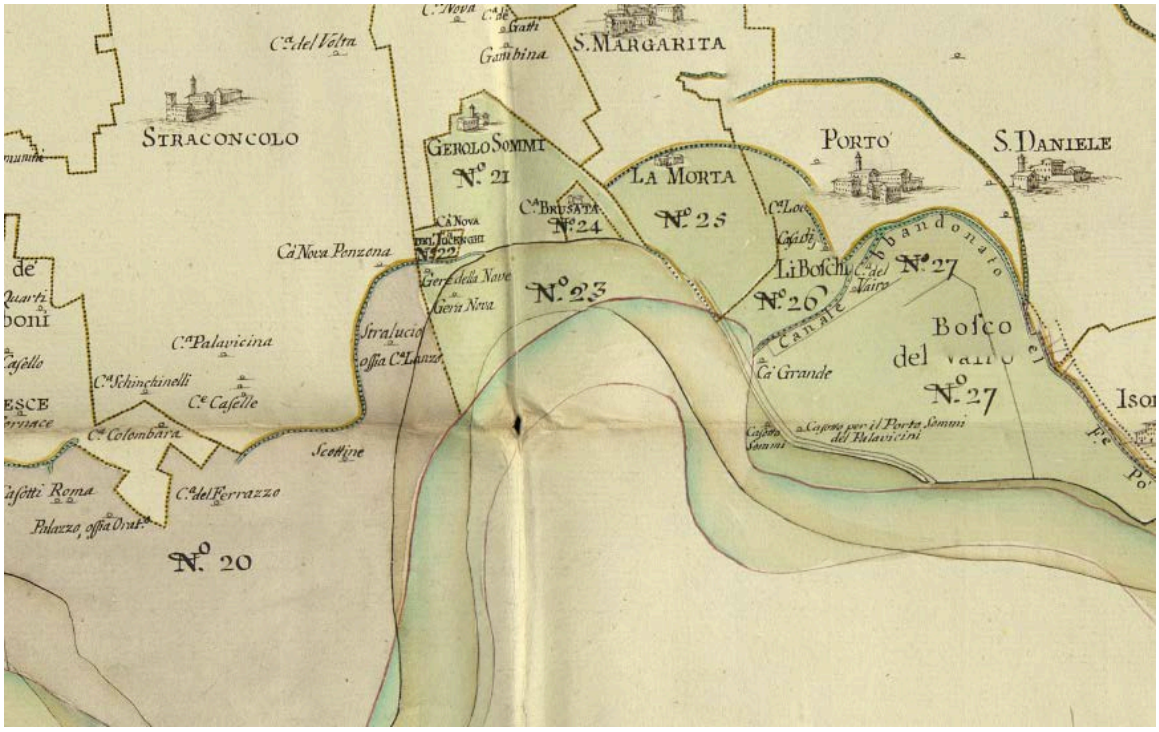

Figure 6.9 Detail from the Bellerio map of the Pò and its banks (1784)

Bellerio's map, together with its complementary memoir, shows the location of Parmesan-controlled and controversial domains on the left bank of the Pò, neighboring the State of Milan. The map distinguishes between domains Parma controlled in a peaceful manner (marked with purple), contested territories (colored with green), the old and the new trajectory of the Pò (marked with brown and blue, respectively), and new alluvial deposits identified in 1782 and claimed by Lombardy.[859] The 37 numbers included on the map corresponded to sections of the memoir, and for each of these territorial units, Bellerio included information about the landowners, the main products, the quality of the land, the population and any additional elements that helped assessed their value. For example, number twenty shown on Figure 6.9 refers to a group of lands neighboring the Province of Cremona, State of Milan under the

[859] HHStA Italien-Spanischer Rat, Lombardei Collectanea, box 75, 547.

authority of Marquis Pallavicini, and facing erosion because of the river. Bellerio compared contemporary tonopyms with the ones on an "ancient plan," which probably was the plan of the Pò river preserved in the Census Office since 1722, modified in 1750, and shared with engineer Baschiera before his border inspection in 1775.[860] The memoir included all possible resources Lombardy could obtain from these sought-after domains, such as wood, cattle, population, arable land, forests, and so on. The green patch surrounding number twenty-one marked the community Gerrolo Sommi's lands, a domain that had used its controversial status to evade paying taxes to either of the two states at least until the 1780s.

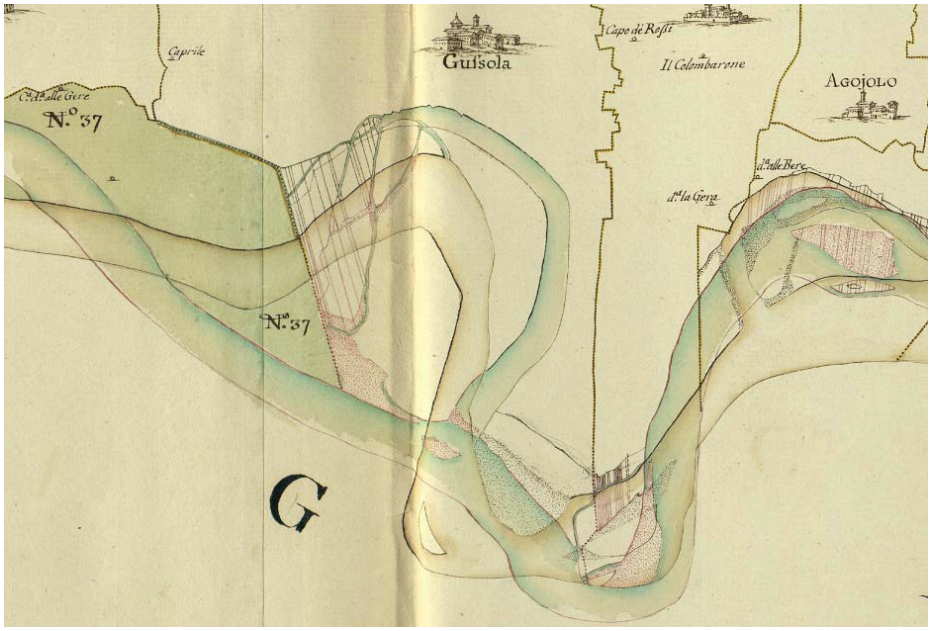

Figure 6.10 Detail from the Bellerio map of the Pò and its banks (1784)

Figure 6.10 shows one of the most dynamic segments of the river, which had led to numerous contestations and violent conflicts between the Habsburg subjects from Gussola, and the Parmesan inhabitants of Coltara. The patches colored with red represent new islands and

[860] ASM Confini p.a., box 78, memorandum from December 23, 1783.

alluvial deposits that Lombardy's Census Office hoped to add to their revenue base. Such land fragments had always been some of the most controversial territories between Milan and Parma. In the summer of 1778, after the first major modification of the Pò's trajectory, the waters separated a significant part of Coltara's domains from the mainland and transformed them into what became a contested island.[861] Changes to the Pò's course continued in 1780, and the waterbed was displaced significantly from its ancient position, marked with brown on Figure 6.10. The issue had not been resolved by 1788, when Kaunitz received from Milan a package with plans and documents supporting Cremona's cause in yet another conflict between the inhabitants of Gussola and Coltara.[862] Clearly, the Habsburg intention to stabilize the Lombardy-Parma border by moving it on the Pò River, regardless of future changes in the waters' trajectory, would have eliminated a significant number of interstate disputes.

Bellerio's memoir and map provided the Habsburg Court with sufficient preliminary documentation to prepare a plan for a possible territorial exchange. However, Vienna's desire to support the radical territorial modification of transforming the Pò into an imperial border had no chance of success unless the Infant of Parma agreed, which seemed impossible in 1784. This year the number of border incidents intensified and included violent clashes, arrests, accusations of contraband and other unpleasant occurrences.[863] Both courts blamed each other, and as neither admitted the other's claims to the contested borderlands, no resolution could be reached.

Additionally, in 1784, Parma continued to pursue the involvement of the Spanish and the French kings as mediators in the process of border settlement. The French representative in Parma, Count Flavigny, championed the Infant's position in his letters to the Foreign Minister in

[861] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 131, Kaunitz to Firmian, August 17, 1778.
[862] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, September 5, 1788, 107-108.
[863] ASM Confini p.a., box 79, Wilczek to Manara, January 15, 1785; Manara to Wilczek, November 11, 1785.

Versailles. In May 1784, Flavigny claimed that with the Habsburg government's support, the inhabitants of Lombardy had intensified their aggressions against Parma.[864] On October 23, 1784, to convince the French Court of the justness of their cause, the Parmesan Minister Manara sent to Versailles a chronological list of border disputes between Lombardy and Parma, blaming the Habsburg subjects for all of them. Manara claimed that the Infant's territorial rights arose from the Treaties of Aix-la-Chapelle and Nice, and that the Habsburg side had refused for almost half a century to respect that status quo and to convene a border congress.[865] The Parmesan strategy proved successful in alarming the Bourbon Courts because of the Habsburg foreign policy over the previous decade.

Indeed, even Kaunitz realized the dangerous implications of having the French Court believe that Lombardy's authorities were unjustly infringing onto Parmesan territory, and he warned Lombardy's minister that "the current political circumstances demanded caution now more than ever."[866] The Chancellor's words could have been a direct reference to the Habsburg Monarchy's open conflict with the Netherlands. At the end of the summer of 1784 the emperor had demanded from the Dutch the opening of the Scheldt estuary, blocked for two centuries, and by October it looked like a war was inevitable between the Habsburgs and the Netherlands.[867] Although Joseph II counted on his French ally's support against The Hague, his expectations were not met. However, at the same time, the emperor hoped to convince the Court of Versailles to sustain his attempt to exchange the Austrian Netherlands for Bavaria; opening the Scheldt

[864] MAE CP, Parme, box 43, 87, Flavigny, May 23, 1784.
[865] Ibid., 130-162, Manara, October 23, 1784. I dated this document based on another letter from Manara, from November 20, 1784. Ibid., 186. For border incidents from 1784 and 1785 see Ibid., 416-421 verso, Manara to Vergennes, May 28, 1785.
[866] "Le presenti circostanze politiche essigono ora più che mai la circospezione." ASM Confini p.a., box 79, Kaunitz to Wilczek, December 6, 1784.
[867] The blockade of the Scheldt had curtailed the development of trade through the Austrian Netherlands port of Antwerp. Ever since his visit to the Austrian Netherlands in 1781 Joseph II had decided to put a stop to this situation. Bernard, *Joseph II and Bavaria*, 144-145. Ingrao, *The Habsburg Monarchy*, 206.

estuary would have served to increase the value of this Habsburg province, making Joseph II's exchange offer more attractive.[868] In a memoir sent in May 1784 to Kaunitz, Joseph II confessed he desired Bavaria not only to increase the cohesiveness of his empire or to increase communication, but also to pave the way for future expansion in Italy or Silesia.[869] The emperor's foreign policy and his declared goals confirmed the Infant of Parma's fears.

The Parmesan Court used Joseph II's reputation as an ambitious emperor interested in expanding his domains to convince the French king of the necessity of his intervention in the Parma-Lombardy border conflict. The emperor's actions against the Netherlands and his scheming to obtain Bavaria convinced France and Spain that Joseph II might have similar expansionistic projects in Italy. These worries were fueled by news from Parma. On December 3, 1785, the French representative in Parma contacted the French foreign minister and warned him that Joseph II planned to obtain the Infant's lands on the left bank of the Pò through a disadvantageous territorial exchange.[870] Flavigny speculated that the intensification of border disputes after Joseph II became the sole Habsburg ruler in 1780 had as its main goal convincing the Infant of Parma to agree to this detrimental arrangement. Flavigny warned that Joseph II's ambitions constituted a threat to the balance of powers in the Italian Peninsula.

The ambassador presented Joseph II's project as an integral part of a comprehensive system of Habsburg expansionism that would enslave Italy. In Flavigny's words: "This Prince [the Infant of Parma] and his Council are truly convinced [...] that the project of its Imperial Majesty is not limited to private interests, but belongs to an expansion system, which could be disastrous for Italy's freedom, if the powers which have possessions and have the interest to

[868] Beales, *Joseph II*, vol. 2, 393. Paul Bernard discusses in detail Joseph II's schemes to obtain Bavaria during the 1770s and 1780s. Bernard, *Joseph II and Bavaria*.
[869] Beales, *Joseph II*, vol. 2, 394.
[870] MAE CP, Parme, box 43, 434-437 verso, Flavigny, December 3, 1785.

maintain the balance [of power] do not give this issue serious attention."[871] Flavigny continued to support the Parmesan cause in December 1786, when he reported on Habsburg military actions against the Parmesans and urged the French government to support Parma against the Habsburg desire to impose Pò as the border.[872]

Meanwhile, on the other side of this contested border, Lombardy's ministers claimed the Parmesans were continuing to usurp Habsburg lands and encouraged Joseph II to adopt an uncompromising attitude. Therefore, on June 26, 1786, as per the emperor's orders, Kaunitz instructed Wilczek to endorse the use of armed force whenever necessary to defend Lombardy's territory. As a result of these imperial instructions, Wilczek asked the general commander of Lombardy to dispatch troops to the domains neighboring Parmesan territories.[873] Moreover, the minister instructed local authorities to pay attention to any novelties and usurpations in the border areas, and report to the provincial authorities such instances.

The imperial orders were implemented at a brisk pace. By July 1786, the districts of Viadana, Gonzaga and Suzzara had performed inspections of their borderlines and sent detailed reports to Milan, some including maps.[874] Figure 6.11 reproduces one of the two plans Francesco Antonio Carli, royal overseer of Viadana, prepared as a result of his border inspection in 1786.[875] Carli travelled on-site and met with the mayor and consul of the district of Viadana to gather accurate information on Parmesan actions violating Lombardy's territory. After he performed the

[871] "Ce prince et son Conseil sont intimement persuadées, Mr le Comte, que le projet de SM Imple ne se borne pas à des vues privées, et qu'elles tiennent à un systême d'agrandissement, qui pourroit devenir funeste à la liberté de l'Italie, si les puissances, qui y ont des possessions, et qui ont intérêt à conserver sa balance, n'y faisoient pas la plus sérieuse attentions." Ibid., 437.
[872] MAE CP, Parme, box 44, 90-92, 99-99 verso, Flavigny, December 10, 1786; Flavigny to Vergennes, December 31, 1786.
[873] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, June 26, 1786; ASM Confini p.a., box 79, Kaunitz to Wilczek, June 26, 1786; Wilczek to Kaunitz, July 8, 1786.
[874] ASM Confini p.a., box 79, Antonio Simoni's report and map, July 20, 1786.
[875] Ibid., plan and report by Francesco Antonio Carli, July 26, 1786.

inspection and reconnaissance of the segment of the river, islands and banks of Viadana, Carli prepared two plans, on which he marked past incidents and recent Parmesan actions.

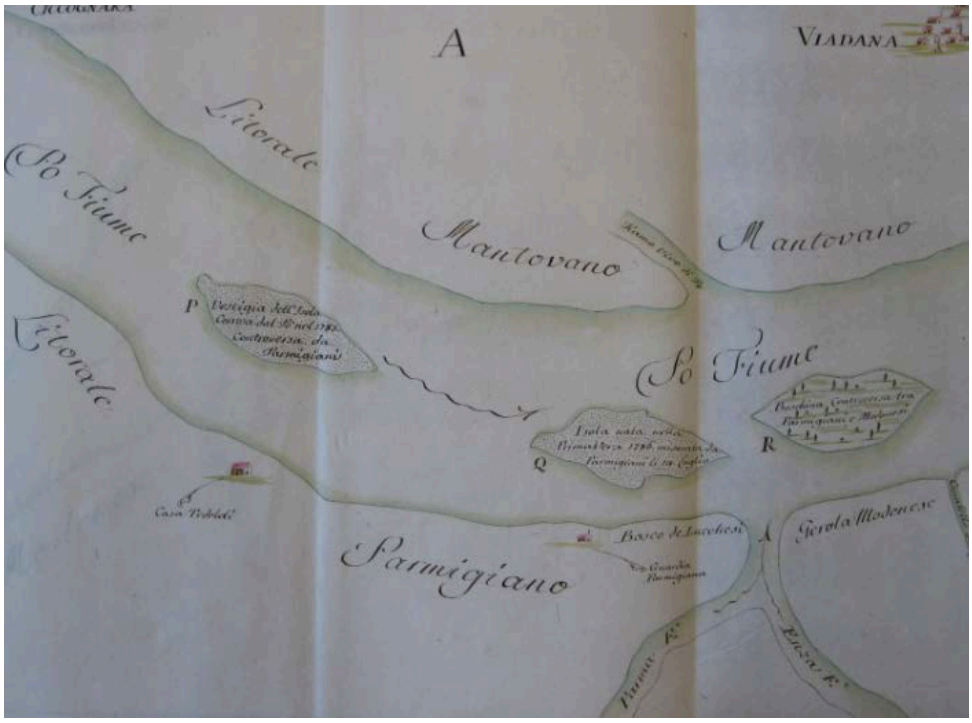

Figure 6.11 Detail from Carli's map of Viadana (1786)

For example, Carli reported that on July 24, 1786 approximately ten Parmesan subjects surveyed the island marked Q, included on Figure 6.11. Although the Infant's men did not try to occupy the island, their action might have preceded an official act of taking possession, as it occurred in the Fall of 1785 with respect to the island marked P.[876] Carli's plans are just one example of many similar documents sent from local communities to Milan in order to keep provincial authorities informed of the borders' situation.

Once all preparations to defend Lombardy's territory were in place, Wilczek contacted his Parmesan counterpart and insisted on the need to convene a border congress, while also

[876] Ibid.

suggesting, as a more expedient action, simply transforming the Pò into the frontier.[877] Immediately after Wilczek sent this dispatch to Parma, the Habsburg troops supported the inhabitants of Lombardy in a series of border conflicts, thus demonstrating that Joseph II's warnings had not been a mere facade.[878] Vienna's hardline approach forced the Parmesan Minister to ask for more details about the Habsburg plan to eliminate border contestations.[879] However, the Infant also appealed again to his Bourbon relatives for support.[880] Regardless of Joseph II's real plans vis-à-vis a possible expansion in the Italian Peninsula, the military force he used against the Parmesans in the disputed borderlands confirmed in the eyes of the European diplomats the rumor that the Habsburg emperor hoped to annex land in the vicinity of Lombardy.

The more Parma tried to transform the border negotiations from bilateral into quadrilateral ones and to move them from Italy to Vienna, the more strongly Kaunitz stressed in his letters to Wilczek the necessity of avoiding such a course.[881] Lombardy's governor even conducted a surprise visit to Parma to convince his Parmesan counterpart there was no need to involve the other Bourbon crowns in the negotiation.[882] However, as reported by the French minister in Parma, the Infant refused this proposal and persevered in his decision. However, despite Parma Court's efforts to involve France and Spain in the negotiations, the two Bourbon Courts delayed taking any diplomatic action.[883]

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[877] Ibid., Wilczek to Manara, November 29, 1786.
[878] Ibid., documents from Manara to Wilczek reporting incidents in the area of Torricella, Cremona on November 29, 1786, and in the Giarolo del Marghei, Cremona, from December 2, 1786, and December 4, 1786. The Habsburg court maintained this forceful line in 1787, as reflected in an imperial order from January 5, 1787 and the number of garrisons maintained in the border areas in places such as Porto Morone, S Steffano al Corno, Gussola and Casalmaggiore. Ibid., fragment from Joseph II's order dated January 5, 1787. Pecis requested more money for the maintenance of the garrisons on January 8, 1787. ASM Confini p.a., box 80.
[879] ASM Confini p.a., box 79, Manara to Wilczek, December 4, 1786.
[880] MAE CP, Parme, box 44, 87-88 verso, Manara to Vergennes, December 9, 1786.
[881] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, January 8, 1787, 7.
[882] MAE CP, Parme, box 44, 164-164 verso, Flavigny, June 17, 1787.
[883] By the end of 1787 it seemed as if France and Spain preferred to keep their distance from the Lombardy-Parma negotiations, and Kaunitz was certain they would only intervene if the future congress were to reach a standstill. HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, 157-157 verso.

It is plausible that the two monarchs wished to consult with their ministers before infuriating their Habsburg ally, to determine the best way to broach the issue with Vienna. In early February 1788, the Spanish foreign minister José Moñino Floridablanca informed Parma that the king had agreed to help the Infant. To ensure the success of their intervention, the Bourbon Courts asked the Infant to provide detailed memoirs and a topographic plan showing the controversial domains, additional evidence to support Parma's claims, a border demarcation proposal, and a list of disadvantages for the Infant if the Pò became the borderline.[884] That same month, the French representative in Parma (Flavigny) reported to his superior in Versailles that the Parmesans were preparing a border map to help the Bourbon ambassadors in Vienna during the negotiations.[885] Flavigny also mentioned in his letter the existence of another small atlas containing plans of the Parmesan borders, submitted to Versailles on October 23, 1784.[886] These instances confirm again that Lombardy's engineers were not the only mapmakers in these borderlands and that both sides understood the importance of cartographic material to impose one's vision on the ground.

Once the Bourbon kings reached a consensus in early 1788, they delegated their ambassadors in Vienna to contact Chancellor Kaunitz offering to help mediate the controversies between Parma and Lombardy.[887] The Bourbon ambassadors claimed in their joint memoir that as the aggressors were Habsburg subjects, it was Joseph II's responsibility to intervene and reestablish the status quo in the border areas. Additionally, the ambassadors promised to present topographic maps and other evidence to show why the Infant "could not agree to the claimed

[884] MAE CP, Parme, box 44, 303-303 verso, Florida Blanca to Ventura, February 3, 1788. The Parmesan Minister transmitted this decision to Milan. ASM Confini p.a., box 80, Ventura to Wilczek, February 26, 1788.
[885] MAE CP, Parme, box 44, 313-314, Flavigny, February 24, 1788.
[886] Ibid.
[887] MAE CP, Autriche, box 354, 182-183 verso, the ambassadors of Spain and France to Kaunitz, March 1, 1788.

disintegration."[888] The letters from the Parmesan ministers and the French representative in Parma influenced the ambassadors' choice of words regarding the Habsburg plan for a territorial exchange. In his report to Joseph II, Kaunitz expressed his displeasure at the expression "disintegration" and blamed it on the Parmesan Court's distortion of the Habsburg offer and actions in the border areas.[889] Kaunitz explained the Infant's desire to involve the Bourbon Courts and move the negotiation to Vienna as an attempt to obtain more leverage against the Habsburgs and also as a way to avoid expenses that a Border Congress convened in Italy would entail. [890]

Although the Chancellor accused the Infant of distortion and defamation of the emperor's character, the Parmesan Court was right in their assumption regarding Joseph II's determination to impose his imperial vision. On February 11, 1788, Kaunitz transmitted to Wilczek verbatim Joseph II's resolution regarding the official policy towards Parma:

> If, after we transmitted to them the compensation we planned to offer to ensure that the River Pò forms the border between the two states, the Court of Parma does not agree to start the negotiations, then we will declare formally that we contemplate not only the border issues born after the treaties of Aix-la-Chapelle and Nice, but also all those that were controversial before [...]; and if this preliminary is not accepted, all negotiations will be suspended, and we will support our rights with determination and will extend our possessory actions as much as possible.[891]

A small state like Parma would not have had any chance to prevail against the Habsburg Monarchy's forces, so the Infant's diplomatic move seems entirely justified. Although the French and Spanish ambassadors intervened in favor of the Bourbon ruler of Parma, these

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[888] "Son Altesse ROyale ne peut pas consentir aux demembrements qu'on pretens." Ibid, 183 verso.
[889] ASM Confini p.a., box 80, Kaunitz to Joseph II, 1788 (wrote between March 1 and April 10).
[890] Ibid.
[891] "Se la Corte di Parma, dopo averle comunicato li compensi da offrirsi per ottenere che il Fiume Pò faccia i limiti fra i due stati, non acconsentisce ad entrare in negoziazione, allora si dichiarerà formalmente, che noi consideriamo non solo le questioni dé Confini nate dopo li trattati d'Aquisgrana, e di Nizza, ma anche tutte quelle, ch'esistevano prima litigiosi, e da decidere; e poi se non si riconosce questa prima base, si finirà ogni trattativa, sostenendo al meglio i nostri diritti con dimostrazione risoluta, e stendendo i nostri atti possessorj, quanto si potrà." HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, 17, Kaunitz to Wilczek, February 11, 1788.

diplomats did not rely only on the Infant's reports and tried to obtain additional information both from Vienna and Parma. In this context, the French ambassador in Vienna, Noailles, sent Versailles a report about the Habsburg attitude regarding the Lombardy-Parma border.[892] Noailles presented Kaunitz as very knowledgeable about the border controversies and genuinely interested in reestablishing peaceful relations with Parma. Kaunitz convinced Noailles that topographic plans sent to Vienna could not replace actual local knowledge.[893] Even though cartography was crucial as a preparatory step for a border negotiation, ministers and administrators with a thorough knowledge of the local geography were indispensable.

As the discussion intensified, the governments in Milan and Parma prepared complaints against each other to convince the Bourbon Courts of the justness of their actions. For example, on September 16, 1786, Giuseppe Maroni prepared a list of Parmesan violations against Lombardy after the September 10, 1773 convention to preserve the status quo.[894] Maroni's list received Kaunitz's praise, and the Chancellor ordered the extension of this report back in time, until 1748.[895] When in the spring of 1788, the French and Spanish ambassadors in Vienna forwarded to Kaunitz the Parmesan version of all border incidents from 1786 onwards, the Chancellor shared Maroni's memoir with the two diplomats.[896]

Additionally, Kaunitz ordered Wilczek to obtain as soon as possible a list of territorial violations caused by the Parmesan side from 1786 until 1788.[897] Complaints and counter-complaints quickly followed without any resolution, and an exasperated Kaunitz encouraged

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[892] MAE CP, Autriche, box 354, 190-192, Noailles to Montmorin, March 5, 1788.
[893] On April 16, 1788, Noailles wrote to the French Foreign Minister that these issues "can only be discussed by commissaries on site." "Il est évident que les intérets en question ne peuvent être discutés que par des commissaires sur les lieux." Ibid., 288, Noailles to Montmorin, April 16, 1788.
[894] ASM Confini p.a., box 79, Maroni, September 16, 1786.
[895] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, February 11, 1788, pages 18 verso-19.
[896] A copy of this list is located in MAE CP, Autriche, box 354, from 385 onwards.
[897] HHStA Italien-Spanischer Rat, Lombardei Korrespondenz, box 153, Kaunitz to Wilczek, May 19, 1788, pages 58-59.

Wilczek to negotiate with the Parmesan minister a convention for the preservation of the status quo. The Chancellor recommended that Lombardy's minister compile the list of contested domains based on the 1779 Quarantini-Regalia map and report and the 1784 Bellerio plan and memoir.[898] Cartographic material was essential in shaping diplomatic negotiations.

By the end of 1788 the discussions progressed to the nomination of commissaries.[899] Soon afterwards, the negotiations reached another standstill due to the death of the Spanish monarch, Charles III.[900] And after the change in leadership in Madrid, the Court's position with respect to the Parma-Lombardy border controversies altered. When the Spanish court finally submitted their guidelines to Parma, they made it clear that the two commissaries should do the following: first, inspect the border together to claim and mark on-site the various borderlands; secondly, work independently to establish the evidence and documentation of their respective rulers and afterwards send their final reports to Vienna for the actual negotiations.[901] The negotiations stopped shortly afterwards, due to the beginning of the French Revolution and the death of emperor Joseph II in January 1790. More than four decades proved insufficient to regulate the Habsburg imperial border with the small duchies Parma and Piacenza.

[898] ASM Confini p.a., box 80, Kaunitz to Wilczek, May 4, 1789.
[899] Ibid., Kaunitz to the French and Spanish ambassadors, December 18, 1788. The Habsburg side nominated as their representative Giuseppe Pecis, who had a long experience with border controversies. Because of his advanced age, Wilczek and Kaunitz considered a possible replacement for Peccis in the person of Baron Trechi (general vice-intendant of finances). Additionally, the Habsburg Court planned to send Maroni as secretary to help Pecis with the negotiations. The Parmesan side nominated as their commissary counselor Antonio Bertioli, president of Parma's Supreme Council of Justice. Ibid., Wilczek to Kaunitz, January 6, 1789; MAE CP, Parme, box 45, 74, Flavigny, May 3, 1789.
[900] MAE CP, Parme, box 45, 14-14 verso, Flavigny, January 25, 1789.
[901] Ibid., 65-65 verso, Flavigny, April 19, 1789.

6.4 CONCLUSION

Shortly after the death of Joseph II, the French representative in Parma, Count Flavigny, expressed his opinion about the Emperor's policy in a letter to Versailles, by stating that Joseph II's "ambition in Italy manifested after the reign of the deceased Empress [Maria Theresa], through his recurring voyages [to Italy], the military roads he built, the [territorial] exchanges he suggested and his pretensions, reinforced by violence, against all his neighbors."[902] Although clearly biased, Flavigny's appraisal of Joseph II's foreign policy had influenced the Courts of Spain and France in their readiness to champion the cause of the Duke of Parma against what they perceived as Vienna's expansionist tendencies.

Despite the Habsburg Court's experience in regulating borders and their strong political position as one of the most powerful European states, the small Duchy of Parma, Piacenza and Guastalla became the proverbial tail that wagged this imperial dog. Relying on his Bourbon dynastic alliances, the Infant incessantly complained about each action directed against his domains and portrayed the provincial government of Lombardy as an unjust neighbor that eagerly waited for the first opportunity to annex neighboring territories.

Although the Habsburgs failed to settle Lombardy's border with Parma, the half-a-century long negotiations left behind rich cartographic material and historical and juridical memoirs, and influenced the creation of new institutions such as the border commissary. Analyzing the production and use of border maps revealed that Vienna was not the only center relying on cartographic material to further its territorial claims. The Infant of Parma and its advisers, together with the French and Spanish ministers, used maps to establish the range and

[902] "Joseph II, dont l'ambition sur l'Italie s'est manifestées dés le régne de feue l'Impératrice, par les voyages réitérés qu'il y a fait, par les chemins militaires qu'il y a fait construire, par les échanges qu'il a proposé, et par les prétentions, soutenues de violence, qu'il a formées contre tous ses voisins," Ibid., 292, Flavigny, May 23, 1790.

value of the disputed borderlands, and to analyze the political consequences of establishing a borderline on the Pò River. Additionally, Joseph II's and Kaunitz's readiness to sacrifice Mantovan provinces in exchange for the enlargement of Milanese lands discloses an important step in the centralization of Lombardy and the province's integration into the imperial fabric: the union of the Duchy of Mantua and the State of Milan in more than name.

7.0 SCRUTINIZING THE HEAVENS, MEASURING THE EARTH: ASTRONOMERS IN THE SERVICE OF THE HABSBURG MONARCHY

> Early modern science and technology developed in large measure within a limited set of localized sites that ranged from state-supported scientific academies and observatories to botanical gardens, aristocratic collections, and apothecary shops [...] Yet it is equally true that local knowledge was very often embedded in geographically extended networks of communication and exchange. These multiple, often overlapping networks directly facilitated the gathering of information and natural objects as well as the dissemination of the natural knowledge produced at those sites.[903]

In 1766, the director of the University Observatory in Vienna and the founder of the Observatory in Milan made plans for a scientific expedition sponsored by the Royal Society of London to the Spanish dominions in California. Although the plan did not materialize in the end, its conception was a reflection of the emergence of science as a global enterprise. The two astronomers, Joseph Liesganig and Roger Boscovich, both members of the Jesuit order, were at the time in the service of the Habsburg Monarchy. However, they also corresponded with and even joined scientific institutions outside the Habsburg borders. As Steven Harris suggests in the above quote, when analyzing the development of early modern scientific practices we need to pay attention both to the local sites of knowledge and to networks connecting these places. Consequently, in this chapter, I investigate the activity of scientists who contributed to the development of astronomy and mapmaking in the Habsburg lands by giving attention to a multi-scale context: provincial,

[903] Steven J. Harris, "Networks of Travel, Correspondence, and Exchange," in *The Cambridge History of Science*, eds. Katharine Park and Lorraine Daston, vol. 3, *Early-Modern Science* (Cambridge: Cambridge University Press, 2006), 341.

imperial and trans-imperial.[904] By analyzing the contribution of Habsburg astronomers affiliated with specific provincial centers in a larger context, I show how these scientists contributed to the development of Habsburg imperial cartography. Additionally, I reveal how astronomers in the service of the Habsburg monarchs connected imperial cultural sites with the wider world and contributed to the development of astronomy and geography on a global scale.

When discussing the eighteenth century Republic of Letters and networks of scientific institutions, scholars are tempted to prioritize the role of the Royal Society in London and the Academy of Sciences in Paris.[905] Although Vienna lacked an Academy of Sciences during the reigns of Maria Theresa and Joseph II, this was not symptomatic of a disinterest in promoting scientific initiatives. Actually, with the encouragement of the Habsburg monarchs, during the eighteenth century, at least four plans were prepared to organize an Academy in Vienna, which reveals the existence of an active intellectual community.[906] The author of one of those proposals was the Jesuit Maximilian Hell, director of the Imperial Observatory in Vienna and a world-renowned astronomer.[907] Hell's example suggests the existence of other fully operational sites of

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[904] Charles Withers suggests to "consider both the movement of the Enlightenment's ideas above and beyond national contexts, and also explore their regional, local, and social manifestations within the nation." Withers, *Placing the Enlightenment*, 41.

[905] James McClellan III, historian of scientific institutions in the eighteenth century, states that "learned societies modeled after the Royal Society of London and the Académie Royale des Sciences in Paris formed the backbone of organized and institutionalized science in the eighteenth century." James McClellan III, "Scientific Institutions and the Organization of Science," in *The Cambridge History of Science*, ed. Roy Porter, vol. 4, *Eighteenth-Century Science* (Cambridge: Cambridge University Press, 2003), 90. Such an assessment downplays the scientific contribution of states who did not prioritize the same type of institutionalized scientific knowledge. A disproportionate scholarly attention to France and Great Britain overshadowed the Habsburg contribution to the Age of Enlightenment. See, for example, the following works devoted to the Academy of Sciences in Paris and the Royal Society in London: Palmira Fontes Da Costa, *The Singular and the Making of Knowledge at the Royal Society of London in the Eighteenth Century* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2009); Roger Hahn, *The Anatomy of a Scientific Institution: the Paris Academy of Sciences, 1666-1803* (Berkeley: University of California Press, 1971); Marie Boas Hall, *Promoting Experimental Learning: Experiment and the Royal Society, 1660-1727* (Cambridge: Cambridge University Press, 1991).

[906] James E. McClellan III, *Science Reorganized: Scientific Societies in the Eighteenth Century* (New York: Columbia University Press, 1985), 139. Joseph Feil discusses in detail the attempts to found an Academy of Sciences during Maria Theresa in Joseph Feil, *Versuche zur Gründung einer Akademie der Wissenschaften unter Maria Theresia* (Vienna: C. Gerold's Sohn, 1860).

[907] Per Pippin Aspaas shows how Maximilian Hell's plan would have incorporated many ex-Jesuits in the new

knowledge production. Indeed, the observatories in Vienna and Milan, and the Academy of Sciences in Brussels are some examples of learned institutions that transformed the Habsburg territories into active contributors to the intra-European and even global scientific dialogue. Additionally, astronomers and scientists working in the Habsburg Monarchy became foreign correspondents or even members of prominent European Academies, and were engaged in global scientific enterprises.

The Republic of Letters reached its heyday during the eighteenth century with the expansion of the network of scientific institutions and the intensification of correspondence uninterrupted even by military conflicts. Academies of sciences and observatories published memoirs and observations for an international audience, and joint scientific projects became the norm, also impacting the fields of astronomy and geography.[908] Eighteenth century geographers were engrossed in developing a "language of location" and describing the world they inhabited.[909] As no single man could travel and measure the whole world, collaboration was essential for what scientists perceived as the improvement of geographical knowledge. Indeed, the quest for precision and accuracy in identifying the shape of the Earth and calculating the distance between Earth and the Sun encouraged two worldwide enterprises in the eighteenth century: measuring meridian arcs and observing the transits of Venus. In both cases, observers travelled all over the world and shared their results with the larger scientific community.

Academy, such as the ones who used to be directors of observatories in Graz, Vienna and Prague. However, Hell's proposal to give this Academy the right to control the production of calendars, a big source of revenue at the time, infuriated the famous publisher Joannes Thomas de Trattner. It seems the book dealer persuaded Maria Theresa to refuse Hell's plan. In her rejection letter the empress also revealed her distrust in the capacity of the ex-Jesuit to organize an Academy: "I find the Abbé Hell not strong enough; an *accademie* that is worse than the already existing ones would be worth neither the costs nor the effort." Per Pippin Aspaas, "Maximilianus Hell (1720-1792) and the Eighteenth-Century Transits of Venus. A Study of Jesuit Science in Nordic and Central European Contexts" (PhD diss., University of Tromsø, 2012), 141-146.

[908] Lorraine Daston, "The Ideal and Reality of the Republic of Letters in the Enlightenment," *Science in Context* 4, no. 2 (1991): 376-378; Withers, *Placing the Enlightenment*, 45-46.

[909] Godlewska, *Geography Unbound*, 3.

The debates about the shape of the Earth materialized in the first half of the eighteenth century in two expeditions organized by the French Academy of Sciences: one to Peru and one to Lapland. The goals of these missions were to measure two arcs of meridian - one on the Equator and one as far away as possible from this line - compare their lengths, and, based on the difference, infer the shape of the Earth.[910] In his study of the Peru expedition and its implications, Neil Safier showed the intricacy of the web involving exchanges between various centers of collection and codification, all contributing to the creation of knowledge.[911] The pursuit of establishing the shape and size of the Earth without any doubt continued in the second half of the eighteenth century, and this phase also included Habsburg scientists, such as Joseph Liesganig. Historians of science also studied how the 1761 and 1769 transits of Venus motivated an unprecedented effort of scientists to coordinate observations and exchange their results.[912] It is in this context that Cassini de Thury travelled to Vienna and worked with Hell and Liesganig on a variety of astronomic and geodetic projects.[913] The global network included scientists serving the Habsburg monarchs in Vienna, Milan and Brussels.

Joseph Liesganig organized two expeditions to measure degrees of meridians; Maximilian Hell travelled from Vienna all the way to Lapland to observe the 1769 transit of Venus; and eighteenth-century Habsburg observatories collaborated with a network of sites of knowledge production outside the empire. Some of these scientific contributions have been analyzed in biographies, in studies devoted to particular institutions such as the Brera or the

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[910] Numa Broc, *La Geographie des philosophes, geographes et voyageurs français au XVIIIe siecle* (Paris: Editions Ophrys, 1974), 37-41.

[911] Safier reveals the importance of local knowledge in carrying out scientific experiments far away from sites of knowledge such as European academies of science or observatories. Additionally, he traces the results of the scientists' work in the field and their impact on the reading public back in Europe. Safier, *Measuring the New World*, 8-15.

[912] Harry Woolf, *The Transits of Venus: A Study of Eighteenth-century Science* (Princeton, NJ: Princeton University Press, 1959), vii.

[913] Ibid., 65.

Viennese Observatories, or in the context of the Cassini family's scientific impact.[914] However, no prior work brings together the impact of Habsburg sites of knowledge production in different imperial provinces on the development of mapmaking. Therefore, this chapter focuses on contributions of scientists working in observatories in Vienna and Milan, and in the Academy of Sciences in Brussels, within the context of the Habsburg rulers' preoccupation with mapmaking.

The first part of the chapter discusses the impact of Viennese observatories on the development of astronomy and mapmaking. The Jesuit fathers Hell and Liesganig, the top Viennese astronomers in the second half of the eighteenth century, were deeply involved in trans-imperial scientific collaborations. Whereas Hell focused more on performing and publishing numerous astronomic observations, Liesganig devoted his career to combining astronomic and geodetic measurements in order to create what his patrons perceived of as more accurate maps. In both cases, the dissolution of the Jesuit order did not put a stop to their scientific career, as the Habsburgs understood the importance of maintaining such experts in the service of the crown.

Moving from Vienna to Lombardy, the second section examines the key role the Jesuit Roger Boscovich played in the development of another astronomic center: the Brera Observatory in Milan. A scientist affiliated with the top European academies, Boscovich refused to sacrifice his international career to satisfy Vienna's interests. His years in Lombardy and his conflicts

[914] Histories of observatories: *Die Geschichte der Universitätssternwarte Wien. Dargestellt anhand ihrer historischen Instrumente und eines Typoskripts von Johann Steinmayr*, eds. Jürgen Hamel, Isolde Müller, and Thomas Posch (Frankfurt am Main: Harri Deutsch, 2010); M. Ludovic Drapeyron, "Project de géométrie géodésique de la France et de L'Italie en 1776, par Cassini de Thury," *Association Français pour l'avancement des Sciences, Compte rendu de la 27e session, Nantes, 1898* (Paris, 1899), 795-797; Carlo Monti, Luigi Mussio, "L'Attività Geodetico Astronomica, topografica, Cartografica degli Astronomi di Brera dal 1772 al 1860 studiata attraverso gli Atti Ufficiali dell'Osservatorio," *Memorie dell'istituto Lombardo-Accademia di Scienze Lettere. Classe di Scienze Matematiche e Naturali* 27, no. 5 (1980): 189-308; Francesco Zagar, *L'Osservatorio Astronomico di Milano nella Storia* (Milan: Arti Grafiche E. Milli, 1963). Some biographical studies: Gerhard Geissl, *Joseph Liesganig - die Wiener Meridianmessung und seine Arbeiten im Gebiet von Wiener Neustadt* (Wiener Neustadt: Verein Museum und Archiv für Arbeit und Industrie im Viertel unter dem Wienerwald, 2001); Germano Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700* (Rome: Accademia nazionale delle scienze detta dei XL, 1988); Aspaas, "Maximilianus Hell."

with the central political authorities reveal the challenges Habsburg rulers faced in the process of institutionalizing and centralizing scientific knowledge. After Boscovich's departure in the mid-1770s, Vienna brought the group of astronomers active in Brera into alignment with imperial interests regarding the development of cartography in Lombardy.

The last section traces the development of astronomical knowledge in the context of the Academy of Sciences created in Brussels in the early 1770s. Local scientists used their international contacts to obtain astronomical data and the provincial government also tried to obtain access to information that could have improved imperial mapmaking projects. Notwithstanding the Habsburg rulers' interest in obtaining good maps of their lands, and their belief that astronomic observations could increase the accuracy of geodetic measurements, financial limitations curtailed institutional expansion. As Boscovich reported, during one of his meetings with Joseph II, the emperor confessed that "having to observe so much on the Land, he did not have much time to observe the sky and the stars" or, in this case, to offer more financial assistance to the development of astronomy.[915] Despite its persistent pleas, the Brussels Academy did not obtain an Observatory in the eighteenth century.

In France, the Academy of Sciences and its affiliated institutions, such as the Observatory in Paris, fostered the interests of their monarch.[916] Similarly, the Viennese rulers also used sites of knowledge such as the observatories in Vienna and Milan, and the Academy of Sciences in Brussels, to improve imperial cartography. As military engineers provided the manpower for on-ground surveying operations, scholars educated in the Jesuit tradition, and often members of this order, wrote theoretical treatises and even trained some of the Habsburg officers on how to make

[915] Joseph II made this remark to Roger Boscovich after the Jesuit invited him to visit the Observatory in Milan during the emperor's visit to Italy in the summer of 1769. ASM Autografi, box 115, folder 40 (Boscovich Ruggero), June 8, 1769, Boscovich to Firmian, 24.
[916] Hahn, *The Anatomy of a Scientific Institution*, 14.

maps. Moreover, these scholars built international collaborations that served a double purpose: learning from the experience of other scientists and gaining access to their published materials or unpublished results while also bolstering the reputation of the Habsburg monarchs as promoters of science.

7.1 JESUITS AND OBSERVATORIES IN EIGHTEENTH-CENTURY VIENNA

On the morning of May 18, 1761, César-François Cassini de Thury, one of the most famous astronomers and mapmakers of his time, arrived in Vienna. Shortly after leaving the boat that had taken him down the Danube from Ulm, Cassini de Thury encountered the Jesuit Maximilian Hell and spent most of his first day in the Habsburg Monarchy's capital inspecting the two observatories in Vienna: the Imperial Observatory under the direction of Hell and the University Observatory under the care of another Jesuit, Joseph Liesganig. As Cassini de Thury wrote after his meeting with Hell: "I already knew him from his work; but he made me feel, through his thoughtfulness, how much one gains by seeing and listening to the savants whom we only know by their reputation."[917] The French academician considered Hell an intellectual equal, and presented the trip to the Habsburg lands and his encounters with local scientists as an important step towards the development of astronomy and geography.

Cassini de Thury travelled to Vienna with the approval of both French Foreign and War Minister Choiseul and the Habsburg Monarchy's Chancellor, Kaunitz. His visit is not an example of the diffusionist model of Enlightenment, radiating from France to the darker corners

[917] "Je le connoissois déjà par ses ouvrages; mais il me fit sentir, par ses prévenances, combien l'on gagne à voir et à entendre les sçavans, que l'on ne connoît que par leur réputation." Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi*, 23.

of Central and Eastern Europe. On the contrary, during this journey, Cassini de Thury enriched his own knowledge and collaborated with astronomers active in the Habsburg dominions. Many of these astronomers belonged to the Jesuit order and remained active men of letters and Habsburg agents even after the suppression of the Society of Jesus in 1773.[918]

The role of the Jesuits in the development of eighteenth century science was influential not only in the Habsburg Monarchy but also in the French, Portuguese and Spanish empires.[919] The members of the Jesuit order had access to a global network of resources, and "the missions of the Society of Jesus were the globalizing institution *par excellence*."[920] The Society's scientific activity, as expressed through their teaching inside and outside the classroom, their correspondence and their publications, was not divergent from the science of the time. Jesuits were active members of the Republic of Letters and trained some of the main intellectuals of the eighteenth century, such as Descartes, Laplace, Diderot, Turgot, Voltaire and Gian Domenico Cassini.[921] As Mordechai Feingold contends, "by and large, the scholarly activities and aspirations of Jesuits were indistinguishable from those of other contemporary savants, secular or ordained, irrespective of denomination."[922] This is certainly true in the case of Maxmilian Hell, Joseph Liesganig and Roger Boscovich, some of the leading figures in the fields of astronomy and cartography in the Habsburg Monarchy.

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[918] Richard Evans mentions the "continuing prominence of priests in the intellectual life of the Monarchy" during the eighteenth century as a striking characteristic of Enlightenment in this empire. Richard J. W. Evans, "The Origins of Enlightenment in the Habsburg Lands," 50-53.

[919] See for example *Science in the Spanish and Portuguese Empires 1500-1800*, eds. Daniela Bleichmar, Paula De Vos, Kristin Huffine, and Kevin Sheehan (Stanford: Stanford University Press, 2009); *El saber de los jesuitas, historias naturales y el Nuevo Mundo*, eds. Luis Millones Figueroa, and Domingo Ledezma (Madrid: Iberoamericana, 2005); Florence C. Hsia, *Sojourners in a strange land: Jesuits and their scientific missions in late imperial China* (Chicago: University of Chicago Press, 2009).

[920] Luke Clossey, *Salvation and globalization in the early Jesuit missions* (Cambridge: Cambridge University Press, 2008), 257.

[921] Mordechai Feingold, "Jesuits: Savants", in *Jesuit Science and the Republic of Letters*, ed. Mordechai Feingold. (Cambridge, MA: MIT Press, 2003), 23-38. See also: *The Jesuits. Cultures, Sciences and the Arts 1540-1773*, eds. John W. O'Malley, S.J., Gauvin Alexander Bailey, Steven J. Harris, T. Frank Kennedy, S.J., 2 vols. (Toronto: University of Toronto Press, 1999-2006).

[922] Feingold, "Jesuits: Savants," 2.

Whereas France, Naples, Portugal and Spain abolished the order in the 1760s, the Habsburg monarchs waited until 1773 and only reluctantly implemented the papal directive that year. As Derek Beales argues, "it was the pope and the other Catholic Powers who imposed on Maria Theresa and Joseph II the suppression of the Jesuits."[923] Moreover, even after the official suppression of their organization, ex-Jesuits working in the Habsburg dominions received pensions and employment from Maria Theresa and Joseph II.[924] The Habsburg rulers' reluctance to banish Jesuits from their lands was an obvious reaction to the important functions the monks fulfilled in the domains of religion, education and scientific development.[925]

This section will demonstrate the key role Jesuits played in the development of the two main observatories in Vienna in the eighteenth century and how these sites of knowledge became important nodes in the network of the Republic of Letters. The association between the Society and astronomic observatories was common in the eighteenth century, when around thirty such institutions developed in connection to Jesuit colleges all over Europe.[926] However, we should not assume that all astronomic observatories were affiliated with the Jesuit order. For example, the first private Observatory in Vienna, a short-lived creation, was not a Jesuit establishment. In 1730, Gian Giacomo Marinoni (1676-1755), who had been one of the main instructors at the first Engineering Academy in Vienna discussed in chapter 2, established on the roof of his home a small observatory. Marinoni's interests reveal the strong connection between astronomy and mapmaking; the promoter of the plane table, a key instrument in mapping the Habsburg lands

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[923] Derek Beales, "Joseph II and the monasteries of Austria and Hungary," in *Enlightenment and reform in eighteenth-century Europe*, 237. Also see Derek Beales, "Maria Theresa, Joseph II and the Suppression of the Jesuits," in Ibid., 207-226.
[924] Szabo, *Kaunitz and Enlightened Absolutism*, 244-245.
[925] Despite the acceptance of Jesuits as important reformers, scientists and educations, the Habsburg state slowly reduced the Society's control over universities and censorship. Beales, "Maria Theresa, Joseph II and the Suppression of the Jesuits," 213-214.
[926]Agustin Udias Vallina, *Searching the Heavens and the Earth: the History of Jesuit Observatories* (Dordrecht, Netherlands: Kluwer Academic Publishers, 2003), 1-10.

throughout the eighteenth century, was also one of the first supporters of institutionalizing astronomic observations in observatories. Shortly after transforming his rooftop into an observatory equipped with the latest instruments, Marinoni guided the Jesuits during the planning and building phases of their own astronomic institution.[927] By 1733, the Society had built an Observatory affiliated to the Jesuit College in Vienna. [928]

The international scientific community reacted with a lot of enthusiasm to the founding of a Jesuit observatory in Vienna. Soon after the first observations in 1736, French and English scientists requested data from Vienna and maintained an active correspondence with the Jesuits throughout the eighteenth century. Also, in 1741, the Ottoman representative in Vienna spent one day visiting the observatory and thoroughly enjoyed trying the various instruments and conversing with the astronomers.[929] The University Observatory remained unrivaled in Vienna only for a couple of decades, as the Habsburg government increased their control over education and sites of knowledge production.

In 1744, in the context of Maria Theresa's educational reforms, the Jesuits lost control of the University in Vienna and only preserved their authority over the fields of philosophy and theology. Additionally, a new building for the university was erected. One decade later after this reorganization, Marinoni died, leaving all his astronomic instruments to the Habsburg government; Maria Theresa donated this collection to a newly created Imperial Observatory.[930] The empress chose Maximilian Hell, a Jesuit, as director of this institution and bestowed upon

[927] Marinoni described his observatory in Giovanni Jacopo de Marinoni, *De Astronomica Specula Domestica et Organico Apparatu Astronomico Libri Duo* (Vienna: Kaliwoda, 1745).
[928] Johann Steinmayr, "Die erste Jesuiten-Sternwarte in Wien. Vortrag im Verein Freunde der Himmelskunde am 9. März 1932 mit späteren Ergänzungen," in *Die Geschichte der Universitätssternwarte Wien*, 169-170.
[929] Ibid., 174-177.
[930] To avoid confusion I will refer to the first Jesuit observatory as the University Observatory and to the second Jesuit observatory as the Imperial Observatory.

him the function of Imperial and Royal Astronomer.[931] In addition to his responsibilities to keep the observatory equipped with all required instruments and to perform astronomic observations, Hell was commissioned to hold lectures, open the doors of the observatory to all interested people and correspond with other observatories outside the Habsburg borders.[932] Hell implemented the imperial orders successfully and preserved his position until his death in 1792.

Creating an Imperial Observatory did not eliminate the importance of its older counterpart, however. At the end of 1754, Joseph Liesganig was named the director of the University Observatory in Vienna and continued working here until the dissolution of his order. In 1761, during his visit to Vienna, Cassini de Thury visited both observatories and commented on the quality of their instruments. Whereas in the case of the Imperial Observatory the French astronomer considered the instruments from Marinoni's legacy as outdated and unreliable, he admired Liesganig's inventory and was happy to find in the collection a quadrant similar to the ones from the Paris Observatory.[933] Liesganig incessantly strived to improve the instrumentation of his institution and employed correspondence to foster exchanges with scientific institutions from other states. With the help of his friend and Jesuit colleague, Roger Boscovich, whom he probably met in the early 1760s, Liesganig sent a request to the Secretary of the Royal Society in London for a number of instruments and also shared with this institution the results of his work.[934]

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[931] Steinmayr, "Die erste Jesuiten-Sternwarte in Wien," 175-176.
[932] Aspaas, "Maximilianus Hell," 67-74.
[933] Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi*, 24.
[934] For example, on April 3, 1765, Liesganig wrote a letter to Bevis to request a number of instruments for his observatory; he also sent a number of astronomic observations to prove his credentials. "A Letter from John Bevis, M. D. to the Rev. Thomas Birch, D. D. Secretary to the Royal Society; Containing Astronomical Observations, Made at Vienna, by the Rev. Father Joseph Liesganig," *Philosophical Transactions of the Royal Society* 55 (1765): 130-138. From this letter we know that by 1764 Liesganig's collection of instruments included: two mural quadrants each with a nine feet radius, a six feet quadrant, a ten feet sector constructed in the style of the Jesuit Roger Boscovich, a four feet quadrant, a moveable quadrant of two and a half feet radius, a transit instrument of six and a half feet, several fixed telescopes, a gnomon 14 feet high, micrometers and other instruments. Two years later, on

While the University Observatory might have been the best equipped in Vienna by the second half of the eighteenth century, the international scientific community knew the name of imperial astronomer Maximilian Hell better than they knew that of Liesganig. The recent work of Aspaas per Pippin demonstrates the key role Hell played during the 1760s investigation of the transits of Venus. Pippin describes Hell as a "nodal astronomer" and "networker" who gathered astronomic observations from the various Habsburg dominions and shared them with scientific centers in places such as London, Padua, Paris, St. Petersburg and many others.[935] As the editor of the *Ephemerides for the Meridian of Vienna* (*Ephemerides Astronomicae ad Meridianum Vindobonensem*) for 35 years, and through his participation in the Vardø expedition to Lapland between 1768-1770 to observe the 1769 transit of Venus, Hell became very well known to European scientists.[936]

In addition to maintaining active international correspondence in order to foster astronomic observations in the Habsburg Monarchy, Hell encouraged the establishment of new observatories. In the case of the astronomical observatory at the Jesuit University in Tyrnau (Trnava, Nagyszombat), finalized in 1755, Hell served as a consultant. From 1752 to 1755, Hell taught mathematics at the Jesuit College of Cluj (Kolozsvár, Klausenburg) in the province of

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April 4, 1767, Liesganig also sent to Bevis a short account of the measurement he did of three degrees of latitude under the meridian of Vienna. "Extract of a Letter, Dated Vienna April 4, 1767, from Father Joseph Liesganig, Jesuit, to Dr. Bevis, F. R. S. Containing a Short Account of the Measurement of Three Degrees of Latitude under the Meridian of Vienna," *Philosophical Transactions of the Royal Society* 58 (1768): 15-16.

[935] Aspaas, "Maximilianus Hell," 13-15, 37-3. Hell's publication of observations connected to the transit of Venus in 1761 proved invaluable for the Academy in Paris, as stated by Lalande. *Correspondance de Ferenc Weiss, Astronome Hongrois du XVIIIe siècle*, ed. Magda Vargha (Budapest: Bibliothèque de l'Université, 1990), 42-43.

[936] In 1762, The Academicians from Paris tried to encourage Maximilian Hell's publication of the Ephémerides by contacting the president of the Vienna University, van Swieten and other Habsburg representatives, and trying to ensure Hell would obtain an assistant to help him with his work. As the great astronomer Lalande wrote with optimism: "La Cour de Vienne protege trops et les Sciences et Ceux qui les cultivent, pour ne pas reconnoître bientôt l'importance d'une semblable secours." Vargha, *Correspondance de Ferenc Weiss*, 40-41.

Transylvania and laid the foundation for another observatory. This project remained unfinished in the eighteenth century due to Hell's recall to Vienna and the dissolution of the Jesuit order.[937]

Although Hell did not himself contribute to the implementation of Habsburg cartographic projects, his astronomic work and correspondence with famous mapmakers and astronomers put Vienna on the map as one of the important European astronomic centers. Hell also maintained a regular correspondence with the Academy of Sciences in Paris, becoming in fact a corresponding member. Hell's example reveals scientific connections between Vienna and Paris, which were probably instrumental in encouraging Cassini de Thury and his son Cassini IV to plan and also implement collaborations with other Habsburg astronomers and mapmakers.[938] In 1761 Hell pursued the observation of the transit of Venus from his observatory in Vienna. However, in 1769 he was able to observe this phenomenon from an island close to the northeastern coast of Norway, with a commission from Christian VII, King of Denmark and Norway. Even though no Jesuits were allowed to enter Protestant Denmark, an exception was made for Hell, and his journey from Vienna through Prague, Dresden, Lepizig, Hamburg and Lübeck allowed him to meet and establish connections with other leading astronomers of the age.[939]

During his trip to Vienna in 1761 Cassini de Thury met first with Hell, but he ended up observing the transit of Venus from the University Observatory and also did extensive geodetic measurements with Liesganig. Less known to scholars today than Hell,[940] Liesganig played an

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[937] Aspaas, "Maximilianus Hell," 61-65.

[938] A large part of Hell's correspondence is in the archive of the Observatory in Vienna. Vienna, Wiener Universitätssternwarte (hereafter WUS).

[939] For the diary of the expedition see: Karl Ludwig Littrow, *P. Hell's Reise nach Wardoe bei Lappland und seine Beobachtung des Venus-durchganges im Jahre 1769* (Vienna: C. Gerold, 1835).

[940] Two recent works that focused on Hell's career are Nora Pärr, *Maximilian Hell und sein wissenschaftliches Umfeld im Wien des 18. Jahrhunderts* (Nordhausen: Bautz, 2013) and Aspaas, "Maximilianus Hell." Additionally, Laszlo Kontler recently published more articles discussing Maximilian Hell's expedition to Lapland and the impact of the main by-product of the expedition, the *Demonstratio. Idioma Ungarorum et Lapponum idem esse.* László Kontler, "Distances celestial and terrestrial: Maximilian Hell's Arctic Expedition of 1768-1769: Contexts and Responses," in *Scholars in Action: The Practice of Knowledge and the Figure of the Savant in the 18th Century*, eds.

important role in the development of cartography in the Habsburg lands.[941] His projects included surveys of meridian arches, the development of a methodology on how to represent large territories on maps, and the survey and mapping of the part of Poland annexed to the Habsburg Monarchy in 1772. Although limited geographically to the Habsburg dominions, Liesganig's career brought him into contact with scientists from all over Europe. After he had to officially shed his Jesuit identity in 1773, Liesganig continued serving the Viennese rulers, and his cartographic and administrative work contributed to the integration of the newly acquired province of Galicia into the empire.[942]

Historians of cartography and astronomy often mention the meeting between Cassini de Thury and Liesganig in Vienna and the work they did jointly in 1761 as an important result of the newly signed Habsburg-Bourbon's alliance and as a turning point in the history of Habsburg cartography. However, the impact of Cassini de Thury's visit to Vienna on Liesganig's career and approach to surveying should not be overestimated. Liesganig's dedication to contributing to the quest of identifying the shape of the Earth and his admiration of the French Academy of Sciences' methodology were only reaffirmed after Cassini de Thury's journey to Vienna. In July 1759, Liesganig had already started surveying an arc of meridian between Vienna and Brunn with support from Maria Theresa and as a result of Boscovich's suggestion. From the start Liesganig had planned his meridian arc survey as part of a series of earlier operations such as the

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André Holenstein, Hubert Steinke, and Martin Stuber (Leiden: Brill, 2013), 721-750; László Kontler, "Politicians, Patriots and Plotters: Unlikely Debates Occasioned by Maximilian Hell's Venus Transit Expedition of 1769," *Journal of Astronomical Data* 19, no. 1 (2013): 83-93.

[941] Joseph Liesganig (1719-1799) joined the Jesuit order in 1734 and was educated in Vienna. From 1742 he taught mathematics in Graz, and from 1744 he taught rhetoric in Linz. After his ordination to priesthood in 1748, he went to Komorn in 1749 as a German preacher and to Kaschau in 1751 as a mathematics professor. 1752, he received the title of historian and mathematician of the Jesuit Order and started working at the Observatory affiliated with the Jesuit College in Vienna. From 1756 until 1773 he was the prefect of this Observatory. In 1752 he started teaching mathematics at the University of Vienna. Walther Fischer, "Liesganig, Joseph", in *Neue Deutsche Biographie*, vol. 14 (1985), 540-542, http://www.deutsche-biographie.de/pnd118998153.html, last accessed on July 20, 2013.

[942] Seegel, *Mapping Europe's Borderlands*, 136.

measurements of La Condamine in Peru, Roger Boscovich in the papal states, and Louis de la Caille at the Cape of Good Hope. La Caille even sent to Liesganig an iron copy of the French measurement unit, the *toise*, used by the Academy in their measurements. In this way, the Jesuit could compare his results with the French scientists' work.[943] Cassini de Thury's arrival in May 1761 provided an opportunity for Liesganig to continue his project while also learning from and exchanging information with this renowned mapmaker.

From the point of view of the French scientist, the trip to Vienna was an opportunity to encounter future patrons and further some of his scientific projects. Cassini de Thury met in Vienna the leading decision-makers in the state: Kaunitz and the members of the imperial family.[944] The French scientist observed that year's transit of Venus at the University Observatory in the company of Liesganig and the future emperor Joseph II. We cannot speculate on what Cassini de Thury talked about with the inheritor of the Habsburg throne, but in his report to the Academy of Sciences in Paris the astronomer wrote "this Prince looked several times to Venus and asked me various questions which proved the range of his knowledge."[945] It is clear that the Habsburg rulers looked on Cassini de Thury's mission with benevolent eyes and encouraged his collaborations with local astronomers.

Empress Maria Theresa received the French astronomer with honor not only because he was a famous scientist, but also because he was a representative of the Habsburgs' new ally, the

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[943] Sven Widmalm, "Accuracy, Rhetoric, and Technology: The Paris-Greenwich Triangulation, 1784-88," in *The Quantifying Spirit in the 18th Century*, 182; Ernst Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," 140.

[944] The day after his arrival, Kaunitz promised governmental support to Cassini for the success of his mission. MAE CP, Autriche, box 282, 208-208 verso. Regarding his audience with the empress, Cassini writes that he had been so overwhelmed by the honor Maria Theresa lavished on him, that he could barely hear and reproduce what she had told him. In original: "Je fus si occupé de tout ce que l'Impératrice me fit l'honneur de me dire, qu'à peine je pouvois l'entendre, & qu'encore moins je pourrois le rendre," in Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi*, x-xi.

[945] "ce Prince regarda plusieurs fois Vénus & me fit plusieurs questions qui prouvoient l'étendue de ses connoissances." Cassini de Thury, "Observation du passage de Vénus sur le Soleil, faite a Vienne en Autriche," in *Mémoires de l'Académie Royale des Sciences année 1761* (Paris: Imprimerie Royale, 1763), 410.

French king Louis XV. Cassini de Thury was aware of his double role. In his written account he stated: "What circumstances could be more favorable to execute such a useful geographical project than the union of interests between France and the princes of the empire and the House of Austria?"[946] The French geographer linked the project for measuring Vienna's longitude with the signing of the 1756 Bourbon-Habsburg alliance. Even more, he underlined how the project would not have been possible without the existence of this treaty as the Seven Years' War did not end until 1763.[947] Cassini de Thury suggested that his project was possible despite the war. A closer examination of his published books, however, suggests the project might have happened because of the war. The decision-makers in Versailles supported the astronomer's enterprise in order to improve the accuracy of maps displaying the war theater in the German lands, while Maria Theresa ensured that at least one of her experts in the art of surveying, Liesganig, worked together with Cassini de Thury and learned from the experience of France's mapmaker.

The French scientist overtly declared in his work that for a very long time French military maps of foreign territories lacked precision, as they were not based on geometric measurements. However, the Duke of Choiseul, occupying both the positions of Foreign and War Minister, commissioned the *ingénieurs géographes* to prepare new maps using instruments such as compasses and plane tables in the hope that their work "will never have to be corrected again." Unfortunately for the French crown, such a vast project would have required years until completion. Therefore, Cassini de Thury suggested that astronomic observations along the perpendicular on the meridian of Paris, traversing Europe from Strasbourg to Vienna, and the correct identification of the location of more than 40 known cities and towns along the way

[946] "En effet, quelle circonstance plus favorable pour exécuter un projet aussi utile à la Géographie, que celle où la France était unie d'intérêt avec la Princes de l'Empire & la Maison d'Autriche?," in Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi*, vi.
[947] Ibid., 5-6

would help correct and ensure the reutilization of older maps.[948] Cassini de Thury had used the opportunity offered by military conflicts to expand his cartographic work before, in the lands of the Austrian Netherlands during the war for the Austrian Succession (1740-1748).[949] However, in the early 1760s the French troops did not control the German lands the French scientist planned to travel through and the Habsburgs had become important allies only recently. Therefore, Maria Theresa and her husband, Francis Stephan, would not have supported a French attempt to prepare detailed topographic maps of the German and Habsburg dominions.

The imperial couple did not encourage Cassini de Thury's mission only out of altruism and deference for their Bourbon allies. As shown in the previous chapter, Maria Theresa and her advisers benefitted during the Seven Years' War from the help of French military officers. Furthermore, the Habsburg political elites adopted some elements from the training and organization of French military engineers. Also, it probably was no coincidence that in 1763, a little over a decade after Cassini de Thury started working on a detailed topographic map of France, Maria Theresa ordered the mapping of the Habsburg Monarchy.[950]

Just as Cassini de Thury was not solely an academician in the service of science, but also a French subject, Liesganig was both a Jesuit and a Habsburg agent. This connection suggests that the bilateral pact furthered the interests of both empires in the field of mapmaking. In addition to observing together the transit of Venus, the Cassini-Liesganig collaboration extended

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[948] Ibid., 3-6.

[949] Between 1746 and 1748, after the French troops had invaded the Austrian Netherlands, Cassini de Thury surveyed and constructed a triangulation network for a significant part of this Habsburg province. Cassini collaborated in his work with military engineers, who then used the triangulation network to prepare detailed topographical maps of the Austrian Netherlands. Lemoine-Isabeau, *Les militaires et la cartographie des Pays-Bas méridionaux et de la Principauté de Liège*, 55-58; Vervust, "From Cartography of Conquest to Cartographic Cooperation."

[950] For a detailed presentation of Cassini's "Map of France" see Konvitz, *Cartography in France*; Monique Pelletier, *Les cartes des Cassini: la science au service de l'état et des regions* (Paris: CTHS, 2002). For more details on the Habsburg "Josephinische Aufnahme" see Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II.*

over more months to include construction of a triangulation network for the area surrounding Vienna. At the order of Maria Theresa and Francis Stephan, Liesganig had already done some preliminary work for the measurement of Vienna's meridian. There is no clear evidence of how the international team of scientists interacted during their work, whether Cassini de Thury or Liesganig had more knowledge, or whether there were any contradicting points of view. Based on the French scientist's account, published in 1765, the reader is led to perceive this joint project as a work done by equals. The astronomer acknowledged that before his arrival in Vienna, Liesganig had already measured a basis of 4000 toises in the area of Vienna with the help of an iron toise sent from Paris by Condamine and de la Caille. This measurement unit had been adjusted on the model of the unit used in Peru. Shortly after the arrival of the French mapmaker, Liesganig showed to Cassini de Thury the best existing map of the area surrounding Vienna and revealed a plethora of faults.[951] The Jesuit believed building a triangulation network for the area around Vienna would improve the accuracy of cartographic representations.

Indeed, the measurements and the triangulation network Liesganig established in collaboration with Cassini de Thury served this purpose. The captain from the engineering brigade, Jean Baptiste d'Avrange, represented on a manuscript map the results of the Cassini-Liesganig collaborative work: *Map of Triangles used to determine the position of more sites in the area of Vienna* (*Carte des Triangles qui sont servis à déterminer la Position de plusieurs Lieux aux environs de Vienne*).[952] Cassini de Thury planned to use this map to convince Holy Roman Emperor, Francis Stephan, to associate astronomic operations with mapmaking work.[953]

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[951] Cassini's remark that he had already noticed the faulty representation of the flow of the Danube serves the purpose of establishing the academicians' authority. Cassini de Thury, *Relations de deux Voyages faits en Allemagne par ordre du Roi*, xi.

[952] Dörflinger, *Die Österreichische Kartographie*, vol. 1, 61; Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," 140.

[953] WUS, "Manuscripte von Hell, Chr. 90," Band 3 (Manuskripte von Hell 2), Mappe 3, July 1, 1761, Hell to Nicolas Louis de la Caille.

Figure 7.1 Vienna and its surroundings on the *Map of Triangles used to determine the position of more sites in the area of Vienna* (1761)

Figure 7.1 shows a fragment from the manuscript map prepared by d'Avrange in 1761.[954] In addition to the main settlements, the engineer represented the triangulation network measured by Cassini de Thury and Liesganig. The map includes not only the meridian and parallel passing through Vienna, but also the perpendicular to the meridian of Paris, thus connecting the Habsburg and Bourbon domains. In the bottom left corner the scientists listed distances from 23 settlements to the meridian and parallel passing through Vienna. D'Avrange incorporated in the top corners a schematic plan of the imperial palaces at Schönbrunn and Laxenburg, as seen in Figure 7.2.[955] The presence of these imperial residences reminded the viewer that the Habsburg patronage made this project possible. Cassini de Thury's *Map of the Surroundings of Vienna* (*Carte des environs de Wienne*) published in 1763 is very similar to d'Avrange's.[956]

[954] ÖNB, Kartensammlung, AB 7 B 1.
[955] Ibid.
[956] This map is reproduced in Dörflinger, *Descriptio Austriae*, 32. ÖNB, Kartensammlung, Alb. 180-14; Paris, Bibliothèque nationale de France (hereafter BNF), GE C – 11362.

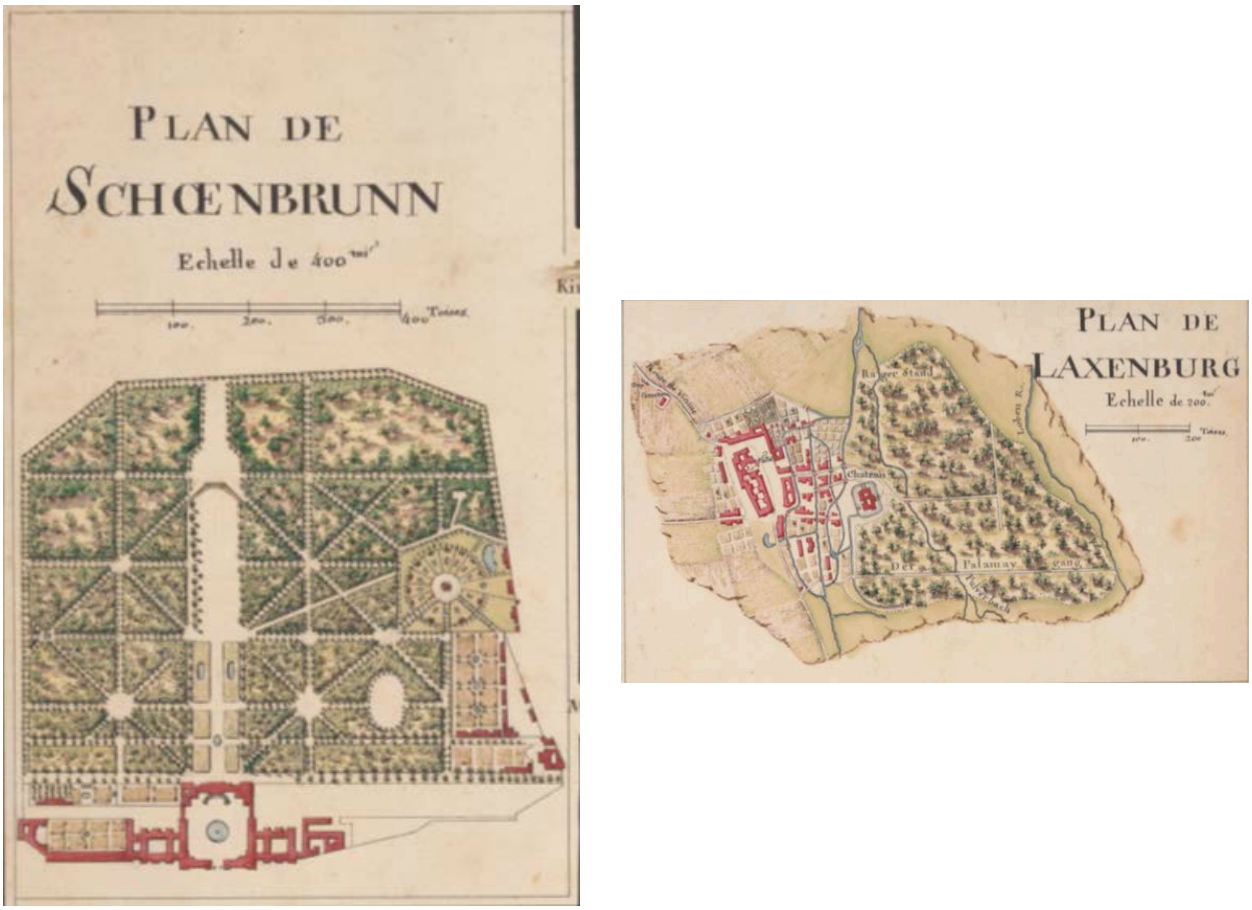

Figure 7.2 Schönbrunn and Laxenburg on the *Map of Triangles used to determine the position of more sites in the area of Vienna* (1761)

The Cassini-Liesganig team served at the time as an example of cooperation across borders, fostered with the help of the Bourbon and Habsburg dynasties. Cassini de Thury took great care in his published work to emphasize the generosity of the Habsburg rulers and their wide knowledge and interest in his work. The French scientist strived to satisfy his Viennese patrons not only as a sign of gratitude, but also in the hope of receiving future commissions for himself and his other relatives, as described in the next chapter.

During his time working with Cassini de Thury we can infer that Liesganig learned more about the methodology on which the Academy in Paris based the construction of the Map of France. Indeed, in 1762, shortly after Cassini de Thury's departure, Maria Theresa ordered

Liesganig to resume his arc measurement operations. The Jesuit surveyed the area between Sobieschiz, close to Brunn in Moravia and Warasdin in Croatia, and measured two bases of around 12 kilometers each: Wiener Neustadt-Neukirchen and Seyring-Raasdorf-Glinzendorf. Some of the students attending the courses at the Engineering Academy participated in the survey operations at Kahlenberg close to Vienna and learned from the Jesuit the mechanics of such measurements. In the end, Liesganig managed to survey three degrees on the Vienna meridian.[957] The measurement of a meridian's degrees and the training of military engineers in the art of geodetic measurements could have been meant to serve as preparatory steps in ordering a survey of the Habsburg Monarchy based on the French model.

On June 21, 1763, two years before publishing any part of his journey, Cassini de Thury submitted to Maria Theresa a narrative of his travels as a sign of gratitude for the empress's "protection for the Sciences." Moreover, it seems he proposed to Maria Theresa a project to improve the maps of her lands and even offered his services.[958] The mere existence of such an offer suggests Cassini de Thury's awareness that the Habsburg monarchs desired a cartographic representation of their lands. However, by the time Maria Theresa actually ordered the mapping of her lands in 1763, she was aware of the Cassinis' failure to adopt a brisk pace in surveying the lands of France and she chose a different approach for her dominions, prioritizing fast mapping over a combination of geodetic and astronomic measurements.[959] Moreover, the Habsburg

[957] Bernleithner, "Oesterreichs Kartographie zur Zeit des Grafen Ferraris," 140-141; Dörflinger, *Die Österreichische Kartographie*, vol. 1, 61-62; Geissl, *Joseph Liesganig*, 13-20.

[958] HHStA StK, WKL, box 5, folder Cassini de Thury und P. Luskanik(?), folio 2. As Cassini's narrative was not located in the Viennese archives we cannot discuss his project. We can infer that his plan would have been based on the project for the Map of France.

[959] Although Cassini estimated the completion of the project for 1768, he had serious difficulties in recruiting trained personnel, and the French monarchy cut all funding during the Seven Years' War. Therefore, the French cartographer had to continue the enterprise as a share company. Luckily, he benefitted from substantial financial support from the political elite of the time, and even the king allowed him to keep all existing materials, instruments, maps, and other working documents. However, the map was far from being finalized when the French Revolution erupted. Konvitz, *Cartography in France*, 21-31.

central political elites had no interest in publishing detailed topographic representations of their territories, preferring to keep the results secret from the prying eyes of allies, enemies and even provincial political elites. Therefore, Habsburg military engineers used older maps and fast geometric surveys without resorting to astronomic measurements. Chapter 3 includes an in-depth discussion of the mapping of Transylvania as part of this imperial cartographic project and reveals details about the Habsburg strategy to obtain a representation of their lands at a swift pace.

Even though the Cassini Map of France did not serve as a guideline for the first military mapping of the Habsburg Monarchy, Maria Theresa supported Liesganig's future projects and was receptive to the Jesuit's suggestions on how to map large territories. On July 15, 1769, Liesganig proposed to Maria Theresa another meridian arc measurement in the Hungarian plain, in the neighboring area of Szeged. In his effort to convince the empress of the importance of such a venture, Liesganig mentioned how scientists from France, England and Italy all waited for this new measurement as a crucial step in establishing the true shape of the earth. Moreover, Liesganig insisted that his work in Hungary would also contribute to the improvement of the geographical knowledge about this Habsburg province. In exchange for imperial patronage, the astronomer offered to take with him a military engineer and train him in the French mapmaking technique. Here, Liesganig most probably referred to the methodology used for the Cassini Map of France.[960] Maria Theresa approved Liesganig's request and gave him 1,000 guldens for his efforts with a condition: the Jesuit had to prepare a short document describing a method to represent large territories on a map based on mathematical principles.[961]

[960] HHStA StK, Vortrage, box 104, folder 1, 41-41 verso.
[961] Ibid., 39; HHStA StK, WKL, box 5, folder Liesganig, P.

Although Maria Theresa had already ordered in 1763 the detailed surveying of her dominions, that project was far from being finished by 1769, and the empress was interested in exploring ways to improve its implementation. Maria Theresa's desire to learn about how to construct a map starting from "true mathematical principles" (wahren mathematischen Grundsätzen) demonstrates her conviction that mathematics was one of the pillars of good map-making. This point also clarifies the reason why the empress chose the engineers that she did, the military officers with the strongest background in mathematics, to prepare detailed maps of her dominions.

After finalizing the meridian arc measurements, Liesganig prepared a thorough report and sent it to Maria Theresa by early November.[962] This report is a window into the mechanics of such an expedition, offering information about the personnel working with Liesganig, the instruments they used, their methodology and other obstacles they had to surpass as part of their work. Liesganig started his expedition on August 7, 1769, and took with him three assistants: the engineer-lieutenant Leopold Unterberger, the sapper lieutenant Hippolytus Verité, and another Jesuit, the mechanic Joseph Rämspöck. All of them, with the exception of Verité, who followed the team a couple of days later, travelled from Vienna to Buda on the Danube.

Liesganig transformed the boat he travelled on into a site for scientific experiments: during his journey down the Danube he used a compass to record the accurate flow of the river. However, the Jesuit was unsuccessful in these attempts and blamed his failure on the unreliable flow of the water and the quality of the shores. He also argued that only a geometrical survey could determine the exact trajectory of the Danube. In this case, having a trained scientist perform the observations was as important as using the proper methodology and instruments. The rise of the scientific expert is typical for what came to be seen in the eighteenth century as

[962] HHStA StK, Vortrage, box 104, folder 3, 247-251.

the basis for correct maps: figures and tables synthesizing the result of astronomic and geometric measurements replaced narrative tales and geographic descriptions as the raw data from which a map was built.[963]

After a brief stay in Buda to make all the necessary arrangements for their trip, Liesganig and Unterberger resumed their journey down the river, arriving in Peterwardein on August 18. Liesganig had left his instruments and his assistant Rämspöck in Buda to wait for Verité. The two of them caught up with Liesganig in Peterwardein on August 24, and the team started on-ground measurements. Liesganig combined the geodetic measurements with astronomic observations. Among the obstacles that slowed down his work the Jesuit mentioned the rainy weather and the scarcity of wood for preparing artificial signs to mark the triangulation network. Liesganig also had to hire a military guard for protection, but he does not provide any further details about the reasons for this decision. After laying down the triangulation network and a second base line, Liesganig finalized the astronomic measurements by October 29, 1769.

Taking the time and effort to record his every step reveals the Jesuit's belief that both the actual experiment and its codification mattered in equal measure. Similar to the leaders of other eighteenth century expeditions to measure arcs of meridian, such as those who undertook the French-Spanish journey to Quito, Liesganig strived to execute, codify and demonstrate the accuracy of his scientific labor.[964] Before making his measurements from the early 1760s and 1769 available to a wider public, Liesganig had to convince his patrons in Vienna about the reliability of his work. The journal of the expedition partially fulfilled this need. Additionally, Liesganig prepared a cartographic representation of his work.

[963] Introduction to Bourguet, Licoppe, and Sibum, *Instruments, Travel and Science*, 1-19.
[964] Safier, *Measuring the New World*, 5.

The map complemented the information included in Liesganig's written report and showed the area between the rivers Tisa and Danube, where the Jesuit constructed his triangulation network.[965] The point where the structure known as the Roman entrenchment (*Römerschanze*) touched the bank of the Tisa represented the starting point for the measurements. This entrenchment connected the river Tisa with the Danube and served as an organizing line for Liesganig for his triangulation network. Point A on Figure 7.3 represents the village Czurock's inn, transformed by the astronomers into a temporary observatory for which they calculated the latitude. The fragment also shows parts of some of the triangles' edges and the angles between them. In the end, Liesganig and his team measured a small segment of the Peterwardein meridian between the tower of the Peterwardein fortress and the parallel going through the inn in Czurock. Based on these measurements the Jesuit deducted the value of one degree of meridian in the Hungarian lowlands. He published his calculations and results in 1770.[966]

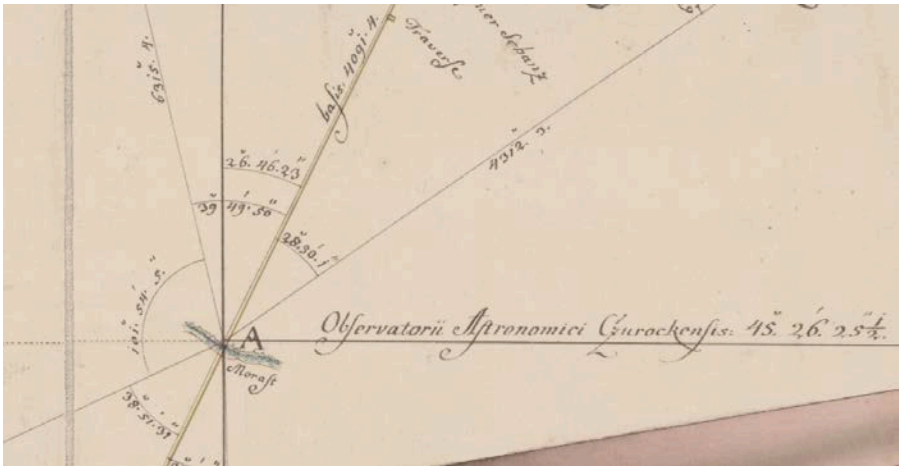

Figure 7.3 The Village Czurock's inn on the *Map of the Roman entrenchment located at Peterwardein between the Danube and Tisza*

[965] ÖNB, Kartensammlung, FKB C.89.2.
[966] Joseph Liesganig, *Dimensio graduum meridiani Viennensis et Hungarici* (Vienna: Augustinum Bernardi, 1770).

Liesganig could not have finalized his measurements in just two months without the help of his assistants. In the final report the Jesuit praised the two engineers, Unterberger and Verité, for their hard work and their ability to do all mathematical calculations and to use instruments such as the quadrant.[967] Liesganig's compliments suggest the two engineers already had a strong background in mathematics and the use of geodetic instruments a result of their education in the Viennese schools.

As requested by the empress in July 1769, in exchange for financial support to complete the measurement of the meridian arc in the Hungarian, Liesganig prepared a short description of a method to map large territories based on mathematical principles.[968] From the opening paragraph, the Jesuit denied any claims to originality and named the Academy of Sciences in Paris and their project for a Map of France as inspirations for this methodology. Liesganig's report discussed all the steps necessary to survey a large territory, including creating a triangulation network and using trigonometric rules to calculate the sides and angles of triangles. The Jesuit decried the lack of preparation of most military engineers with respect to theoretical geometry and criticized the surveying work they did to create representations of the Habsburg dominions.

Liesganig's statements attacked the principles adopted by the general quartermaster's staff for the production of the Great Military Map (Josephinische Aufnahme). Nonetheless, Liesganig did not consider the work of military engineers pointless, and insisted that already finished maps could be improved with the help of his method. The scientist praised the ability of engineers to build a triangulation network and brought as an example the high quality work that Leopold Unterberger and Hippolytus Verité performed in 1769. In Liesganig's opinion, the real

[967] HHStA StK, Vortrage, box 104, folder 3, 247-251.
[968] KA KPS, K VII a 6-5.

obstacle in the way of good mapmaking was a lack of instruments, especially quadrants, and the absence of proper surveyors who could combine geodetic and astronomic measurements.[969]

As a preliminary step to creating a map for the Monarchy, Liesganig suggested starting from the arches of meridian he had measured in the early 1760s and in 1769, and extending those triangulation networks north and south. He also recommended measuring another network from east to west along the 47th parallel north, thus connecting the Principality of Moldavia and Transylvania at one end with the Swiss cantons at the other. Additionally, Liesganig wanted to compute two triangulation networks organized around two perpendiculars to the two meridians: one starting from Prague and covering Bohemia, the other going through Vienna and including Austria and Upper Hungary. In the Jesuit's opinion, a good engineer could calculate values for the two meridians and three perpendiculars in three years. At the end of his report, Liesganig volunteered to do a trial for a large territory in order to demonstrate the superiority of his method.[970]

On May 4, 1770, shortly after Liesganig submitted this project proposal, Maria Theresa ordered that the Jesuit should undertake a general survey of Lower Austria with the help of quadrants and triangles, namely by doing astronomic measurements and building a triangulation network.[971] Obviously by issuing this order Maria Theresa was signaling her acceptance of Liesganig's offer to demonstrate the viability of his mapmaking methodology.

By mid-May, Liesgang announced his eagerness to start the project once the construction of the quadrant was completed. The Jesuit promised the conclusion of the survey by the fall of 1770 and asked for 2,000 guldens to subsidize his travel- and survey-related expenses. Liesganig claimed he required no assistants for the measurements. Nonetheless, he offered to train some

[969] Ibid.
[970] Ibid.
[971] HHStA StK, Vortrage, box 105, folder 3, 12.

military engineers during the survey of the surroundings of Vienna.[972] Liesganig had trained military engineers during his 1769 arc measurements in Hungary, so he knew the benefits of such a system. This arrangement was not unheard of before Liesganig's proposal. In the early phases of his map of France, Cassini de Thury also trained engineers on the job in an area between Paris and Versailles.[973] During the French scientist's trip to Vienna, he might have discussed with Liesganig the challenge of instructing good mapmakers, which may have led to Liesganig's willingness to train others.

As a result of Liesganig's proposal, Kaunitz ordered the Aulic War Council to contact the Jesuit and decide which engineers to send to work with him when the survey reached the surroundings of Vienna.[974] Unfortunately I could not locate any trace of reports of Liesganig's survey of Lower Austria; the latest archival trace, dated June 28, 1770, documents Liesganig's decision to replace the on-the-job training of engineering students on how to conduct geometric survey operations with classroom instruction.[975] Therefore, until more evidence resurfaces, we can infer this project was never finalized.[976]

Even though Liesganig's survey of Lower Austria was probably unsuccessful, the Jesuit remained valuable to the Habsburg rulers as an expert in the art of mapmaking. One year later, on August 9, 1771, a new imperial order stated Liesganig would train a group of students from the Engineering Academy in Vienna in the science of astronomy. Prior to Liesganig's arrival, officers from the engineering brigades had to prepare a select subgroup of students in the fields of theoretical geometry and trigonometry; moreover, the students had to possess a good grasp of

[972] Ibid., 84-85.
[973] Dainville, "Enseignement des 'Géographes' et des 'Géomètres'," 488-489.
[974] HHStA StK, Noten an den HKR, box 5, May 19, 1770.
[975] KA HKR, Protocoll 1037, Rubric 57, no. 73.
[976] Lower Austria was eventually surveyed by the general quartermaster's staff in the 1770s under the command of Major von Neu. Paldus, *Die militärischen Aufnahmen im Bereiche der habsburgischen Länder aus der Zeit Kaiser Josephs II.*, 24.

surveying based on trigonometric operations.[977] Clearly, the imperial leaders in Vienna hoped to prepare a new generation of mapmakers, experts in the fields of both geodetic and astronomic measurements.

The dissolution of the Jesuit order in 1773 did not interrupt Liesganig's work in the service of the Monarchy. In 1772, Maria Theresa had already deployed him to Galicia, the part of Poland that the Habsburgs had annexed that same year. During the following decades Liesganig prepared maps and a cadastral survey of this region and continued his astronomical observations at the Observatory in Lviv, the capital of the province.[978]

As the examples of Hell and Liesganig show, Jesuits serving the Habsburg monarchs in the eighteenth century as astronomers and mapmakers had careers that kept them moving between geographic areas and institutional settings.[979] As members of the Jesuit Austrian province, Hell and Liesganig served the Society as educators and scientists, especially in Vienna, but also in Transylvania, Hungary and Galicia; as Habsburg agents, these two astronomers consulted political rulers on geodetic and other scientific projects impacting the whole of the Monarchy; and as representatives of the Republic of Letters, these Jesuits fostered trans-imperial connections with states such as France and Denmark. The examples of Hell and Liesganig demonstrate the importance of applying a multi-level analysis to the contribution of Habsburg scientists to the development of astronomy and mapmaking in the eighteenth century.

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[977]Gatti, *Geschichte der K.u K. Ingenieur- und K.u K. Genie-Akademie*, 256; On August 25, 1771, the Genie and Fortification Corps sent the list of students: Götz Ioannes, Starck Franciscus, Appel Conradus, Mancini Salvator Emidius, Fuhrmann Carolus Antonius, Gemperlj Ernestus, Langer Carolus., KA GHA, 1771 15 38.

[978] S. Apunevych., O. Lohvynenko, B. Novosyadlyj, M. Kovalchuk, "First Astronomical Observatory in Lviv," *Kinematics and Physics of Celestial Bodies* 27, no. 5 (2011): 265-272; Geissl, *Joseph Liesganig*, 8.

[979] Aspaas, "Maximilianus Hell," 95.

7.2 ROGER BOSCOVICH AND THE DEVELOPMENT OF ASTRONOMY IN LOMBARDY

In the same way the king of Denmark sought out Maximilian Hell's help, Habsburg political elites also made efforts to recruit scholars from other parts of Europe. One such example is Roger Boscovich, one of the most famous scientists of the second half of the eighteenth century.[980] This section explores Boscovich's relationship with the Habsburg Monarchy, first as a visitor to Vienna, then as a professor at the University of Pavia and the College of Brera. Boscovich inspired the meridian arc measurements of Liesganig and made consistent efforts to institutionalize astronomic observations in Milan. This scientist successfully planned and ensured the foundation of an astronomic observatory as part of the Jesuit College of Brera, which became an important site for astronomic and mapmaking knowledge in the Habsburg Monarchy.

Similar to the two observatories in Vienna, the one in Brera created close correspondence connections with other scientific centers in Europe, as well as almost contributed to a second collaboration between Cassini de Thury and Habsburg scientists, and at Kaunitz's orders, laid the ground for an improved map of Lombardy based on both astronomic and geodetic measurements. Moreover, some of the Jesuits working in Brera, including Boscovich and Francesco Luino, prepared reports on how to improve the education of engineers and surveyors working in Lombardy. Like Liesganig, Jesuits active in Lombardy were not isolated in an ivory tower, but worked in the service of the Habsburg government to further its priorities. Therefore,

[980] For many decades scholars have presented and analyzed Boscovich's biography, his numerous works in fields such as astronomy, mathematics and physics, and his extensive correspondence. See for example: Luciano Agnes, *Ruggero Giuseppe Boscovich: un professore gesuita all'Università di Pavia, 1764-1768* (Milan: Cisalpino, 2006); Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*; John Pappas, "R.J. Boscovich et l'Académie des Sciences de Paris," *Revue D'Histoire Des Sciences* 49 (1996): 401-414; Rita Tolomeo, *Ruggiero Giuseppe Boscovich. Lettere per una storia della scienza (1763-1786)* (Rome: Accademia Nazionale delle Scienze, 1991); *Roger Joseph Boscovich, S.J., F.R.S., 1711-1787: studies of his life and work on the 250th anniversary of his birth*, ed. Lancelot Law Whyte (London: Allen & Unwin, 1961).

in order to understand Habsburg cartography, we need to supplement the overview of military engineers with a discussion of the astronomers from Milan working at the Brera Observatory.

Boscovich's interest in two of the main scientific adventures of the eighteenth century, namely establishing the shape of the Earth and observing the transit of Venus, influenced the trajectory of his career. In 1750, when Michel Angelo de Blasco, the military engineer discussed in chapter 2, transferred into the service of the Portuguese king, John V, he almost had Boscovich as one of his colleagues. The Jesuit had expressed his interest in traveling to Brazil and measuring a meridian arc in the area while also working for the Portuguese ruler and helping with the implementation of the Treaty of Madrid.[981] However, as Boscovich was a figure known to many in Rome, the State Secretary of the Papal States, Cardinal Valenti-Gonzaga, convinced pope Benedict XIV to present the Jesuit with a counter-offer: sponsorship for an expedition to measure a meridian arc of two degrees from Rome to Rimini. Boscovich accepted the offer and together with the English Jesuit Christopher Maire they finalized this project and also prepared a highly acclaimed new map of the Papal States. Prior to this project, Boscovich requested from the Academy of Sciences in Paris a copy of the toise used by the French in their Peru and Lapland measurements; sadly the copy of the toise reached too late for him to utilize it. Still, Boscovich's methodology directly influenced Liesganig and his measurements in Austria and Hungary discussed in the previous section.[982]

Boscovich's approach to measuring meridian arcs spread not only through example. The Jesuit made active efforts to convince some of the crowned heads of Europe to sponsor similar projects in their lands. The editor of the 1770 French edition of Boscovich's work *Voyage*

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[981] Burkholder and Johnson, *Colonial Latin America*, 281-301; Maxwell, *Pombal*, 52-55.

[982] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 75-80; Mary Pedley, "'I Due Valentuomini Indefessi': Christopher Maire and Roger Boscovich and the Mapping of the Papal States (1750-1755)," *Imago Mundi: The International Journal for the History of Cartography* 45 (1993): 62.

Astronomique et Geographique dans l'Etat de l'Eglise mentioned how the scientist pleaded with Maria Theresa to order the measurement of meridian arcs in Moravia, Austria, Styria and the plains of Hungary. Moreover, Boscovich convinced the King of Sardinia to command similar operations in Piedmont, and during his trip to England, he persuaded the Royal Society to complete a meridian arc measurement in America.[983] As illustrated by Liesganig's career, Boscovich was also successful in convincing the Habsburg rulers of the importance of contributing to this global enterprise.

During his stay in Vienna between 1757-1758 and the first months of 1763, Boscovich met with members of the imperial family, their main advisors, and other scientists, including Liesganig, numerous times. Moreover, he taught courses in mathematics and physics and received permission from Emperor Francis Stephen to work in the Natural History Museum. Additionally, in 1763, he took part in the meridian arc measurements that Liesganig and his team executed in Austria.[984] Convinced of Boscovich's value as a scientist, Maria Theresa and Chancellor Kaunitz recruited him to teach at the University of Pavia starting at the beginning of the academic year 1764. It is during this time that the first disagreements between Boscovich and his Habsburg employers arose. In only a couple of years after Boscovich's arrival in Pavia, Kaunitz became convinced the Jesuit was prioritizing his own scientific ambitions rather than contributing to the development of university education. Kaunitz's discontent only increased when he found out the Jesuit planned to join an international scientific expedition under foreign sponsorship to travel to California.

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[983] Christopher Maire and Ruggero Giuseppe Boscovich, *Voyage astronomique et geographique, dans l'État de l'Eglise: entrepris par l'order et sous les auspices de pape Benoit XIV: pour mesurer deux dégrés du méridien, & corriger la carte de l'Etat eccleśiastique* (Paris: N.M. Tilliard, 1770), 59-60, footnote 1.
[984] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 91-98, 169.

In the years leading up to 1769, scientists all over Europe prepared to send expeditions to to observe the transit of Venus.[985] In this context, the Royal Society of London, which Boscovich had officially joined in 1761,[986] invited the Jesuit to lead a group of scientists to the Spanish dominions in California. Flattered by the offer, the astronomer lost no time in informing Lombardy's plenipotentiary minister, Count Firmian, of his desire to accept the commission and asking for a leave of absence from his position at the University of Pavia.[987]

Despite Firmian's optimism that the imperial leaders in Vienna would surely approve Boscovich's request, things turned sour by the end of the summer; Kaunitz refused to allow Boscovich to leave his post and expressed his displeasure with the Jesuit's frequent trips away from Pavia.[988] Despite this rebuff, Boscovich persevered in his desire to accept the Royal Society's assignment. By October 1766 he received the official invitation and claimed in letters to his collaborators that he had obtained all necessary permissions from his spiritual and temporal superiors.[989] Why would Boscovich make such a claim despite the Habsburg authorities' true position? Firstly, the Jesuit had Firmian's support and believed this minister would intercede for him with Kaunitz. Secondly, the scientist hoped the Habsburg rulers would not want to appear as narrow-minded monarchs who were hindering scientific progress and not contributing to the 1769 expeditions to observe the transit of Venus.[990] Boscovich aggravated his position when he tried to recruit his friend and collaborator Liesganig to the expedition.[991]

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[985] As the 1761 observations did not provide a definite result for the solar parallax and another chance was less than a decade away, scientists started preparing for the 1769 transit by selecting the best observation sites and gathering funding for expeditions. Woolf, *The Transits of Venus*, 150-153.
[986] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 130.
[987] May 4, 1766, Firmian to Boscovich, reproduced in Tolomeo, *Ruggiero Giuseppe Boscovich*, 287.
[988] Ibid., 288-291, July 7, 1766, Boscovich to Firmian.
[989] October 14, 1766, Lalande to Weiss, reproduced in Vargha, *Correspondance de Ferenc Weiss*, 62.
[990] January 3, 1767, Boscovich to the Sardinian minister in Vienna, Count Canale, reproduced in Tolomeo, *Ruggiero Giuseppe Boscovich*, 303.
[991] The Royal Society had obtained the Spanish king's approval for Boscovich and another Jesuit astronomer to travel to California. If funds were secured, the Royal Society hoped to send with the scientists two sets of

The director of the University Observatory in Vienna, Liesganig, had proven himself valuable to his Habsburg patrons and Kaunitz wanted to keep the scientist in the imperial capital, far from the dangers of a trans-Atlantic expedition. Liesganig's efforts to convince Chancellor Kaunitz to allow him and Boscovich to travel across the Atlantic were fruitless. According to Liesganig's account, Kaunitz's rejection to allow the two Jesuits to participate in the expedition to California was not open to any debate. During one of Liesganig's audiences in 1766 Kaunitz told him: "What is this I hear about you also wanting to engage in the same foolishness as Boscovich, crossing the ocean and perhaps not seeing anything there?" The Chancellor made it clear he hoped Liesganig would not persist in his desire to go to California.[992] In the face of Boscovich's stubborn persistence to plan for this long trip sponsored by the Royal Society, Liesganig wrote to Boscovich again on May 28, 1767. The Viennese astronomer listed the drawbacks such a trip would entail for Boscovich's career, especially the disappointment and possible wrath of the empress and her trusted advisor Kaunitz. The Spanish government's dissolution of the Jesuit order in 1767 removed Boscovich's dilemma, as he could no longer travel safely to any Spanish territories.[993]

As illustrated by the Boscovich plan to travel to California, the Habsburg rulers appear to have gone against the greater interest of global science. However, we saw in the previous section that in 1768, Maria Theresa approved Hell's request to travel with the sponsorship of the Danish

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instruments so that the observations could be done in two different sites. December 22, 1766, James Douglas Morton] to Boscovich, reproduced in Tolomeo, *Ruggiero Giuseppe Boscovich*, 298-299.

[992] Juan Casanovas, "Boscovich's Proposed Voyage to California," in *Međunarodni znanstveni skup o Ruđeru Boškoviću [=Proceedings of The international symposium on Ruđer Bošković, Dubrovnik, 5th-7th October 1987]*, ed. Žarko Dadić (Zagreb: Jugoslavenska akademija znanosti i umjetnosti, 1991), 237-238.

[993] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 183-188; Aspaas, "Maximilianus Hell," 283-286. Although there is no evidence regarding Maria Theresa's or Joseph II's attitude towards Boscovich's ambition to work for the Royal Society, we can safely infer that they supported Kaunitz's decision. In addition to the Habsburg rulers' desire to preserve valuable scientists in their service we should also take into account the web of diplomatic alliances. The Seven Years' War (1756-1763 had positioned the Habsburg Monarchy and England in competing camps, and there were no significant foreign policy changes until the late 1760s. Preserving the alliance with France remained a constant of Habsburg foreign policy until the late 1780s. Casanovas, "Boscovich's Proposed Voyage to California," 237-238.

king to Lapland to observe the transit of Venus. Therefore, we cannot make generalizing statements about the Habsburg attitude towards the promotion of scientific knowledge on an imperial or global scale. In each case we need to take into account the role of diplomatic connections, the credibility of the scientists making the request with the Court, and the potential value that the Habsburg rulers saw in diverting the energy of their scientists from imperial projects.

The incident over Boscovich's plans to travel to California negatively impacted the scientist's relationship with Vienna. The Habsburg government no longer saw maintaining him as a professor in Pavia as feasible, especially as Boscovich repeatedly complained about the lack of proper facilities and preferred to spend his holidays in Brera working at the astronomical observatory.[994] Therefore, it should not be surprising that in 1770, Boscovich was transferred to Milan as professor of optics and astronomy in the Palatine Schools.

The Jesuit's move to Milan coincided with the Habsburg government's efforts to reform the engineering education in Lombardy. As discussed in chapter 2, in 1771, the government in Vienna requested proposals for reforming the licensing process of engineers in the State of Milan from a group of experts in teaching mathematics and astronomy. Similar to how Liesganig trained military engineers from Vienna to improve their mapmaking skills, Jesuits from Lombardy offered their suggestions on how to improve the education of engineers. Francesco Luino, one of the astronomers in Brera, submitted one of the reports.[995] Luino decried what he called the decadence of the *Collegio* and the presence of numerous engineers who were engineers in name only, with no real knowledge about the art of surveying. The Jesuit proposed

[994] Brambilla, "Scientific and Professional Education in Lombardy," 60.
[995] ASM DR, box 245, May 29, 1771.

creating a professorship and a public school for engineers that would be the only institution to license engineers. Luino volunteered himself for the position of teacher for young engineers.[996]

Probably in this same context Boscovich wrote a project for a School of Geodesy to train surveyors and engineers on how to survey and prepare maps of territories.[997] In the plan, Boscovich criticized the existing system of internship, during which engineers or surveyors in training did not learn the essential aspects of the profession, but only served as copyists, scribes or even servants for their mentors. Moreover, Boscovich condemned the lack of theoretical training for future surveyors and their inability to use the latest instruments such as the newer plane table. The Jesuit proposed appointing one of the astronomers from the Milanese observatory as a geodesy professor at the Brera College, as this group of scientists had a lot of practical experience with using surveying instruments and possessed both theoretical and practical knowledge. Boscovich recommended that only graduates of this course of geodesy should be allowed to apply to join the *Collegio* of engineers and the duration of their practical training under a licensed engineer should be reduced by one year.[998]

In addition to teaching at the Palatine Schools and acting as a consultant for the government after his relocation to Milan, Boscovich dedicated a large part of his working time to the observatory, the establishment of which he considered a personal achievement.[999] Shortly after the transfer, the astronomer made it clear he refused to recognize any of his new colleagues at the observatory in Milan as intellectual equals. Boscovich's attitude was insulting to the local

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[996] ASM Autografi, box 138, folder 20 (Luino Francesco), November 22, [1771], Francesco Luino to Firmian.
[997] ASM Autografi, box 115, folder 40 (Boscovich Ruggero), undated document, probably written after Boscovich started his professorship in Brera in 1770.
[998] Boscovich's proposal for a School of Geodesy was not his first suggestion on how to improve the educational system in Lombardy. In another undated proposal for reforming the teaching of mathematical and physical sciences at the University of Pavia, the Jesuit discussed details such as the number of teachers and the notions they should teach to various groups of students based on their specialization. ASM Autografi, box 115, folder 40 (Boscovich Ruggero), undated document with the title "Progetto di una Scuola di Geodesia."
[999] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 205.

scientists, especially seeing as prior to Boscovich's coming to the Habsburg province of Lombardy, a group of astronomic observers was already living and working as part of the Jesuit College of Brera. With the support of the College's rector Federico Pallavicini, the professors Giuseppe Bovio and Domenico Gerra had pursued astronomic observations at least since 1760 and had purchased the first astronomical instruments. In the early 1760s, Pallavicini also invited Luigi Lagrange, an experienced astronomer from the Observatory of Marseilles, to relocate to Milan and train a new generation of astronomers.[1000] After his arrival in Pavia in 1764, Boscovich started spending his holidays in Brera and Pallavicini expressed his interest in building an observatory. Boscovich had already prepared a project for a possible Observatory in Rome and had studied in detail this type of institution in Greenwich, so he eagerly took over the commission. The Observatory was finalized by 1765 and Boscovich emerged in the European scientific community's eyes as the founder of institutionalized astronomy in Milan. [1001]

Even after his transfer to the Palatine Schools in Milan, a move which should have satisfied Boscovich's desire to spend more time working at the Observatory, he continued to infuriate the main political figures in Vienna. In 1769, Kaunitz ordered Boscovich to start a series of "Efemeridi Astronomiche," a publication of astronomic observations related to the observatory's meridian.[1002] This suggestion was most certainly modeled on the work of Maximilian Hell in Vienna and his analogue publication of such observations. However, Boscovich immediately contacted two of his main protectors, Count Firmian and the Habsburg

[1000] Lagrange determined the precise geographic position of Brera to correlate the astronomic observations with the ones done at other observatories. He also started a series of meteorologic observations. Enrico Miotto, Guido Tagliaferri, Pasquale Tucci, *La Strumentazione nella Storia dell'Osservatorio Astronomico di Brera* (Milan: Università degli Studi di Milano, Edizioni Unicopli, 1989), 12.

[1001] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 181-182; Zagar, *L'Osservatorio Astronomico di Milano nella Storia*, 31-32; Miotto, *La Strumentazione nella Storia dell'Osservatorio Astronomico di Brera*, 11-12.

[1002] The Bancroft Library, University of California, Boscovich Archives (hereafter BA), carton 4, folder 34, item K1, May 15, 1769, Kaunitz to Boscovich.

ambassador in Paris, Mercy-Argenteau, to obtain their help in lifting this responsibility from his shoulders. The Jesuit refused to perform the observations necessary for the publication of the Ephemerides as he considered them a tiresome routine activity that would have taken his time away from more interesting projects.[1003] Additionally, the Jesuit became entangled in an irreconcilable conflict with the other astronomers working in Brera. All these factors led to Boscovich's dismissal from Habsburg service in 1773.[1004] In Kaunitz's words: "It is in no way necessary to have a sublime genius in order to be a good observer; as there are numerous things to verify in astronomy, tireless work and long observations are necessary; in this manner the Brera Observatory could become one of the best in Europe."[1005]

The new regulation governing the Observatory issued in the summer of 1772, confirmed the success of what we can describe as an anti-Boscovich faction.[1006] A new director was appointed, Lagrange, who worked in Brera with Francesco Reggio and Angelo Cesaris. The astronomers started publishing the Ephemerides in 1775, coopted to their team another talented astronomer, Barnaba Oriani, in 1776 and became deeply involved in preparing a map of Lombardy based on astronomic and geodetic operations, the project discussed in chapter 4.[1007] The Habsburg rulers encouraged the astronomers in Brera to establish links with other astronomic centers. Specifically, the 1772 Regulation stated that the director of the Observatory

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[1003] BA, carton 4, folder 26, item 28; February 5, 1770, Mercy-Argenteau to Boscovich, BA, carton 4, folder 48, item M45, December 2, 1769, Firmian to Boscovich.

[1004] Paoli offers a detailed discussion of the conflict between Boscovich and his fellow astronomers. Even after his departure from Lombardy Boscovich continued to play an essential part in the research agenda of the Observatory. Moreover, during the 1780s, when he returned to Milan, Boscovich became one of the main consultants of the Habsburg government regarding the mapping of Lombardy based on astronomic and geodetic measurements. Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 221-259.

[1005] Original: "non essere in alcun modo necessario un genio sublime per essere buon osservatore; esservi moltissime cose da verificare in astronomia, alle quali si richiede un indefesso lavoro, ed osservazioni lunghe; con questa strada potersi rendere la Specola di Brera una delle più buone d'Europa." September 27, 1772, Kaunitz to Firmian, letter reproduced in Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 228-229.

[1006] Milan, Archivio dell'Osservatorio Astronomico di Brera (hereafter AOAB), Archivio Amministrativo Vecchio (hereafter AAV), box 2, folder 4 entitled "Documentazione relativa alle vicende di Ruggero Boscovich ed ai suoi rapporti con la Specola di Brera," August 15, 1772.

[1007] Zagar, *L'Osservatorio Astronomico di Milano nella Storia*, 33-34.

should establish regular correspondence with the main observatories in Europe, such as the ones in Greenwich, Paris and Bologna.[1008] And just as the Jesuits from Vienna encountered the renowned astronomer Cassini de Thury and worked together on astronomic observations and geodetic measurements, the Observatory from Milan was also involved in an international collaboration.

Lombardy, a border province of the Habsburg Monarchy, had its own strong scientific tradition. However, the Viennese decision-makers meddled repeatedly in the process of scientific institutionalization and tried to model the activity of the Milanese Observatory on its counterpart from the imperial capital. Additionally, the Habsburg rulers tried to regulate the ambitions of scientists in their service whenever such ambitions collided with imperial interests. At the same time, in order to foster an international reputation as a patron of arts and sciences, Kaunitz encouraged the Observatory of Brera to become an important contributor to international scientific enterprises.

7.3 THE ACADEMICIANS FROM BRUSSELS AND ASTRONOMIC PROJECTS IN THE AUSTRIAN NETHERLANDS

Although Vienna did not have an Academy of Sciences until the mid-nineteenth century, a similar venture arose earlier in the western-most province of the Habsburg Monarchy: the Academy of Sciences and Letters in Brussels. The project was first proposed in the 1760s, when plenipotentiary minister in the Austrian Netherlands, Cobenzl, together with Patrice Count of

[1008] AOAB, AAV, box 2, folder 4, 26. In addition to contacting the most famous European observatories, the astronomers in Brera contacted other Habsburg astronomers, such as Father Weiss, active in Hungary. Letter from Louis Lambertenghi to Ferenc Weiss, May 20, 1777, reproduced in Vargha, *Correspondance de Ferenc Weiss*, 130.

Neny, chief-president of the Private Council, and other intellectuals from Brussels began lobbying intensely for the establishment of an Academy of Sciences. To encourage the central authorities' willingness to approve the foundation of a scientific institution, on June 16, 1768, Cobenzl sent a project to Kaunitz for founding a Literary Society of Brussels (*Société littéraire de Bruxelles*), which would focus on promoting both literature and science.[1009] Although this institution was not proposed as an Academy, its promoters envisioned it as a first step in that direction. Early in 1769, Maria Theresa signed the constitutive document of this society, but it took some years for this organization to become recognized by other European scientific institutions of the time. For example, when Roger Boscovich visited Brussels in the fall of 1769, he mentioned the existence of a Literary Society coordinated by Needham although, as he stated, he "did not know even what this society consists of."[1010]

With support from the provincial and central government, in the early 1770s the Society underwent an institutional transformation. On December 16, 1772, the organization became the Imperial and Royal Academy of Sciences and Letters (*Académie Impériale et Royale des Sciences et des Belles-Lettres*) and benefited from the personal patronage of Maria Theresa.[1011] From its foundation, the Habsburg government desired the Academy in Brussels to foster connections with academies and other scientific institutions all over Europe, in a way similar to the observatories in Vienna and Milan. Article 23 of the Academy's regulation stated that the institution should establish regular correspondence with both national and foreign savants in

[1009] For a brief summary of the first proposals for creating an Academy in Brussels and the first stage this institution went through as a Literary Society, see Jacques Lavalleye, *L'académie Royale des Sciences, des lettres et des beaux-arts de Belgique, 1772-1972. Esquisse Historique* (Brussels: Palais des Académies, 1973), 13-20; Hervé Hasquin, "L'Académie impériale et royale de Bruxelles," in *L'Académie impériale et royale de Bruxelles. Ses académiciens et leurs réseaux intellectuels au XVIIIe siècle*, ed. Hervé Hasquin (Brussels: Académie Royale de Belgique, 2009), 5-19.

[1010] ASM Autografi, box 115, folder 40 (Boscovich Ruggero), September 22, 1769, Boscovich to Firmian, folio 28.

[1011] André Molitor, "La Création de l'Académie Royale de Belgique," in *Études sur le XVIIIe siècle. XV Unité et Diversité de l'Empire des Habsbourg à la fin du XVIIIe siècle*, eds. Roland Mortier and Hervé Hasquin (Brussels: Université de Bruxelles, 1988), 12-13.

order to take advantage of their knowledge and discoveries. The scientists who would prove more apt at establishing this "literary trade" were to be preferred when electing new academicians.[1012]

In order to establish a wider network, the Academy in Brussels tried to attract foreign members to join her ranks.[1013] In contrast to the French Academy of Sciences, which jealously guarded the right to choose its own members,[1014] the Academy in Brussels depended more on the government's approval for any such decision.[1015] Another method to cement international connections and to increase the visibility of the institution on an international scale was exchanging published memoirs with other academies, such as the Academies of Science in Paris, Mannheim, Zélande, Besançon, and Strasbourg, the Royal Society and the Antiquarian Society from London, the Bologna Institute, the Academy of Inscriptions from Paris, and the Academies from Saint Petersburg and Berlin.[1016]

Becoming part of an international network was a way for the Brussels Academy to try and overcome some of its weaknesses, as an examination of their efforts in the fields of astronomic observations and mapmaking demonstrate. From the first stages of the existence of the Academy, its members desired the presence of an experienced astronomer. As no qualified person could be found among the intellectual community of the Austrian Netherlands, the academicians contacted the Academy of Sciences in Paris, asking for an astronomer; because the

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[1012] *Mémoires de l'Académie Impériale et Royale des Sciences et Belles-Lettres de Bruxelles*, vol. 1 (Brussels: J.L. de Boubers, Imprimeur de l'Académie, 1777), xxix.
[1013] In 1787, the Academy included 23 members from the Austrian Netherlands and 15 foreigners. Lavalleye, *L'académie Royale des Sciences*, 22.
[1014] See, for example, the strong opposition the members of the French Academy displayed against the election of Roger Boscovich. Pappas, "R.J. Boscovich et l'Académie des Sciences de Paris," 406-407.
[1015] Molitor, "La Création de l'Académie Royale de Belgique," 13. In practice it seems the Academy had most of the times free choice in choosing its members and even rejecting candidates proposed by the government. For examples, see Michèle Galand, "Le cercle des académiciens de Bruxelles: proximité et ouverture internationale," in *L'Académie impériale et royale de Bruxelles*, 41-42.
[1016] Lavalleye, *L'académie Royale des Sciences*, 38-39.

French institution asked for an exorbitant compensation, the scientists in Brussels looked for an alternative. They found a solution in the person of Nathaniel Pigott, a fellow of the Royal Society, who had travelled to the Austrian Netherlands in 1772 to retrieve astronomic instruments sent from England.[1017]

The English representative in Brussels presented Pigott and his son, Edward, to governor Charles of Lorraine, who also acted as the protector of the Academy, in April 1772. A couple of months later, as Pigott was passing through Brussels on his way to Spa, the director of the Academy, Needham, approached him with a proposal: measuring the geographical coordinates of the main towns of the Austrian Netherlands.[1018] An official request by the director of an Academy of Sciences, even though not a renowned one, probably flattered a scientist like Pigott, who had collaborated in the past with such institutions. At the time the Habsburg government was supporting a survey of the territory of the Austrian Netherlands under the leadership of Count Joseph Ferraris. Therefore it is not implausible to assume that the local authorities called Pigott to help with this massive cartographic undertaking.[1019] Indeed, in 1772 and 1773 the two Pigotts and the director of the Brussels Academy, Needham, undertook a scientific journey throughout the province. Equipped with an impressive array of instruments, the team travelled through Namur, Luxembourg, Antwerp, Ostend, Tournay, Brussels and Louvain.[1020]

[1017] Pigott claims he was contacted in early 1772 to help improve the maps of the Austrian Netherlands but he does not give details about who reached out to him, whether it was the Academy in Brussels or the government. As the government controlled the Academy closely, regardless of who contacted Pigott, the Habsburg authorities were most likely the ones who made the decision. "Observations Astronomiques, faites aux Pays-Bas Autrichiens en 1772 et 1773, par M. Pigott, Gentilhomme Anglois, de la Société Royale de Londres, et associé etranger des Académies de Caen et de Bruxelles," in *Mémoires de l'Académie Impériale et Royale*, 5.

[1018] "Nathaniel Pigott (1725-1804)", *in L'Académie impériale et royale de Bruxelles*, 251.

[1019] As Claire Lemoine-Isabeau states, it is not possible based on archival evidence to demonstrate whether Ferraris used Pigott's observations when preparing the map of the Austrian Netherlands. Lemoine-Isabeau, "L'élaboration de la carte de Ferraris," 42.

[1020] Anita McConnell and Alison Brech, "Nathaniel and Edward Pigott, Itinerant Astronomers," *Notes and Records of the Royal Society of London* 53, no. 3 (1999): 307. Lavalleye, *L'académie Royale des Sciences*, 32. During the meeting on May 25, 1773, the academicians discussed the astronomic observations made by Pigott in the Austrian Netherlands and decided to admit him into the Academy as a foreign member. This decision could only have been

As McConnell and Brech stated, "the account of the [Ferraris] cartographic survey is silent on the Pigotts's contribution, nor has any report to the Austrian authorities been traced."[1021] However, hints suggesting the government's direct interest in Pigott's work can be retrieved from the correspondence between the Academy's president, Joseph de Crumpipen, and the Habsburg ministers in the Austrian Netherlands. During Pigotts' and Needham's travels, the scientists addressed a number of requests to Crumpipen, who forwarded them to provincial authorities. For example, Needham asked for housing in the various towns they travelled, passports for customs and other papers to ease the journey.[1022] However, the government refused to approve any additions to the 800 florins he had initially received. Crumpipen transmitted to Needham the government's disappointment regarding the quality of the observations they had received and the group's inability to "produce exact and precise knowledge" for all the sites.[1023] The work of the English astronomers clearly had a higher stake for the Habsburg authorities than mere scientific curiosity.

The direct interest of the government in the expedition's success is also revealed in Pigott's memoirs and reports, published by the Academy in Brussels and the Royal Society in London. In the memoir "Astronomic Observations done in the Austrian Netherlands in 1772 and 1773" Pigott included as the main justification for the expedition the need to determine locations with the help of astronomic observations in order to improve geographical maps for the Austrian

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possible with the support of the government, who in this way rewarded Pigott for his scientific contribution. Brussels, Archives de l'Académie royale des Sciences, des Lettres et des Beaux-Arts de Belgique (hereafter AARS) Academy of Sciences Brussels, Archives Anciennes (hereafter AA), ARB 39, 58.

[1021] McConnell and Brech, "Nathaniel and Edward Pigott, Itinerant Astronomers," 307. In 1773, Nathaniel Pigott presented to the Plenipotentiary Minister of the Austrian Netherlands a booklet containing the astronomic observations he had made in the province. This report was forwarded to the president of the Academy in Brussels, Crumpipen. AARS, AA, ARB 16.

[1022] AGR SEG, box 1496, Crumpipen to Neny, August 10, 1772.

[1023] "Je vous avouerai cépendant, qu'on s'etoit flatté ici, que le resultat de vos observations et de vos recherches, auroit produit sur toute cette partie des connoissances exactes et sures, tandis qu'il paroit par votre lettre, que l'operation ne sera pas complette, et qu'à differens egards on devra se contenter de calculs d'approximation, sur lesquels il n'est guere possible de tabler avec certitude." AARS, AA, ARB 15, November 17, 1772, Crumpipen to Needham.

Netherlands.[1024] In the summary of the observations Pigott sent to London in 1775 he wrote how "this astronomical journey was undertaken at the request of the government here. They expressed a desire that the situation of some of their towns, at least, should be determined by observations."[1025]

Moreover, if we look at this enterprise in a larger imperial context, the hypothesis that the Habsburg government supported astronomic observations in order to gather additional data for the Ferraris map receives extra support. As discussed in the previous sections, Maria Theresa and Kaunitz had showed interest in Liesganig's work and his mapping methodology. Whereas there is no surviving evidence of Liesganig's survey of Lower Austria, throughout the 1770s and 1780s we know the astronomers in Brera did a series of observations to improve the maps of Lombardy. Their contribution will be discussed in chapter 8.

Throughout the eighteenth century one of the main complaints of the Brussels academicians remained the lack of an observatory.[1026] As a temporary solution for their institutional deficiency, the academicians in Brussels decided to recruit international colleagues with access to the latest instruments for astronomic observations. One such individual was Charles Messier, member of the French Academy of Sciences and other similar European organizations. In the 1770s, Messier sent to the director of the Brussels Academy, Needham, a series of astronomic observations which could be used in conjunction with Pigott's work. Shortly

[1024] "Observations Astronomiques, faites aux Pays-Bas Autrichiens en 1772 et 1773, par M. Pigott," 3-5. Early in 1775, when the academicians decided which of the memoirs presented to the Academy throughout the past years should be published, one of the evaluators, Nelis, wrote that not only was Pigott's project useful but it had used money from the government and the Academy, so it was in their interest to publish it. AARS, AA, ARB 539.

[1025] Nathanael Pigott, "Astronomical Observations Made in the Austrian Netherlands in 1772 and 1773. By Nathanael Pigott, Esquire, F. R. S. Foreign Member of the Academies of Brussels and Caen. In a Letter to the Reverend Nevil Maskelyne, Astronomer Royal, F. R. S.," *Philosophical Transactions of the Royal Society of London* 66 (1776): 183. Pigott's report discusses the instruments he used and all the observations he made, together with a summary of his calculations.

[1026] Pigott decried a lack an Observatory in the Austrian Netherlands: "while in Germany, France, England we are multiplying the astronomic observations, they have been completely neglected in the Austrian Netherlands, where until now there has not been a single observatory constructed." "Observations Astronomiques, faites aux Pays-Bas Autrichiens en 1772 et 1773, par M. Pigott," 4.

after sharing his results, Messier became a foreign member of the Academy of Sciences in Brussels. The French astronomer received this honor not only because of the quality of the shared observations but also because he had access to a fully equipped Observatory in Paris.[1027]

The academicians in Brussels were surely aware of the governmental support offered for the observatories in Vienna and Milan. Therefore, they had a strong foundation to believe their Academy would also receive approval for constructing such a structure. During a meeting on November 16, 1774, the Academicians discussed a memoir about the current state of the Academy, put together by Needham, the secretary of the Academy Georges Joseph Gerard and Jean-François Marci. The scientists hoped to obtain the government's approval and financial support to enlarge their Academy with a cabinet of physics, a chemistry laboratory, an observatory, a natural history cabinet and a botanical garden. The report insisted that without an observatory "it is not possible to make astronomical or meteorological observations, which would be very useful for this province, and which are absolutely necessary if we want to maintain a profitable correspondence with the other academies, which know how to use all these notions for the profit or great advantage of their country and of navigation."[1028] Although the provincial political authorities agreed to forward the Academy's request to Vienna, their efforts were in vain.[1029]

Not only were these requests not granted, but the central government even refused to approve simpler requests such as the purchase of instruments that would ease astronomical observations. For example, during a meeting on January 18, 1776, Needham informed his

[1027] The abbé Chevalier evaluated Messier's observations and during the meeting from May 25, 1773, he presented a report to his colleague academicians recommending Messier's election as member of the Academy. AARS, AA, ARB 39, 60-61.
[1028] "Un Observatoire sans lequel il n'est pas possible de faire des observations astronomiques ou meteorologiques, observations qui seroient fort utiles pour ces provinces, et qui sont absolument necessaires si l[on veut entretenir une correspondance fructueuse avec les autres academies qui savent mettre toutes ces choses a profit au grand avantage de leur pays et de la navigation." AARS, AA, ARB 39, 152.
[1029] Lavalleye, *L'académie Royale des Sciences*, 32-33.

colleagues that Pigott planned to sell the instruments he had used during his astronomic journey between 1772 and 1773 in the Austrian Netherlands for around 1200 florins. Pigott had offered his instruments to the Academy as he was aware of their acute need for an observatory and hoped the government would support such a project.[1030] The astronomer Jean-Baptiste Chevalier also insisted on the importance of having good instruments to make astronomic observations and encouraged Needham to talk with the plenipotentiary minister about this possible purchase.[1031] However, the government rejected the proposal.[1032] Therefore, even though the Academy had some personnel able to do astronomical and meteorological observations, they could not use their abilities at full capacity during the eighteenth century.[1033]

While the Academy of Sciences in Brussels contributed in a very limited manner to the first topographic survey of the Austrian Netherlands, the scientists served as governmental consultants on other issues such as mining, agriculture, or navigation, to name just a few.[1034] Moreover, the foreign members of the Academy and the extensive correspondence of its members with other sites of scientific knowledge ensured the vitality of the Austrian Netherlands as an important node in the network of enlightenments.

[1030] In a letter sent by Pigott to the Royal Society and read in the meeting on May 7, 1778, the astronomer expressed the belief that the Habsburg government would soon support the building of an observatory in Louvain and the supplying of it with proper instruments. I have not retrieved any further archival information regarding such a project. Nathaniel Pigott, "Astronomical Observations Made in the Austrian Netherlands in the Years 1773, 1774, and 1775. By Nathaniel Pigott, Esq. F. R. S. Foreign Member of the Academies of Brussels and Caen, and Correspondent of the Royal Academy of Sciences at Paris," *Philosophical Transactions of the Royal Society of London* 68 (1778): 638.

[1031] AARS, AA, ARB 39, 196.

[1032] "Nathaniel Pigott (1725-1804)," in *L'Académie impériale et royale de Bruxelles*, 252.

[1033] On December 3, 1787, the academicians prepared another memoir that included elements they deemed necessary to obtain in order to pursue high quality scientific work. One of their main requests was the building of an observatory, but it seems the government did not approve the project. AARS, AA, ARB 41, 268.

[1034] On April 13, 1777, the plenipotentiary minister Starhemberg ordered the Imperial Academy to refrain from publishing the memoir of Dom Mann on the topic of rivers, channels and methods for water drainage. A possible reason for this order was the government's interest in this issue. AARS, AA, ARB 40, 125. In 1777, the government ordered the academicians to evaluate the project of the engineering officer Du Val for a water dam. AARS, AA, ARB 40, folios 158, 164, 176, 178. For a list of memoirs submitted to the Academy see AARS, AA, ARB 771.

7.4 CONCLUSION

In 1774, when asked about the establishment of an Academy of Sciences in Vienna, Maria Theresa stated, "I could not possibly decide to set up an accademie des sciences [sic] with three ex-Jesuits and one professor of chemistry, however worthy; we should be a laughing-stock in the world."[1035] As Richard Evans suggested, and this chapter demonstrates, we should not take the empress's declaration as indicative of intellectual apathy within her dominions. Maria Theresa's assertion might have been influenced by the dispersal of scientists in various provincial centers, such as Milan and Brussels. The size and structure of the Habsburg Monarchy discouraged the development of a dominant intellectual pole and promoted a decentralized imperial network of sites of knowledge. And although Maria Theresa did not sponsor the creation of an institution to rival the French Academy of Sciences or the Royal Society of London, she encouraged the development of science as part of other institutional frameworks, such as the observatories in Vienna and Milan and the Academy of Sciences in Brussels.

Throughout the eighteenth century, the Viennese rulers strived to control Jesuit scientific institutions and to encourage the formation of secular sites of knowledge. As part of their mapmaking efforts, the Habsburgs used and encouraged the astronomic knowledge produced in Vienna, Milan and Brussels. However, the activity of Jesuits and academicians in the Habsburg realm was subordinated to the dynasty's political and economic priorities. Therefore, "localized sites" such as the observatories in Vienna, the observatory in Brera, and the Academy of Sciences in Brussels should be studied as part of the same political entity and not as isolated scientific communities. Each site of knowledge became a node in "overlapping networks" that

[1035] Evans, "The Origins of Enlightenment in the Habsburg Lands," 50.

encouraged the circulation of personnel, artifacts and information.[1036] The correspondence networks of these Habsburg centers of scientific knowledge allowed Vienna to benefit from the experience of astronomers such as Boscovich, Cassini de Thury, the Pigotts and Messier. The implementation of these experts' proposals depended on other contextual factors such as the political status quo, financial constraints and even the personality of the scientists involved in the discussions. However, one common element emerges from the examples presented above: eighteenth-century scholars need to approach the production and circulation of scientific ideas from a triple perspective: provincial, imperial, and trans-imperial.

[1036] Harris, "Networks of Travel, Correspondence, and Exchange," 341.

8.0 AN INTERNATIONAL NETWORK OF ASTRONOMERS AND THE MAPPING OF LOMBARDY

In 1769, Maria Theresa ordered the director of the Observatory of the University of Vienna, Joseph Liesganig, to prepare a memoir describing the technique of mapping large territories based on mathematic principles.[1037] This memoir, discussed in chapter 7, offered an alternative to the methodology that the general quartermaster's staff employed to create the Great Military Map of most of the Habsburg provinces. Whereas the military engineers working in provincial settings such as Transylvania performed no astronomic measurements, Liesganig believed in the importance of coordinating geodetic and astronomic observations. This astronomer put his ideas into practice when surveying the Habsburg province of Galicia, acquired in 1773 by the Habsburgs as a result of the first Polish partition. To implement his project, Liesganig measured three baselines and built a triangulation network that covered 1,400 square miles. In addition, he performed astronomic observations from the Observatory of Lviv.[1038] Liesganig's memoir and his map of Galicia show that the Habsburg rulers were not opposed to the idea of using astronomic observations to obtain maps of their dominions.

This chapter adds to larger themes introduced in chapter 7, such as the contribution of Habsburg astronomers to global geographic enterprises through trans-imperial cooperations and

[1037] KA KPS, K VII a 6-5.
[1038] Apunevych, "First Astronomical Observatory in Lviv," 270. Walther Fischer, "Liesganig, Joseph," in *Neue Deutsche Biographie 14* (1985), 540-542. http://www.deutsche-biographie.de/pnd118998153.html, last accessed on November 17, 2014.

the development of scientific centers in Vienna, Milan and Brussels. Taking as a unit of analysis Lombardy, I explore Habsburg cartographic projects in this province from the 1720s to the 1790s in connection with the drawing of an accurate map of the province. In contrast to chapters 2 to 6, that mainly explored the cartographic work of military engineers, the next pages analyze the work of astronomers and reveal the importance of international connections for the success of mapping projects.

During the second half of the eighteenth century, Habsburg political elites in Vienna believed that, if properly designed and surveyed, maps could assist the government in diplomatic negotiations, internal reforms and war waging. Indeed, by 1777, Habsburg military engineers and artillerymen had surveyed numerous imperial provinces as part of the Great Military Map project and had almost finalized the Ferraris map of the Austrian Netherlands. Maria Theresa's efforts to reform the education of engineers and to organize these technical experts into special army corps had yielded satisfactory results and had created an efficient Habsburg mapmaking machine.

Astronomic measurements were not used in creating the Great Military Map for most Habsburg provinces not due to lack of knowledge, but most likely because the Aulic War Council prioritized speed over the perfect combination of all map sheets. As the Great Military Map was preserved in manuscript form and never circulated widely in an engraved version, the imperial authorities probably considered geodetic measurements sufficient to gather in-depth geographic knowledge of their dominions for the use of Habsburg officials. If engraved versions of the Great Military Map at a smaller scale had been prepared, as was done for the Ferraris map of the Austrian Netherlands, the Habsburgs would have had to take into account the international reception of such works. Astronomic measurements were considered essential not only for a map's accuracy but also in order to connect key points on this map with a global grid of

coordinates. Therefore, non-Habsburg experts would have most likely dismissed the Great Military Map as flawed.

By the second half of the eighteenth century, Cassini's map of France, which combined astronomic and geodetic observations, had established its fame throughout Europe. Ferraris's success in emulating Cassini's work and finalizing a publishable version of the map of the Austrian Netherlands encouraged Chancellor Kaunitz to support a similar project for Lombardy. Highly trained civil and military engineers populated government departments in Lombardy, such as the Census Office, the special border demarcation commissions and the Magistrato Camerale (Lombardy's institution in charge of financial matters). Nonetheless, until the end of the 1780s, the Habsburg provincial government had still failed to prepare a map of this province satisfactory for the Viennese rulers. This oversight is even more striking considering that Lombardy possessed a large observatory populated with expert astronomers interested in combining geodetic and astronomic operations in order to improve the geographic knowledge of this province.

If, in the case of Transylvania and the Austrian Netherlands, military personnel played the leading role in the mapping enterprises, the discussion and the production process surrounding the topographic map of Lombardy offers an alternate story. During peacetime, Lombardy's military engineers were involved in preparing border maps, economic surveys for the Census office and plans to improve the irrigation and canal system. But they did not take part in the extension of the Great Military Map to Lombardy. Instead, Chancellor Kaunitz prioritized the preparation of a publishable topographic map for Lombardy, relying on the knowledge of the astronomers, who combined astronomic and geodetic observations to complete this work.

After the establishment of the Brera Observatory in 1765, the resident astronomers obtained access to necessary instrumentation for calculating longitudes for the main cities of Lombardy.[1039] Moreover, they expressed vivid interest in coordinating the measurement of a triangulation network for Lombardy, as a preliminary step for preparing a precise map. Both these projects would have put Milan on the map of leading astronomic centers and would have offered valuable geographic information about this province both to the Habsburg government and the international scientific community. Despite this initial enthusiasm, it took a couple of decades for the astronomers working at the Observatory of Brera to gain the support of the imperial authorities and to obtain the required funds to acquire instruments necessary for their measurements. By 1791, the Brera astronomers had finalized the geodetic measurements and had successfully combined them with astronomic calculations. Because of these scientists' methodology, the Habsburg authorities considered the map of the Brera astronomers (*Carta degli Astronomi di Brera*) the first accurate cartographic representation of this province.

In 1930, Maria Combi published the first monograph discussing the map of the Brera astronomers, executed between 1788 and 1796 under the direction of Angelo de Cesaris, Francesco Reggio and Barnaba Oriani.[1040] In her work, Combi discusses seventeenth and eighteenth century maps that incorporated parts of Lombardy and analyzes the 1770's attempts of the Habsburg government to obtain a detailed cartographic representation of Lombardy. She also narrates in detail the successful astronomic and geodetic operations from the late 1780s that constituted the basis for a revised map of Lombardy. Combi indicates the involvement of foreign mapmakers such as César-François Cassini de Thury and Giovanni Antonio Rizzi Zannoni in the

[1039] Paoli, *Ruggiero Giuseppe Boscovich Nella Scienza e Nella Storia del '700*, 181-182; Zagar, *L'Osservatorio Astronomico di Milano nella Storia*, 31-32; Miotto, *La Strumentazione nella Storia dell'Osservatorio Astronomico di Brera*, 11-12.
[1040] Combi Maria, *Una carta topografica della Lombardia del secolo XVIII* (Milan: F. Combi, 1930).

production process of the map of Lombardy. She mentions how the Brera astronomers ordered scientific instruments in London and reveals Chancellor Kaunitz's desire to obtain a map of Lombardy modeled on the Ferraris map of the Austrian Netherlands. Nonetheless, Combi's primary focus throughout remains Lombardy, and she neither connects this cartographic enterprise with similar projects occurring in other Habsburg provinces nor gives full-fledged attention to the international scientific networks that the Brera Observatory was integrated into.

Therefore, this chapter explores the discussion accompanying the production process for the map of the Brera astronomers and situates the story of this cartographic enterprise in two larger contexts: that of the Habsburg Monarchy and that of the transimperial scientific community. I argue that the efforts of the Brera astronomers to transform their observatory into an important scientific node of the larger European network motivated these scientists to prepare a map of Lombardy. The astronomers' correspondence networks and Barnaba Oriani's trip to London ensured the acquisition of first-class geodetic instruments and conveyed to Lombardy information about similar European projects. Therefore, the Brera astronomers had a twofold goal in mapping Lombardy: fulfilling the desire of the Viennese rulers in order to ensure the government's support for the Observatory and raising the profile of their Observatory on the scientific map of Europe.

The following pages also show that the Habsburg monarchs invested not only in secret military maps but also strived to be at the vanguard of scientific developments in Europe. For late eighteenth-century mapmaking that goal implied combining astronomic and geodetic measurements. Being at the forefront of scientific advances allowed the Habsburgs to tap into the international pool of experts and recruit them permanently or temporarily into the service of Vienna. As chapter 7 discusses, the collaboration between French scientist, Cassini de Thury,

and the director of the Observatory at the University of Vienna, Joseph Liesganig, led to the implementation of a trigonometrical survey in the area of Vienna. Roger Boscovich, another international expert, contributed decisively to the foundation of the Brera Observatory in Lombardy. Therefore, publishing a map of Lombardy based on both astronomic and geodetic operations would have reaffirmed in the eyes of the European community of scientists that the Habsburgs were committed to contributing to the development of cartography on a global scale.

8.1 THE CADASTRAL MAPS OF LOMBARDY

The exclusion of Lombardy's territory from the Great Military Map was not due to the government's lack of interest; quite the contrary. Already by the middle of the eighteenth century, the Habsburg rulers had finalized an impressive survey of their lands in the State of Milan for taxation purposes. The legacy of these cadastral maps influenced projects for the mapping of Lombardy until the late 1780s, as they were considered ideal starting points for a new cartographic enterprise. Therefore, this chapter section briefly outlines the first Habsburg large-scale mapping projects in Lombardy.

Between 1718 and 1750, in order to increase the tax base and curtail tax evasion in the State of Milan, the Habsburg authorities commissioned a set of maps accompanied by registers that contained estimates for agricultural produce, the land's size and the land's value. The Habsburg agents surveyed 2387 maps at the scale of 1:2,000 and they compiled reduced scale versions of these maps for the Census office, for the central administration, and for the local communities.

The historiography of cadastral maps has applauded this Habsburg initiative because it encouraged a modern tax reform in Lombardy and inspired similar enterprises in places like France, Piedmont and Spain.[1041] However, the story of the Milanese cadaster is not a narrative of an imperial reform implemented without any problems. In fact, the local elites of Lombardy, who desired to preserve their fiscal immunities, consistently tried to thwart the success of this project. In Dianne Harris's words, "the history of the Austro-Lombardian cadaster is also a poignant story about colonial authority and its limits, a case study in efforts at foreign dominance and native opposition."[1042] Although the locals initially refused to accept the inclusion on these maps of domains whose owners resided in other communities, the authorities ordered that all lands should be represented "where nature placed them" (nel territorio dove natura li ha collocati), thus confirming the primacy of imperial territorial priorities over local interests and traditional land subdivisions.[1043] Each cadastral register contained a list of all landowners, details about the land's usage, the property's dimensions and the property's value. Instead of the owners' names, the surveyors used numbers to identify all properties. Because the mapmakers used highly specialized surveying instruments (the plane table) and a standard measurement unit (the *pertica*), "the cadaster reduced physical space to a geometric equation, an abstraction that was to be taken as fact."[1044] Presenting Lombardy's landscape in a series of what were perceived as accurate and precise maps made this province's geography visible to the decision-makers in Vienna.

[1041] See for example "The Milanese Censimento: the first surveyed and mapped cadastre" in *The Cadastral Map in the Service of the State. A History of Property Mapping*, eds. Roger J.P. Kain and Elizabeth Baigent (Chicago: University of Chicago Press, 1992), 181-190; Daniel M. Klang, *Tax Reform in Eighteenth Century Lombardy* (New York: Columbia University Press, 1977); Zaninelli, *Il Nuovo Censo dello Stato di Milano*.
[1042] Dianne Harris, *The Nature of Authority: Villa Culture, Landscape, and Representation in Eighteenth-Century Lombardy* (University Park: Pennsylvania State University Press, 2003), 40.
[1043] Aurora Scotti, "La cartografia lombarda: criteri di rappresentazione, uso e destinazione," in *Lombardia: il territorio, l'ambiente, il paesaggio*, ed. Carlo Pirovano, vol. 3 (Milan: Electa, 1983), 102-103.
[1044] Harris, *The Nature of Authority*, 43-49.

Estimating the circulation of maps that resulted from the work on the Milanese Census is difficult. For example, we know that the engraver Marc'Antonio Dal Re managed to obtain the drawings and started producing commercial versions of the provincial maps, but then Dal Re ended up entangled in a complicated juridical case that led to the cessation of his work and the confiscation of his plates by the provincial authorities.[1045] A possible reason for the Habsburg state's confiscation of Dal Re's engraved plates could have been the officials' fear that Dal Re had manipulated and distorted the information present on the maps in favor of Lombardy's nobility, a group opposed to the reform of taxation.[1046] On the other hand, the Habsburg authorities might have desired to use Dal Re's plates as a starting point for a commercial version of the map. Indeed, the fiscal lawyer (*avvocato fiscale*) who led the investigation against Dal Re, Francesco Fenaroli, encouraged the government to support the publication of a version of the general cadastral map, because "in the most cultured states of the world, the publication of geographic descriptions of cities and provinces is allowed [...] and without the help of such publications the beautiful and profitable study of geography would be done in vain, and the many published atlases and numerous geographic maps reveal the interest of the Rulers/Sovereigns themselves, and the best editions derive from the work of either Real Geographers or Public Academies opened by princes, who gave if not the actual order, at least the permission for such geographic works."[1047] Clearly, some Habsburg agents perceived the advantages of producing a publishable version of these cadastral maps.

[1045] Mario Signori, "La cartografia lombarda fra tradizione catastale ed esigenze amministrative," in *L'immagine interessata territorio e cartografia in lombardia tra 500 e 800* (Como: NODO, 1984), 58.
[1046] Harris, *The Nature of Authority*, 55.
[1047] The quote: "comprendere che li Sovrani stessi se ne sono interessati e le migli'Ori edizioni derivano o da Reali Geografi, o dalle pubbliche accademie erette da Principi, onde vi è la presonzione se non del Comando, almeno della permissione," Cited in Signori, "La cartografia lombarda fra tradizione catastale ed esigenze amministrative," 58-59.

In 1757, the Census Giunta ordered the publication of a Topographical Atlas of the State of Milan, including maps based on the cadastral cartographic operations.[1048] This atlas contained 71 maps of the various cities and provinces of the State of Milan.[1049] A map showing the whole State of Milan was at the front of the atlas and remained the only unitary image of this part of Lombardy throughout the 1760s.[1050] Yet, the value of these maps was doubtful, as they lacked a representation of the landscape's topography, contained no latitude and longitude information and included multiple errors with respect to the position of roads and boundaries. Moreover, due to political and military concerns led the Habsburgs to prohibit any reproductions of this atlas.[1051]

The cadastral maps offered an incomplete image of the Habsburg dominions in Lombardy. Limited to the State of Milan, they failed to incorporate the Duchy of Mantua.[1052] But even before the 1780s, when the Habsburgs extended the census measurements to Mantua, Vienna took the first steps in the production of a printed, for-sale map of Lombardy. In the early 1770s, Chancellor Kaunitz expressed his desire for a map of Lombardy that would not only serve Habsburg bureaucrats, but would also promote a unitary image of this Habsburg province for whoever acquired a copy, including travelers, scientists and other intellectuals.[1053]

Therefore, in the summer of 1773, the Chancellor ordered Firmian to start preparatory work for a map of the State of Milan. At Roger Boscovich's suggestion, Kaunitz commissioned two experts in the art of mapmaking to evaluate the quality of the geodetic measurements

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[1048] Scotti, "La cartografia lombarda," 114.
[1049] Signori, "La cartografia lombarda fra tradizione catastale ed esigenze amministrative," 58.
[1050] Aurora Scotti, "L'immagine della Lombardia nel secolo XVIII: definizione dei confini e rappresentazione cartografica," in *Lo Stato e la Città: Architetture, Istituzioni e Funzionari nella Lombardia Illuminista* (Milan: Franco Angeli, 1984), 28.
[1051] Harris, *The Nature of Authority*, 47.
[1052] As discussed in chapter 6, the integration of Lombardy's administrative components took most of the eighteenth century. Mori, *Il Ducato di Mantova*.
[1053] Scotti, "La cartografia lombarda," 115.

performed during the Census operations and to analyze the final cadastral maps.[1054] Having no desire to commission a new expensive and lengthy topographic survey of the State of Milan, Kaunitz hoped the wealth of information encompassed on the cadastral maps would accelerate the cartographic operations. The specialists Kaunitz consulted were the Jesuit father Francesco Luini (1740-1792), professor of mathematics training engineers in Milan, and counselor Giuseppe Pecis, the coordinator of the short-lived ad-hoc commission in charge of Lombardy's borders, waterways and roads.[1055]

Kaunitz's order for a new map of the State of Milan resonated strongly with Pecis, who had decried the lack of a map of Lombardy as shameful, especially when taking into account the existence of detailed survey maps in the archives of the Census Office.[1056] In Pecis's opinion, the Habsburg government's lack of a general map of Lombardy was even more striking in view of the French mapmakers' efforts and successes in obtaining a cartographic representation of this province. Pecis mentioned the existence of a series of maps of Lombardy in the archives of the French War Ministry, probably prepared during the war campaigns of 1733 and 1735, and revealed how French cartographers George-Louis le Rouge and Jean-Baptiste Bourguignon d'Anville had already managed to obtain maps based on the Census sources. Indeed, as Pecis quoted in his memoir, d'Anville confessed in his "Geographical Analysis of Italy" that he "had been quite lucky to obtain a copy of a manuscript and general map of this [Milanese] census."[1057] As foreign mapmakers so reputable as d'Anville used the cadastral maps as an essential source for discussing the geography of Lombardy, Pecis encouraged the Habsburg government to

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[1054] ASM Confini p.a., box 5, June 14, 1773, Kaunitz to Firmian.
[1055] For biographical information about Francesco Luini see W. Mantovani, *F. Luini, fisico e paesano d'Europa del '700, Quaderni di storia della fisica* XI (2003), 49-57. For information about Pecis see ASM DR, box 241, October 6, 1768, Maria Theresa's order. Also mentioned in Capra, *La Lombardia Austriaca Nell'Età delle Riforme*, 274.
[1056] ASM Confini p.a., box 5, July 16, 1773, Pecis to Firmian.
[1057] Jean-Baptiste Bourguignon d'Anville, *Analyse Géographique de l'Italie, dédiée a Monseigneur le Duc d'Orleans, Premier Prince du Sang* (Paris: Veuve Estienne & fils, 1744), 42.

follow in their footsteps. D'Anville's access to a version of the general cadastral map demonstrates the unauthorized circulation of cartographic material in the eighteenth century.[1058]

In addition to the cadastral maps, Pecis mentioned to his superiors the possible existence in the Archive of the Castle in Milan of a series of plates used for Giacomo Cotta's topographic maps.[1059] The Census and the Cotta maps were the only cartographic sources available for preparing a Map of Lombardy. This is especially striking considering the existence in Lombardy of skilled military engineers, such as the de Blasco brothers discussed in chapter 2, and the Habsburg government's preoccupation with preparing cartographic material to assist in the process of border demarcation, as described in chapter 6.

Based on Kaunitz's letters to Milan, it is clear that the Chancellor envisioned the map of Lombardy as a piece in the larger cartographic representation of the Habsburg Monarchy. Indeed, in answering Pecis's query about the size of the final map of Lombardy, Kaunitz mentioned as a reliable model for this enterprise the project for a general map of the Austrian Netherlands, at the time proceeding under the leadership of Ferraris. In the Chancellor's view, a good map incorporated elements such as royal and public roads, navigable channels, significant waterways, the location of postal stations, monasteries, abbeys, big and small towns, castles, ruins or abandoned fortresses, mines and forests.[1060]

[1058] D'Anville's success in obtaining sensitive information such as Lombardy's cadastral maps is not the only known instance of this mapmaker's ability to use his international network to acquire cartographic material. As Júnia Ferreira Furtado showed, in the 1740s, the Portuguese minister to France, Luís da Cunha, had provided the French mapmaker Jean-Baptiste Bourguignon d'Anville with invaluable cartographic information, to enlist this scientist's help in preparing maps of South America. Although, in that case, the decision-makers in Lisbon had sanctioned the circulation of this cartographic material, the collaboration between da Cunha and d'Anville illustrates the creation of trans-imperial personal connections that facilitated the transmission of manuscript maps. Júnia Ferreira Furtado, *Oráculos da Geografia Iluminista: Dom Luís da Cunha e Jean-Baptiste Bourguignon d'Anville na Construção da Cartografia do Brasil (*Belo Horizonte, Brazil: UFMG, 2012).

[1059] ASM Confini p.a., box 5, August 5, 1773, Kaunitz to Firmian. Maria Combi identified a note mentioning the existence of four plates by Giacomo Cotta in the Archive of the Castle that showed the following territories: the Principality of Pavia, Lomellina, Novarese, Vigevenasco, Tortonese, Alessandrino, and the Vercellese with part of Piedmont, Langhe and Monferrato. Combi, *Una carta topografica della Lombardia*, 16.

[1060] ASM Confini p.a., box 5, August 5, 1773, Kaunitz to Firmian.

This was a minimal list of elements that most eighteenth-century topographic maps incorporated in their legend, as illustrated also by the Great Military Map of the Habsburg provinces. Including such interest points on a map made the imperial authorities' presence visible and inserted the province into the larger polity, namely the Habsburg Monarchy. The network of postal stations, roads and channels connected Lombardy with the rest of the Monarchy, whereas mines, forests and towns were sources of revenue for the Habsburg authorities. Therefore, Kaunitz's understanding of a good map implied not only an accurate representation of the natural landscape, but also the insertion of human-made elements that impacted the Habsburg administration of this province.

The Chancellor was not the only one envisioning Lombardy as part of the larger imperial fabric. Before starting the mapping process, Pecis requested from Vienna copies of two measurement units: the Viennese *klafter* and the French *toise*.[1061] Clearly, Pecis hoped that the new map of Lombardy would become part of a larger cartographic discourse and that it would convey information relevant both for the imperial and European scientific community. Kaunitz fulfilled Pecis's request with the help of the director of the University Observatory in Vienna, the Jesuit Father Joseph Liesganig, who personally prepared a copy of the French *toise*.[1062] Ensuring the use of consistent measurement units to map Lombardy's landscape was not something new. Rather than employing a mosaic of local traditional systems of measurement, the census surveys used as a measurement unit the *pertica*.[1063] Nonetheless, Pecis's request introduced a novel element: employing standard units developed in the empire's capital and France. Using the Viennese *klafter* confirmed that Lombardy was a Habsburg province and that the results of the

[1061] Ibid., July 16, 1773, Pecis to Firmian. One French *toise* equals 1.94 meters and one Austrian *klafter* is equivalent to 1.896 meters. Cardarelli, *Encyclopaedia of Scientific Units, Weights, and Measures* 79; 99.
[1062] Ibid., August 5, 1773, Kaunitz to Firmian; December 1, 1774, Kaunitz to Firmian.
[1063] Harris, *The Nature of Authority*, 43.

surveying and mapping process had relevance for an imperial audience. Adding to the list of units the French *toise* confirmed this measurement entity's emergence as the European standard.

Another important issue the authorities had to consider was the geographic extension of the map. The continuously changing political landscape of Italy in the first half of the eighteenth century created a serious cartographic dilemma: should the general map of Lombardy incorporate information from all the maps contained in the Office of the Census, including the ones representing territories that were no longer Habsburg dominions? To answer this query, Kaunitz reminded Pecis how "on the well-executed maps, we always find some part of the neighboring states, even if only to make known what the adjacent districts are."[1064] Moreover, in some cases, including segments of neighboring states allowed the mapmakers to fill in otherwise empty slots on the final map.[1065]

Despite this promising correspondence between Kaunitz and Pecis, the work on the new map of Lombardy stagnated. As a result, on December 1, 1774, Kaunitz complained about the lack of any news about the progress of this project. The archives did not preserve any answer from Lombardy.[1066] The Chancellor repeatedly tried to reanimate the project in 1776 and 1777. In 1776, Cassini de Thury expressed his desire to perform geodetic measurements in Lombardy, as part of a larger project extending the triangulation network covering France all the way to Italy.[1067] In 1777, the Italian mapmaker J.A. Rizzi Zannoni (1736-1814) offered to measure two degrees of Milan's meridian and to use the results of this operation to prepare an improved geographical map of the State of Milan. Although fruitless, Cassini de Thury's and Rizzi

[1064] "Nelle Carte ben eseguite, sempre si ritrova qualche parte dè paezi confinanti, se non altro ad oggetto di far conoscere quali sieno li distretti limitrofi." ASM Confini p.a., box 5, August 5, 1773, Kaunitz to Firmian.
[1065] Ibid.
[1066] Ibid., December 1, 1774, Kaunitz to Firmian.
[1067] Drapeyron, "Project de géométrie géodésique de la France et de L'Italie en 1776, par Cassini de Thury," 795-797.

Zannoni's proposals offer an intriguing view of trans-imperial scientific connections and the commitment of the Habsburg government to recruit into their service the brightest mapmakers of the age. Moreover, these failed projects offered the astronomers from Brera the opportunity to demonstrate the Habsburg government their ability to coordinate the mapping of Lombardy.

8.2 CASSINI DE THURY'S AND RIZZI ZANNONI'S GEOGRAPHIC PROJECTS FOR LOMBARDY

Cassini de Thury's successful mission in the German lands during the early 1760s, when he measured the length of the perpendicular to the Paris meridian all the way to Vienna, encouraged the French scientist to propose a similar enterprise in 1776. The diplomatic correspondence surrounding the discussions about Cassini de Thury's proposal paints an image of Habsburg rulers as invested patrons of cartography in the eighteenth century. However, the failure of this project also exposes how the dynasty only encouraged trans-imperial mapmaking and astronomic collaborations in exchange for significant perceived benefits for their empire. International scientific collaboration had its limits.

On March 25, 1776, the French foreign minister, Vergennes, contacted the Habsburg ambassador in Paris and initiated negotiations for a new scientific venture: Cassini de Thury's plan to extend the triangulation network covering France all the way to Italy.[1068] The French academician planned to measure a baseline going along the 45th parallel north, connecting Grénoble to Florence, and therefore also passing through the Habsburg provinces of Lombardy

[1068] Drapeyron, "Project de géométrie géodésique de la France et de L'Italie en 1776, par Cassini de Thury," 795-797.

and Tuscany.[1069] In his detailed proposal for doing these calculations, Cassini de Thury repeatedly compared the venture with his earlier project in the German lands in order to encourage Maria Theresa's consent, which he obtained after some months.[1070]

From the correspondence between Kaunitz and Lombardy's minister, Firmian, we learn Maria Theresa's motivations for approving Cassini de Thury's request. Firstly, France was the main ally of the Habsburg Court in Europe and the French king supported Cassini de Thury's project. Secondly, the empress wanted to be seen as an important patron of sciences in the French astronomer's subsequent publication of his travels in Italy. Kaunitz reminded Firmian to approach this collaboration cautiously, as "this Frenchmen believes himself to be the restaurateur, and maybe creator of our Geography, and desires to attribute to only himself all the credit."[1071] On the other hand, Milan had its own expert astronomers working in Brera, so Kaunitz advised Firmian to consult them regarding Cassini de Thury's project and to prepare a plan on how to take advantage of the French scientist's operations in Lombardy to stimulate Habsburg geographic ventures in the area.[1072] As per Kaunitz's instructions, Firmian forwarded Cassini de Thury's project to the director of the Brera Observatory, Lagrange, and to Paolo Frisi, mathematics professor at the Palatine Schools.[1073] In order to counteract any possibility of Cassini de Thury's claiming for himself all the glory of a successful implementation of the project, Lagrange and Frisi promised to prepare detailed reports containing all preliminary work done by Habsburg employees.[1074]

[1069] HHStA Frankreich Notenwechsel, box 11, March 25, 1776, Vergennes to Mercy.
[1070] HHStA StK, WKL, box 5, folder Cassini de Thury und P. Luskanik(?).
[1071] "questo Francese creda d'essere il ristoratore, e forse creatore della nostra Geografia," ASM Autografi, box 119, folder 26 (Cassini di Thury Cesare Francesco), May 20, 1776, Kaunitz to Firmian.
[1072] Ibid.
[1073] ASM Autografi, box 119, folder 26 (Cassini di Thury Cesare Francesco), June 3, 1776, Firmian to Lagrange and Frisi.
[1074] Ibid., June 29, 1776, Firmian to Kaunitz. The Lombardy authorities were also concerned with being overshadowed as patrons of sciences by the ruler of Piedmont, in whose states Cassini de Thury had to perform

Additionally, in preparation for Cassini's expedition, the astronomers in Brera, together with Frisi, decided to determine the longitude and latitude of Pavia and Cremona, both on the 45th parallel north, along which Cassini de Thury planned to execute his measurements. The geographic coordinates obtained by the astronomers could then be corroborated with Cassini de Thury's astronomic and geodetic measurements. Reliable coordinates for the main cities in Lombardy would then improve the reliability of provincial maps. Lombardy's scientists also made plans to extend the triangulation network Cassini hoped to measure on the province's territory.[1075] Clearly, the scientists serving the Habsburgs tried to use this international scientific collaboration with Cassini de Thury for the betterment of provincial cartography.

Just four days later, after the first report, Frisi contacted Firmian again to inform him about an addition to the earlier plan: with the help of Giuseppe Megel, working as a *macchinista* (mechanical engineer) in Brera, the astronomers had prepared an additional set of instruments which could be used to calculate the coordinates of Como. Frisi considered this operation as a possible preliminary step for calculating the length of a meridian degree going from the banks of the Lake Como, through Milan and towards Pavia.[1076] In this way, Lombardy's scientists hoped to continue in Boscovich's and Liesganig's footsteps and contribute to one of the eighteenth century's scientific quests: establishing the shape of the Earth.

Kaunitz offered governmental support for the Brera astronomers' initiative and understood the importance of their work to preparing an accurate map of the province. The Habsburg Chancellor considered astronomic observations essential for obtaining a "precise" map

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measurements before arriving in Lombardy. In order to make sure the Habsburg authorities' reception of Cassini de Thury would match the ruler of Piedmont's attentions, Firmian ordered the Habsburg representative in Turin, Antonio Enrico de Bem, to gather all the relevant information. Bem had to pay special attention to the help offered by the Court of Turin to Cassini de Thury during the measurement operations, especially regarding postal services, accommodation and additional personnel. Ibid., June 29, 1776, Firmian to Antonio Enrico de Bem.

[1075] ASM Autografi, box 129, folder 16 (Paolo Frisi), July 7, 1776, Frisi to Firmian.

[1076] Using the opportunity of a moon eclipse, the astronomers affiliated with Brera planned to make observations in Pavia, Cremona and Como. Ibid., July 11, 1776, Frisi to Firmian.

and had considered the possibility of calculating the coordinates for Lodi and Como even before he received Frisi's proposal.[1077] This example shows again how the main decision-makers in Vienna, such as Kaunitz, had a firm belief in the possibility of drawing an accurate map, which would need no further modifications if based on correct mathematical and astronomical principles.

In the end, Cassini de Thury's project was abandoned because the King of Sardinia refused to allow the French scientist to perform any measurements in Piedmont.[1078] In Kaunitz's opinion, the king's decision was influenced by Cassini de Thury's claim that his operations would help create better maps, which could be useful during military operations. As the King of Sardinia feared a possible military conflict with France, he did not want to take any risks by letting a French agent obtain a good representation of his territory. However, Kaunitz advised Firmian that if Cassini still desired to pursue his measurements in Lombardy, he should receive full support from the provincial government. The Habsburg rulers were not afraid of a foreign state obtaining good maps of Lombardy because, as revealed by Kaunitz's letter, "the cadastral maps, and even the specific maps of each parish and province, are easily obtained even by foreign travelers for the price of few *zecchinis*, as I know from their own confessions."[1079] The Chancellor obviously understood that some cartographic information could not be kept secret.

Although Cassini de Thury's proposed project never became reality, the discussion surrounding it brought to life a diplomatic and scientific network connecting Habsburg astronomers, diplomats and political rulers with their counterparts across the border. Kaunitz and

[1077] At the time he had not been informed yet of the astronomers' decision to include Como in their project. ASM Autografi, box 119, folder 26 (Cassini di Thury Cesare Francesco), July 22, 1776, Kaunitz to Firmian.
[1078] Ibid., July 10, 1776, de Ben to Firmian.
[1079] "le Carte del Censo, ed anche le mappe particolari d'ogni pieve, e provincia si facili ad aversi sino da viaggiatori forastieri per il prezzo di pochi zecchini, come lo so per la confessione de medessimi." Ibid., July 29, 1776, Kaunitz to Firmian.

Maria Theresa promised help to Cassini de Thury in the hope of accelerating the work on the map of Lombardy. But as soon as it became obvious that the diplomatic efforts and financial costs to implement the French scientist's ideas were too high, the Habsburg rulers decided to keep their distance as they anyway had a significant group of astronomers residing in Lombardy.

Soon after the abandonment of Cassini de Thury's proposal, the authorities in Lombardy sent to Vienna their attempt at remapping the State of Milan. Chancellor Kaunitz was deeply disappointed with the results. Kaunitz considered the so-called Ramis map, engraved in 1777 by Giovanni Ramis, as just another copy of the cadastral maps that failed to incorporate the results of the latest astronomic observations.[1080] In the Chancellor's words, this map was "not only infinitely far from the degree of perfection that it could have had, if it had been directed by an intelligent man belonging to this profession, but [was] also much below the most common topographic maps of other states."[1081] Kaunitz criticized the map for being just a copy of the map prepared some decades before by the employees of the Milanese Census office, a cartographic source full of deficiencies, including: the omission of border areas belonging to the State of Milan's neighbors that would have helped illuminate boundary disputes; the poor representation of the road network and main settlements; the lack of toponyms for various sites; the inability to distinguish between various landscape features, such as mountains, plains or forests; and the absence of any correlation between geodetic and astronomic measurements, despite the presence of highly trained astronomers in Milan.[1082] The Chancellor's detailed review of this latest map of Lombardy reveals this official's understanding of what made a map useful to the government and

[1080] Scotti, "L'immagine della Lombardia nel secolo XVIII," 28-29.
[1081] "non solo è infinitamente lontana da quel grado di perfezione, che poteva avere, se fosse stata diretta da un uomo intelligente del mestiere, ma molto al di sotto delle più comuni Carte Topografiche d'altri paesi." ASM Confini p.a., box 5, December 8, 1777, Kaunitz to Firmian, Vienna.
[1082] "non solo è infinitamente lontana da quel grado di perfezione, che poteva avere, se fosse stata diretta da un uomo intelligente del mestiere, ma molto al di sotto delle più comuni Carte Topografiche d'altri paesi." Ibid.

valuable to the larger scientific community. Therefore, the Chancellor's statement that "the money used for this map full of defects could have been spent with more profit" was not surprising. Kaunitz contrasted the Ramis map with the Ferraris map of the Austrian Netherlands, finalized that same year, and offered the topographic map of the Austrian Netherlands as a model for Lombardy's authorities.[1083]

The desire of the Habsburg government for a good map of Lombardy was probably no secret in the circle of international elite mapmakers. Indeed, in the fall of 1777, J.A. Rizzi Zannoni (1736-1814), known at the time to the Habsburg Court for his Atlas of Poland, sent a memoir to Chancellor Kaunitz expressing his desire for a commission to measure two degrees of Milan's meridian and to use the results of this geodetic operation to prepare an improved geographical map of the State of Milan. Rizzi Zannoni openly admitted he had obtained a copy of the manuscript map compiled based on the Milanese census results, and he criticized this cartographic source for placing significant sites inaccurately (*à caprice*).[1084] Rizzi Zannoni's international career, which had taken him from Warsaw to Paris to Padua, to name just some of the places he passed through, had helped him build a wide-ranging network. These international connections were instrumental in Rizzi Zannoni's ability to obtain high rank commissions from various European monarchs.[1085] Although we cannot know for sure what motivated Rizzi

[1083] Ibid.
[1084] Ibid., Rizzi Zannoni's Project.
[1085] Vladimiro Valerio's biography of Rizzi Zannoni, well anchored in both archival documents and secondary sources, convincingly reconstructs the trajectory of this mapmaker's career, and reveals the impact of diplomatic and intellectual European connections on the cartographic commissions Rizzi Zannoni received. Valerio, *Societa, uomini e istituzioni cartografiche nel Mezzogiorno d'Italia*, especially pages 99-121. For an older, but covering a larger time-span, biography of Rizzi Zannoni see Aldo Blessich, "Un Geografo Italiano del secolo XVIII. Giovanni Antonio Rizzi Zannoni (1736-1814)," *Bollettino della Società Geografica Italiana*, ser. 3, 11 (1898): 12-23; 56-69; 183-203; 453-466; 523-537. Konvitz offers some details about Rizzi Zannoni's career in the service of the French king, which included a variety of projects, such as a commission to trace the boundary between France and the Bishopric of Liège, an unfinished project for an atlas of all the French borderlines, and a map of the war theater between the Russian and Ottoman Empires. The financial scandals surrounding Rizzi Zannoni's commissions and his sudden departure from France to elude his creditors in 1776 support Kaunitz's statement that this mapmaker

Zannoni to submit his proposal to Vienna, this mapmaker had been working in Paris at the time when Cassini de Thury had sent his 1776 memoir to Maria Theresa asking for the permission to perform geodetic measurements on Lombardy's territory. Moreover, the Habsburg Court's desire for a map of Lombardy was probably known.

Kaunitz saw Rizzi Zannoni's request as an opportunity to motivate the government of Lombardy to finalize the map of the whole province. The Chancellor shared the memoir with Firmian and expressed his hope that Lombardy's scientists, including the astronomers of Brera, would expand Rizzi Zannoni's ideas so that the map incorporated the whole of Lombardy, namely both the State of Milan and the Duchy of Mantua. Kaunitz also expressed his firm belief that, in order for a map to be precise, it had to be based on astronomical observations. Therefore, he ordered for Rizzi Zannoni's geodetic measurements to be accompanied by the work of the Brera astronomers.[1086]

The provincial government made efforts to create a dream-team of mapmakers to collaborate with Rizzi Zannoni. In order to gather insightful comments on Rizzi Zannoni's plan, Firmian questioned astronomers Cesaris, Reggio and Oriani, working at the Brera Observatory, government counselor Giuseppe Pecis and Paolo Frisi (1728-1784),[1087] mathematics professor at the Palatine Schools in Milan.[1088] Distrustful of Lombardy's government ability to implement a precise map of this province, Kaunitz followed this project closely. Once the astronomers' and Frisi's comments regarding Rizzi Zannoni's memoir arrived in Vienna, Kaunitz involved in the evaluation process a mathematics professor that had worked on a recent map of Galicia and

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"was one of a few cartographers who used their skills to defraud their patrons." Konvitz, *Cartography in France*, 35-36.

[1086] ASM Confini p.a., box 5, November 13, 1777, Kaunitz to Firmian.

[1087] Amedeo Agostini, "Frisi, Paolo," http://www.treccani.it/enciclopedia/paolo-frisi_(Enciclopedia-Italiana)/, last accessed on November 20, 2014.

[1088] AOAB, AAV, box 8, April 7, 1781, Milan. Firmian to Angelo de Cesaris, Milan. Combi, *Una carta topografica della Lombardia*, 35.

Lodomeria.[1089] This evaluator could have been none other than the experienced astronomer and surveyor Joseph Liesganig, who had performed measurements of arc meridians in the proximity of Vienna and the Hungarian plains. Furthermore, Liesganig was a strong promoter of coordinating geodetic and astronomic measurements in order to increase the precision of large-scale maps.[1090]

The Chancellor reaffirmed Vienna's commitment to support a surveying project that would give the government access to "a precise geographic map of our Lombardy." [1091] He also underscored the connection between this initiative and enterprises underway in other areas of the empire. Indeed, Kaunitz reminded Firmian that, during recent years, the Habsburg employees had surveyed other provinces of the Monarchy with precision. Furthermore, Kaunitz did not simply mention these other Habsburg cartographic projects, but promised to send a copy of the Ferraris Map to serve as a tangible model for the Lombardy project.[1092] The Chancellor did not offer to send any map sheets of the Great Military Map because he envisioned Lombardy's map as a printed, commercial cartographic work, along similar lines as the *Carte Marchande* version of the Austrian Netherlands' map, prepared under the leadership of Ferraris.

Kaunitz overrode Governor Ferdinand's reluctance to commit significant funds for this cartographic enterprise, and on February 5, 1781, the Chancellor ordered the States of Milan and Mantua to pay for all of the astronomic instruments necessary for the completion of the Map of Lombardy. Although Kaunitz put Paolo Frisi in charge of this project as the most experienced scientist, he ordered him to work together with the Brera astronomers and to consult Pecis with

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[1089] August 20, 1778, Kaunitz to Firmian. Reproduced in Blessich, "Un Geografo Italiano del secolo XVIII," 194-196.
[1090] See chapter 7, Section 7.1. where I discuss this report.
[1091] "una esatta Carta geografica della nostra Lombardia." August 20, 1778, Kaunitz to Firmian. Reproduced in Blessich, "Un Geografo Italiano del secolo XVIII," 194.
[1092] Ibid.

respect to technical issues, such as the scale of the map. Furthermore, Kaunitz commissioned the Census office to assist the mapmakers in their operations and to lend them some draftsmen.[1093] To familiarize the astronomers of Brera with Rizzi Zannoni's earlier work, Firmian sent them a copy of Rizzi Zannoni's Atlas of Poland.[1094] Also, to guide them in their plans for the map of Lombardy, Kaunitz sent to Pecis and Frisi the engraved Ferraris Map of the Austrian Netherlands.[1095] The Chancellor's first-hand involvement in the preparation for realizing this map of Lombardy reveals his familiarity with other cartographic projects underway within the Monarchy lands and abroad. Furthermore, Kaunitz was well aware of the resources that the province of Lombardy could mobilize, including astronomers, employees of the Census office, professors residing in Milan and other bureaucratic experts in mapmaking.

Unfortunately, the provincial agents did not work well together. The personal rivalry between Paolo Frisi and the astronomers of Brera compromised the success of the possible collaboration between these scientists and Rizzi Zannoni. Frisi had met Rizzi Zannoni for the first time in mid-December 1777, and initially they both planned to include astronomic observations as part of this cartographic project, thus factoring in the collaboration of the astronomers of Brera. However, soon after, Frisi resorted to underscoring the geodetic dimension of the project in his proposals to the government and relegated the astronomic part to a secondary role.[1096] On the other hand, in a memoir sent to the government on April 18, 1781, the astronomers insisted that geography was subordinate to astronomy and provincial maps were "arbitrary and abnormal" if not connected with celestial points. These scientists' statement that "in France and other parts, the best geographic maps were preceded by similar operations

[1093] Combi, *Una carta topografica della Lombardia*, 32; 34-35.
[1094] AOAB AAV, box 8, December 13, 1777 Firmian to Cesaris.
[1095] Combi, *Una carta topografica della Lombardia*, 35.
[1096] Valerio, *Societa, uomini e istituzioni cartografiche nel Mezzogiorno d'Italia*, 110-111.

performed by astronomers" had the purpose of convincing the government that other states had already recognized the superiority of astronomy.[1097]

Clearly, both Frisi and the Brera astronomers tried to establish their preeminence as coordinators of this cartographic project by bringing to the forefront the area of their expertise, namely geodesy and astronomy, respectively. Scholars trying to explain the conflict that developed between Frisi and the astronomers blamed it either on the astronomers' jealousy and their desire to coordinate this project[1098] or the lack of respect Frisi showed towards the Brera scientists' expertise.[1099] However, identifying a culprit is less important than the impact this lack of cooperation had on the faith of Rizzi Zannoni's project.[1100]

More than three years after Rizzi Zannoni had submitted his proposal, the top scientists in Lombardy could not reach a consensus and failed to obtain the government's approval for any operations. Meanwhile, Rizzi Zannoni received a more tempting offer of employment from the Kingdom of Naples. Despite the Habsburg efforts to delay this mapmaker's departure, by June 1781 he had left Padua for Naples and begun working on a map of those dominions.[1101] Vienna had missed another opportunity to obtain a high quality topographic map of Lombardy.

[1097] AOAB AAV, box 8, April 18, 1781. Plan of astronomical observations with respect to the Geographical Map of Milan and Mantua presented by the Brera astronomers.

[1098] Blessich, "Un Geografo Italiano del secolo XVIII," 197.

[1099] Combi, *Una carta topografica della Lombardia*, 28.

[1100] Frisi refused to convene with the Brera astronomers and maintained a unilateral correspondence with Rizzi Zannoni. The reason he gave for his behavior was that astronomic observations were not a necessary prerequisite for the implementation of Rizzi Zannoni's map project. Moreover, Frisi accused the astronomers of having published faulty astronomic observations and calculations in the Observatory's Ephemerides. AOAB AAV, box 8, April 9, 1781, copy of the letter from Cesaris to Frisi; April 18, 1781, copy of the letter from Cesaris to Firmian; April 28, 1781, letter from the astronomers to Baron de Sperges; May 22, 1781, memoir of the Brera astronomers. The public indictments Frisi brought against the work of his colleagues working at Brera did not remain restricted to governmental circles, but resonated within the larger scientific community. For example, the famous Veronese mathematician, Antonio Maria Lorgna (1735-1796) sent a letter of support to Cesaris congratulating him on the moderation with which he had answered Frisi's accusations. AOAB, AAV, Corrispondenza Scientifica (CS), box 83, June 15, 1782, Lorgna to Cesaris.

[1101] Valerio, *Societa, uomini e istituzioni cartografiche nel Mezzogiorno d'Italia*, 112-117. In 1795, Rizzi Zannoni published a "New Map of Lombardy and its adjacent regions drawn at the order of its Sicilian Majesty" (Nuova Carta della Lombardia e delle sue regioni aggiacenti formata d'ordine di SM Siciliana) that might have been based

8.3 THE BRERA ASTRONOMERS AND THE GEOGRAPHIC MAP OF LOMBARDY

Archival documents do not mention the Map of Lombardy after Rizzi Zannoni's departure to Naples. This archival silence does not mean that the project was abandoned. On February 14, 1785, Kaunitz resurrected the idea and ordered Firmian to safeguard its implementation. The Chancellor considered this an opportune moment, as the provincial government had just finalized the survey and the tax reform for the Duchy of Mantua.[1102] Frisi's death might have been another factor encouraging the resuscitation of this project, as the Brera astronomers could finally coordinate the work without having their scientific authority contested.[1103] As a result of Kaunitz's desire, on May 20, 1786, the government ordered the astronomers of Brera to estimate the total costs for preparing a new geographical map of Lombardy based on both astronomic and geodetic observations. The imperial order also decreed that the astronomers consult Roger Boscovich regarding the implementation of this project.[1104]

This example shows that, although Boscovich had left the Habsburg service in 1773, he continued to act as a scientific consultant for the Habsburg government. On May 26, 1786, Boscovich replied and refused to offer a cost estimate for the project, because he could not predict local conditions and the pace of the work. Furthermore, he argued that the cadastral maps contained faulty information, establishing the position of the topographic elements, such as the flow of the rivers, channels and other points of interest. Therefore, the new mapping project required expensive teams of engineers and surveyors.[1105]

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on some observations he had managed to perform in Lombardy. However, no further information confirms this hypothesis. Combi, *Una carta topografica della Lombardia*, 42.

[1102] Mori, *Il Ducato di Mantova*, 106.

[1103] Combi, *Una carta topografica della Lombardia*, 54-55.

[1104] AOAB AAV, box 8, May 20, 1786, Decree 396 to the astronomers of Brera.

[1105] Combi, *Una carta topografica della Lombardia*, 66-67.

In contrast to Boscovich, the Brera astronomers did not shrink from offering an estimate of the map's costs. As this was not the first time that the Brera astronomers had served as government advisers on this issue, it took them only eleven days to send a detailed memorandum to the provincial authorities.[1106] They projected a cost of approximately 10,000 florins for the project and envisioned the following main steps in the process of the map's production: determining the map's triangulation network, choosing a series of intermediary sites as control points, drawing a manuscript version of the map, and engraving it. The astronomers themselves intended to perform the first stage, namely the measurement of two bases and a series of triangles, and to accompany it with a series of celestial observations performed at Lombardy's borders. For the second step, which entailed establishing the position of intermediary sites and necessitated less-skilled labor, the astronomers recommended the employment of young geometers and engineers in training in order to keep the costs of the operations low. The cadastral maps are presented again in this document as essential sources for the map of Lombardy. Although taking a cautious stance with respect to the accuracy of these cadastral maps, the astronomers show confidence that they could identify and correct any blatant errors with additional measurements. After finalizing on-site measurements and compiling information from the cadastral maps, the astronomers planned to use the meridian of Milan as a reference point for calculating all distances. Similar to the Ferraris proposal for an engraved map of the Austrian Netherlands, the astronomers of Brera hoped to recoup some of the expenses by selling 500 or even 1,000 copies of the final product. However, they warned the government that such cartographic projects always entailed varying costs due to the unpredictable nature of mapping operations.

[1106] AOAB AAV, box 8, May 31, 1786, memoir of the astronomers.

Due to their need to step outside the Observatory and perform on-site measurements, the astronomers requested from the government a variety of instruments, some unavailable in Lombardy. An undated document, probably sent in 1786, signed by Barnaba Oriani, one of the main astronomers working at Brera, provides more information about the nature of the instruments and observations believed to be essential for the new map of Lombardy.[1107] In October 1785, Oriani travelled through most of the Duchy of Milan and performed a series of measurements that confirmed the higher accuracy of the cadastral maps when they did not include hilly or mountainous areas. In Oriani's opinion, as expressed in his memoir, the astronomers could perform geodetic measurements and rectify the cadastral maps in maximum two years. This scientist was also optimistic that performing measurements in the mountainous locations in the border areas would allow the mapmakers to perform observations of sites belonging to Lombardy's neighboring states, information that could be included in the final map.

Oriani considered this cartographic project significant not only in the context of the Habsburg Monarchy. Indeed, this astronomer argued that a new map of Lombardy had the potential to encourage similar projects in neighboring lands, and claimed that in this way, "the Imperial Court would have the honor of having offered the first example and the first push towards perfecting the Geography of Italy, as it [the Court] had already done for its domains in the Low Countries [Austrian Netherlands], Hungary, Austrian Poland etc."[1108] Furthermore, Oriani projected that the map of Lombardy and its triangulation network could connect with Cassini's map of France, as the heights of the Alps were visible from both Italy and France and could thus serve as a bridge. Clearly, Oriani saw a double purpose for the map of Lombardy:

[1107] Ibid., 1786, Barnaba Oriani memoir.

[1108] "e la Corte Imperiale avrebbe l'onore d'aver dato il primo esempio e la prima spinta alla perfezione della Geografia dell'italia, come lo hà gia dato per i suoi dominj dei Paesi Bassi, dell'Ungheria, della Polonia Austriaca etc." Ibid. Combi dates this document to the time interval March-April 1786. Combi, *Una carta topografica della Lombardia*, 63.

satisfying the Habsburg government's desire for a precise provincial map and contributing to the international effort to survey and represent accurately as much land as possible. In this way, Oriani considered himself not only a Habsburg employee, but also a member of the larger scientific community.

As a result of Oriani's commitment to developing international links, it is not surprising that, in the spring of 1786, he accepted Chancellor Kaunitz' proposal to submit a plan for a journey to acquire scientific instruments needed to perform the geodetic operations for the new map of Lombardy.[1109] Oriani proposed an itinerary from Milan to London with stops in important cultural and astronomical centers, including Turin, Genoa, Strasbourg, Mannheim, Frankfurt, Brussels, Amsterdam and Paris. The journey had a dual goal: ordering high quality instruments in London to perform the geodetic and astronomic measurements required to complete the map of Lombardy and connecting the Brera Observatory and its astronomers with similar foreign institutions and scientists.[1110] Plenipotentiary minister Wilzeck and Chancellor Kaunitz had no hesitations in approving financial support for Oriani's journey, which they considered a beneficial enterprise both for the future of the Brera Observatory and the success of the map of Lombardy.[1111] However, Kaunitz conditioned Oriani's trip on a pledge that the scientist had to make to not abandon the work on the map of Lombardy in exchange for an offer

[1109] Combi, *Una carta topografica della Lombardia*, 57-58.

[1110] AOAB, Collection B Oriani, box 206, fascicle 2, April 1786, Barnaba Oriani's proposal. This document is also discussed in Guido Tagliaferri, Pasquale Tucci," The visit to the Low Countries in 1786 of the astronomer Barnaba Oriani of Milan," in *Italian Scientists in the Low Countries in the XVIIth and XVIIIth centuries*, eds. C.S.Maffioli and L.C.Palm (Amsterdam: Rodopi, 1989), 277-290.

[1111] AOAB AAV, box 9, fascicle 18, April 18, 1786, Wilzeck to Oriani; Combi, *Una carta topografica della Lombardia*, 64. Oriani's journey benefitted from the diplomatic apparatus of the Habsburg Monarchy, as Wilzeck recommended him to the Habsburg ministers and other imperial officials stationed in cities such as Brussels, Amsterdam, Hague, London, and Paris. AOAB, Collection B Oriani, box 206, fascicle 2, 1786, April, Oriani to Wilzeck and June 19, 1786, Oriani to Franchi. Additionally, Boscovich also submitted letters of recommendation on Oriani's behalf to some of his contacts that could prove helpful during the trip. AOAB, Collection B Oriani, box 206, fascicle 2, April 30, 1786, Boscovich to the Marquis of Paulmy and the Cardinal of Luynes.

of employment by another European monarch.[1112] After Rizzi Zannoni abandoned his commitment to the map of Lombardy in exchange for a better offer from Naples, Kaunitz wanted to make sure Vienna would not lose another valuable mapmaker.

During the journey, Oriani maintained a regular correspondence with Wilzeck and kept this minister informed about the people he encountered, the state of science in the various lands he visited, and even his participation in scientific observations such as the balloon ascent of Jean-Pierre Blanchard in Brussels in the summer of 1786.[1113] As illustrated by Oriani's diary entries at various points in the journey, the astronomer examined maps that could have served as a model for or continuation of the map of Lombardy. On May 16, 1786, during his stay in Lucerne, Oriani met François Louis Pfeiffer de Wyher (1716-1802), an ex-captain in the Swiss guard who had performed detailed topographic surveys for some parts of Switzerland. The map this cartographer showed to Oriani included 136 sections and surprised the Italian astronomer with its ambitious scope and precision. Oriani even expressed the hope that the Swiss map could be connected with the future map of Lombardy.[1114] One month later, in Brussels, Oriani obtained access to the original maps Ferraris and his artillerymen had prepared for the Austrian Netherlands.[1115] Considering that Chancellor Kaunitz had suggested to the government in Milan his desire to take the Ferraris map as a model for a similar venture in Lombardy, Oriani's interest in the work of this cartographer is to be expected.

Throughout his journey, Oriani actively pursued meetings with renowned astronomers. In Brussels, he visited Jean-Baptiste Chevalier, member of the Imperial and Royal Academy of Sciences and Letters in Brussels, a strong promoter for the establishment of an observatory in the

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[1112] ASM Confini p.a., box 5, May 4, 1786, Kaunitz to Firmian.
[1113] AOAB AAV, box 9, fascicle 18, June 6, 1786; July 4, 1786; July 22, 1786. Wilzeck to Oriani.
[1114] *Un Viaggio in Europa nel 1786: Diario di Barnaba Oriani Astronomo Milanese*, eds. Agnese Mandrino, Guido Tagliaferri, and Pasquale Tucci (Florence: Leo S. Olschki, 1994), 56-57.
[1115] Ibid., 84-85, 87.

Austrian Netherlands.[1116] In Paris, Oriani hoped to meet the famous scientist Cassini IV, who had offered in 1776 to map Tuscany, then ruled by Maria Theresa's son, Leopold. Continuing in his father's footsteps, Cassini IV was also an established astronomer. Although Oriani failed to encounter Cassini IV, who was out of town at the time, the French scientist later contacted him and requested some of the volumes of the Ephemerides published under the auspices of the Brera Observatory, thus expressing his vivid interest in the scientific activity of Lombardy's astronomers.[1117]

After his arrival in London, Oriani learned from General William Roy (1726–1790) about a joint project agreed upon by London and Versailles measuring the difference between the Greenwich and Paris meridians.[1118] The English king, George II, had commissioned Roy and the royal engineers to implement this work.[1119] With the help of triangulation, Cassini de Thury had already established the difference in longitude between Paris and Vienna, and he hoped to perform similar work in Italy, as discussed in the previous chapter section. Therefore, measuring the longitude difference between Greenwich and Paris would provide one more piece in Cassini de Thury's ambition to create a global network.

The main focus of Oriani's journey was ordering instruments for the Observatory, and he was highly successful. Indeed, the contacts this astronomer made during his 1786 trip proved useful in the years to come regarding this aspect. The instruments ordered in London served the astronomers in Brera in their daily activities, including their work on the map of Lombardy. By

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[1116] AARS AA, ARB 39, 196. *Un Viaggio in Europa nel 1786*, 85. Tagliaferri and Tucci also published an article discussing Barnaba Oriani's sejourn in the Austrian Netherlands, in which they discuss the importance of the Ferraris Map for the Astronomers' project. Tagliaferri and Tucci, "The visit to the Low Countries in 1786 of the astronomer Barnaba Oriani of Milan."

[1117] *Un Viaggio in Europa nel 1786*, 154-155; AOAB, Collection B Oriani, box 206, fascicle 2, 1786, Cassini IV to Oriani,.

[1118] *Un Viaggio in Europa nel 1786*, 139-140,

[1119] Jean-Pierre Martin and Anita McConnell, "Joining the observatories of Paris and Greenwich," *Notes and records of the Royal Society of London* 62, no. 4 (2008): 356.

the second half of the eighteenth century, London had emerged as the center of scientific instrument-making and Oriani was not the first nor the last European scholar travelling all the way there to put in an order.[1120]

Hans Moritz von Brühl (1736-1809), Saxon minister plenipotentiary in London and astronomer, proved extremely helpful in ensuring the implementation of Oriani's orders for instruments.[1121] Brühl had an extensive knowledge of and connections with numerous instrument makers located in London. For example, on May 28, 1787, Brühl informed Oriani that he had ordered a sextant and put on hold a theodolite from the Dollond family's shop. Although Oriani would have preferred purchasing a theodolite from Ramsden, Brühl assured him that by adding a second telescope to Dollond's theodolite, the final product would be as good as any instrument manufactured in Ramsden's workshop.[1122] When Oriani insisted on acquiring a theodolite with two telescopes from Ramsden, his determination proved futile, as the manufacturer sold the one available instrument fulfilling these requirements to another customer. Brühl insisted again on the idea of making the purchase from Dollond's shop.[1123] However, it quickly became clear that Dollond's theodolite could not accommodate the addition of a telescope, and Brühl contacted manufacturer John Stancliffe.[1124] Luckily for Oriani, Brühl was able to navigate with dexterity the complex Londonese network of instrument-makers and retailers.[1125]

[1120] For information about the emergence of scientific instruments and the role of London in the scientific instruments' trade, see G.L'E.Turner, "Eighteenth-Century Scientific Instruments and their Makers," in *Eighteenth-Century Science. The Cambridge History of Science*, vol. 4, 511-535. To read more about the impact of instruments on the history of science, see Bourguet, Licoppe, and Sibum *Instruments, Travel and Science*.

[1121] Anita McConnell, *Jesse Ramsden (1735-1800). London's Leading Scientific Instrument Maker*. (Aldershot, England: Ashgate, 2007), 124; "BRÜHL (Heinrich Reichsgraf v.)" in *Allgemeine Encyclopädie der Wissenschaften und Künste*, vol. 13, http://gdz.sub.uni-goettingen.de/dms/load/img/?PPN=PPN346936519&DMDID=DMDLOG_0341, last accessed on November 20, 2014.

[1122] AOAB AAV, CS, box 85, May 28, 1787, Brühl to Oriani, London.

[1123] Ibid., June 25, 1787, Brühl to Oriani, London.

[1124] Ibid., July 13, 1787, Brühl to Oriani, London.

[1125] Turner, "Eighteenth-Century Scientific Instruments and their Makers," 527.

Ordering a sextant did not prove straightforward either. Dollond's worker in charge of that task had so many other orders to honor that the waiting time for a customized sextant could have easily reached a couple of years. Therefore, Brühl suggested to Oriani that he purchase a version of this instrument already available in Dollond's shop.[1126] In the end, to accommodate Oriani's special order for the sextant, Brühl had to order the instrument from the Troughton workshop, and the Italian astronomer was very satisfied with the final product.[1127] Once the instruments were finished, Brühl sent them towards Milan either through Brussels, via the Habsburg plenipotentiary minister of the Austrian Netherlands, Count Belgiojoso, or on ships travelling to Genoa or other Italian ports closer to Milan.[1128]

By the end of July 1788 Brühl had sent to Milan a theodolite and a sextant; and although the instruments were not manufactured in Ramsden's shop, the German astronomer hoped that Oriani and his colleagues would use them successfully during the trigonometric operations for the map of Lombardy.[1129] The correspondence between Oriani and Brühl illustrates the complexity of the process of ordering geodetic and astronomic instruments. Sending a commission to a reputable manufacturer did not ensure the successful delivery of the instrument, unless the client monitored the production process and answered additional queries regarding the customization of the device. The limited number of expert instrument makers introduced further delays in the production process and maintained the prices elevated. The Habsburg astronomers' active participation in this highly specialized market demonstrates their membership in the community of leading scientists in the fields of astronomy and geodetic measurements. Crossing

[1126] AOAB AAV, CS, box 85, June 25, 1787, Brühl to Oriani, London.
[1127] Ibid., box 86, May 28, 1788, Brühl to Oriani, London; February 27, 1789, Brühl to Oriani, London.
[1128] In June 1787, Brühl sent a clock to Belgiojoso. Ibid., box 85, June 25, 1787, Brühl to Oriani, London.
[1129] Ibid., box 86, August 19, 1788, Brühl to Oriani, London.

boundaries repeatedly during his journeys and correspondence, Oriani helped consolidate the position of the Brera Observatory as an active node in the network of Enlightenment.

No instrument was more important for the astronomers of Brera than the mural quadrant they had ordered from Ramsden. Mural quadrants were essential instruments to fix the position of stars.[1130] The Brera observatory had possessed a quadrant since 1768. However, the faulty construction of the instrument led to numerous errors in the astronomers' calculations, which encouraged them to request financial help from the government for the acquisition of a more precise quadrant.[1131] The Brera astronomers were not the only scientists seeking Ramsden instruments. This London manufacturer rose to fame in the last quarter of the eighteenth century, and scientists travelled from far away to buy and order custom geodetic and astronomic instruments. Even though Ramsden constantly failed to respect agreed-upon deadlines, the accuracy of the final products preserved the success of his business.[1132] The mural quadrant Oriani ordered during his stay in London was an essential instrument for identifying accurately the geographical coordinates of the Brera Observatory, and therefore would have contributed to the precision of the map of Lombardy.[1133]

The Habsburg government's direct interest in the success of the cartographic operations ensured Wilzeck's approval of a subsidy of 600 *zecchini* to help the astronomers cover the cost of the mural quadrant.[1134] Furthermore, once in London, Oriani visited Ramsden's shop together with the Habsburg consul Antonio Songa.[1135] The presence of this Habsburg official probably had the function of signaling to the London manufacturer the direct interest of the Habsburg ruler

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[1130] "Mural Quadrant" in *History of Astronomy: An Encyclopedia*, ed. John Lankford (New York: Garland, 1997), 340-341.
[1131] McConnell, *Jesse Ramsden*, 138
[1132] Ibid., 6-7.
[1133] Ibid., 88.
[1134] AOAB AAV, box 9, fascicle 18, April 18, 1786. Wilzeck to Oriani.
[1135] McConnell, *Jesse Ramsden*, 138

in the commissioning of the mural quadrant to enhance the likelihood of a speedy execution of the order. However, this probable intent did not materialize. Based on Brühl's letters to Oriani, we know that although the work on some of the quadrant's components was in full swing by the summer of 1787, the quadrant was finalized only in 1790, four years after the initial order.[1136] The astronomers finally installed the instrument in Brera in the summer of 1791.[1137] Obtaining a quadrant from the top instrument maker in Europe increased the reliability of the measurements performed in Brera, and thus raised the profile of their publications, such as the annual Ephemerides.

Before the installation of this quadrant, the Brera astronomers spent some years working on the Map of Lombardy. After Oriani's return to Milan and while waiting for the arrival of some instruments ordered in London, the astronomers ensured the fabrication of some other apparatuses with the help of Brera's mechanic, Giuseppe Megele.[1138] Trained in Vienna by Liesganig, Megele had been working as a mechanic at the Observatory of Brera since 1773.[1139] Therefore, the astronomers had to rely on imperial and trans-imperial connections to obtain the necessary instruments for their cartographic work.

By August 1788, the astronomers had completed the measurement of the basis for their triangulation networks in the area along the River Ticino between Nossate and Soma. Performing measurements along the river had two advantages: it reduced the effort required for the transportation of instruments and the results of the measurements could help the government to improve the irrigation system in the area. In their report to Lombardy's government, the

[1136] AOAB AAV, CS, box 85, July 13, 1787, Brühl to Oriani, London.
[1137] McConnell, *Jesse Ramsden*, 139.
[1138] AOAB AAV, box 8, April 1788, the astronomers to the Government.
[1139] Liesganig trained Giuseppe Megele (1740-1816) at the Observatory of the Vienna University. Monti and Mussio, "L'Attività Geodetico Astronomica, topografica, Cartografica degli Astronomi di Brera dal 1772 al 1860," 304.

astronomers describe the methodology they used in detail; providing such specifics corroborated the validity of their measurements. In the first stage, the scientists identified two tall points, namely the bell tower of Nossate and a nearby church. They positioned ten indicators between these reference points and measured the distance with the help of instruments such as an English theodolite and a telescope. The English theodolite mentioned in this report was probably acquired thanks to Barnaba Oriani's efforts. Next, the astronomers added to the triangle the bell towers of Busto and Soma. Once they linked the bell towers of Busto, Soma, Nossate and some other key sites by determining their angles, the astronomers finalized the first stage of the operations. During this measurement campaign, the astronomers had to pay special attention to preserving the properties of the metal measurement units that were sensitive to variations in temperature.[1140]

For the second stage of their geodetic operations, the astronomers split into more teams and continued building the triangulation network in different provinces. For this phase, they requested and obtained from the government copies of a printed map of Lombardy to ensure the coordination of their measurements.[1141] The measurement of the triangles continued without problems in 1788 and 1789, and the astronomers determined the distances and positions for towns and sites from the western to the eastern extremity of the State of Milan.[1142] The work was not extended to the Duchy of Mantua until 1790 due to the astronomers' concurrent commitment to publish the volumes of the Brera Ephemerides for 1790 and 1791.[1143]

[1140] AOAB AAV, box 8, August 10, 1788, report of the astronomers to the Royal Imperial Council on how they measured the basis.
[1141] Ibid.; Ibid., August 21, 1788, the Royal Imperial Council to the astronomers.
[1142] Ibid., December 1788, Francesco Reggio to the Royal Imperial Council; Ibid., August 24. 1789, Reggio, de Cesaris, Oriani to the Royal Imperial Council.
[1143] Ibid., August 24, 1789, Reggio, de Cesaris, Oriani to the Royal Imperial Council; Ibid., March 12, 1790, de Cesaris, Reggio, Oriani to the Royal Imperial Council.

In addition to performing geodetic measurements, the astronomers had to rely on the information encompassed in the cadastral maps. Therefore, in the beginning of 1788, they requested the government's permission to utilize these cartographic documents. Initially, the representatives of the Census Office refused to share this data,[1144] and we can infer that the provincial or central government had to interfere to ensure the astronomers' access to the maps.

One issue important for the Viennese Court since the early 1750s had been establishing the position of Lombardy's borders and concluding treaties with neighboring states to avoid further conflicts. With the exception of the border segment with Parma and Piacenza (discussed in chapter 6), the Habsburg government was successful in marking Lombardy's borderline during Maria Theresa's reign. Once Joseph II inherited the throne in 1780, he reinforced Vienna's commitment to defending the inviolability of Lombardy's borders. Indeed, an imperial decree from 1786 stipulated that the local authorities from Lombardy's administrative subunits located on the borders had to perform trimestral, monthly or weekly inspections to observe the position of the frontier line.[1145]

The government's vow to defend Lombardy's borderlines encouraged the authorities to try to obtain geographic information about the neighboring areas lying outside this province. Therefore, on October 20, 1788, the Habsburg government announced that "any map would be faulty if it does not include the indication of Lombardy's borders with the foreign states, and the places of these [foreign states] close to the borders."[1146] This order was not news for the Brera astronomers, as Kaunitz had expressed since the 1770s his strong desire for a Map of Lombardy that would include part of neighboring territories. Therefore, during the month of October 1788,

[1144] Ibid., March 1788, memoir of the Astronomers.
[1145] Scotti, "L'immagine della Lombardia nel secolo XVIII," 33-34.
[1146] "che qualunque carta sara sempre difettosa, se vi manca l'indicazione dei confini della Lombardia cogli stati esteri, e dei luoghi di questi ultimi prossimi al confini," AOAB AAV, box 8, November 11, 1788, the Royal Imperial Council to the Astronomers.

the astronomers connected sites and settlements from the western part of Milan with territories outside the Habsburg lands located across the Ticino River and the Lake Maggiore.[1147] In this way, the Map of Lombardy offered not only an accurate image of the Habsburg of territory but, just as with the Great Military Map of Transylvania, overflowed across the borderlines. Figure 8.1 reproduces part of the second map sheet of the Brera Astronomers' Map of Lombardy as an example.[1148] The density of settlements and roads shown for the territory of the State of Milan surpasses the amount of detail incorporated for the lands west of Lombardy. Still, when compared with the earlier Ramis Map, which included nothing across the Lombardy's borders, the Astronomers' Map was substantially better.

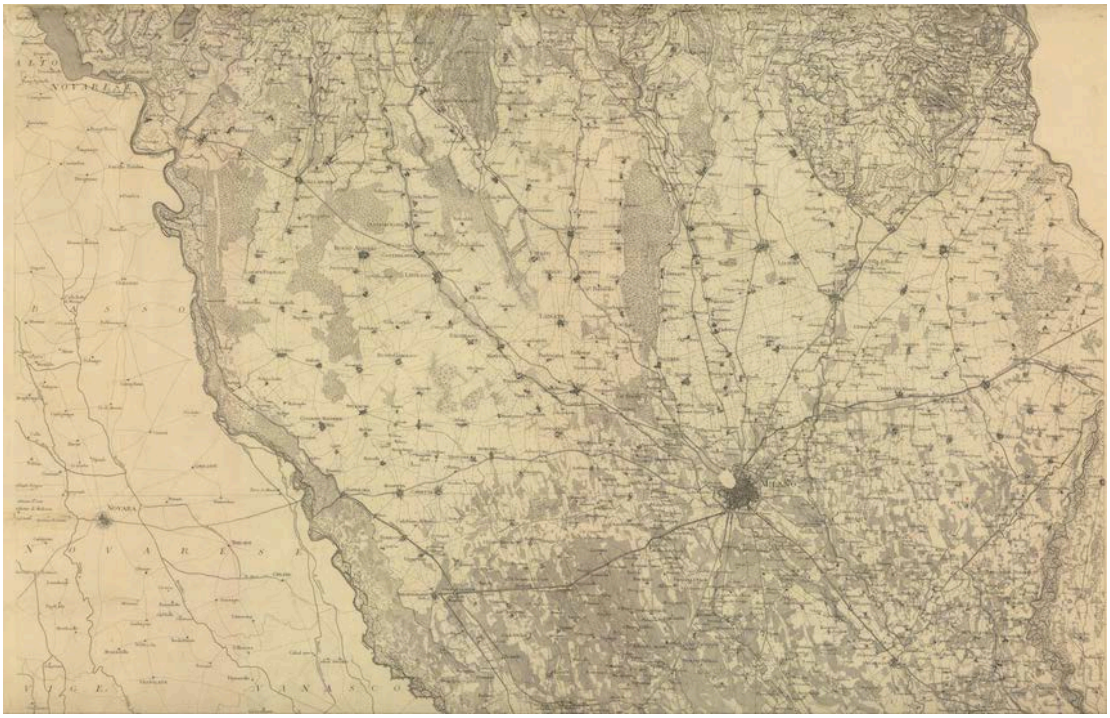

Figure 8.1 Sheet Two from the Map of the Brera Astronomers

[1147] Ibid., December 1788, Francesco Reggio to the Royal Imperial Council.
[1148] ASM, "Carta topografica del Milanese e del Mantovano basata sulle misure effettuate dagli astronomi di Brera fra il 1788 e il 1791," sheet 2.

Rather than choosing as a map scale the scale of the Great Military Map, the astronomers selected the scale of Cassini's Map of France (1:86,400).[1149] This decision might have been influenced by Ferraris's decision to publish the *Carte Marchande* of the Austrian Netherlands at the same scale as Cassini's Map of France. The choice of the map's scale shows how in addition to fulfilling the Habsburg imperial goals, the astronomers conceptualized the Map of Lombardy as a testimony of their cartographic ability and their contribution to the European corpus of topographic maps.

8.4 CONCLUSION

Kaunitz did not live to see the geographic map of Lombardy he so desired. After the Chancellor's death in 1792, only eight out of the nine map sheets of the Brera Astronomers' Map were engraved before the French invasion of Lombardy in 1796. In the face of the French danger, the Habsburg authorities sent the already engraved maps, the drawings, and the plates to Vienna. The last sheet was engraved in Vienna and by the time the complete map was ready for distribution and made its way back to Milan, its importance had declined sharply. The French topographers had surveyed the territory themselves and had integrated their map of Lombardy into a larger geographical context that included a large part of the Pò valley and the newly formed Cisalpine Republic.[1150] Soon after its completion, the Map of the Brera astronomers was already showing an outdated political reality and had lost its relevance for the government.

This chapter shows, that, in the case of Lombardy, the existence of detailed cadastral maps from the middle of the eighteenth century tempered the government's enthusiasm to invest

[1149] Signori, "La cartografia lombarda fra tradizione catastale ed esigenze amministrative," 59.
[1150] Scotti, "L'immagine della Lombardia nel secolo XVIII," 39; Scotti, "La cartografia lombarda," 124.

in another set of large-scale cartographic works. Instead, Vienna prioritized the mapping of provinces for which there were no large-scale cartographic sources, such as Transylvania and the Austrian Netherlands. And in the end, the Great Military Map was never extended to Lombardy for financial and military reasons. Even when Chancellor Kaunitz pursued the implementation of a precise map of Lombardy based on geodetic and astronomic measurements, he envisioned this project as a way to show the world the Habsburg prowess in the field of mapmaking. Therefore, it was to be expected that the astronomers of Brera, active members of an international network of scientists, took the lead in the mapping of Lombardy. The story of the map of Lombardy demonstrates that not all Habsburg-sponsored international collaborations were fruitful. Nonetheless, both successful and failed trans-imperial enterprises reveal Vienna's commitment to participate in the multi-polar dialogue that shaped cartography in the Age of Enlightenment.

9.0 CONCLUSION

The map-mindedness of the Habsburg leading triad between 1740 and 1790, including empress Maria Theresa, Emperor Joseph II and Chancellor Kaunitz, determined an intensification of geographic enterprises, ranging from large-scale topographic surveys, border maps, the measurement of meridian degrees, geographic provincial maps and maps of strategic areas, such as fortresses and mountain passes. This list is far from exhaustive, but is representative of the various scales that Habsburg mapping encompassed. As maps permeated the fabric of government, obtaining visual information about far-away provinces became a priority for the Viennese decision-makers, whether they attempted to improve the fortification system or outsmart their neighbors in diplomatic negotiations regarding the positions of the borderline.

This dissertation offers examples for different types of maps and shows some commonalities of imperial cartography in the eighteenth century. First of all, mapmakers became affiliated with imperial institutions. The Habsburg corps of engineers, the artillery corps of the Austrian Netherlands and the imperial astronomers active in Vienna and Milan all shared a belief in the power of mathematics and measurement instruments to transplant the complexity of the landscape to a two-dimensional medium. As these expert groups monopolized the science of mapmaking, they developed a set of criteria that validated the quality of maps. Surveying expeditions became a necessary prerequisite for accurate and reliable maps, as engineers and astronomers busied themselves with measuring the Habsburg territory.

The second element bridging the various types of Habsburg maps was the desire of imperial authorities to curtail the circulation of sensitive information. Vienna attempted to impose these "intentional silences"[1151] with the help of military institutions. The rigid hierarchy and centralized nature of the army encouraged a culture of secrecy. The Aulic War Council strived to collect all strategically valuable maps in Vienna and limit the access to these sources. As shown in chapter 1, one of the standard procedures after the death of Habsburg officers, especially if they had mapmaking responsibilities, included retrieving all sensitive cartographic material before other parties accessed the information. It is doubtful that this collection strategy was without fail, especially when officers perished in conflict areas. Also, even the Aulic War Council's attempt to retrieve unauthorized copies of maps from Habsburg subjects, as shown in chapter 7 for the case of the map of Transylvania, reveals that provincial actors sometimes disregarded their superiors' directives. Clearly, the effort of the decision-makers in Vienna to control the circulation of maps had its limits. Still, the Aulic War Council maintained its monopoly of production and preservation of military maps, especially in manuscript form.

The third element that confers unity to Habsburg maps was the preoccupation of Vienna's rulers with eliminating territorial enclaves, eradicating frontier disputes and establishing linear borderlines. These priorities led to a quantitative explosion of border maps. Vienna had been at the forefront of employing maps in the service of border treaties, ever since the implementation of the 1699 Treaty of Karlowitz. Situated in the center of Europe and bordering numerous states, the Habsburg Monarchy contributed significantly to the development of a more or less standardized European approach to border negotiations. Combining legal and historical documents with visual representations of the contested lands and sending joint

[1151] John Brian Harley, "Silences and Secrecy: The Hidden Agenda of Cartography in Early Modern Europe," *Imago Mundi* 40 (1988): 57-76.

demarcation commissions to implement border treaties, the Habsburgs and their negotiating counterparts strived to assume economic and social control of contested borderlands. Even the Great Military Survey of Transylvania, the Ferraris map of the Austrian Netherlands and the Astronomers' Map of Lombardy devoted special attention to the frontier areas and, in some cases, spilled over the imperial borders. The Great Military Map of Transylvania served as the stepping-stone for extending Habsburg maps to foreign lands, namely the borderlands of Moldavia and Wallachia. Ferraris convinced the prince bishop of Liège and the prince abbot of Stavelot to allow his artillerists to survey their lands. Clearly, there was a pattern for mapping as an antecedent of Habsburg expansion or territorial adjustment. Therefore, it is not surprising that, in the case of the geographic map of Lombardy, Kaunitz's desire to incorporate information about the neighboring areas could not be easily accommodated; the Duchy of Parma did not allow Habsburg engineers to step on their lands due to fear of Habsburg expansionism.

Last but not least, the Habsburg rulers co-opted the assistance of large-scale topographic maps to quantify their natural and human resources. The Great Military Map together with the Ferraris Map covered most of the provinces of the Monarchy and offered extensive information about all settlements, the road network, the natural resources, the landscape and other significant sites for each area. Preserved in manuscript form, these large-scale maps constituted the first consistent representation of most of the lands of the Habsburg Monarchy. The general quartermaster's officers directed the surveying of contiguous Habsburg provinces and they employed similar techniques of collecting information and transposing the imperial geography on maps. Ferraris and his subordinates from the artillery corps of the Austrian Netherlands had a similar training and their cartographic work can be interpreted as an extension of the Great Military Map.

The production process of Habsburg maps in the second half of the eighteenth century problematizes the notion of authorship. Vienna guided the mapmakers in their representational choices, prioritizing information about imperial borders, military objectives and economic resources. The mapmakers themselves worked in teams and in some cases, such as the Ferraris map or border demarcation surveys, employed cartographic material produced in foreign centers. Often forgotten, the local population contributed significantly to the mapping of their regions. As the case of Transylvania underscores, the inhabitants of this region assisted the imperial mapmakers not only with information about the land's toponymy and logistics support, such as housing, means of transportation and food; officers with some mapmaking skill belonging to the military border regiments acted as surveyors and draftsmen. Therefore, we should interpret the Great Military Map, the Ferraris Map, the border demarcation maps and the geographic map of Lombardy as collective projects, benefitting from the input of various layers: provincial, imperial, and trans-imperial.

Extending the idea of communication across borders, we can conceptualize Habsburg mapmakers as knowledge-brokers, mediating between the networks of scientific Enlightenment and the Habsburg political centers. Military engineers, such as Michel Angelo de Blasco, Mihály Lajos Jeney, and Ferraris, together with astronomers including Maximilian Hell, Roger Boscovich, and Barnaba Oriani, crossed political borders, sometimes repeatedly, and contributed to the circulation of geographic knowledge. And although not all of them ended their career in the service of Vienna, their Habsburg connections lasted throughout their lives. Most of the biographical sketches I selected underscore links between Vienna and Versailles, due to the nature of my research trips and archival serendipity. Nonetheless, the journey of Maximilian Hell to Denmark's province of Lapland and de Blasco's transfer into the Portuguese service suggest

that further investigations would probably yield information about other international connections that facilitated the development of Habsburg cartography. The efforts of the Brera astronomers to acquire instrumentation from London and the attempt of Boscovich and Liesganig to travel to America as part of a mission sponsored by the Royal Society suggest additional links. Considering the transimperial careers of mapmakers challenges us to reevaluate the existence of a distinct Habsburg cartography. Instead of conceptualizing the development of mapmaking along national or imperial lines, we need to address the existence of international experts, whose ability to coordinate cartographic enterprises recommended them to political rulers as desirable employees. In the eighteenth century, these mapmakers' visual vocabulary, the instruments they used, and their land surveying technologies converged, contributing to the development of similar European and even global standards about what made a map accurate.

The work of expert mapmakers could not have been possible without the interest and vast resources of imperial polities. Purchasing instruments necessary for land measurements and astronomic observations, hiring people to help with the logistical matters of scientific ventures, and relying on governmental agents to access certain territories were essential matters ensuring the success or failure of cartographic projects. Even though Ferraris was a recognized mapmaker who relied on his subordinates from the artillery corps, in order to map the Austrian Netherlands he required financial help from Vienna and the collaboration of provincial authorities.

On the other hand, the imperial decision-makers' desire for the preparation of certain maps was not sufficient either. As the case of the geographic map of Lombardy revealed, Chancellor Kaunitz's persistence in commissioning this work encountered numerous obstacles. The astronomers working at Brera and Paolo Frisi squabbled over the methodology and the leadership of the project. And even after the government acknowledged the astronomers'

foremost role in mapping Lombardy, acquiring specific surveying instruments delayed the implementation of this enterprise.

Based on the examples included in the dissertation we conclude that the success of Habsburg cartographic projects depended on the financial and logistical support of the Viennese political leaders, the existence of mapmakers capable to coordinate the enterprise, and the collaboration of provincial officials.

In addition to drawing conclusions about the history of Habsburg cartography, this dissertation illuminates the functioning of the Monarchy's government. Despite the efforts of Maria Theresa and especially Joseph II to centralize their dominions, the mechanics of cartographic enterprises in Transylvania, the Austrian Netherlands and Lombardy reveal the variety of provincial institutions and approaches employed to manage the geography of these areas. Whereas the Austrian Netherlands and Lombardy had a pre-eighteenth-century tradition of mapmaking, schools for training engineers and a body of cartographic knowledge, Transylvania was deficient in these respects. But when it came to the actual implementation of Habsburg imperial projects, the efficient military chain of command in Transylvania trumped any potential disagreements with provincial authorities about the project. If financial and human resources had allowed it, Maria Theresa would have used the mapping of Transylvania to gather detailed information about the value of taxable lands in order to curtail fiscal evasion. In less than four years, the officers of the general quartermaster's staff and of the regiments deployed in Transylvania finalized the Great Military Map and extended it to Moldavia and Wallachia. In the case of Lombardy and the Austrian Netherlands, obtaining a good geographic map of these areas relying on coopting provincial civil authorities in the mapmaking effort. The paper trail of the Ferraris Map demonstrates that the governor of the province had to issue specific orders to all the

administrative units of the Austrian Netherlands to enlist their aid. Still, obtaining information about the position of borderlines and the toponymy of each region remained a convoluted affair.

Examining Transylvania, the Austrian Netherlands and Lombardy allows us to grasp both the diversity of cartographic projects in the Habsburg Monarchy and the diverse political interactions between Vienna and provincial centers. These case studies cover three different segments of the imperial borders and thus include trans-imperial interactions with a variety of political neighbors. Even though these three examples are only a subset of the total number of Habsburg dominions, their experiences stand in for other regions as well.

One of the main topics this dissertation investigated was the contribution of cartography to the emergence of imperial borderlines. The desire to consolidate the natural border consisting of the Carpathian Mountains with a tracing of the borderline favoring Transylvania's defense influenced the Habsburg policy in the area. In the case of their Transylvanian borderlines, the Monarchy obtained not only a frontier demarcation favorable to Vienna, but also the northern part of Moldavia. Profiting from the subordinate rapport between Moldavia and the Ottoman Court, and Constantinople's need for a peaceful relationship with Vienna, the Habsburg authorities greatly diminished the value of Moldavian maps in the border negotiations.

Examining the process through which the Viennese rulers laid their claims in the border areas identified the significant role of provincial mapmakers and military agents. Applying the standards of Habsburg military engineers regarding what made a map accurate, the Transylvanian Stephan Lutsch von Luchsenstein discredited the spatial representations of the Moldavians from the 1750s and 1760s and challenged their understanding of the boundary areas' geography. The creation of special border regiments in Transylvania consolidated the Habsburg control of the frontier areas, as officers belonging to these regiments inspected the position of the

border markers. These regiments served as the first line of defense not only against military enemies but also by enforcing the sanitary cordon, the customs regulations and the circulation of migrants. With the help of provincial agents and the geopolitical situation, Vienna imposed its territorial desires in the Transylvanian borderlands. The documents of the 1775 Habsburg-Ottoman convention included a map modeled on the cartographic standards of Viennese mapmakers, thus demonstrating that the Habsburgs were victorious not only from a political point of view, but also from a scientific one.

Delimiting clear borderlines did not go as planned for Vienna in all provinces. The first border treaty signed with France in 1769 aimed to eliminate territorial disputes on the Austrian Netherlands' frontier. But this document failed to offer a definitive solution. The implementation of the convention's articles led to another decade of negotiations and the conclusion of a new treaty. The joint French-Austrian border commissions argued over newly discovered enclaves, regardless of their size, and both sides prepared memoranda and counter-memoranda to support their arguments for the trajectory of the borderline. The Austrian Netherlands' experienced military engineers and the Giunta of Contested Lands found their match in the negotiating ability of French agents, such as the jurist Christian-Frédéric Pfeffel. Using cartographic weapons similar to those of the Habsburgs, Pfeffel defended the French political and commercial interests in the borderlands and his work paved the way for the second border convention.

In addition to having to confront an equal opponent, the Habsburg representatives in the Austrian Netherlands had to tackle the interests of the four separate entities belonging to this province and bordering the French lands: the counties of Flanders and Hainaut, the duchy of Luxembourg and the city of Tournai. Rather than pursuing the border negotiations in Brussels by taking into account only the priorities of Vienna and Versailles, the French and Habsburg

diplomats had first to obtain the approval of the provincial Estates of Flanders, Hainaut, Luxembourg, and Tournai. The institutional and administrative complexity of the Habsburg governance in the Austrian Netherlands, together with the political strength of their neighbor, explains the convoluted nature of the border negotiations in this part of the empire.

The longwinded discussions with the duke of Parma and the failure of the Habsburg Court to trace a clear borderline between Lombardy and this duchy offers a counter-example to the success of Vienna in demarking imperial frontiers in Transylvania and the Austrian Netherlands. Even in the case of Lombardy, the Monarchy achieved the negotiation and signing of treaties with other neighbors, including the Republic of Venice, the Kingdom of Sardinia and the Duchy of Modena. The strategic and economic value of the Pò River, separating Vienna's dominions from Parma, raised the stakes of the negotiation, especially after Joseph II expressed his desire to take full control of this waterway. The existence of skilled engineers both in Parma and Lombardy, together with the preparation of detailed historical and legal memoranda debating the ownership of the contested lands located on the banks of the Pò, were insufficient. The Duke of Parma refused to accept any of the Habsburg territorial claims and brought into the conflict his Bourbon relatives ruling in France and Spain. As bilateral negotiation became a trans-imperial dialogue involving four rulers, the conflicts between the Parmesan and Lombardy's inhabitants in the border areas intensified and no consensus could be reached by the end of Joseph II's reign.

These three case studies of border demarcations cover a small percentage of the entirety of Habsburg frontiers. Nonetheless, they reveal some key factors in understanding the evolution from jurisdictional to territorial sovereignty in the eighteenth century. Regardless of their size, European states, such as the Habsburg Monarchy, France, the Duchy of Parma and the Ottoman Empire, prioritized the interests of central political rulers against provincial interests. The rise of

maps as crucial negotiating weapons spanned the whole continent. Military engineers prepared detailed territorial representations that brought the complexity of the borderlands to the tables of diplomatic negotiators. An increased awareness about the local geography of the frontier lands increased the governments' commitment to eliminate ambiguous situations and to define clear borderlines.

At the same time as the Habsburg rulers identified the necessity to define clear borderlines as a political priority, they also desired to inventory the resources of their own dominions. Examining the production of Habsburg maps reveals the utilitarian face of the Enlightenment. The central and provincial government gathered information about the landscape features and the human geography of Vienna's dominions in order to negotiate successfully territorial exchanges, demark borderlines, improve the defense of the empire, extract economic resources, and increase taxes.

The Great Military Map of Transylvania engaged the efforts of imperial and provincial mapmakers and, together with emperor Joseph II's 1773 journey to this province, increased the visibility of this area in Vienna. Although Maria Theresa failed to employ the survey work for this map as a pretext to reevaluate the taxation system, the Habsburgs gathered a diverse array of economic information about settlements, mines, crops and roads. On the opposite side of the empire, Ferraris developed a project similar in scope to the Great Military Map. Although, initially, Ferraris had hoped to combine survey work with information preserved on French maps, his failure to retrieve useful cartographic works extended the time required to finalize his project. In the end, the manuscript maps of the Austrian Netherlands included a range of points of interest similar to those of the Great Military Map of the Monarchy, and the information was gathered based on the direct land survey of military agents. The case of Lombardy contrasted

with those of Transylvania and the Austrian Netherlands, as this area had already been the object of a detailed survey in the first half of the eighteenth century. By the 1770s, the cadastral maps produced as a necessary step for the reform of taxation were no longer sufficient for the decision-makers in Vienna. Chancellor Kaunitz desired a new geographic map based on a combination of astronomic measurements and land surveys that would position Habsburg cartography at the forefront of scientific developments in this field.

The story of the map of Lombardy reveals that Habsburg cartography produced more than governmental tools for managing distant provinces or settling border disputes. Maria Theresa, Kaunitz and Joseph II also fulfilled the role of educated patrons who valued the geographic work of astronomers for its pure scientific virtue. Without idealizing the altruistic goals of the Habsburg rulers, the collaboration between Liesganig and Cassini de Thury in the surroundings of Vienna, the government's approval for Cassini de Thury's plans to perform geodetic measurements in Lombardy and the authorities' financial and diplomatic support for Barnaba Oriani's European journey all support the active role of the Habsburgs in the development of cartography as a trans-imperial science.

The story of Habsburg maps and mapmakers in the Age of Enlightenment offers a window into the complex imperial politics that shaped the Habsburg lands throughout the eighteenth century. Same as the Enlightened Absolutist policies, the Habsburg cartographic gaze was neither all-encompassing nor unchallenged. Vienna had to constantly negotiate its authority over provinces and in the arena of international diplomacy. Nonetheless, the Habsburg rulers' optimistic belief in the power of maps to facilitate a rational approach to governing an empire encouraged numerous imperial cartographic projects that guided Maria Theresa's and Joseph II's reforms.

APPENDIX. TIMELINES

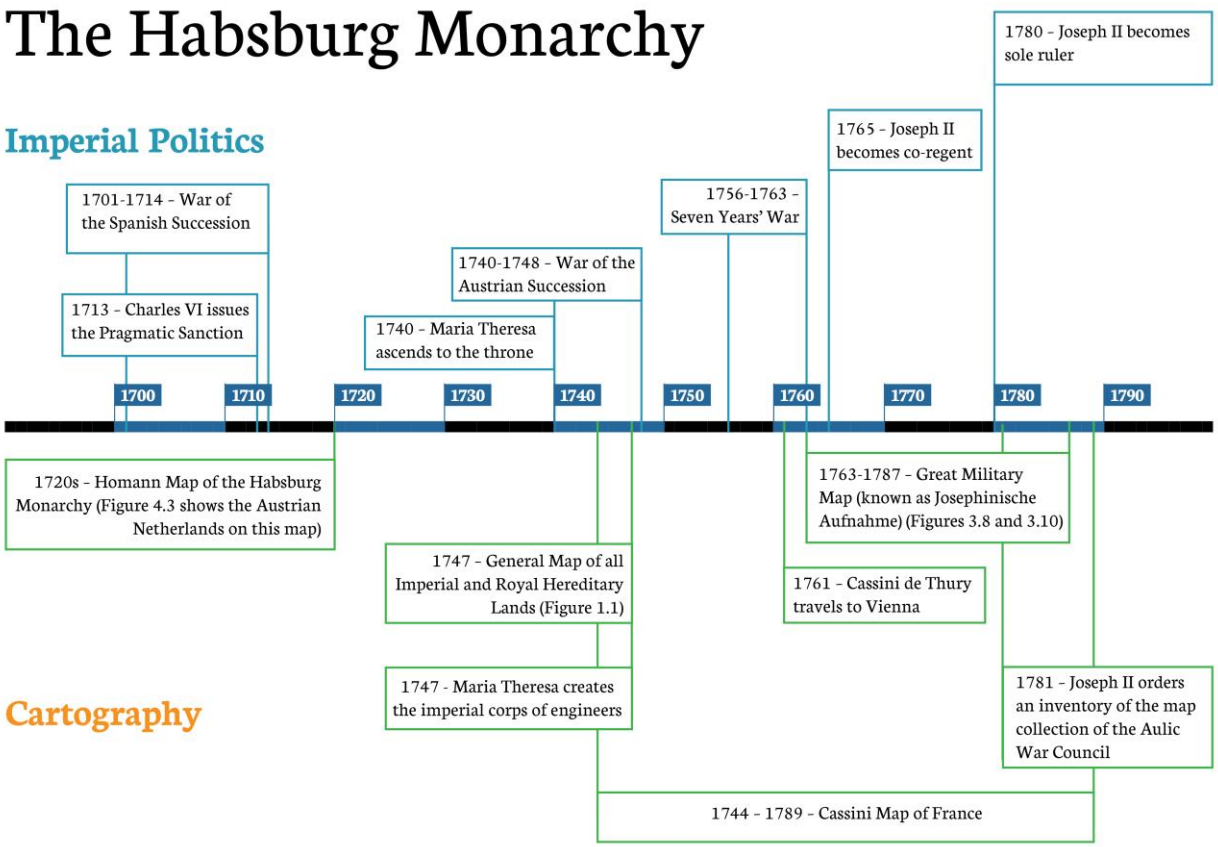

Figure A.1 Habsburg Monarchy Timeline

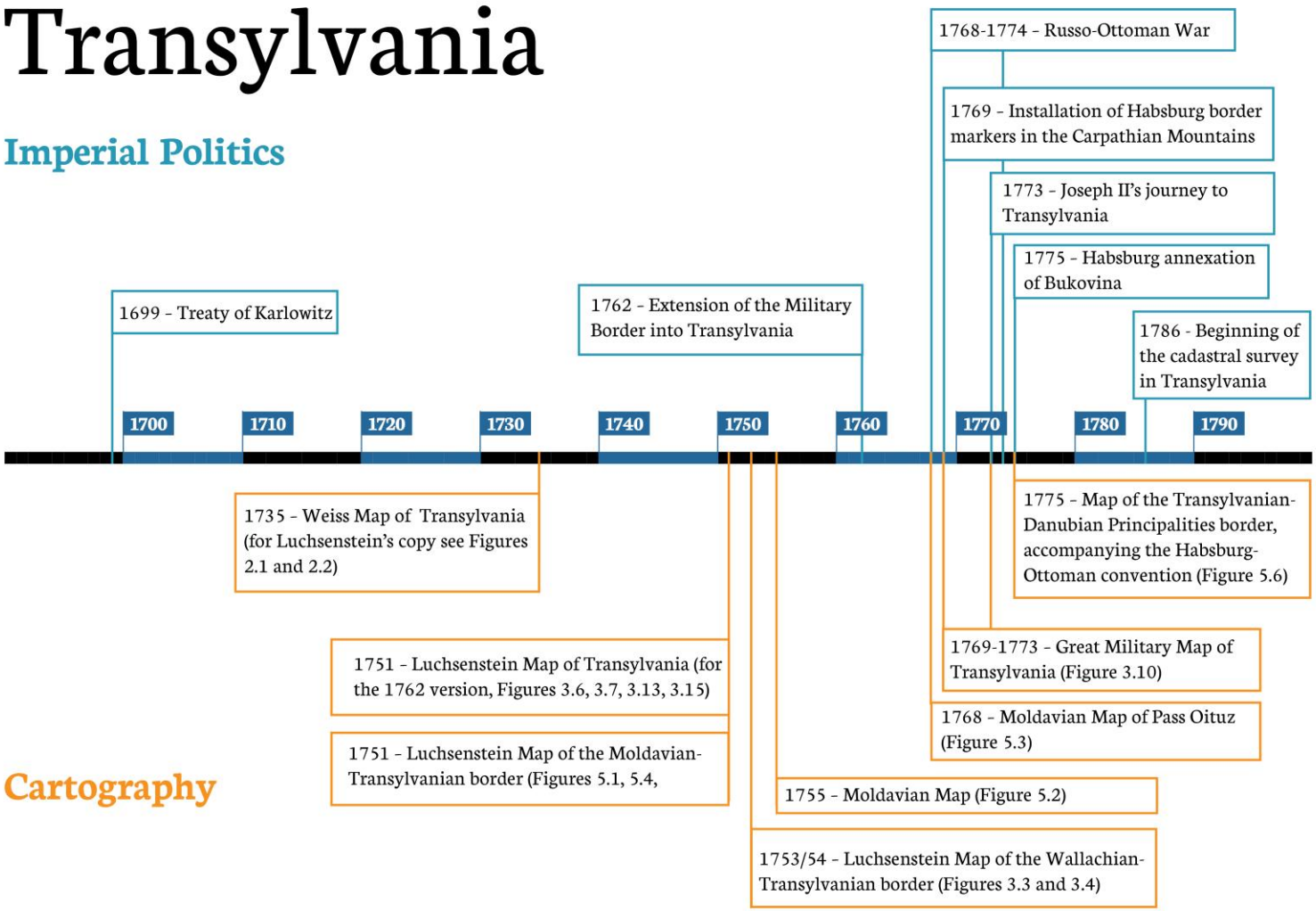

Figure A.2 Transylvania Timeline

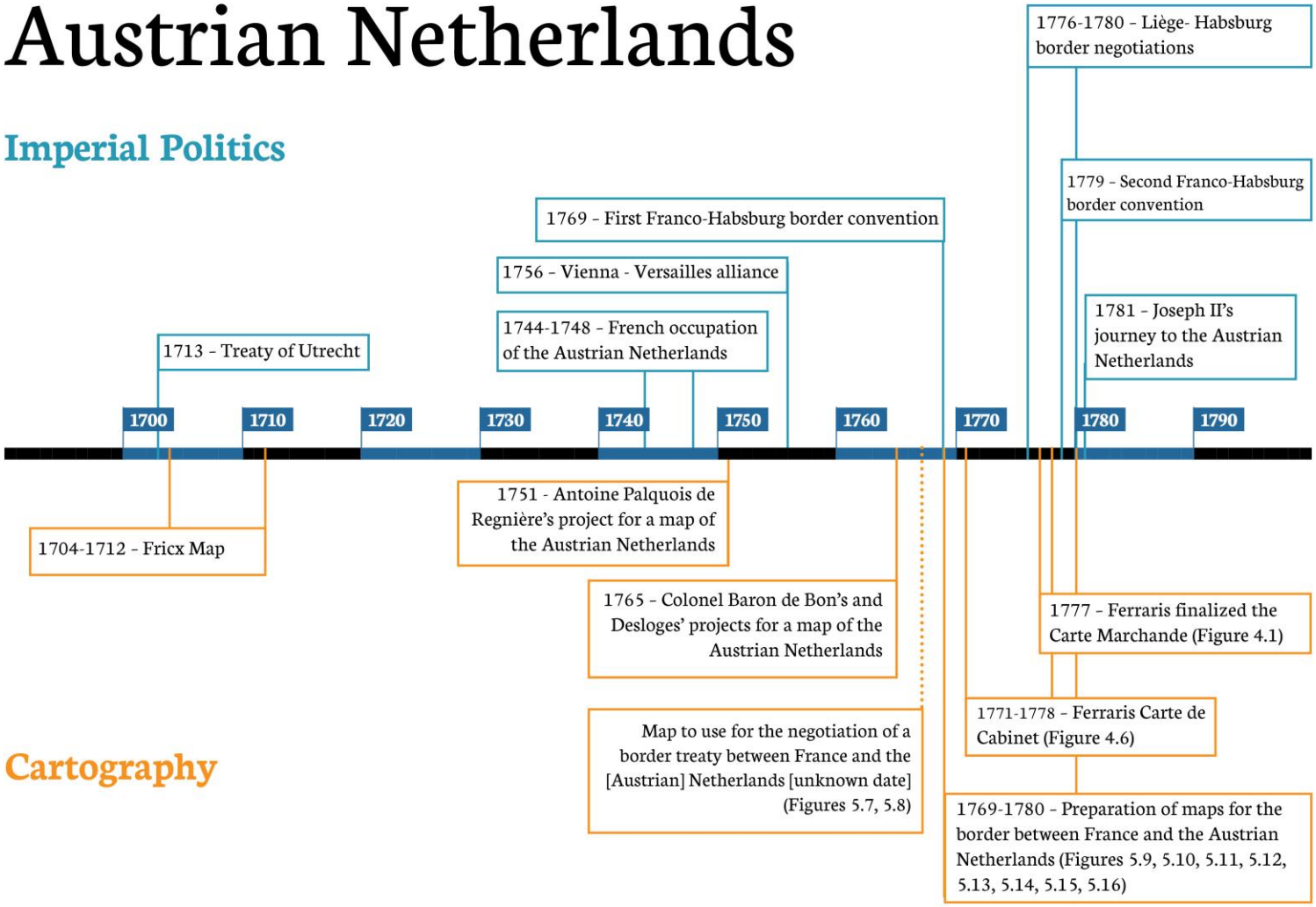

Figure A.3 Austrian Netherlands Timeline

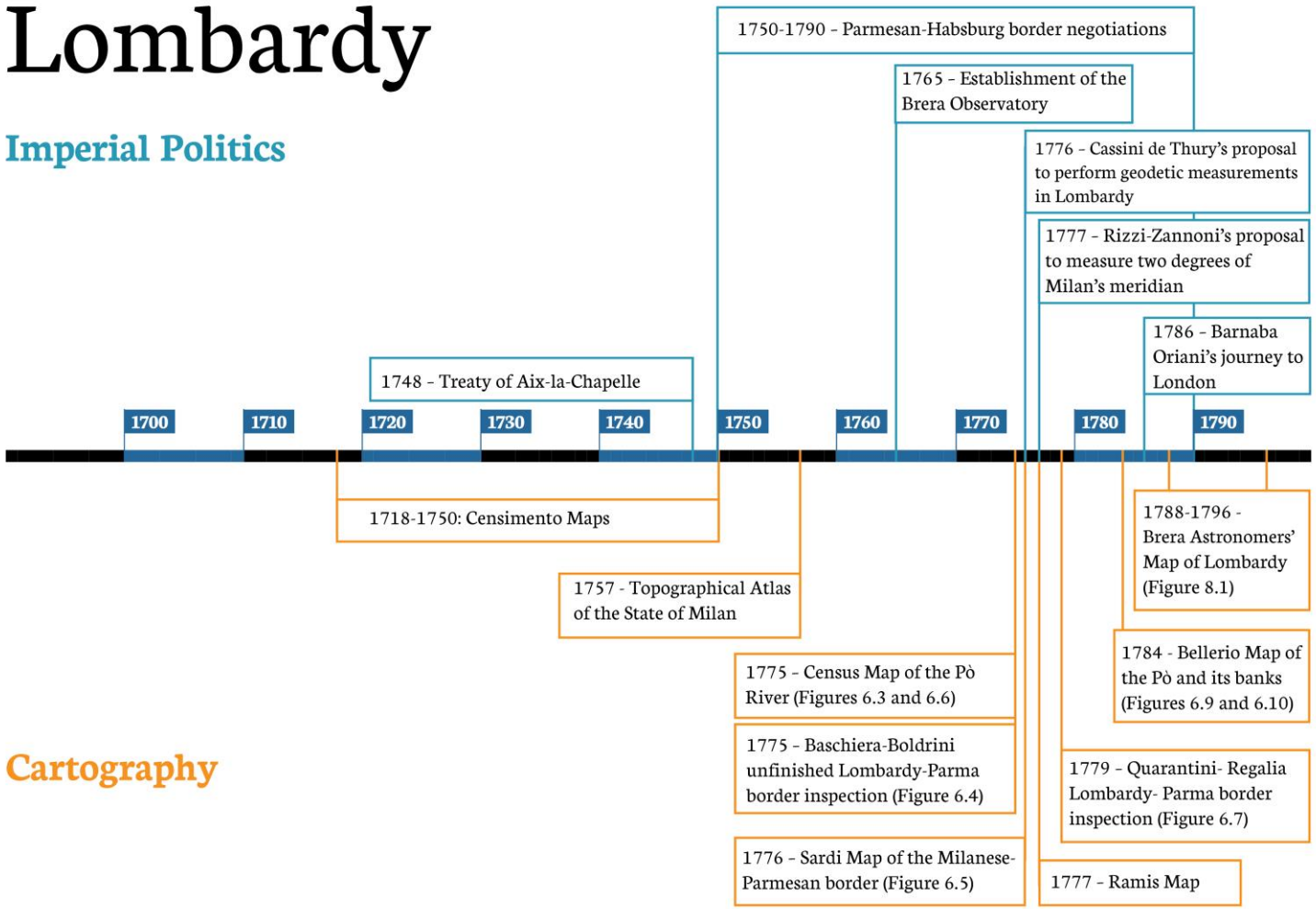

Figure A.4 Lombardy Timeline

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As my narrative centers around the process of imperial centralization, I used many documents produced by state institutions that initiated cartographic projects or relied on their results as part of their work. Whenever possible I gathered biographical information about specific officers and astronomers that contributed to the Habsburg cartographic production in the eighteenth century. The correspondence among different central Habsburg institutions located in Vienna, and among Viennese superiors and provincial subordinates, sometimes mentioned maps and provided further clues about these documents' use. Diplomatic correspondence crossing imperial borders and exchanges of letters between Habsburg scientists and their international counterparts connected Vienna's cartographic contributions to global developments. And last but not least, map collections contained rich material for the eighteenth century. The main challenge I encountered working with maps from special collections was finding accompanying documents that would detail their commissioning, production, circulation, and use. In some instances I found archival documents in other collections that helped fill in the blanks about the maps' context.

The archives are grouped based on the city they are preserved. I have ordered the archives in the following order: imperial archives and collections in Vienna in alphabetical order, provincial archives and collections from the Austrian Netherlands, Lombardy and Transylvania in alphabetical order, other archives in alphabetical order. In Vienna I consulted documents from the Austrian State Archives (Kriegsarchiv and Haus-, Hof- und Staatsarchiv) related to the

activities of Habsburg military engineers; correspondence among various state institutions, such as the Aulic War Council and the State Chancellery; correspondence between the central government in Vienna and provincial governments. Additionally, I did extensive research at Map Department at the Austrian National Library (Österreichische Nationalbibliothek) that preserves, among other things, the Habsburg Court's map collection. The archives of the Observatory in Vienna house folders containing the correspondence of Jesuit astronomer Maximilian Hell.

The archives in Brussels, Milan and Sibiu contain documents related to the governance of the Austrian Netherlands, Lombardy and Transylvania, respectively. In all three cases I have searched for map collections and any additional repositories related to the history of astronomy and astronomers. In Brussels there was no Observatory during the time of Maria Theresa and Joseph II; instead, I examined the archives of the Academy of Sciences that included among its members astronomers. The collections of the Brera Observatory in Milan were a wealth of information about the founding of this observatory, the scientific correspondence between the Brera astronomers and other scientists, Barnaba Oriani's journey to London and the production of the geographic map of Lombardy. Although he founded the Brera Observatory, Roger Boscovich's correspondance is located at the Bancroft Library, University of California; with the help of the interlibrary loan office at the University of Pittsburgh I obtained copies of relevant letters. In the collections of the Ambrosian Library, I have located family documents and correspondence related to military engineer Michel Angelo de Blasco. In Sibiu, in addition to the National Archives (Arhivele Nationale) I spent time researching at the Brukenthal Library, as it preserves an important map collection of eighteenth- century governor Samuel von Brukenthal.

The archives in Paris allowed me to trace some trans-imperial threads. The rich diplomatic correspondence preserved in the Foreign Affairs Archives (Archives du Ministère des

Affaires étrangères) provided invaluable insight into the cartographic activities of the Habsburgs, as reported by French ambassadors in Vienna, Brussels and Parma. Moreover, these archives house collections related to the border demarcations between France and the Austrian Netherlands. The archives center of the French Ministry of Defense and its armed forces (Vincennes, Service historique de la Défense) contain relevant information about French military engineers and their activities. The map collections of the French National Library (Bibliothèque Nationale de France) and the National Archives (Archives Nationales) include cartographic material related to the French-Austrian Netherlands border demarcations.

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