61 · Renaissance Cartography in East-Central Europe, ca. 1450–1650

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Geography alone cannot explain the meaning of the term "East-Central Europe," which is best described as a historical region.[1] Renaissance East-Central Europe is here defined as the continental area east of the Holy Roman Empire covered by the Kingdoms of Poland, from 1387 unified with the Grand Duchy of Lithuania, and the Kingdom of Hungary, including Croatia, as well as the territories under their political or military influence.[2] Despite the great diversity within the region, this chapter assumes a cultural unity and organizes the different modes of cartography into one cultural cartographic region.

This outline of the history of cartography in East-Central Europe during the Renaissance does not represent the kaleidoscope of changing political-territorial entities. The region comprised a series of feudal Christian states by the eleventh century. Each ruling dynasty within the region sought to extend its power and thus ensure its longevity and independence. Louis the Great, the Angevin king of Hungary, was elected king of Poland in 1370, but his empire did not unify all East-Central Europe. After his death in 1382, his daughter Mary inherited the throne of Hungary, while his other daughter, Jadwiga, married Jagiello, the grand duke of Lithuania who established the Polish-Lithuanian union in 1386. The lillies of Anjou gave way to the symbols of dynasties that would dominate the sixteenth- and seventeenth-century struggle for power in East-Central Europe, the Jagiellos and the Habsburgs.

In addition to internal conflict, the incursions of the Ottoman Empire along the region's southern border in the fifteenth century posed significant problems. The Ottoman threat was abated only by military campaigns. In 1456 Belgrade was successfully defended by János Hunyadi, whose son Matthias Corvinus was crowned king of Hungary in 1458. Matthias stopped the Turkish advance and reinforced the southern borders, but in his imperial ambition he fought against both the Habsburgs and the Jagiellos. He died in Vienna in 1490, and the struggle for power between those royal families continued until 1526, when the long-feared invasion of Hungary by Süleymān the Magnificent shook the very foundations of the state system. The peak of Jagiellonian dominance in East-Central Europe was 1490–1526. Thereafter, despite a long series of wars against the Turks, Sweden, and the emerging Russian state, Poland remained a power during the sixteenth century until its gradual decline after 1650 led to its complete disintegration by 1795. But the major polities vying for power in this area after 1526 were the Habsburgs, Russia, and the Ottoman Empire.

The shifting boundaries of political influence profoundly affected cartographic activity in the region. Because of its character as a zone of conflict, whether active or potential, East-Central Europe did not develop the stable cartographic and publishing centers found in Central and Western Europe. At the same time, changing political fortunes and the quest for territorial sovereignty and defense generated significant maps for administration and war.

The surviving maps of East-Central Europe also reflect the turbulent history of the Renaissance period. After the revolutionary development of chorographical mapmaking in the earliest decades of the sixteenth century, only derivative country maps were compiled and printed. Most of the cartographic works in the region remained in manuscript and were only rarely printed. A striking feature is the paucity of commercial cartography. Works could not be printed locally, mainly because the nobility dominated the social structure. Consumer interest, however, led map publishers in Central and Western Europe to print maps of East-Central Europe, and those maps preserved traces of now-lost manuscript maps. For the se-

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Abbreviations used in this chapter include: *Honterus-emlékkönyv* for Ágnes W. Salgó and Ágnes Stemler, eds. *Honterus-emlékkönyv/ Honterus-Festschrift* (Budapest: Országos Széchényi Könyvtár, Osiris Kiadó, 2001), and *Lazarus* for Lajos Stegena, ed., *Lazarus Secretarius: The First Hungarian Mapmaker and His Work,* trans. János Boris et al. (Budapest: Akadémiai Kiadó, 1982).

1. Andrew C. Janos, *East Central Europe in the Modern World: The Politics of the Borderlands from Pre- to Postcommunism* (Stanford: Stanford University Press, 2000).

2. Bohemia, as part of the Holy Roman Empire, is excluded, and much of the German cartography in the region is treated in chapter 42 in this volume.

FIG. 61.1. REFERENCE MAP OF EAST-CENTRAL EUROPE. Places mentioned in this chapter are shown.

ries of wars in the area, especially the Turkish wars, military operations and fortification works resulted in maps, plans, and sketches, many preserved outside the region. Figure 61.1 provides a reference map.

The Study of Early Maps in East-Central Europe: Historiographic Overview

The study of old maps as important historical sources in East-Central Europe was pioneered in the eighteenth century by the historian Matthias Bel, who systematically collected old maps for his great historico-geographical work on Hungary.[3] References to old maps in other early printed works were fleeting. A rare exception was Jan Potocki's 1796 treatise on the history of the Black Sea in which he described six medieval portolan charts.[4] In an 1807–8 discussion, the poet and linguist Ferenc Kazinczy described Wolfgang Lazius's 1556 map as the earliest map of Hungary, but Ferdinánd Miller, director of the Magyar Nemzeti Múzeum (National Museum) in Pest, corrected this view by noting the 1528 map by Lazarus.[5] In 1836, in an age of growing national awareness, a short and general overview of the history of Hungarian cartography beginning with the work of Lazarus was published in a popular journal.[6]

Joachim Lelewel was an eminent scholar and pioneer of the history of cartography in East-Central Europe, especially Lithuania and Poland. Although his research on the history of Polish cartography was not systematic, in the 1830s and 1840s he published various works on medieval geography and maps. Lelewel's work was complemented by that of Edward Rastawiecki, who published the first outline of a general Polish map history in 1846.[7]

In 1863 János Hunfalvy summarized the contemporary knowledge on early maps and assessed their scientific value.[8] An edition of the Lazarus map of Hungary was discovered and exhibited in 1876, and the Benedictine historian and librarian Flóris Rómer mentioned that he had been seeking the Lazarus map for fifteen years.[9] The first general study of the history of Hungarian cartography, by the historian Sándor Márki, added no new information.[10]

More systematic and extensive research on national cartographic histories began in the late nineteenth century. V. Kordt's three-volume history of Russian cartography, published beginning in 1899, was a strongly academic work and included full-size reproductions and historical descriptions of nearly one hundred maps from the fifteenth to seventeenth centuries.[11] Working according to modern political divisions, Kordt's collection included maps of the former Polish, Lithuanian, and Ukrainian territories. Other scholarly studies soon followed: Ludwik Birkenmajer, a historian of astronomy, published major studies on Nicolaus Copernicus and Bernard Wapowski; and the 1613 Radziwill map was described and mathematically analyzed by Henryk Merczyng and Jan Jakubowski.[12]

Around the same time, the eminent Hungarian geographer Pál Teleki published a facsimile atlas and study of the history of cartography of Japan.[13] After extensive international research, Teleki initiated a study of the history of Hungarian cartography. In 1911, while serving as the general secretary of the Hungarian Geographical Society, he advocated the systematic collection and study of early Hungarian maps.[14]

A large accumulation of material on the history of Polish military cartography was published by Bolesław Olszewicz in his comprehensive work of 1919.[15] These historical outlines were the starting point of his future studies, especially his chronological bibliographic reviews. Although a lack of critical methodology allowed the inclusion of insignificant and unreliable pieces of informa-

3. Matthias Bel, *Notitia Hvngariae novae historico geographica,* 4 vols. (Vienna: Pavlli Stravbii, 1735–42). The first historical overview on the mapping of Hungary was given by Karl Gottlieb von Windisch, *Geographie des Königreichs Ungarn* (Pressburg: Löwe, 1780), 9–11.

4. Jan Potocki, *Mémoire sur un nouveau peryple du Pont Euxin* (Vienne: M. A. Schmidt, 1796).

5. Ferdinánd Miller, "Jegyzések Magyar Ország' régi Mappáiról," *Hazai Tudósítások* 10 (1808): 79–80, and idem, "Folytatás Magyar Ország' régi mappáiról," *Hazai Tudósítások* 11 (1808): 86–87. Miller's account was based on the catalog of the collection of Bernat Moll (today in Brno, Czech Republic).

6. D. Novák, "Magyarország' térsége és földabroszai," *Hasznos Mulatságok* 21 (1836): 162–66, and 22 (1836): 170–71.

7. Joachim Lelewel: *Géographie du Moyen Âge,* 5 vols. (1852–57; Amsterdam: Meridian, 1966), and Edward Rastawiecki, *Mappografia dawnej Polski* (Warsaw: S. Orgelbranda, 1846).

8. János Hunfalvy, *A Magyar Birodalom természeti viszonyainak leírása,* 3 vols. (Pest: Emich Gusztáv, 1863–65).

9. Flóris Rómer, "A legrégibb magyarországi térkép," *A Hon* 45 (1876): 2. The article describes the 1553 edition.

10. Sándor Márki, "A magyar térképírás múltja és jelene," *Földrajzi Közlemények* 24 (1896): 291–303.

11. V. Kordt, *Materialy po istorii russkoy kartografii,* 3 vols. (Kiev: Komissiya dlya razbora drevnikh aktov, 1899, 1906, 1910).

12. Ludwik Antoni Birkenmajer, "Marco Beneventano, Kopernik, Wapowski, a najstarsza karta geograficzna Polski," *Rozprawy Wydziału Matematyczno-Przyrodniczego Akademii Umiejętności,* ser. A, 41 (1901): 134–222; Henryk Merczyng, "Mappa Litwy z r. 1613 ks. Radziwilla Sierotki pod wzgeledem matematycnym," *Sprawozdania Tow. Naukowego Warsawskiego,* Dept. III (1913); and Jan Jakubowski, "W spravie mapi Litwy Tomasza Makowskiego, 1613," *Przeglad Geograficzny* 1 (1918–19): 297–306.

13. Pál (Paul) Teleki, *Atlasz a Japáni szigetek cartographiájának történetéhez* (Budapest: Kilián Frigyes Utóda Magy. Kir. Egyetemi Könyvkereskedő, 1909). The German edition, *Atlas zur Geschichte der Kartographie der japanischen Inseln* (Budapest: Hiersemann, 1909), is still a foundational work.

14. Pál Teleki, "Felhívás Magyarország cartographiájának ügyében," *Földrajzi Közlemények* 39 (1911): 57–60.

15. First published as Bolesław Olszewicz, "Polska kartografja wojskowa (Szkic historyczny)," *Bellona* (1919), 267–85, and later in book form, idem, *Polska kartografja wojskowa: Zarys historyczny* (Warsaw: Główna Księgarnia Wojskowa, 1921).

tion, this early collection on anything related to cartography in Poland would become very important. Olszewicz's work provided a reference point for later studies, such as those by Jan Giergielewicz, whose work on the history of military cartography included important detail on sixteenth- to eighteenth-century military engineers.[16]

Kálmán Eperjesy studied the manuscript maps in the military archives in Vienna, and his pioneer catalog, listing 2676 items related to Hungary, was published in 1929.[17] At a time when even important printed maps were unknown, manuscript material offered vast opportunities for research explorations. Among these manuscripts were hundreds of maps from the Turkish Wars, preserved in Karlsruhe, Germany, and cataloged by Lajos Glaser, Teleki's student.[18] Glaser also curated the 1936 map exhibition of material in the Magyar Országos Levéltár (National Archives of Hungary). This first historical overview of civilian mapmaking in Hungary was followed one year later by an exhibition devoted to the military archives in Budapest. The role of seventeenth-century cartography in military defense was clearly understood in Croatia, a major scene of the Turkish Wars, where Emilije Laszowski studied the work of important military engineers.[19]

Karol Buczek, a key figure in the history of Polish cartography, shed new light on sixteenth-century cartography in Poland by reconstructing its Renaissance origins through the important works of Bernard Wapowski, Wacław Grodecki, Matthias Strubicz, and other previously unknown mapmakers. In 1934 he introduced the newly discovered Wapowski fragments at the International Geographical Congress in Warsaw.[20] The preparation of Buczek's "Monumenta Poloniae Cartographica," the first facsimile collection of Polish map history, indicated how far the field had come by 1939. Unfortunately, the outbreak of World War II prevented the book from being published. The war destroyed a substantial part of the historical archives, including maps, but Buczek's catalog of material survived. After the war, the review of the historical cartographic literature and the assembly and preservation of collections of old maps were the most important tasks.

The first monograph on the history of Hungarian cartography, the result of decades of research, was published in 1952–54. Ferenc Fodor, a colleague of Teleki, wrote a history of geographical science but for ideological and political reasons was allowed to publish only the parts on map history.[21] This monograph, ordered both chronologically and thematically, commented on and explained a catalog of maps and is still a fundamental reference book despite its notable problems. The chapters on the Renaissance period, for example, are now obsolete, due to its author's limited access to important material in foreign archives.

In 1963, Buczek published a monograph on the history of fifteenth- to eighteenth-century Polish cartography.[22] This was the first scholarly publication to focus on the early history of cartography in East-Central Europe. For Buczek, "Poland" was a contemporary historical-political unit. Despite its cartobibliographical failures and problems with explanations and conclusions, this volume remains a good starting point for further study. The Polish edition was revised and translated into English in 1966.[23] With this new edition, the history of East-Central European cartography was opened to international scholarship.

In Hungary in the 1970s, historians of cartography devoted much work to the Renaissance beginnings of Hungarian cartography. The collective work of experts who studied different aspects of Lazarus's 1528 map was first printed as a working manuscript in 1976 and after some revisions was published in English in 1982.[24] In spite of some questionable interpretations and many reference problems, this rare English publication is still a standard reference work.

A number of systematic catalogs for separate countries, published in the 1980s and 1990s, show growing scholarly interest in the history of cartography but also the need for cooperative synthesis.[25] The *Descriptio Hungariae* is

16. Jan Giergielewicz, *Zarys historji korpusów inżynierów w epoce Stanisława Augusta* (Warsaw, 1933), and idem, *Wybitni polscy inżynierowie wojskowi: Sylwetki biograficzne* (Warsaw: Główna Księgarnia Wojskowa, 1939).

17. Kálmán Eperjesy, *A bécsi Hadilevéltár magyar vonatkozású térképeinek jegyzéke* (Szeged, 1929).

18. Lajos Glaser, *A karlsruhei gyűjtemények magyarvonatkozású térképanyaga = Ungarn betreffende Karten und Pläne in den Karlsruher Sammlungen* (Budapest: M. Kir. Állami Térképészet, 1933).

19. Emilije Laszowski, "Izvještaji Ivana Pieronija o hrvatskim krajiškim gradovima i mjestima god. 1639," *Starine* 29 (1898): 12–32, and idem, "Važan rukopis Martina Stiera," *Vjesnik Kr. Hrvatsko-slavonsko-dalmatinskoga Zemaljskoga Arkiva* 10 (1908): 197–202.

20. Karol Buczek, "Bernard Wapowski, der Gründer der polnischen Kartographie," in *Comptes rendus du Congrès International de Géographie,* 4 vols. (1935–38; reprinted Nendeln: Kraus Reprint, 1972), 4:61–63.

21. Ferenc Fodor, "Magyar térképírás I–III," *Térképészeti Közlöny* 15, special issue, vol. 1 (1952): 1–176, vol. 2 (1953): 177–309, and vol. 3 (1954): 313–441.

22. Karol Buczek, *Dzieje kartografi polskiej od XV do XVIII wieku: Zarys analityczno-syntetyczny* (Wrocław: Zakład Narodowy im. Ossolińskich, 1963). The monograph, in Polish, is accompanied by forty-eight facsimile plates.

23. Karol Buczek, *The History of Polish Cartography from the 15th to the 18th Century,* trans. Andrzej Potocki (Wrocław: Zakład Narodowy im. Ossolińskich, Wydawnictwo Polskiej Akademii Nauk, 1966; 2d ed., Amsterdam: Meridian, 1982). The English edition reproduced sixty maps on loose sheets collected into a canvas folder.

24. *Lazarus;* contributors included László Bendefy and László Irmédi-Molnár, representing the pre-war generation of historians, and Pál Hrenkó, a productive later historian of cartography.

25. Luciano Lago and Claudio Rossit, *Descriptio Histriae: La penisola istriana in alcuni momenti significativi della sua tradizione car-*

an illustrated catalog of the maps of Hungary from 1500 to 1650, and the two-volume *Atlas Hungaricus* describes maps of Hungary in printed atlases.[26] It is noteworthy that both works were written by authors whose collections were created not in Hungary but in Italy and France. This lack of local support is apparent in a recent four-volume work on the general history of surveying and mapping in Hungary, produced and distributed only as a manuscript.[27] The map history journal *Cartographica Hungarica* (1992–) is also a private enterprise.

A major private collection, consisting of the rarest early maps of Central Europe and Poland, was created in Germany around the 1970s. After the publication of some rare works in facsimile, the Poland-related material from the collection was exhibited in Germany and Poland and later the material was generously donated to the library in Wrocław.[28] At present, private collectors still play an important role in stimulating interest in the history of East-Central European cartography through exhibitions, catalogs, and publications from their historical collections.

Despite the extensive cartobibliographical works mentioned above, the description of the map corpus regarding East-Central Europe is far from complete. By and large, the published works are devoted to early maps depicting the region; maps made in the region receive much less attention. This state of affairs, although hardly acceptable for scholars, does reflect the historical material that has survived. Compared to other parts of Europe, the loss of cultural heritage in East-Central Europe has been immense. War and unrest have repeatedly devastated this region, which already had a low rate of cartographic production.

Modern digital technology will doubtless contribute to the advancement of the subject. With the development of web-based catalogs, scholars from any part of the world can access historical material. At the same time, local historians of cartography can extend the scope of their research by participating in international projects. The online catalogs of national libraries can be accessed, although the possibilities for researching cartographic material are rather limited at present. The web-based project of the map department of the Országos Széchényi Könyvtár (National Library of Hungary) in Budapest is a major achievement: not only catalog information but also high resolution images of rare fifteenth- to eighteenth-century maps can now be studied and downloaded.[29]

Antique and Medieval Traditions: Ptolemy and Portolan Charts

The importance of Ptolemy's *Geography* for Renaissance cartography was substantial, although his representation of East-Central Europe was conceptually outdated. Ptolemy's well-known overestimation of the east-west axis of the Mediterranean Sea resulted in disfigured proportions for Europe, paradoxically including a greatly reduced Eastern Europe. Yet despite their defects, Ptolemaic maps, compared with the geographical works of other classical authors, provided a wealth of information about East-Central Europe unavailable elsewhere. The very early and non-Ptolemaic regional maps appearing in or originating from East-Central Europe (by Lazarus, Bernard Wapowski, and Johannes Honter) provide documentary evidence of modes of mapmaking different from the *tabulae* of Ptolemy's *Geography,* but the dominance of the Ptolemaic tradition repressed such modes until the mid-sixteenth century.

Medieval portolan charts of the Mediterranean more reliably represented the coastlines of East-Central Europe, the Black Sea, and especially the eastern Adriatic. The Croatian and Dalmatian harbors were strongly influenced by the political and commercial power of Venice. The Istrian Pietro Coppo wrote now-rare manuscript works representing various Italian chartmaking traditions. His *Sum[m]a totius orbis* (1524–26), an early printed work with fifteen small woodcut maps, is a forerunner of later atlases.[30] Other East-Central European chartmakers who worked elsewhere include Vincenzo Volcio of Ragusa (Dubrovnik, Croatia), who worked from 1592 as a master portolan maker in Livorno and Naples.[31]

Local sources were used by the cosmographer Henricus Martellus (Heinrich Hammer) Germanus, who worked in Rome and Florence, for the maps of his edition of Ptolemy. In representing the southern part of the region, he included settlements mentioned in the travel account of Ambrosio Contarini.[32] The two surviving versions of Martellus's

tografica sino a tutto il secolo XVIII, per una corologia storica (Trieste: LINT, 1981); Mirko Marković, *Descriptio Croatiae* (Zagreb: Naprijed, 1993); and idem, *Descriptio Bosnae & Hercegovinae* (Zagreb: AGM, 1998).

26. Tibor Szathmáry, *Descriptio Hungariae,* vol. 1, *Magyarország és Erdély nyomtatott térképei, 1477–1600* (Fusignano: T. Szathmáry, 1987), and Lajos Szántai, *Atlas Hungaricus: Magyarország nyomtatott térképei, 1528–1850,* 2 vols. (Budapest: Akadémiai Kiadó, 1996).

27. István Joó and Frigyes Raum, eds., "A magyar földmérés és térképészet története," 4 vols. (Budapest, 1990–94).

28. Tomasz Niewodniczański, ed., *Imago Poloniae: Dawna rzeczpospolita na mapach, dokumentach i starodrukach w zbiorach Tomasza Niewodniczańskiego/Imago Polaniae: Das polnisch-litauische Reich in Karten, Dokumenten und alten Drucken in der Sammlung von Tomasz Niewodniczański,* 2 vols. (Warsaw: Agencja Reklamowo-Wydawnicza Arkadiusz Grzegorczyk, 2002).

29. <http://www.topomap.hu/oszk/hun/terkepek.htm>

30. The unique copy of Coppo's atlas is preserved in the maritime museum at Piran, Slovenia, and published in facsimile: Luciano Lago and Claudio Rossit, *Pietro Coppo: Le "Tabvlae" (1524–1526),* 2 vols. (Trieste: LINT, 1986).

31. Nikola Zic, "Naši kartografi XVI stoljeća: Dubrovčanin Vinko Vlčić," *Jadranska Straza* 13, no. 1 (1935): 12–13; Volcio's chartmaking activies are mentioned in chapter 7 in this volume.

32. The Venetian ambassador took a journey to Persia via Poland and Muscovy (1473–77), see Ambrosio Contarini, *Questo e el viazo de*

map of Central Europe[33] represented continental territories threatened by the Ottoman Empire. One copy is almost identical to a map published by Francesco Rosselli (Florence, ca. 1491).[34] A pioneer of commercial map and print making in the late fifteenth century, Rosselli had earlier been active (ca. 1478–82) in Buda as an illuminator of volumes in the Bibliotheca Corvina of King Matthias Corvinus.[35] One of the items listed in the inventory of Rosselli's belongings after his death in 1513 may have referred to Hungary, although the note "Ungheria dopia, d'un folio reale" is obscure and its interpretation is unclear.[36] It is unlikely that Rosselli made a detailed map during his stay in Buda only to copy Martellus's manuscript for his printed edition.[37]

The Mathematical-Astronomical Tradition

By the fourteenth century, students who had finished the trivium and quadrivium at local ecclesiastical schools could continue their studies at foreign universities. University class registers listed students by national groups (e.g., *natio Hungarica*). Initially, the majority of Hungarian students attended the University of Bologna (starting in 1265). By the end of the fifteenth century, however, Vienna and Cracow had become more important intellectual centers. In the ecclesiastic school of the cathedral of Esztergom the study of computus was an important subject, and for different calculations of the religious days in the calendar the astronomical work of Johannes de Sacrobosco was taught. The manuscript notes of the Esztergom students taken between 1419 and 1423 are preserved and demonstrate university-level (Studium generale) education.[38]

Georg von Peuerbach, the eminent astronomer of Vienna, was called to Hungary in about 1454, where he became court astrologer to King Ladislaus (László) V. Peuerbach compiled his observations and prepared his famous tables in Buda in about 1455.[39] His introduction mentions that a version of the tables was dedicated to Bishop János Vitéz of Varadinum (Oradea, Romania), although Peuerbach had not measured that town's geographical coordinates.[40]

The astronomer Johannes Regiomontanus, a pupil of Peuerbach, spent some productive years between 1467 and 1471 at the royal court in Buda and at the newly founded university at Pozsony (Bratislava, Slovakia). The Hungarian king Matthias Corvinus founded the Academia Istropolitana in Bratislava, and the papal bull permitting the Academia was issued in 1465. The importance of astrology for the university is demonstrated by a horoscope (fig. 61.2). The horoscope could have been made by Regiomontanus, but more probably by his Polish friend and fellow lecturer of the university, Martin Bylica of Olkusz. In his *Ephemerides* (Nuremberg, 1474), Regiomontanus did not give the coordinates of Esztergom and his longitude for Buda (12.5° from Nuremberg) is almost five degrees in error, well beyond the mean error of contemporary astronomical measurements.

Bylica represented the famous Cracow school of astronomy in the royal court of Buda.[41] He arrived from Italy with Regiomontanus in 1471 and worked as astronomer to Matthias Corvinus and Ladislaus (Ulászló) II. Leaving his books and instruments to the University of Cracow, Bylica died in Buda.[42] His astrolabe and torquetum show the expertise of Central European instrumentmakers, among them the Viennese Dominican friar Hans Dorn, who worked in Buda until the 1490s. Regiomontanus died in Nuremberg in 1476, and in 1478 Matthias sent

misier Ambrosio Contarin ambasador de la illustrissima signoria de Venesia al signor, Uxuncassam re de Persia (Venice, 1487).

33. One copy, dated about 1493, is in Florence, Biblioteca Nazionale Centrale (Codex Magliabechianus, Magliab. Lat. CIII. 16), and an earlier version is in Leiden, Universiteitsbibliotheek (Cod. Voss. Lat. 23).

34. This Leiden copy was reproduced in transcription by Albert Herrmann, *Die ältesten Karten von Deutschland bis Gerhard Mercator* (Leipzig: R. F. Koehler, 1940).

35. Florio Banfi, "Sole Surviving Specimens of Early Hungarian Cartography," *Imago Mundi* 13 (1956): 89–100, and Csaba Csapodi and Klára Csapodi-Gáronyi, *Bibliotheca Corviniana: Die Bibliothek des Königs Matthias Corvinus von Ungarn,* 2d ed. (Budapest: Corvina Kiadó; Magyar Helikon, 1978). The Florence-born Rosselli—his Central Europe sheet is undated and unsigned, but the world map in the same group is signed "F. Rosello Florentio"—was mentioned in 1470 as an illuminator of the frescos in the cathedral of Siena. In 1480 he was noted in the cadastral book of Florence as a thirty-three-year-old unemployed painter, although in the same source he is reported to have left for Hungary long before.

36. The original is in Florence, Archivio di Stato, Magistrato Pupilli, vol. 190. The Rosselli inventory was published by Jodoco Del Badia, *Miscellanea fiorentina di erudizione e storia,* 2 vols. (1886–1902; Rome: Multigrafica Editrice, 1978), 2:24–30, esp. item 44. The interpretation of this notice is not easy, the word *"dopia"* allowing several possible translations. Even if the word should be read *"doppia"* in Italian, the item could be a duplicate of the same plate or two different plates in royal folio size. Moreover, as a print trader, Rosselli regularly bought plates from other engravers as well, so we cannot be sure the obscure plate was from his hand.

37. There is a printed map of the Balkans in the Rosselli material in Florence that was not copied from the known Martellus manuscript of the region. The focus of the printed map shifted south, whereas north of the river Drava the map remained almost empty.

38. Vienna, Schottenstift, Cod. Lat. 305.

39. The work was published later: Georg von Peuerbach, *Tabulae Eclypsia Magistri Georgij Peurbachij,* ed. Georg Tannstetter (Vienna, 1514).

40. He estimated the difference of local times, and the value of 7.5° was simply added to the longitude of Vienna. Peuerbach's *Quadratum geometricum* (Nuremberg, 1516), which he also dedicated to Vitéz, could suggest the hypothetical meridian measurement.

41. Leslie L. Domonkos, "The Polish Astronomer Martinus Bylica de Ilkusz in Hungary," *Polish Review* 13, no. 3 (1968): 71–79.

42. Some of the astronomical instruments Bylica used are preserved in Cracow, Collegium Maius, Jagiellonian University.

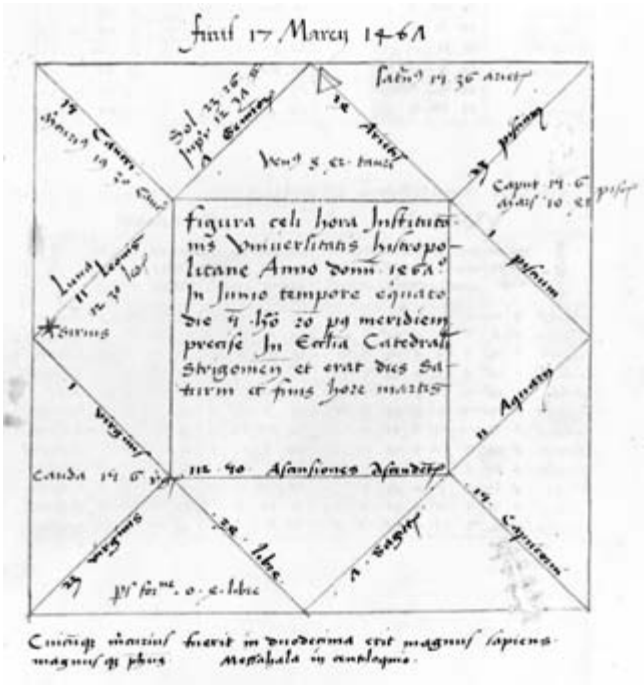

FIG. 61.2. HOROSCOPE, 1467. "Figura coeli hora Institutionis Universitatis Histropolitane; Anno domini 1467 . . . " The horoscope used for the symbolic founding of the university Academia Istropolitana in 1461 in Bratislava was made some years later in Esztergom. The copy shown here is from a codex of Ptolemy's *Almagest*.
Size of the original: ca. 29 × 27.2 cm. Photograph courtesy of the Bildarchiv, Österreichische Nationalbibliothek, Vienna (Vien. Cod. Lat. 24, fol. 212).

Dorn to the city to buy the astronomer's legacy. Bylica's torquetum was made by a Viennese instrumentmaker in 1487. It was possibly constructed after Regiomontanus's model,[43] which is known from his description of 1467. Bylica's instruments demonstrate the strong influence of Regiomontanus, whose improvements in the construction of these old instruments can be seen in Bylica's astrolabe.[44] Thereafter, astronomical instruments were regularly brought to the Hungarian royal court. Thomas Dainerius, an Italian physicist and secretary of the diplomatic mission of the prince of Ferrara, reported from Buda in 1501 on the visit of the instrumentmaker and cosmographer Martin Waldseemüller. Another contemporary instrument that might have been used for mapmaking is the watch made by "Egedius Ungarus" in 1502 in Buda.[45]

Regiomontanus gave the positions of Buda and Casovia (Košice, Slovakia) in his *Ephemerides*. It is assumed that he measured the latitude in Košice for the construction of a sundial for the wall of St. Elisabeth cathedral. By the end of the fifteenth century, the Klosterneuburg coordinates apparently remained unknown in Hungary, although the Cracow table dated to after 1483 was most probably derived from Regiomontanus's calendar.[46] The "Tabula longitudinis et latitudinis regionum" (ca. 1490) is attributed to Wojcieh z Budzewo (Albert Brudzewo), an astronomer at Cracow University. The list is obviously a compilation from earlier sources, but an interesting addition is the latitude of Esztergom (47°N). This information may reflect the personal contacts between humanists in Poland and Hungary.

Of the numerous Renaissance Hungarians who studied abroad, we have limited knowledge of but one surveyor: Petrus Lossai. Lossai studied at the University of Vienna in 1519 and wrote manuscript notes on the use of the astrolabe,[47] closely copying part of a printed work by Johannes Stöffler.[48] Lossai copied the final part of the book (paragraph 58–61) and the printed illustrations to explain the practical use of the astrolabe for measuring altitudes (fig. 61.3), and he certainly spent considerable time studying the practical questions of geometry. The Lossai codex is evidence of the distribution of scientific knowledge in contemporary Europe. The manuscript also suggests that practical geometry was an important part of university-level education in the late fifteenth century.

The accuracy of contemporary astronomical instruments was rather limited, and the measurements were not suitable for making chorographical regional maps. Studies reveal that sixteenth-century geographical positions were not derived from direct observations.[49] To the contrary, the first chorographical maps in Europe became sources of geographical coordinates that were simply measured from maps. This possibility has been consid-

43. Diedrich Wattenberg, "Johannes Regiomontanus und die astronomischen Instrumente seiner Zeit," in *Regiomontanus-Studien,* ed. Günther Hamann (Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 1980), 343–62.

44. Ernst Zinner, *Leben und Wirken des Joh. Müller von Königsberg genannt Regiomontanus,* 2d ed. (Osnabrück: Zeller, 1968), 26–46.

45. László Bendefy and Lajos Stegena, "How Lazarus's Map Was Made," in *Lazarus,* 20–22, esp. 21.

46. Cracow, Biblioteka Jagiellońska, MS. 1858.

47. Budapest, Országos Széchényi Könyvtár, Cod. Lat. m. a. 197. For a facsimile edition, see Petrus Lossai, *Petri Lossai Notationes et Delineationes 1498,* ed. Poronyi Zoltán and Fleck Alajos ([Pécs: Pécsi Geodéziai és Térképészeti Vállalat, 1969]). The work was attributed to Petrus Lossai, a student in Bologna, and is dated to 1498 in the title added to the manuscript by the librarian, Jakab Ferdinánd Milleker, in the early nineteenth century; Milleker also mentioned that Lossai worked as a practical geometer in Lithuania. The source for this information is unknown, but the dating of the manuscript is wrong, and it is known that Lossai did not study in Bologna. Anna Borecky, "Mikor és hol készült Lossai Péter kódexe?" *Magyar Könyvszemle* 113 (1997): 240–65.

48. Johannes Stöffler, *Elvcidatio fabricæ vsvsqve astrolabii* (Oppenheim: Jacobum Köbel, 1513).

49. Rüdiger Finsterwalder, "Genauigkeit und Herkunft der Ortspositionen im mitteleuropäischen Raum zu Beginn des 16. Jahrhunderts," *Kartographische Nachrichten* 47 (1997): 96–102.

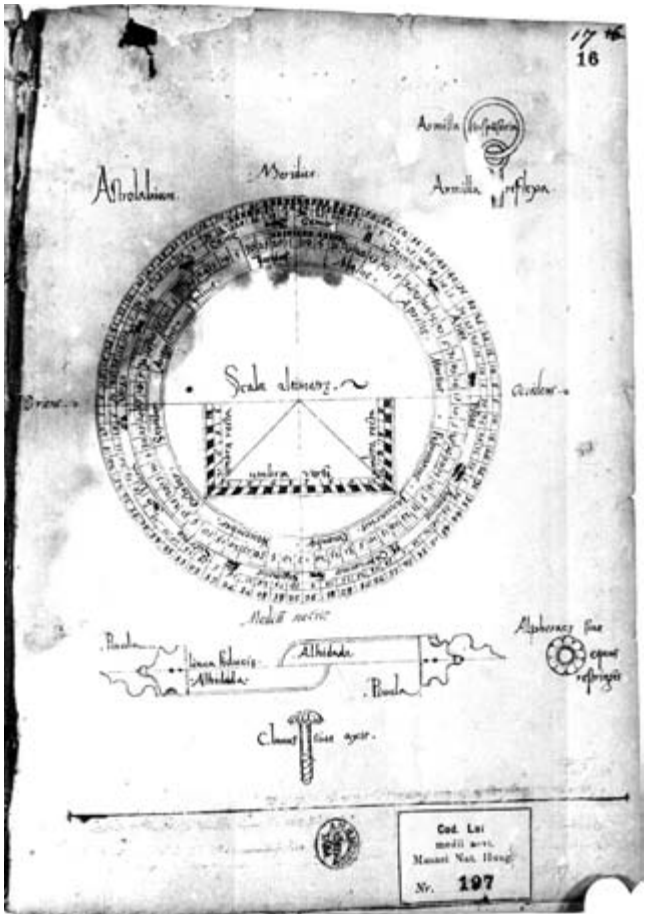

FIG. 61.3. ASTROLABE, CA. 1519. A drawing of the parts of the astrolabe. The use of the instrument is discussed in the manuscript of Petrus Lossai, a Hungarian student at the University of Vienna.
Diameter of the astrolabe: 12 cm. Photograph courtesy of the Országos Széchényi Könyvtár, Budapest (Manuscript Collection, Cod. Lat. 197).

ered in connection with the fifteenth-century Fridericus text and tables among the astronomical manuscripts of the Vienna-Klosterneuburg circle, which contain the first non-Ptolemaic positions of some Hungarian cities.[50] If priority is given to graphic representation, the unusually high accuracy of the Klosterneuburg coordinates (especially the longitudes) can be explained. If we accept this priority, early regional maps can be interpreted as a sort of analog computer: simple surveys of distances and directions graphically representing geographical positions. Consequently, the contribution of traditional astronomy to Renaissance practical cartography, especially to regional mapmaking, was by no means substantial. Yet theoretically and ideologically Renaissance astronomy and mathematics provided the social context necessary for later scholarly cartographic investigations of East-Central Europe.

The Local Context: Beginnings of Local Mapmaking

Engineering in East-Central Europe can be traced far back in history. The earliest records relating to surveys in Hungary are from the eleventh century. The first geographic representations, made to identify local boundaries, were made in the thirteenth century. The simple sketches that survive, however, are probably later copies of the originals. Boundary identifications were ordered by the Hungarian king Sigismund of Luxembourg (Holy Roman Emperor, 1433–37), in 1436.

The original record identifying boundaries for the Hungarian villages of Bottyán, Polgár, and Somló, presumably first written in Latin, survives in two Hungarian translations. The text is a narration of a field trip taken by the boundary commission. The detailed description of artificial boundary marks (such as cairns) was, obviously, the most important task of the work. In an important statement in the text, the commissioners remarked that they had made a new mark to the east of "a clearly recognizable old boundary mark." They gave distances in qualitative terms (such as "arrow shoot") and often recorded directions ("east").[51]

Similar practices, following ancient tradition, resulted in medieval itineraries. The earliest such itinerary of the road to Jerusalem across Hungary was made shortly after 1031. At the turn of the fourteenth century, descriptions of roads, *itineraria scripta,* were assembled by the Teutonic knights in Prussia for invasions in Lithuania. The report of the 1413–14 journey through this region by the Burgundian diplomat Gilbert de Lannoy was also a valuable source of information. These sources were not always reliable, however. Peter von Wormditt was reported to have drawn a map from memory for the pope in 1413 and explained that the diocese Dorpat (Tartu, Estonia) was in Sweden.[52] One map, painted on cloth or canvas, was used by the Polish envoy in Rome in 1421 to deny the knights' territorial claims.[53]

In the Middle Ages, simple land measurements were taken using local measuring units, but estimations (traditionally done by counting steps) were preferred in practice. In 1379, in the city of Sopron (Ödenburg, west Hungary), individual houses and landowners were recorded in a list written in German. The measuring instrument for

50. Ernst Bernleithner, "Die Entwicklung der österreichischen Länderkunde von ihren Anfängen bis zur Errichtung der ersten Lehr-Kanzel für Geographie in Wien (1851)," *Mitteilungen der Österreichischen Geographischen Gesellschaft* 97 (1955): 111–27.

51. Budapest, Magyar Országos Levéltár, MOL, P 1313. Lad. 17.

52. Paul Nieborowski, *Peter von Wormdith: Ein Beitrag zur Geschichte des Deutsch-Ordens* (Breslau: Breslauer Verlagshandlung, 1915), 114.

53. Buczek, *History of Polish Cartography,* 22–23.

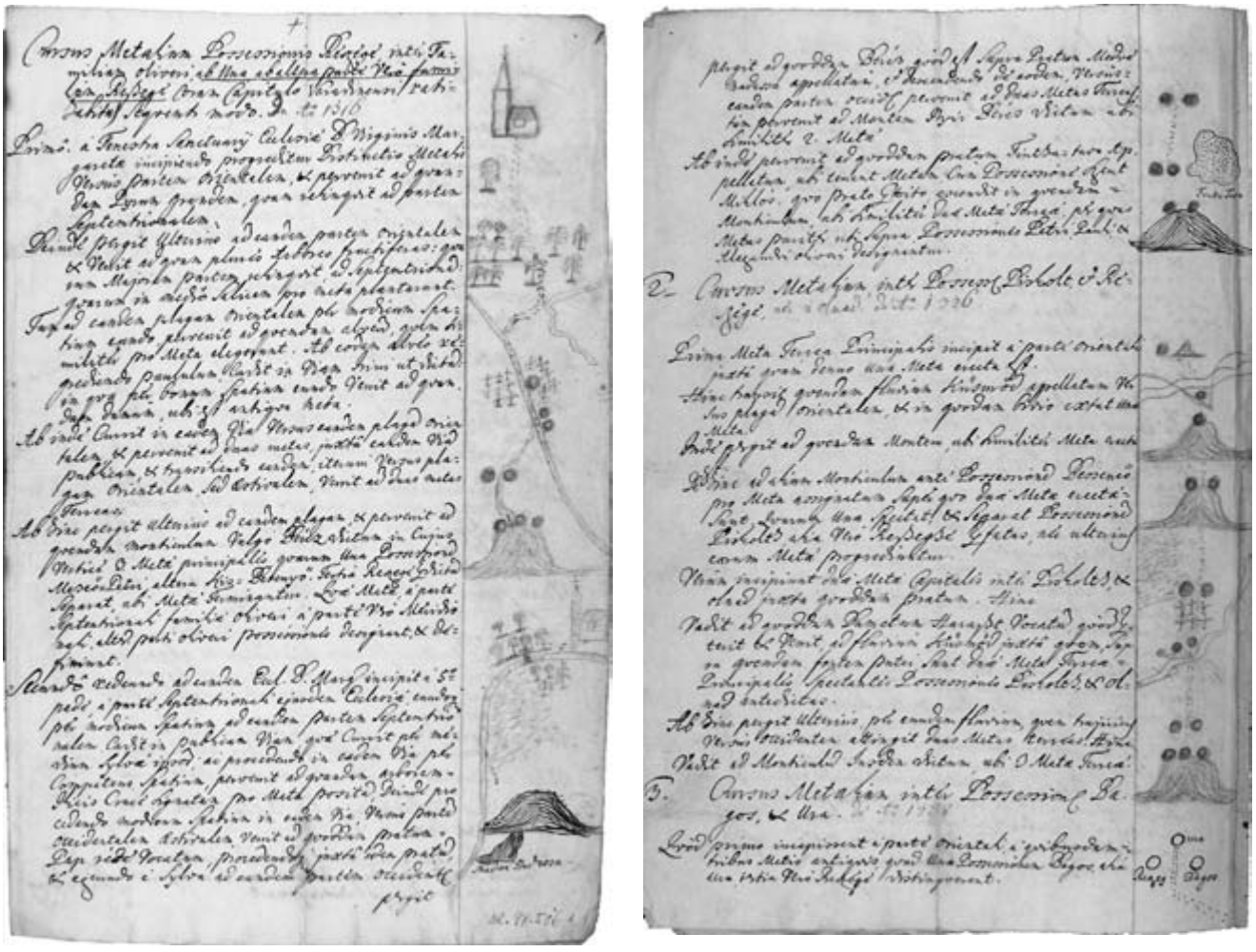

FIG. 61.4. BOUNDARY MAP, RESZEGE, HUNGARY. Sketch drawn in brown crayon or pencil accompanying the boundary marking in Reszege, Hungary. The surviving copy was made in the eighteenth century; the date of the original survey, 1316, was added.
Photograph courtesy of the Magyar Országos Levéltár, Budapest (DL 98516).

this very early cadastral survey was the rope. In 1410, in Arács, the gate of a local church defined a unit of measurement, and eighteen such units gave the length of the measuring rope used to divide some land between the Benedictine monastery and the nobility. The Albertina plan (ca. 1421) represents the late medieval image of Vienna and also (in the upper-left corner) Bratislava, a city in Sigismund's Kingdom of Hungary.[54]

The oldest property sketch known in Hungary dates to 1488, but there are references to earlier examples. A Latin report dated 1316 on the boundary marking procedure followed in the village of Reszege survives in an eighteenth-century copy (fig. 61.4). The text describes the boundary line in narrative form and an enclosed sketch represented the boundary by a dotted line and the significant landmarks by pictorial signs. It is remarkable that the strip map and text constitute parallel strategies of expression.

Similar Polish examples can be mentioned. On the fragment of the text map of Pomerania (ca. 1464), the distribution of the names of towns corresponds to their relative locations. On the 1527–28 map of the land along the Dowspuda River, written text describes important events.[55] In 1522, following a border adjustment near what is today Banská Bystrica, Slovakia, a sketch was drawn, proving that there were educated clerks in the sixteenth century who managed to overcome the difficulties of map drawing. In the next century, large estates in Poland were surveyed and mapped by sworn surveyors.

54. Preserved in Vienna at the Wien Museum (formerly the Historisches Museum der Stadt Wien). Karl Fischer, "Die kartographische Darstellung Wiens bis zur Zweiten Türkenbelagerung," *Wiener Geschichtsblätter* 4 (1995): 8–28, esp. 8.

55. Vilnius, Universiteto Biblioteka, Dept. of Manuscripts, 527.

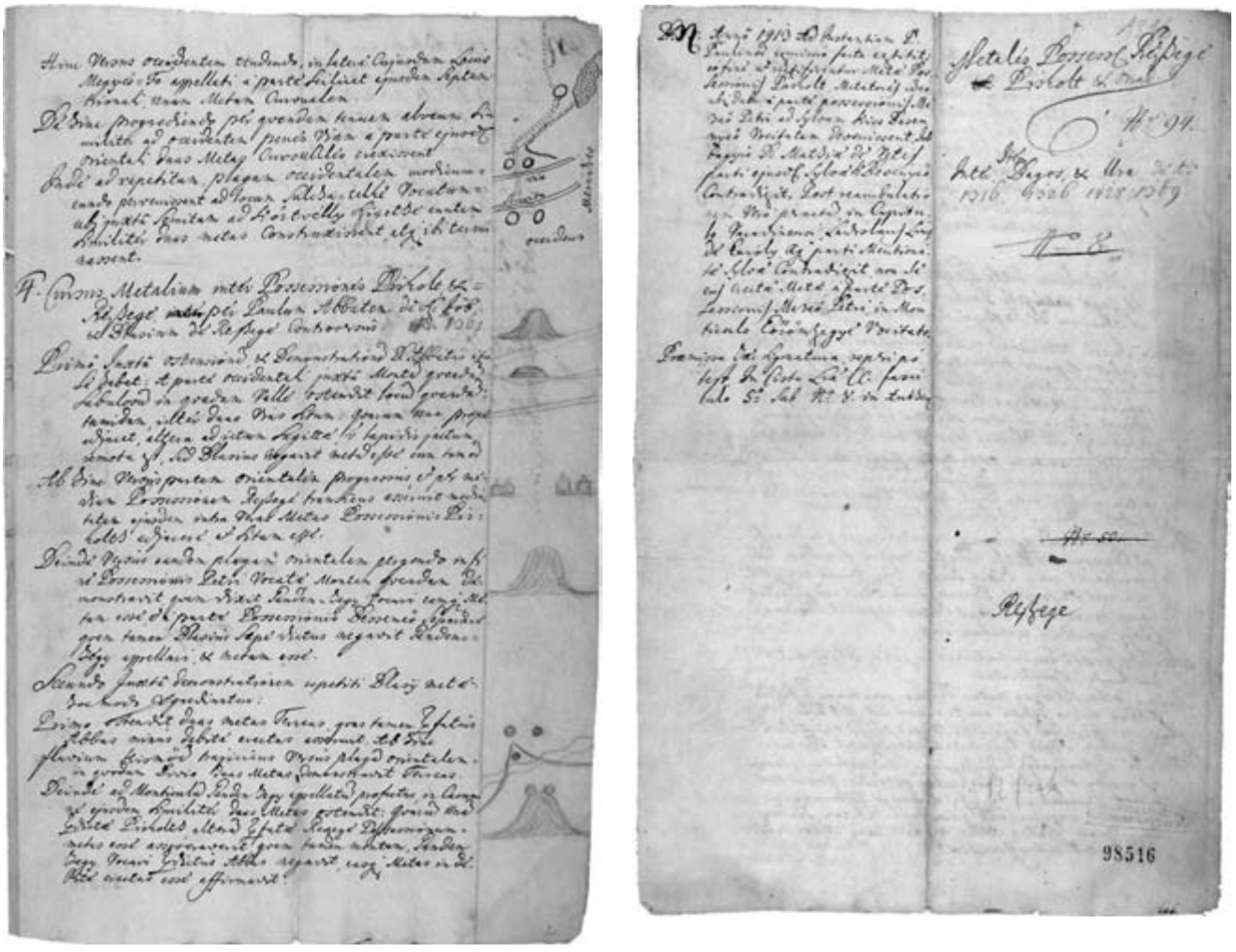

FIG. 61.4. (*continued*)

For example, a list of the land property plans in the prince Boguslaw Radziwill's archive dates to 1662.

An early document in Latin, written in 1525–26 in Sárvár, near Szombathely in western Hungary, tells how a land surveyor, one "Benedictus Zombathely," was commissioned to undertake some engineering works.[56] Benedictus is titled *Rwdasmesther,* Hungarian for the German *Ruthenmeister,* which is to say a surveyor-engineer or practical geometer and not someone with a university degree.[57] The brief account records several payments made to Benedictus in western Hungary, so that we can suppose that he worked on the urgent task of maintaining and fortifying castles against the Turks. By the second half of the sixteenth century, foreign—usually Italian—architects were paid much better than the twelve golden guilders Benedictus earned. Their high salaries reflected, however, the substantially changed political, economical, and historical conditions in Hungary.

Other extant documentation from the period includes a copy of a 1555 survey of the Hungarian town of Pápa containing important information on the contemporary practice of reconstruction and fortification.[58] In 1553 a note was made about the completion of a map of the castle of Gyula in Hungary. From this short text we know that the surveyor-engineer, Francisco Aldini, was assisted by a certain painter Alberto, who was possibly responsible for the survey's decorative plan.[59] A remarkably de-

56. László Bendefy, *Szombathelyi Benedek rudasmester: Adatok a középkori magyar földmérés történetéhez* (Budapest: Tankönyvkiadó, 1959). Bendefy's conclusion is supported by indirect evidence, but a survey is not mentioned in the document.

57. The document was found in Budapest, Magyar Országos Levéltár, Ref. no.: M.O.D.L. 26355.

58. Budapest, Magyar Országos Levéltár, OL. Nádasdy-számad. B. 1556, p. 228–30.

59. László Irmédi-Molnár, "Adatok a XVII. századi és a korábbi idoők magyar térképtörténetéhez," *Földrajzi Értesítő* 15 (1966): 263–73, esp. 267. The document with the name "Alberto Kepyro" was, however, written in Latin, so Irmédi-Molnár's interpretation, based on the meaning of the Hungarian word *képíró* (painter), is questionable.

tailed map sketch shows the settlements south of Lake Balaton.[60] Dated to the mid-seventeenth century, the folio-size manuscript shows the position of 151 settlements. Special symbols mark the deserted or uninhabited places, altogether 131 of them, demonstrating the tremendous devastation the country suffered during the Turkish wars.[61] And in 1636 the engineer Johannes Landy died in Casovia (Košice, Slovakia). An inventory of his properties mentions books, paper, writing and drawing tools, castle views, and plans with notes taken in Hungarian.[62] Although the manuscript cartographic material is by no means exceptional, the appearance of printed material is a significant indicator of a more widespread cartographic culture. A "mappe of Cracow" is of special interest, but unfortunately nothing more of it is known. The last sentence of the inventory records "some printed maps of territories on the wall," which demonstrates that maps and decorations in this region were used in ways similar to those used in Western Europe. This sporadic information regarding local map use reflects what was substantially different about cartography in East-Central Europe: its limited scope and low frequency of use.

The New Paradigm: Regional Cartography in East-Central Europe

the reception of ptolemy: john of glogow and johannes de stobnicza

Among the oldest sources of information in Cracow on geography were a manuscript copy of Ptolemy's *Geography,* prepared in Italy (probably in Venice) between 1465 and 1475,[63] and a copy of the 1486 Ulm edition of the *Geography,* which in 1494 was in the possession of John of Glogow (Jan Głogów), a professor at the university.[64] Glogow, who was interested in astronomy and who wrote commentaries on Ptolemy's *Almagest* and Johannes de Sacrobosco's treatise,[65] used his copy of the *Geography* during his lectures on cosmography. His numerous handwritten annotations can be read as notes on the theory of cartography. In addition to John of Glogow's lectures, the astronomer Martin Bylica lectured on the *Ephemerides* of Regiomontanus in 1493.[66]

By the early sixteenth century, there was an increasing interest in cosmography in Cracow. The introduction that Johannes de Stobnicza (Jan ze Stobnicy) wrote to Ptolemy's work was first printed there in 1512, and a second edition followed in 1519.[67] Two woodcut maps—copies of the two small hemispheres at the top of Martin Waldseemüller's large 1507 world map, representing the old and new worlds[68]—were included in the volume and a university textbook. The maps are considered the first to be printed in Poland.[69] The printer was Florian Ungler, who would later publish the original works of Bernard Wapowski. In the mid-sixteenth century, Ptolemy's *Geography* was apparently a popular and sought-after work in Cracow. Both Ungler and Matthias Scharffenberg offered it for sale in 1551 and 1547, respectively.[70]

bernard wapowski: the new shape of sarmatia

Bernard Wapowski was a pioneer mapmaker in East-Central Europe. Born around 1475 into a wealthy family in Radochonice, Poland, he entered the University of Cracow in 1493. Around 1500 he left his homeland for Italy and continued his studies at the University of Bologna, where he received a doctoral degree in law in 1505. Wapowski went to Rome to the court of Pope Julius II, who supported him and appointed him to his personal retinue. At the same time, a new edition of Ptolemy's *Geography* was being prepared by Marco Beneventano in the city, and Wapowski was able to supply him with new information relating to Poland.

From 1506, Wapowski addressed himself to a fundamental revision of the cartography of his homeland of Poland and Lithuania. He began this ambitious work in Rome, where in 1510 he became papal protonotary, and

60. Budapest, Magyar Országos Levéltár, Inv. no.: Esterházy Archives, Repos. 92. Fasc.1.X. 9.

61. Irmédi-Molnár, "Adatok a XVII," 263–72.

62. "Inventarium Universarium Rerum Egregii quondam Domini Johannis Landy . . . Die 27 Marty Juni 1636," Budapest, Magyar Országos Levéltár, Symbus Serie III. Saec. XVII. Fasc. 28 B.2285.

63. The codex in Cracow, Biblioteka Jagiellońska, MS. 7805, is a copy of that in the Biblioteca Apostolica Vaticana, Cod. Vat. Lat. 5698.

64. Cracow, Biblioteka Jagiellońska, Inc. 821. Inscription of possessor: "The book of master John of Glogow, bought for 4 florins," and "Master—1494—Glogow."

65. John of Glogow, *Introductorium compendiosum in Tractatum sphere materialis magistri Joh. de Sacrobusto, quem abbreviavit ex Almagesti Sapientis Ptholomei Claudii* (Cracow, 1506).

66. Birkenmajer, "Beneventano, Kopernik, Wapowski."

67. Johannes de Stobnicza, *Introductio in Ptholemei Cosmographiam* (Cracow: Florianum Unglerium, 1512); see Franciszek Bujak, "Geografja na Uniwersytecie Jagiellońskim do Połowy XVI-go wieku," in *Studja geograficzno-historyczne* (Warsaw: Nakład Gebethnera i Wolffa, 1925), 1–61, esp. 41–47, and p. 351, table 9.1, in this volume.

68. Figure 9.9 and A. E. Nordenskiöld, *Facsimile-Atlas to the Early History of Cartography with Reproductions of the Most Important Maps Printed in the XV and XVI Centuries,* trans. Johan Adolf Ekelöf and Clements R. Markham (1889; reprint, New York: Dover, 1973), pl. XXXIV.

69. The rare woodcut hemispheres included in Stobnicza's *Introductio* had been considered the oldest printed maps with the name *America* until 1901. Jadwiga Bzinkowska, "Jan, ze Stobnicy. Introductio in Ptholomei cosmographia . . . ," in *I Found It at the JCB: Scholars and Sources, Published on the Occasion of the Sesquincentennial Celebration of the Founding of the John Carter Brown Library* (Providence, R.I.: John Carter Brown Library, 1996), 4–5.

70. Artur Benis, "Inwertarze księgarn krakowskich Maciejy Scharffenberga i Floriana Unglera (1547, 1551)," *Archiwum do Dziejów Literatury i Oświaty w Polsce* 7 (1892): 1–71.

he continued it after returning to Cracow in 1515. Employed as a royal secretary and chronicler, he also wrote a history of Poland from earliest times to 1535; his manuscript, although not published until 1847–48, seems to have been an important source for later writers.[71] Overall, Wapowski's work was representative of Renaissance scholarship and reflected his thorough knowledge of classical writers, especially Ptolemy, and his passion for geographical studies. In particular, he systematically collected surveys and geographical information for a new chorographical map of the huge region.

The work of an earlier chronicler, Jan Długosz, was certainly among the important sources Wapowski used for making the new maps. Długosz was first the secretary of the Cracow bishop (later cardinal) Zbigniew Oleśnicki and from 1436 he served as canon of the Cracow cathedral. In 1449, Długosz spent some time in Rome and took part in diplomatic missions during the war with the Teutonic Order (1454–66). Later he became a tutor to the sons of the Polish king Casimir IV. His major writings include the twelve-volume chronicle *Annales seu cronicae incliti Regni Poloniae,* of which the introductory part, "Chorographia Regni Poloniae," is a detailed geographical description of Poland.[72] This work was clearly utilized by Wapowski, who continued the chronicle after Długosz.[73]

Długosz's written description of Poland comprises a textual map of the country. His chorography was heavily based on the rich hydrography of Polish territories.[74] The main rivers provided a natural geographical structure, with towns and villages being listed in sequence along each river. Długosz identified some two hundred settlements together with other important geographical features, such as lakes, swamps, and mountains.[75] Wapowski incorporated Długosz's chorographical work with the information from other sources. According to Alexandrowicz, Wapowski measured with a compass and surveyed the courses of the rivers, making it possible for him to locate more details with much greater accuracy than did Długosz.[76] Długosz's "Chorographia Regni Poloniai" was also an important source for other writings on Poland, including Matthias von Miechow's *De duabus Sarmatiis . . .* (Cracow, 1517), which tried to correct the distorted image of the country that dominated the contemporary literature.

THE WAPOWSKI FRAGMENTS

There is almost no information about how Wapowski started his cartographic project or how he worked in the field. We know that he planned on an enormous scale and that the result was outstanding. Wapowski's cartographic activity was certainly the renaissance of Polish cartography: it was the breakthrough in shaping the modern geographical image of the huge region of European Sarmatia. Unfortunately, only fragments of Wapowski's maps are known to have survived.[77] The almost complete loss can be explained by the great Cracow fire of 1528, which destroyed Ungler's printing office. Ungler had in 1526 received the privilege from Sigismund I of Poland to print three woodcuts of Wapowski's maps of the king's territories in East-Central Europe.[78] Fragments of parts of the maps of Sarmatia and Poland, probably proof copies published in 1526 or shortly afterward, survived into modern times (fig. 61.5).[79] But ill luck haunted even the Wapowski fragments: they disappeared in the fire that destroyed the Krasinski Library in 1944. Low-quality photographs of the fragments were preserved in the proofs of Buczek's "Monumenta Poloniae Cartographica"; other early maps and facsimile reproductions were destroyed after the German occupation of Warsaw in 1939. Altogether, seven Wapowski fragments are known from the reproductions: three from the map of Sarmatia and four from a map of Poland. The fragments are of different size and content, enabling only the partial reconstruction of the original works.[80]

WAPOWSKI'S *POLONIA* (CA. 1526)

The fragments of Wapowski's map, mentioned as the "general" map in Ungler's 1526 privilege, were found in 1932: part of Greater Poland (*Polonia Maior*), another fragment representing Samogitia, a strip of the map's title, and a piece of the frame (fig. 61.6).[81] Based on these fragments and indirect documentary evidence, Buczek recon-

71. Bernard Wapowski, *Dzieje korony Polskiej i Wielkiego ksiestwa litewskiego od roku 1380 do 1535,* 3 vols. (Wilno: T. Glűcksberg, 1847–48).

72. The manuscript is in Cracow, Biblioteka Czartoryskich, sign. 1306. IV.

73. Buczek, *History of Polish Cartography,* 26 n. 78.

74. Franciszek Bujak, "Długosz jako geograf," in *Studja geograficzno-historyczne* (Cracow: Nakład Gebethnera I Wolffa, 1925), 91–105.

75. Jadwiga Bzinkowska, *Od Sarmacji do Polonii: Studia nad początkami obrazu kartograficznego Polski* (Cracow: Nakładem Uniwersytetu Jagiellońskiego, 1994), 27–34.

76. Stanisław Alexandrowicz, *Rozwój kartografii Wielkiego księstwa litewskiego od XV do połowy XVIII wieku,* 2d ed. (Poznań: Wydawnietwo Naukowe Uniwersytetu Im. Adama Mickiewicza w Poznaniu, 1989).

77. Buczek, "Bernard Wapowski."

78. Published in Jan Ptaśnik, ed., *Cracovia Impressorum XV et XVI saeculorum* (Leopoli: Sumptibus Instituti Ossoliniani, 1922), 119–120 (no. 287).

79. Kazimierz Piekarski found the fragments in old accounting books of the Bochnian salt mines (1540–60) located in the Archiwum Glowne Akt Dawnych (Central Archive of Old Records) in Warsaw. They were apparently used as waste paper, which supports the opinion of Karol Buczek, who identified them as proof prints.

80. On the fragments, see Buczek, *History of Polish Cartography,* 32–48.

81. Buczek, *History of Polish Cartography,* 36 n. 113.

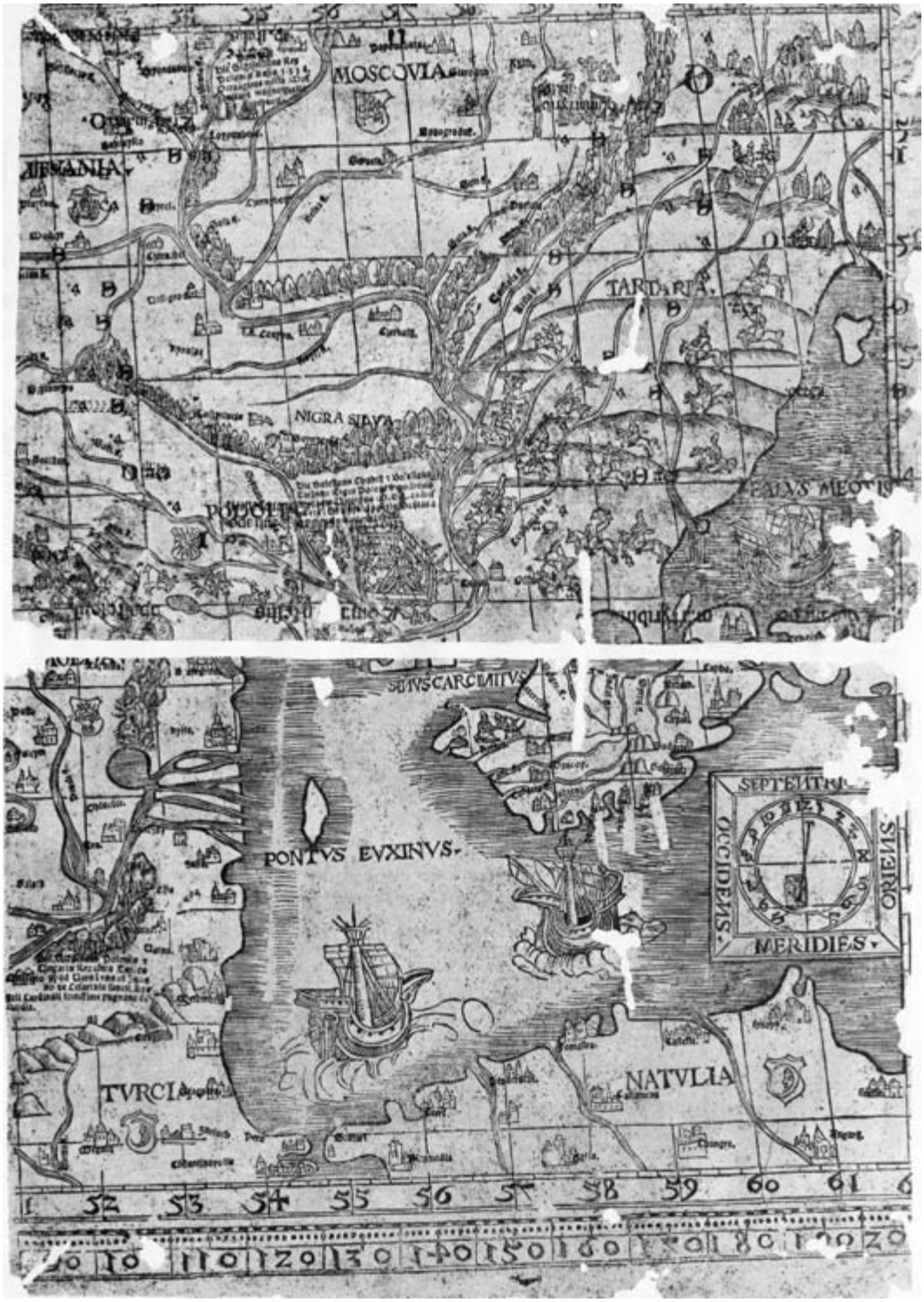

FIG. 61.5. BERNARD WAPOWSKI, MAP OF SARMATIA, CA. 1528. From these two preserved fragments, we can reconstruct the eastern part of the map of European Sarmatia, printed between 1526 and 1528 by Florian Ungler in Cracow. The woodcut was combined with metal type used to print the smaller place-names and captions. These were apparently printed in a second printing. In the lower fragment, note the rectanglar strips left empty for the place-names in the Crimean peninsula (extending into the Black Sea, disrupting the wavy sea pattern). Although there is a geographical grid, the map is full of pictorial elements.
Size of the upper fragment: 20.5 × 30 cm; lower fragment: 21 × 30 cm. From Karol Buczek "Monumenta Poloniae Cartographica" (unpublished, 1939). Photograph courtesy of the Biblioteka Narodowa, Warsaw (ZZK 0.909/2).

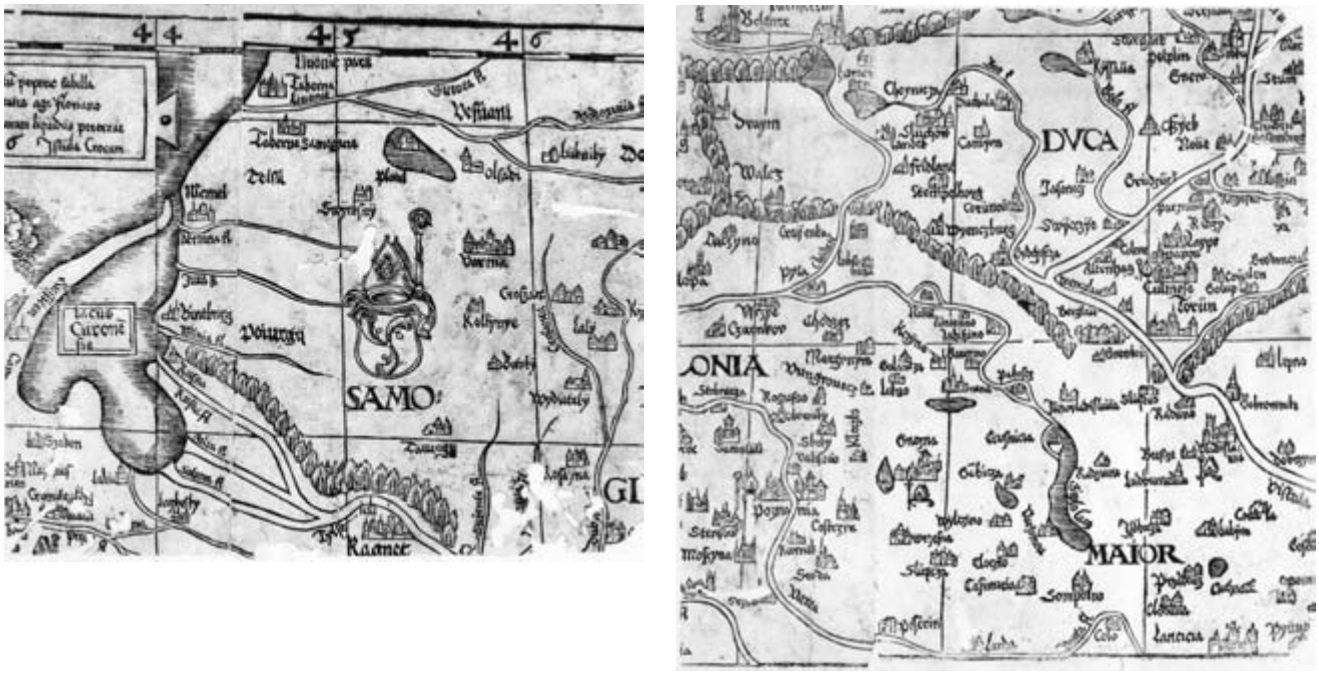

FIG. 61.6. BERNARD WAPOWSKI, MAP OF POLAND, CA. 1526. Two fragments of Wapowski's large woodcut map of Poland and Lithuania. On the northern fragment (left), below the map's frame, is a part of the title. The last line "6 Istüla Crocam" suggests that the map was printed by "Florianus" in 1526 in Cracow on the Vistula River. Represented on the other fragment are central Poland (Polonia Maior) and a part of ducal Prussia. Pictorial symbols mark the bishopric centers, e.g., Poznania (Poznań), and the archbishop's seat, Gnezna (Gniezna).
Size of the originals, left: 20 × 21 cm; right: 22 × 21 cm. From Karol Buczek "Monumenta Poloniae Cartographica" (unpublished, 1939). Photograph courtesy of the Biblioteka Narodowa, Warsaw (ZZK 0.909/3).

structed this lost map. Its title was most probably "Mappa in qua illustr[antur ditiones Regni] Poloniae ac Magni D[ucatus Lithuaniae pars]." The size of the original map might have been impressive: about 90 by 86 cm without the title. The area represented extended from upper Hungary in the south to the borders of Samogitia and Curlandia in the north, and from the meridian of Francfort (Frankfurt am Oder) in the west to the longitude of Rów (Bar) in Podolia. The details of the map could be reconstructed through Grodecki's later map.[82] Buczek counted 116 place-names on the fragment of central Poland and he supposed that relatively few places were marked in the regions of Lithuania, Silesia, and Pomerania. He estimated that more than one thousand cities, towns, and villages would have been represented on Wapowski's map, most of them in Poland and east Prussia.[83]

For assistance in representing east Prussia, Wapowski may have consulted the astronomer Nicolas Copernicus, who had a keen interest in the geography of east Prussia. He was in close contact with Wapowski, and it is assumed that the famous astronomer's observations were studied when the first maps of Poland and Sarmatia were constructed. Copernicus is also considered to be the mapmaker of Frombork and the Vistula lagoons. Unfortunately, these maps are known only from correspondence. For this reason, we cannot be sure Copernicus actually used any astronomical method for mapmaking.

WAPOWSKI'S SOUTH SARMATIA (1528?)

Three Wapowski fragments represent a large part of the Grand Duchy of Lithuania, the Khanate of Crimea (Tartaria), and a strip of Muscovy (Moscovia) and appear to form the eastern half of a map. From the latitudes and longitudes given on the fragments, one can imagine the coverage of the entire map: presumably titled "Tabula Sarmati(a)e . . . ," it perhaps extended from the latitude of Constantinople (41°N) to that of Toruń (53°N) and was about 60 by 40 cm in size. The western half of this woodcut map probably covered south and central Poland, upper and eastern Hungary, Transylvania, and the northern part of the Balkans. This area corresponds well to the description in the 1526 privilege. The map of south Sarmatia was once thought to have been printed from four blocks. This could have been the case, but the size of the remaining fragments suggests that the printer

82. See the discussion later in this chapter on Wacław Grodecki's maps of Poland.

83. Buczek, *History of Polish Cartography,* 36–37 n. 116.

needed to use only one block (measuring about 30 × 42 cm) for the whole eastern half; consequently the whole map was printed on two sheets. Apart from the fragments, Wapowski's map of Sarmatia can be reconstructed from later known works that presumably copied his map. The earliest of these is Heinrich Zell's wall map of Europe, published in about 1533 in Nuremberg. Another is the well-known *Polonia et Ungaria* by Sebastian Münster, first published in the 1540 Basel edition of Ptolemy's *Geography*.

Buczek supposed that a third chorographical map by Wapowski covered north Sarmatia, including eastern Pomerania, Samogitia, east Prussia, Livonia, Lithuania proper, northeastern Grand Duchy of Muscovy, and southeastern Sweden. This hypothetical coverage is based on the supposition that the size of the two maps was the same—that is, the northern part would have complemented the southern part. Actually, as Buczek noted, the description of the area covered by the supposed map of north Sarmatia is not clearly defined.[84] This northern map has been completely lost; no fragment remains. We know, however, that in 1530 Wapowski sent two "chorographies" to Johann Eck in Augsburg.[85] From letters dated 1529 from Johann Hess to Willibald Pirckheimer, we also learn that not long before, two "inelegant yet not useless" maps of Sarmatia and Scythia had been published in Cracow. Writing from Wrocław, Hess asked his friends in Cracow to send him these maps, but he received only the map of Sarmatia.[86] From this information we can conclude the two maps formed a pair.[87] Alternatively, these sources might have referred to one map printed on two sheets; if so, the complete loss of the north Sarmatia map may indicate that it was in fact never printed.

Buczek also hypothesized a second edition of Wapowski's map of south Sarmatia, because a similar map, *Tabula Sarmatiae,* was mentioned by Abraham Ortelius in his catalog of map authors, alternatively dated to 1525 (1574 edition) or 1528 (1575 edition) and attributed to "Florianus." This attribution probably referred to Florian Ungler, the printer. The changing publication date has fueled speculation. Following Buczek, Alexandrowicz suggests that a putative second edition incorporated material provided in a manuscript map of Hungary by Stephan Brodarich (István Brodarics) in 1527.[88] Unfortunately the latter map is not extant, the publication date of Wapowski's map is uncertain, and the theory of the second edition is not supported by documentary evidence. Indeed, at present we have neither documentary evidence—except for the privilege of 1526—nor cartographic evidence supporting the existence of a Wapowski map of Sarmatia before 1528. The hypothesis is based solely on the different dates given by Ortelius. Yet the change from 1525 to 1528 can simply be interpreted as the correction of an earlier printing mistake. Moreover, if we accept 1528 as the date of publication, this mention could equally be considered as referring to the first and only edition of Wapowski's map of south Sarmatia.[89]

From the correspondence of Wapowski we know that he continued his cartographic work after 1526–28. His friends tried to persuade him to cooperate with Alexander Sculteti in the making of a map. Sculteti is known to have made a now-lost map of Livonia in 1529. In 1533, Wapowski was working on maps of Livonia, Scandinavia, and Muscovy, assisted by various ecclesiastical people. Johannes Dantiscus, the bishop of Chelmno, sent him two maps of Scandinavia and more maps were also expected from other contributors. Wapowski hoped to complete the work in 1533, but it is not known whether he succeeded.

The First Printed Map of Hungary

Textual descriptions of Hungary in the historical works of the fifteenth-century Italian humanists Antonio Bonfini, Pietro Ransano, and Sebastiano Compagni described the spatial characteristics of the country. These works were in all probability based on route descriptions that guided medieval travelers, diplomats, and tax collectors.[90] We have enough evidence to accept the thesis that spatial information had been systematically collected and accumulated in Hungary before the sixteenth century. Yet the nature of the textual representations and the lack of graphical documents suggest that the organization of geographical information into a holistic image of the whole country did not begin until the late fifteenth and early sixteenth centuries.

An important compilation for researchers following the development of Nicolaus Cusanus's map of Central Europe is the woodcut Germania map by the Venetian, Giovanni Andrea Valvassore. The title of this map, *Quot picta estt parua Germania tota tabella . . . ,* was taken directly from the Cusanus map, which served as a base

84. Buczek, *History of Polish Cartography,* 32 n. 101.

85. Buczek, *History of Polish Cartography,* 32–34.

86. Hess's letters were published in Johannes Heumann, *Documenta literaria varii argumenti . . .* (Altdorf, 1758), 79 and 119.

87. Wapowski's letter was published in *Acta Tomiciana* 12 (1906): 241 (no. 256).

88. Alexandrowicz, *Rozwój kartografii Wielkiego,* 41–42.

89. In this case, the phrase "not long ago" in Hess's 1529 letter to Pirckheimer means "last year," that is, 1528. Because of the fire that destroyed Ungler's printing workshop in Cracow, Wapowski's maps could not have been printed later. In summation, the privilege was granted in 1526 and all other sources suggest both a later date of 1528, and only a single edition for the map of south Sarmatia.

90. The earliest such itinerary describing the pilgrim's road crossing Hungary was made after 1031. György Györffy, *István király és műve,* 3d ed. (Budapest: Balassi, 2000), 299–301.

FIG. 61.7. GIOVANNI ANDREA VALVASSORE, MAP OF HUNGARY, CA. 1538. Valvassore's map was published as a popular Italian print. It shows the places the Turks occupied until 1521 and the fall of Belgrade. Several places were marked with city signs but left unnamed, indicating that the work was not intended for general geographical purposes but to show the locations of contemporary events. Note the place "compole" (Kompolt, Hungary) below the fragmented inscription "VNGARIA" and the symbolic figures of battles not yet fought. The almost uninhabited settlement marks a major battlefield where an uprising of Hungarian peasants was defeated in 1514. The woodcut by Matteo Pagano (Venice, ca. 1538) was based on an unknown manuscript.
Size of the original: 27.1 × 37.1 cm. Photograph courtesy of the Országos Széchényi Könyvtár, Budapest (Collection of Early Books, TR 207).

map. Valvassore's map was undated, but it was made ca. 1538 (fig. 61.7). A smaller, anonymous, manuscript and undated war map of Hungary was discovered and attributed to Valvassore early in the twentieth century.[91] That copy disappeared during World War II, but another copy of the Valvassore war map was discovered in a collection of thirteen woodcuts found in Italy in 1987.[92] The context, style, and subjects of these maps and views indicate they were all printed in the same workshop between 1535 and 1541. The map of Hungary was identified as a work of Valvassore's workshop. The watermark shows that the printing paper was dated about 1538, so it could be a later print, taken from the block, presumably cut before 1526.[93]

"LAZARUS SECRETARIUS," THE MAPMAKER

Experts have studied the unique copy of Lazarus's 1528 map of Hungary ever since its rediscovery in the late nineteenth century.[94] The first surviving printed map of the country and its surroundings, this map was an early product of wider developments that led to modern regional cartography in Renaissance Europe. The map also demonstrates the effects of complicated information transfer in the early sixteenth century. The reconstruction of this process reveals significant features of the original manuscript map. The new interpretation proposed here, of the map's transformation from manuscript to print, is the result of recent research and is intended to correct apparent cartobibliographical mistakes. A particular historiographic problem is that no less than five individuals were associated with the map, four of much greater social and intellectual standing than Lazarus, so that the attribution of authority has been somewhat confused.[95]

Nonetheless, the long and complicated dedicatory text made the identity of the map's original author clear: "The map of Hungary on four sheets, compiled by one Lazarus, an experienced [learned] man, the secretary of the late Cardinal Thomas of Esztergom."[96] Beyond this, little is known about Lazarus.[97] One generation later, in 1552–

91. Reproduced in Wolfgang Lazius, *Karten der österreichischen Lande und des Königreichs Ungarn aus den Jahren 1545–1563,* ed. Eugen Oberhummer and Franz Ritter von Wieser (Innsbruck: Wagner, 1906). The manuscript map was found in Munich, Bayerische Staatsbibliothek. On Cusanus, see chapter 42 in this volume.

92. Szathmáry, *Descriptio Hungariae,* 1:57.

93. Tibor Szathmáry, "Hazánk első ismert nyomtatott haditérképének vizsgálata társtérképeinek függvényében," *Cartographica Hungarica* 1 (1992): 6–19, and idem, "Hazánk egyik legrégibb nyomtatott térképe II. rész," *Cartographica Hungarica* 2 (1992): 2–10.

94. The only copy of the map dated 1528 was left for us by Sándor Apponyi, a Hungarian collector of old books and maps, who bought this valuable and unique woodcut in the 1880s from an antique dealer in Paris. The map was mentioned much earlier by Martin von Schwartner, *Statistik des Königreichs Ungern* (Pest: M. Trattner, 1798), 43. The Florentine cosmographer Giovanni Battista Riccioli also mentioned Lazarus's name ("Lazari Vgonis," which is presumably the corrupted form of Lazarus Strigoni[ensi]s) among makers of maps of Hungary in his *Geographiæ et hydrographiæ reformatæ . . .* (Venice, 1672). Lazarus's map was listed in the *Bibliotheca classica* by Georg Draud, 8 vols. (Frankfurt am Main, 1625), 4:1173. Lipen dates "Laz(ari) Secretarii Hungaria in Mappa" to 1588, which is obviously a printing error. Martin Lipen, *Bibliotheca realis philosophica,* 2 vols. (Frankfurt: J. Friderici, 1682), 1:693.

95. Abraham Ortelius's attribution of the map, in his 1575 "Catalogus auctorum," to Peter Apian has generally been followed. The confusion about its authorship is reflected in Karrow's authoritative monograph—Robert W. Karrow, *Mapmakers of the Sixteenth Century and Their Maps: Bio-Bibliographies of the Cartographers of Abraham Ortelius, 1570* (Chicago: For the Newberry Library by Speculum Orbis Press, 1993)—where the map is mentioned in the entries on Peter Apian (54), Johannes Cuspinianus (140), and Jacob Ziegler (605) and called "the Lazarus/Ziegler/Tanstetter/Cuspinianus/Apian map of Hungary" (55).

96. The title in contemporary Latin: *Tabula Hungarie/ ad quatuor latera per/ Lazarum quondam Thomae/ Strigonien(sis) Cardin(alis). Secretariu(m) viru(m)/ exp(er)tum congesta, á Georgio Tanstetter/ Collimitio reuisa auctiorq(ue) reddita, at-/ que iamprimu(m) à Jo.(anne) Cuspiniano edita/ Serenissimo Hungarie et Bohemiae/ Regi Ferdinando principi et infanti/ Hispaniarum, Archiduci Austriae etc./ sacra. auspitio maiestatis suae, ob reip(ublicae)/ Christiane usum, opera Petri Apiani/ de Leyßnigk Mathematici Ingol-/ stadiani inuulgata Anno/ D(omi)ni 1528.*

97. The problem with identifying the real Lazarus in historical documents is that we do not know whether the name was a family or a Christian name. This ignorance has not stopped speculation. A Hungarian stu-

56, his name appeared again in Vienna on the Latin and German editions of Wolfgang Lazius's map of Hungary.[98] In these texts, Lazarus is called a Hungarian student (*ein ungarische Diakh*) and of the clan of the Huns (*Lazarus gentis Hunnicae*), suggesting that he was Hungarian.[99] On the 1528 map, Lazarus was given the rather modest title of "secretarius," indicating no high academic (magister) or ecclesiastic (canonicus) position, and he was further qualified as an experienced person (*virum expertum*).[100] He apparently had no scientific degree. In the early sixteenth century, the college of Esztergom taught astronomy, cosmography, and computus, but such knowledge was less useful in mapmaking than were practical skills and expertise. Lazarus was most likely a talented and reliable clerk in the chancellery. If so, he could have been commissioned by Archbishop Bakócz (Cardinal Thomas of Esztergom), who played a leading role in state administration and directed both the ecclesiastical and royal chancelleries. The construction of a detailed and correct map of the country would have been an effective tool for state administration and military campaigns at a time when military reform was a major issue and the defense of Hungary against the Ottoman Empire was becoming a pressing problem.

A letter to the printed map's editor, Georg Tannstetter, from the learned Jacob Ziegler, dated Venice, 6 April 1529, allows us to date Lazarus's work. Ziegler mentioned that he had personally worked on the manuscript of the map with its "prime author" at the time of a peasant revolt in Hungary.[101] This revolt would most probably have been in 1514, when a crusade against the Turks, organized by Archbishop Bakócz, developed into a serious internal conflict. Ziegler's letter is convincing evidence that Lazarus had already started work on his map in 1514 and certainly before 1520.[102]

The map's dedication identified its editor as Tannstetter, also known by his humanist name of Collimitius, a professor at the University of Vienna, and its publisher as Johannes Cuspinianus (Spiesshaimer), a famous Austrian humanist who had frequently visited Buda (twenty-four times between 1514 and 1526) in the service of Emperor Maximilian I. Tannstetter and Cuspinianus had already collaborated on a cartographic project. Another printed map of Hungary is mentioned in a 1523 letter to the elec-

dent named Lazarus de Stuelweissenburg has been found in the 1512 register of the University of Vienna (entry of 14 April in Nacio Hungariae, Z 47); see *Die Matrikel der Universität Wien,* 6 vols. (Graz: H. Böhlaus, 1954–67), vol. 2, no. 1, 389; thus Ernst Bernleithner, "Der Autor der ältesten Ungarnkarte und seine Mitarbeiter," *Mitteilungen der Österreichischen Geographischen Gesellschaft* 116 (1974): 178–83, esp. 179, could posit that Lazarus worked in 1514 with his former professor, Tannstetter. Based on the similarity of the names of contemporary Vienna students Rosetus and Rozen, Lazarus has also been identified with a nobleman from upper Hungary who took the name at ordination (entry of 14 April 1508), in *Die Matrikel,* vol. 2, no. 1, 353; see László Bendefy, "Lázár deák személye," *Geodézia és Kartográfia* 23 (1971): 338–40. A person called "Lazarus Roseti" has been suggested as canon of the Esztergom (Strigonium) chapter in 1510 by the registers of the episcopal county ("Lazarus Rosetus Capellanus Archi-Episcopi Thomae, 1510," in P. Luksics, "Az esztergomi főkáptalan a mohácsi vész idején," *Esztergom Évlapjai* [1927]: 70–93). Another contemporary document mentions this Lazarus as "canonicus" (1509–14) and as tithe collector (1510–11). The manuscript was found by Luigi Ferdinando Marsigli in 1686 and preserved among his papers in Bologna ("Divisio Agrorum spectantium ad varia Hungarie ecclesias as anno Domini 1500 ad annum 1527," in Cod. Lat. 634). However, according to documentary sources, Lazarus was not the personal secretary to Archbishop Bakócz. See Ferencz Kollányi, *Esztergomi kanonokok 1100–1900* (Esztergom: Buzárovits Gusztáv Könyvnyomdája, 1900), 124.

98. The appearance of the name "Lazarus" on the map by "Lazius" resulted in much confusion. See, for example, J. M. Rogers, "Itineraries and Town Views in Ottoman Histories," in *HC* 2.1:228–55, esp. 247 n. 68. Lazarus and Lazius were different persons.

99. The Latin text on Lazius's 1556 map referred to the earlier work made by "Johannes Cuspinianus and Lazarus, at one time of the Hunnish race, in the beginning of this war." In contemporary texts Hungarians were frequently called Huns. Although the interpretation is uncertain, from this remark it is clear that Lazarus's work was published for the war against the Turks. Flóris Rómer copied a fragment of Lazius's map that he saw in Vienna in the late nineteenth century (Budapest, Országos Széchényi Könyvtár, Fol. Hung. 1111 52–58). According to Rómer's manuscript, the map read: "Und gleichwol ermelte Hungarische *Mappa vor viel Jaren D. Johann Cuspinian/ auff angeben* Lazari einen Hungarischen Diakhen ver*fast/ und durch Petrum Appianum in dem Truck ist ausgegan*gen" (And although the mentioned map of Hungary was constructed many years ago by Johann Cuspinianus from the data of Lazarus, a Hungarian 'Diakhen,' and it went to press by Peter Apian) (italic parts of the text correspond to the incomplete fragment of the printed map [Budapest, Országos Széchényi Könyvtár, OSZK TM 6 984]).

100. Lazarus could be an acknowledged scribe ("notarius") who was titled "secretarius." Wapowski was a royal secretary, a position allowing him access to the information at the chancellery and offering the support of state administration in subsequent collecting surveys.

101. Karrow, *Mapmakers of the Sixteenth Century,* 605, misinterpreted the context of this document and suggested that Ziegler reported from Vienna. The letter was dated from Venice, and Ziegler explicitly said he could see the map there, while Tannstetter was in Vienna. "Hungariam tuam his diebus Venetias allatam vidi . . . anno MDXXIX." Jacobus Zieglerus Landavus, Georgii Collimitio Medico, S. D. Scholias, Vienna, Universitätsbibliothek, II. 247, 095, cited in Antal Fekete Nagy, *Monumenta rusticorum in Hungaria rebellium anno MDXIV,* ed. Victor Kenéz and László Solymosi (Budapest: Akadémiai Kiadó, 1979), 545. It is clear from the context that the mapmaker called "Eleazarus" in Ziegler's letter is Lazarus. It is also remarkable that Ziegler could make a comparison between the 1528 print and a manuscript of Brodarich's and find identical representations of Hungary on both maps.

102. Ziegler stayed in Hungary from 1514 to 1520, but his practical contribution to the map was apparently rather limited. From his short reference it could be assumed that they discussed some cosmographical problems (for example, the compilation of the material) relating to Lazarus's mapping project. It is possible that Ziegler also planned an edition of the map of Hungary. In a letter of January 1530 he described his plan for a new edition of Ptolemy's *Geography* and mentioned a map of Hungary he had already completed (Karrow, *Mapmakers of the Sixteenth Century,* 605). At the same time, a map of Sarmatia, just then being made, might be a reference to Wapowski's work. Unfortunately, these pieces of information could not be corroborated because these important maps by Ziegler remain unknown to us.

tor of Saxony.[103] It is also known that after the fall of Belgrade (1521), Tannstetter received a five-year privilege for a military map of Hungary.[104] This map may have been among the maps of Hungary presented to Emperor Charles V in 1566.[105] These sources actually give documentary evidence that a Tannstetter-Cuspinianus printed map of Hungary already existed in 1522, but this was not an earlier printed edition of Lazarus's work.[106] Instead, Cuspinianus wrote in 1528 that he could both measure the dimensions of Lake Fertő (Lake Neusiedler, on the Hungary/Austria border) and locate the site of the bridge built by the Roman emperor Trajan on a description or map of the Kingdom of Hungary that he had recently found.[107] In other words, Cuspinianus found Lazarus's manuscript in 1526–27, had Tannstetter edit it, and then had Tannstetter's former pupil Peter Apian print it in 1528.

THE *TABULA HUNGARIE* (1528)

The only extant copy of the printed Lazarus map of 1528 has an upright format, with north at the top (fig. 61.8). If the four printed sheets are put together, they make a wall map.[108] The large quantity of hydrographical and orographical details and, above all, of some 1400 geographical names suggests the systematic collection of information. The spelling of the names supports the opinion that the author was a Hungarian: in some cases the names show precise variations representing differences in dialect,[109] implying that information was collected from local sources or field work. Significantly, only 356 of the approximately 1270 settlements can be found inside the borders of present-day Hungary; the rest belong to several surrounding East-Central European countries.[110] The density of geographical information on the map is highly uneven. The few settlements represented in western Hungary have only German or Latin names. The representation of Lake Balaton, the largest lake in East-Central Europe, is highly distorted in shape and size, and it has been proposed that the editors were responsible.[111] The white spaces along the Austrian border may suggest either an incomplete and unfinished manuscript or a deliberate policy of secrecy.

The notes on the map refer to much earlier military conflicts with the Turks. At the siege of Galamboc, for example, Emperor Sigismund was defeated.[112] The name "Syrffen" stands for Kossovo, where Hunyadi was defeated in 1448. The map clearly emphasizes the lines of the southern border fortifications that developed in the fifteenth century to defend Hungary against an emergent

103. Hans Brichzin, "Megjegyzések az első nyomtatott Magyarország térképről (1522)," *Cartographica Hungarica* 1 (1992): 37–40.

104. Although this map has been proposed as the first edition of Lazarus's original manuscript, contemporary documents suggest that it was a sketchy representation of military operations against the Turks: "After this, he, Tannstetter hastily made a geography or a sketch about the Christian and Turkish lands, and the campaigns the Christians made against the Turks, or those made against them, with lines he described in detail, which geography he has printed." Reichsregistratur Karls V, Bd. fol. 128, Vienna, Staatsarchiv.

105. Innsbruck, Statthaltereiarchiv, Ambraser Akten, 1566, and Reichsregister of Emperor Charles V, vol. 6, p.128.

106. For these speculative editions, see for example, László Bendefy, "Lázár deák 'Tabula Hungariae . . . ' című térképének eddig ismeretlen kiadásai," *Geodézia és Kartográfia* 26 (1974): 263–69, and Brichzin, "Megjegyzések."

107. In his posthumously published book on Austria, Cuspinianus described the course of the river Rábca/Rebniz from its source and said that it flows into Lake Fertő/Neusiedler: "which is seven miles long and three miles wide, how it is clearly seen on our map of Hungary that I dedicated to our king." Johannes Cuspinianus, *Austria* (Basel: Oporini, 1553), 651. In his treatise on Roman consuls, Cuspinianus mentioned the map of Hungary he found in connection with the location of the bridge of Trajan: "But as I have recently encountered a description (drawing) of Hungary and published a map dedicated to King Ferdinand of Hungary and already in print (to Hercules, a distinguished work, if I may say so without envy), I have located the bridge on that representation. Similarly, I mentioned the bridge in the description of our Austria, where all the rivers flowing into the Danube could be found from the source to the Black Sea." Johannes Cuspinianus, *Ioannis Cuspiniani, uiri clarissimi, diui quondam Maximiliani imperatoris a Consilijs, & oratoris De consulibus Romanorum commentarij . . .* (Basel: Oporini, 1553), 418–19. The bridge that Trajan (Marcus Ulpius Traíanus), the Pannonia-born Roman emperor, had constructed over the Danube (south of Turnu Severin, Romania) was considered important information: both Cuspinianus and Brodarich mentioned it to demonstrate their scholarly knowledge. The bridge is on the 1528 Lazarus map, so it can be an indicator of its use by late compilers (such as Zell). The source of information regarding Trajan's bridge is possibly the work of Antonio Bonfini, historian to King Matthias. He was personally involved in the project and translated an architectural work for Matthias, who also planned the construction of a permanent Danube bridge. Antonio Bonfini, *Rerum Vngaricum decades . . .* (Basel, 1568), 4.7.125.

108. At first glance the Lazarus map seems to be quite similar to the contemporary Etzlaub-type map. But, although a very early chorographical map, it depicts a territorial unit with many more details and much higher accuracy and as such represents a new cartographic mode and is an important landmark of the development of modern European mapmaking. Zsolt Török, "A Lázár-térkép és a modern európai térképészet," *Cartographica Hungarica* 5 (1996): 44–45.

109. For example, we find "Orotzlankw" in the Bakony Mountains and "Arozlake" in the Mátra Mountains, which is the Palots version for the same word, today both written in Hungarian as "Oroszlánkő."

110. The locations of about one hundred settlements are represented by symbol only, without names. The map represents the Kingdom of Hungary before 1526, including territories belonging to the present Hungary, Austria, Slovakia, Ukraine, Romania, Serbia and Montenegro, Bosnia, Croatia, and Slovenia.

111. Bendefy explained that the printed map shows the route of the surveyor(s) around the lake and said it was mistaken for the actual coastline, which was not drawn on the manuscript. László Bendefy and Imre V. Nagy, *A Balaton évszázados partvonalváltozásai* (Budapest: Műszaki Könyvkiadó, 1969), 65–68.

112. The inscription on the map shows the date 1428 and not 1409. This incorrect date is evidence of Cuspinianus's contribution. He made the same mistake in his book. Johannes Cuspinianus, *Oratio protreptica ad Sacri Romani Imperii principes . . .* (Basel, 1553), 715.

Chorographia Hungarie.

Eine kurtze vnnd Warhafftige beschreibung der Vngerlande.

(*Facing page*)
FIG. 61.8. *TABULA HUNGARIE,* 1528. The first printed edition of Lazarus's manuscript is the first printed map of Hungary, a milestone in the development of European regional mapmaking. The large broadsheet was printed from four woodblocks combined with stereotypes in Apian's workshop in Ingolstadt. Despite its unusual orientation and structure, the accuracy of this very detailed chorographical map suggests the adoption of an itinerary tradition in practical mapmaking in East-Central Europe. The printed map, according to the dedicatory cartouche, was a cooperative work of an emergent Renaissance cosmography. This woodcut was printed on paper, colored, cut into sections, and mounted on cardboard.
Size of the original: 78 × 55.2 cm. Photograph courtesy of the Országos Széchényi Könyvtár, Budapest (Collection of Early Books, App. M. 136).

Ottoman power.[113] The historical information was apparently added to the manuscript by Cuspinianus.[114] His contribution was probably limited to historical notes taken from his own works.[115] He clearly emphasized Emperor Sigismund's efforts for political reasons to support King Ferdinand I's fund-raising campaign. To demonstrate the importance of defense against the imminent Ottoman threat, the 1526 defeat at Mohács is represented in miniature: a cross marks the place where King Louis II died with some 26,000 Christian soldiers.[116]

As printed, the map was intended to be colored according to simple instructions given in the upper left corner. The inscription in German listed the lands conquered by the Turks—"All this is shown by the red color, while the yellow shows the Christians. May the Almighty Lord keep them in His grace!"—and further explained that "All that is inside the dotted line was devastated by the Turks after they had won the battle in the year 1526."[117] The message was clear: the territories occupied by the infidels on the now faded map were originally colored light red, intruding deep into the yellow-colored Christian part. The striking appearance of the map thus graphically expressed Habsburg-Christian propaganda.

The text panel running below the map is a historical and geographical description, in both German and Latin, of the country and includes some revealing information about the making of the map. Interestingly, although it is called "a chorography and road map,"[118] roads are not represented, so it can be assumed that this information refers to the method by which information was collected, whether by surveys or from itineraries. The Latin historical description, written after 1526, is the basis for the slightly altered German version.[119] Between the legs of the compasses are instructions on the use of the scale, given in German miles, to measure distances. No latitude or longitude is given on the map, so the reconstruction of any geographical graticule is impossible.

The two large floral cartouches on both sides are the most decorative elements of the map. One is the coat of arms of King Ferdinand I (king of Hungary, 1526–64; Holy Roman emperor, 1558–64), the other is a symmetrically placed counterpart containing the dedication.[120] These highly important symbolic elements cover a large portion of the map and greatly influence the structure of the image.[121]

LAZARUS'S MANUSCRIPT (CA. 1514)

Lazarus's printed map was a collective work, and it should be interpreted as the result of a complicated process of information transfer. In this case, the structure of the original manuscript map, found by Cuspinianus, was modified by the editors and printer in accordance with the established conventions of early modern regional cartography in Central Europe.

A significant feature of the 1528 printed map is its confusing structure and orientation. Not only is the course of the Danube very similar to the distorted Ptolemaic representations, the cardinal directions marked on the map's frame—with north supposedly at the top—do not match its geographical content. It has been suggested that the content of Lazarus's map was rotated: rotating the whole map clockwise through forty-five degrees seems to give an appropriate orientation to the main rivers. Yet detailed examination reveals that the amount of rotation is not uniform across the whole map.[122] It has also been hypothesized that this problem of orientation stems from

113. This emphasis is another piece of indirect evidence that the manuscript was constructed earlier than 1521, when the system of border fortresses collapsed with the fall of Belgrade.

114. The title and dedicatory text on the map explicitly states that Cuspinianus initially published it in 1528. Consequently, it was the first printed edition of Lazarus's work.

115. The other possibility, that the manuscript was prepared by Lazarus for Cuspinianus, is suggested by the text on Lazius's 1556 map of Hungary (see p. 1822, note 99).

116. An account of the Mohács battle was included in Cuspinianus's *Oratio protreptica ad Sacri Romani Imperii principes . . . ,* 1st ed. (Vienna: J. Singriener, [1526]). In connection with the description of the flow of the Danube, Cuspinianus mentions the location of Trajan's bridge and remarks "it is known by few even of the learned."

117. The dotted line was wrongly identified as a road in earlier literature; see Eleonóra Okolicsányiné Harmos, "Magyarország térképe 1528-ból," *Térképészeti Közlöny* 1 (1931): 165–71.

118. "Totius Hungariae Chorographia, itenerariaq(ue); urbium, uicorum, arciu(m), castellorum, fluminum(m) montium, syluarumq(ue); iuxta geometricam dimensionem distantia."

119. For example, the last sentences in Latin mention the Hungarians "are in imminent danger from the Turks" whereas in the German text we read "the Turks have also entrenched themselves there."

120. The coat of arms on the great shield is printed in mirror, whereas the representation of the superimposed smaller shield in the middle is right-reading. This mistake could be attributed to the woodcutter.

121. The 220-cm^2 map area was not covered by but emptied for the decorative elements.

122. This nonuniformity was realized by Oberhummer and von Wieser, who could differentially rotate the map between fifty and ninety degrees (Lazius, *Karten der österreichischen Lande,* 38).

the original construction of the map on the Stabius-Werner or some other Ptolemaic projection for world maps,[123] but mathematical analysis demonstrates that the printed map actually has an irregular structure.[124] Moreover, it is hard to imagine that Lazarus would construct a complicated grid of an entire world map for a chorographical representation of Hungary; it is much more likely that he would have used a simple rectangular graticule for drawing the manuscript, one that would be easy to construct and to work within. To explain the printed map's orientation, we need to consider the intellectual transformations that were applied by the editors to the manuscript map. Lazarus's manuscript was certainly not oriented to north,[125] was probably at a larger scale, [126] and possibly bore no indication of cardinal directions. The incorrect course for the Danube might have resulted, for example, from Tannstetter fitting the map into the contemporary geographical framework of Ptolemy's *Geography.*[127] Indeed, Tannstetter admitted that he had partially transformed the original structure of the manuscript, but that he could not decide on the orientation of the manuscript: in the German text below the map, Tannstetter (Collimitius) informed users that the map still needed to be correctly oriented.[128]

A better explanation for the distortion involves the map's upright sheet format and the addition of elements usually required on maps at this time, specifically the dedication and the coat of arms. When the printed edition was prepared, the map content was simply shifted to leave room for these decorative and symbolic elements. This practice was not unusual in the Renaissance, when problems were generally solved graphically. Spatial distortion would result, but the distances would still be shown properly between the settlements along the main roads. This characteristic of the printed map is strong evidence that the textual description can be taken literally: the map was originally constructed as an itinerary, a road map.[129] Tannstetter thus changed the orientation and format of the map, but conserved its valuable information as much as possible. The procedure had only a slight influence on the reliability of the map itself, which was built on the basis of distances and directions.

In many parts of the printed map, the arrangement of the settlements apparently follows the rivers or roads connecting them. Among the settlement names, more than a dozen curious pairs have been discovered that each represent a single settlement, with two closely placed symbols and two, slightly differently transcribed, placenames.[130] Placed on a modern map, the locations of the duplicated settlements reveal a regular pattern. Consequently, they strongly suggest that the original manuscript was constructed from smaller units, with the places in question serving as register marks that made it possible to join the sheets.[131] Because they were foreigners and did not know these smaller rural places, the editors did not recognize that they were duplicated and so left each pair in the printed version. The appearance of the duplicates indicates that Lazarus did not contribute to the work in Vienna.

Tannstetter sent the revised manuscript to his former student, Apian, who in 1527 had become a professor at the university in Ingolstadt. Apian was interested in cosmography, and he established a printing shop reputed for the high quality of its work. Lazarus's map could have been the first large map to be printed by Apian. The large quantity of names caused a serious problem, which was solved by the application of the new printing technology

123. László Irmédi-Molnár, "The Earliest Known Map of Hungary, 1528," *Imago Mundi* 18 (1964): 53–59, and idem, "Lázár deák térképének problémája," *Földrajzi Közlemények* 19 (1971): 103–24. Presumably this explanation was based on the information given on the second Viennese astronomical school in Oberhummer and von Wieser's book (Lazius, *Karten der österreichischen Lande*). According to documentary sources, however, Lazius (and Cuspinianus?) improved the early map of Austria by Stabius (Karrow, *Mapmakers of the Sixteenth Century,* 139–40).

124. György Érdi-Krausz, "The Mathematical Structure of Lazarus's Maps," in *Lazarus,* 89–96.

125. In his editorial notes, Irmédi-Molnár suggested that Lazarus had decided on a northeast orientation to cover optimally the contemporary territory of Hungary (Okolicsányiné Harmos, "Magyarország térképe 1528-ból," 167). Writing on the structure of the 1528 map, Hrenkó considered the possibility that the Lazarus manuscript could have been east oriented (Pál Hrenkó, "A Lázár-térkép szerkezete," *Geodézia és Kartográfia* 26 [1974]: 359–65). I consider a south orientation of the original map to be the most plausible.

126. The reference to a map of Hungary in Cuspinianus, *Ioannis Cuspiniani, uiri clarissimi,* 651, provides indirect evidence for a larger-scale manuscript and editorial intervention.

127. Lajos Stegena, "A Duna folyásának ábrázolása régi térképeken és a Lázár-térkép tájolása," *Geodézia és Kartográfia* 40 (1988): 354–59.

128. László Irmédi-Molnár, "The Texts of the Lazarus Maps," in *Lazarus,* 23–31, esp. 26. It is remarkable that the instructions on proper map use, similar to those on Etzlaub's road map, are given only in German, which could be explained if we assume the editors made a later inclusion of the text. They certainly thought this information was essential, for the map they published was highly unconventional.

129. As a map based on surveys of major roads and rivers with a compass, Lazarus's manuscript may have been similar to Etzlaub's *Rom Weg* map (see plate 44).

130. Plihál's experimental reconstruction of the manuscript was based on nine pairs of settlements (Katalin Plihál, "Lázár kéziratának sorsa a megtalálástól a megjelenésig," *Geodézia és Kartográfia* 42 [1990]: 372–79). The reconstruction of the manuscript could not explain, however, why the names were duplicated on the manuscript. Plihál's suggestion that Lazarus simply forgot about them is not convincing.

131. Earlier studies on the map suggested that Lazarus compiled his map from at least three different regional maps, which were revealed by the locational errors (Hrenkó, "A Lázár-térkép szerkezete"). I propose here a systematic and uniform map work that was constructed on more sheets. This work was reduced and copied, and one further copy was found by Cuspinianus.

of stereotyping.[132] A comparative analysis of the type styles of this work and the other contemporary maps of Apian could reveal their common origin.[133] The woodblocks for the map were cut in Regensburg by Michael and Martin Ostendorfer. They started with the settlements, followed by relief, forests, and hydrography; irregularities along the sheet joints indicate they worked on each block separately. The transformation of the manuscript's structure concluded in the workshop, where the names of the conventional cardinal directions were added to the margins.

THE RECEPTION OF THE MAP

Lazarus's map was printed in Ingolstadt in May 1528. The cooperation of Lazarus, Ziegler, Cuspinianus, Tannstetter, Apian, and other unknown contributors resulted in a holistic geographical image of Hungary at a time when the organization of the military defense of the southern borders required spatial decisions. In one sense, the map was outdated when it appeared. The territory lost to the Turks in 1526 meant that Lazarus's map could not serve the same Kingdom of Hungary it represented. In another sense, the reliable and detailed representation of the territories between the Habsburg and Ottoman powers would become even more important over the years. The map showed the future defense zone of the Habsburg Empire, the theater of war for Turks and Europeans for the next century and a half.

The favorable reception of Lazarus's map is demonstrated by its subsequent editions: Giovanni Andrea Valvassore (Venice, 1553), anonymous Roman edition in 1559 (1558?), Michele Tramezzino (Rome, 1558), and Johannes Sambucus (Vienna, 1566). Following Claudio Duchetti's prints (ca. 1577), Giovanni Orlandi published a copy using the plate of the anonymous 1558 Rome edition as late as 1602.[134] These maps and their later copies or derivatives multiplied the effect of Lazarus's map on European cartography during the sixteenth and seventeenth centuries. It was, however, not the 1528 printed edition of Lazarus's map that was included in the most influential European cartographic syntheses. The more conventionally oriented compilations by Lazius (1566) and Sambucus (1571) fit better into the context of Ortelius's and Mercator's atlases.

STEPHAN BRODARICH: A MISSING LINK?

A putative map of Hungary by Stephan Brodarich is known from documentary sources only. The most important contemporary record for its existence is a 1529 letter from Jacob Ziegler. When informing Tannstetter about the receipt of a copy of the 1528 Lazarus map, Ziegler mentioned a "similarly accurate map" that Brodarich had drawn.[135] The Viennese cataloger Michael Denis, in 1793, recorded a "Mappa Hungariae" dated to before 1529, although he had seen neither Brodarich's map nor Tannstetter's, which he also mentioned in the same note.[136] It seems very likely that Denis took the information directly from Ziegler's 1529 letter.

Brodarich was chancellor to King Louis II and in 1526 fought in the disastrous battle against the Turks at Mohács. The following year in Cracow he published his story of the battle.[137] He might have prepared a manuscript map of Hungary, but there is no evidence that such a map was used by Wapowski in his revision of his map of Sarmatia. It is hard to imagine that in wartime Brodarich would have been able to construct a detailed chorographical map of Hungary in Cracow, as Alexandrowicz supposed.[138] Brodarich mentioned that he had included a map to explain the geography of Hungary in his booklet. If he copied earlier the hydrographic structure of some of Lazarus's manuscript, with the original and correct orientation of the

132. On the use of this technology, see David Woodward, "Some Evidence for the Use of Stereotyping on Peter Apian's World Map of 1530," *Imago Mundi* 24 (1970): 43–48.

133. This research would contribute to our knowledge about map printing in Apian's workshop, summarized in Karl Röttel, "Peter Apians Karten," in *Peter Apian: Astronomie, Kosmographie und Mathematik am Beginn der Neuzeit,* ed. Karl Röttel (Buxheim: Polygon, 1995), 169–82.

134. The first anonymous (Lafreri) Rome edition is not a pirated copy of the edition published by Tramezzino, both in 1558. The size and content of the two maps are slightly different. The Tramezzino plate was etched, whereas the plate attributed to Lafreri was engraved, explaining its longer life.

135. See p. 1822, note 101.

136. Michael Denis, *Nachtrag zu seiner Buchdruckergeschicht Wiens [bis MDLX]* [Vienna, 1793], 84 n. 4, mentioned the Brodarich map under the title "Stephani Broderici Mappa Hungariae" with the note "ante annum 1529." At the end of the note, Denis asked, "Where then are these maps?" so he apparently could not see any of them. According to Stegena, Brodarich's map was published in Cracow before 1529 (Lajos Stegena, "Editions of Lazarus's Map," in *Lazarus,* 16–19, esp. 16–17). Stegena mentions the 1861–62 manuscript notes of the Hungarian scholar Flóris Rómer, archivist of the Magyar Tudományos Akadémia (Hungarian Academy of Science). At the same time, Rómer listed another map by "Florianus 1528" according to Draud, *Bibliotheca classica,* 4: 1174. It was, however, a misinterpretation that these maps were in the library of the Magyar Tudományos Akadémia. The subtitle on Rómer's list, which was considered as evidence, was actually a later addition by another hand.

137. Stephan Brodarich, *De conflictu Hungarorum cum Solymano Turcarum imperatore ad Mohach historia verissima* (Cracow, 1527). Brodarich's booklet debates Cuspinianus's unfavorable opinion of the Hungarians (in the latter's *Oratio protreptica* . . .). Brodarich's work, printed by Florian Ungler, the printer of the Wapowski maps, gives a short geographical overview on Hungary and refers to a map of the country apparently intended to be included in the work. The booklet is extremely rare today and no copy of that map is known.

138. See Alexandrowicz, *Rozwój kartografii Wielkiego,* 41–42. Moreover, the Brodarich map of Hungary, similar to Lazarus's work, did not represent any parts of Sarmatia.

work, the Brodarich map could be more accurate than the 1528 Tannstetter-Cuspinianus edition. There are traces of such a representation, based on maps now lost, in the maps of Heinrich Zell (ca. 1533) and Sebastian Münster (1540).

A Transylvanian Humanist: Johannes Honter

Johannes Honter was representative of cosmographers and modern mapmakers in Europe. He was born about 1498 in Kronstadt (Braşov, Romania), at the time a Saxonian city in multicultural Transylvania in the Kingdom of Hungary. He started using his humanist name, Honter, when he enrolled at the University of Vienna in 1515.[139] He received the bachelor's degree in 1522 and the magister's degree in 1525, the year Peter Apian received his doctorate. The first decades of the sixteenth century brought the revival of the mathematical-astronomical-geographical school at the University of Vienna, after Conrad Celtis founded the "Collegium Poetarum et Mathematicorum" there in 1501. That name reflected the holistic character of Renaissance thinking in which nature could be reflected using the tools of both mathematics and poetry. The famous scholars of the university, Tannstetter and Johannes Stabius, were teachers of a younger generation of cosmographers. Honter was among the students who were in Vienna when regional cartography was being discussed.

Honter left Vienna, possibly in 1527, after the first successful Ottoman campaign against Hungary, when the political situation in his homeland became critical. After a recorded visit to Aventinus in Regensburg in 1529, and possibly a visit to Apian in Ingolstadt,[140] Honter entered the University of Cracow in March 1530. As a magister he could lecture there, although there is no documentary evidence supporting that he did so. In Cracow, however, the great interest in cosmography had been marked earlier by the activity of astronomers like Albert Brudzewo and mapmakers like Bernard Wapowski.

Honter's *Rudimentorum Cosmographiae Libro Duo* (1530)

The most important result of Honter's short stay in Cracow between spring and summer of 1530 was the publication that made him famous throughout Europe. His small octavo *Rudimentorum cosmographiae* was the first modern geographical schoolbook, ideal for teaching Latin in schools. Its title suggested not a scholarly treatise, but a short, lucid, and yet comprehensive textbook of just sixteen pages.[141] The *Rudimentorum cosmographiae* was a prose introduction to cosmography, reflecting the contemporary and rather loose usage of the term. The first part (*liber*) is devoted to astronomy, the next section to geography. After the concise treatment of these subjects there is a synoptic list of places and peoples (*Nomina locorum et gentium*). Despite the very limited space, Honter's book is a regional geography. The local characteristics of the landscape are described throughout the text. Its precedessor was Apian's own introduction to cosmography, the *Cosmographicus liber* (Landshut, 1524). Honter took most of his 1398 geographical names from Apian's list of 1417 names.

The first edition of the *Rudimentorum cosmographiae* was modestly illustrated: there was a small woodcut map of the eastern hemisphere on the title page. Some of the printed books, however, contained a small world map, the *Universalis geographiae typus,* derived from Waldseemüller's 1507 wall map.[142] Honter might have copied the content from Apian's 1520 world map, but represented it not in the heart-shaped but in a Ptolemaic-type projection.

Saxony in Transylvania: Honter's Chorographical Map (1532?–1546?)

By the mid-1530s Honter was in Basel, where he became a student of the Helvetian reformer, Johann Oecolampadius. He also worked with several important figures of the Reformation, such as the cosmographer Sebastian Münster and the publisher Heinrich Petri, and would later maintain these personal contracts after leaving.[143] For example, he cut some celestial charts in wood in 1532 for

139. His father was a tanner named Jörg (Georg), whose family name is subject to debate. He was identified as Georg Grass, but this family was not known in the city in 1498. He adopted the name Honter, in Saxonian dialect the name of a tree that saved him from drowning in a creek (Gerhard Engelmann, *Johannes Honter als Geograph* [Cologne: Böhlau, 1982]). For another biography, see Karrow, *Mapmakers of the Sixteenth Century,* 302–3.

140. Engelmann gives indirect evidence for this important stay (*Johannes Honter,* 104). Honter seems not to have been involved in the making of the Ingolstadt globe gores, attributed to Peter Apian (Rüdiger Finsterwalder, "Peter Apian als Autor der sogenannten 'Ingolstädter Globusstreifen'?" *Der Globusfreund* 45–46 [1998]: 177–86), because his 1530 and 1542 world map and globe representations repeat Waldseemüller's significant error regarding the western coast of Africa.

141. *Iohannis Honter Coronensis Rudimentorum cosmographiae libri duo* (Cracow, [1530]; 2d ed. 1534), printed by Matthias Scharffenberg.

142. Reproduced in Rodney W. Shirley, *The Mapping of the World: Early Printed World Maps, 1472–1700,* 4th ed. (Riverside, Conn.: Early World, 2001), 70 (no. 65), with a confusing description. The original woodblock, preserved in Cracow, was used there for printing some copies before 1849. Unfortunately, in 1939 the block disappeared (Engelmann, *Johannes Honter,* 56).

143. Hans Meschendörfer and Otto Mittelstrass, *Siebenbürgen auf alten Karten: Lazarus Tannstetter 1528, Johannes Honterus 1532, Wolfgang Lazius 1552/56* (Gundelsheim: Arbeitskreis für Siebenbürgische Landeskunde Heidelberg, 1996).

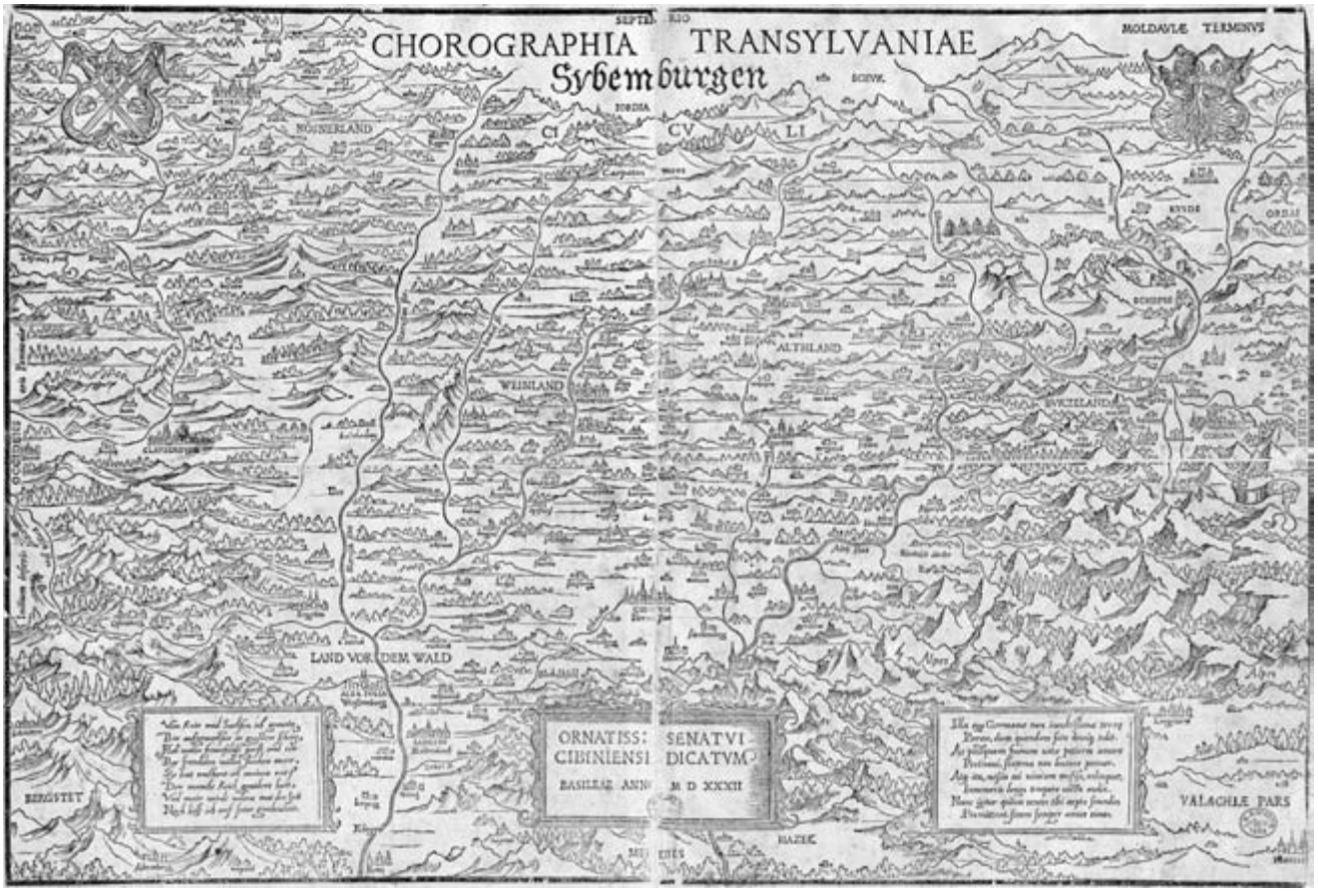

FIG. 61.9. JOHANNES HONTER, MAP OF TRANSYLVANIA, DATED 1532 (COPY PRINTED AFTER 1539). The map is dedicated to the magistrate of the city of Cibinum-Hermannstadt (Sibiu), center of the Siebenbürgen region. Below the map, on either side of the dedication, appears a laudatory poem in German and Latin. The map was cut into wood by Honter in 1532 in Basel. The unique copy, woodcut print on paper, uncolored, was printed after 1539 in Braşov, probably as a proof copy.
Size of the original: 37.2 × 55.5 cm. Photograph courtesy of the Országos Széchényi Könyvtár, Budapest (Collection of Early Books, RMK.III.296).

inclusion in Petri's edition of Aratus of Soli's astronomical work (*Phaenomena*), although the book was eventually published in 1535 in octavo format, and it was probably for this reason that the folio charts were left out.[144] The practical knowledge and printing experience Honter acquired in Basel became crucial to his later activity. Without being printed, his works would have been lost or remained marginal.

Another folio map by Honter from his Basel period is dated 1532. It is known only from a unique surviving copy—an early example of regional cartography—printed later. As the title indicates (*Chorographia Transylvaniae, Sybembürgen*), the work is a chorographical map of the remote part of Europe (fig. 61.9). The 219 place-names on the map, given in German, as well as the numerous pictorial signs of settlements without names, show the region in south Transylvania inhabited by Saxonians (actually settlers from Swabia) since the thirteenth century. In this respect the map's ideological message should be noted: Honter represented only the German population of the region, although for centuries the *natio Saxonium* lived there together with other people. In the sixteenth century, Transylvania contained four main nations: Hungari, Siculi, Saxones, and the seminomadic and therefore rarely recorded Vlachi. Some settlements with Hungarian majorities were included on Honter's map, but the significant Romanian (Vlach) population was consistently symbolized only in generic terms: *Blechisdörfer* (villages of the Vlach) and *Blechisfeld* (field of the Vlach). The map's silence is clearly ideological. The problem of Honter's selective representation was noted in a letter of bishop Antal Verancsics in 1549.[145]

144. A similar problem occurred later with the chorographical map, which could not be included in the cosmographical work.

145. Verancsics (Verantius, Vrančič), born in Sebenik, Dalmatia, was influencial in the Roman Catholic Church, becoming bishop of Transylvania and later archbishop of Esztergom. Verancsics kept in contact

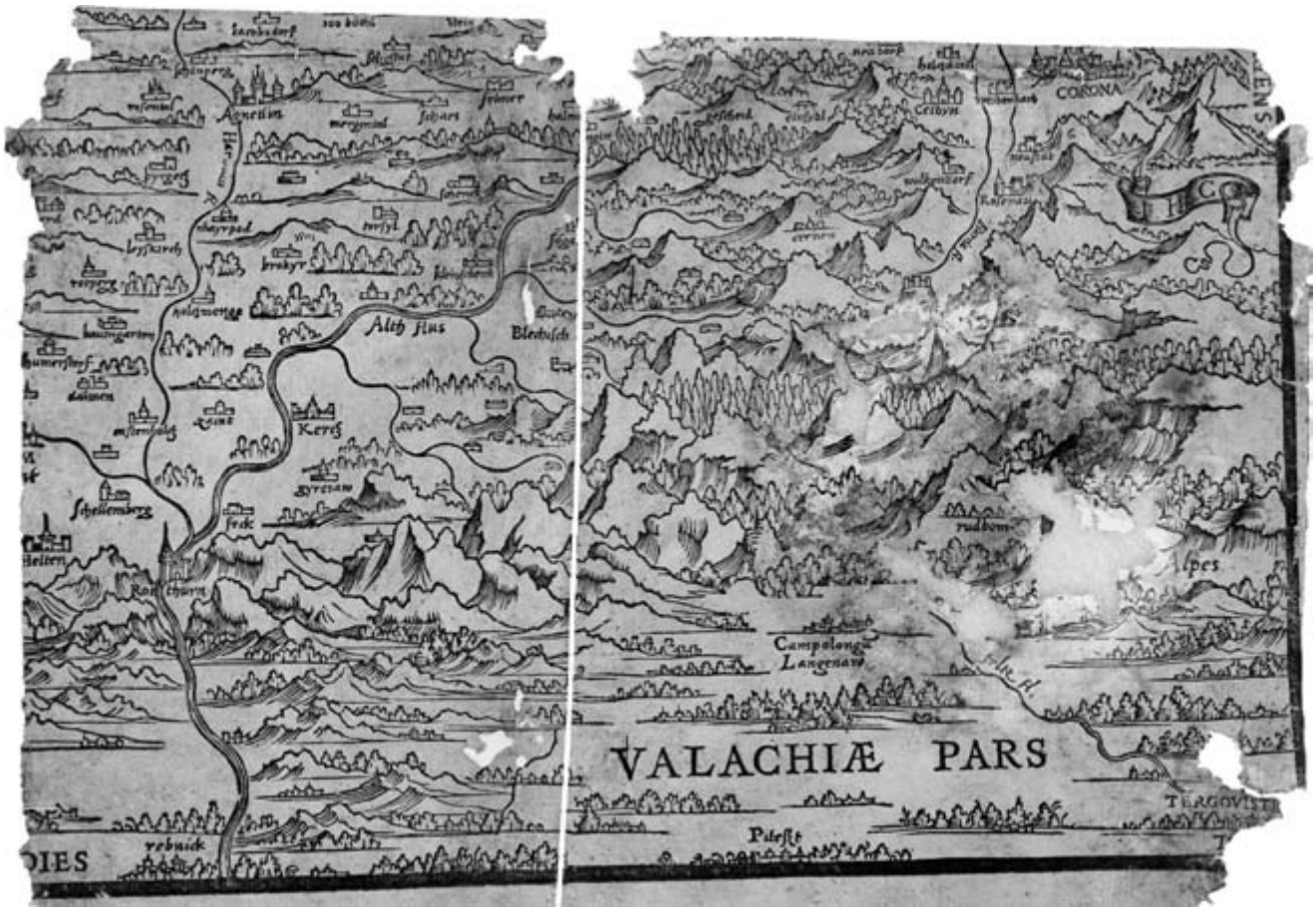

FIG. 61.10. JOHANNES HONTER, MAP OF TRANSYLVANIA, SECOND EDITION (AFTER 1546). Fragments of the second edition of Honter's chorographical map were recovered from book bindings. The southern part of the woodblock (including the title and the laudatory poems) was removed and a new part was joined to the old block. The correction and extension of the woodblock resulted in new map content in a wide strip along the bottom of the map. Note the new place-names "cernen" and "rudbom" (both in the fragment on the right; upper left and center, respectively), printed in the new area. The new settlement names were cut into wood and the small plugs were inserted into the block. The addition of the new printing elements to an existing block demonstrates Honter's mastery of the woodcut technique.
Size of the originals, left: 20 × 11.5 cm; right: 20 × 15 cm. Photograph courtesy of the Országos Széchényi Könyvtár, Budapest (Collection of Early Books, RMK.II.37a).

Despite its detailed representation of the region, Honter did not consider his woodcut map to be complete, as the only known copy of the 1532 map was printed later to serve as a basis for corrections. Analysis has revealed that the surviving copy was printed on paper made in the local Braşov paper mill, founded only in 1546. There is also documentary evidence that Honter thought to revise his Transylvania map in 1544.[146]

In 1987 two pairs of fragments of Honter's map were found in the Országos Széchényi Könyvtár, Budapest (fig. 61.10). That these were of the revised second edition is suggested by their lack of cartouche and laudatory poem. The upper part of this map is almost identical with the 1532 map, but the southern part is completely reworked, and the mountains stand on horizontal lines. This representation of relief is characteristic of the maps in the second edition of Honter's cosmographical book of 1542. The differences between the old and the new parts of the woodblock can be explained by the correction process.[147] The smaller corrections included two new place-names and symbols for the settlements of *rudbom* (Rukendorf-Rucăr, Romania) and *cernen* (Zerneschț-Zărneşti, Romania). We can suppose that for these places on the map, holes were made and wood plugs inserted for cutting the additional content. The settlement symbol and label for *rudbom* was written (as *rutbom*) by hand, offer-

with Honter, a Protestant, who informed him about his maps and sent a copy for corrections.

146. Antal Verancsics, *Verancsics Antal . . . összes munkái,* 12 vols., ed. László Szalay and Gusztáv Wenzel (Pest, 1857–75), 6:332.

147. Gedeon Borsa, "Eine bemerkenswerte Holzstockkorrektur von Johannes Honterus," *Gutenberg-Jahrbuch* 63 (1988): 269–72.

ing more evidence that this was a proof copy. On the new, lower part of the block, the faint white line along the joint of the two parts of the block can just barely be seen by the naked eye, demonstrating Honter's outstanding talent as woodcutter, already remarked upon by Münster in Basel. Unfortunately, the fragments of the second edition lack a narrow strip at their joints and their extension does not make it possible for us to reconstruct the whole map.

RUDIMENTA COSMOGRAPHICA, 1542

After his return to Braşov in 1533, Honter became a leading figure of the Transylvanian Reformation; Luther called him the "Apostle of Hungarian lands."[148] Honter was a reformer of the educational system, and he organized a humanist school in the city, publishing several books as part of his ambitious schoolbook program. Among his books, printed in his own workshop,[149] was a new edition of his short cosmographical introduction, completed in 1542. He extensively reworked the earlier editions. One of the most striking changes was that the Latin text of this new *Rudimenta cosmographica* was written as 1366 hexameters. Honter obviously wanted to make his work easier to memorize for students. In the Renaissance, mathematics, astronomy, and cosmography were not infrequently coupled with poetry.[150] In 1541 Honter sent some proof copies of the new edition to friends and distinguished persons who were asked to suggest corrections.[151]

The 1542 edition was larger: the verse text was longer and the whole work now comprised four sections, with the geographical part being divided into two sections. With the publication of this small, octavo book, Honter became a pioneer educator in the field of natural sciences. But its major innovation was cartographic, with the addition of sixteen woodcut maps at the end of the book (plate 75). In effect, this systematic and uniform corpus of printed maps was the first non-Ptolemaic pocket atlas.[152] The quarto size of the printing press in Honter's Braşov workshop meant that the illustrations had to be printed very carefully. To include larger maps, he adapted his illustrations to the book format and printed maps on facing pages. After printing, folding, cutting, and binding, each half-map had to match with its other half on the facing page. The first and the last page of the atlas allowed space for only an octavo-size map, which explains why a separate map of Sicily was included.

The first three plates illustrated traditional cosmographical concepts. The major circles of the astronomical coordinate system were represented with the image of a *sphera armillaris*. The illustration of the geocentric cosmos demonstrates Honter's description in the first part of his book. Although he certainly knew about Copernicus's theory, he insisted on the long-established geocentric view, making his work by no means revolutionary. The order of the planets and the names of the cardinal directions and the winds on the next pages also show antiquated concepts. The basics of orientation were illustrated with a remarkable picture of a tiny globe. It has been suggested that Honter constructed a terrestrial globe to use as an instructional aid in his school. The idea was popularized by the milestone study of Nordenskiöld and was extended by Engelmann, who supposed that the 1542 world map was prepared from the globe.[153] Yet Honter used a cordiform projection for that map, and there is no information about globe gores that could have been used for the construction of a printed globe. The hypothesis of Honter's production of a terrestrial globe could have resulted from the misinterpretation of the globe image in the *Rudimenta* (fig. 61.11).

Following the introductory cosmographical plates was the world map, with the title "Universalis cosmographia." Honter derived this from the Apian world map of 1520, in which the New World was represented as two separate landmasses. The southern continent is named "America" on Honter's map, although the name is not mentioned in his text. One possible reason for the omission of this and other place-names was the constraint imposed by the hexameters. Of the 1398 geographical names of the first, Cracow edition, almost one-third were excluded in the 1542 edition. After the world map, the regional maps offer more detailed graphic images. The untitled woodcuts are in a simple, rectangular frame, with neither grid nor scale. The maps cover Europe systematically from Iberia

148. See, for example, the title of Theobald Wolf's book: *Johannes Honterus, der Apostel Ungarns* (Kronstadt, 1894).

149. The printing workshop was founded after Honter's return from Basel in 1539. The outdated view that a certain Theobaldus Gryffius, physician and woodcutter of Basel, accompanied Honter in 1533 is based on a nineteenth-century source, presumably a deliberate falsification. An analysis of the type faces reveals close similarities with the type of the Scharffenberg workshop in Cracow and with those of the famous Basel Petri office. No exact match has been found, however, so Honter could have acquired his type from different sources (Judit V. Ecsedy, "Kísérlet a Honterus-nyomda rekonstrukciójára," in *Honterus-emlékkönyv,* 119–49).

150. This humanistic approach to geography is demonstrated in Conrad Celtis, *Qvatvor libri amorvm* (Nuremberg, 1502), an allegorical poem and artistic version of his planned "Germania illustrata."

151. Although the circulation of the 1541 *Rudimenta cosmographica* was limited, this incomplete version was published in Wrocław, Poland, in about 1542. The book was probably printed by Andreas Winkler, the only local printer in the period 1538–53. The work was likely taken to Wrocław by Valentin Wagner, who chose a northern detour and traveled to Wittenberg via Cracow in 1541 to avoid a more dangerous route in upper Hungary during the Turkish war. The Wrocław edition gives no bibliographic data.

152. Sophus Ruge, "Der Periplus Nordenskiölds," *Deutsche Geographische Blätter* 23 (1900): 161–229, esp. 219.

153. Nordenskiöld, *Facsimile-Atlas,* 83, and Engelmann, *Johannes Honter,* 64.

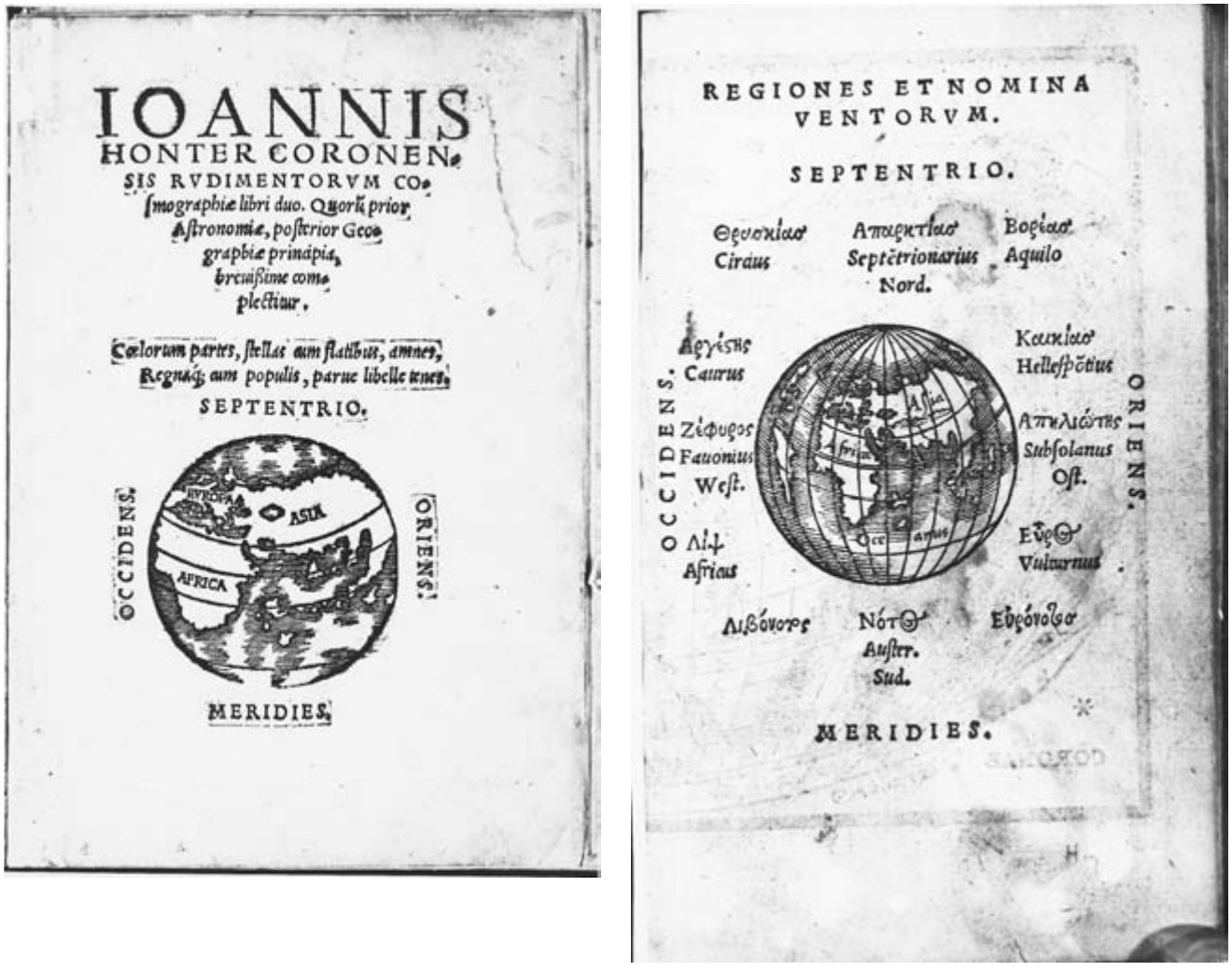

FIG. 61.11. JOHANNES HONTER, IMAGES OF TERRESTRIAL GLOBES, 1530 AND 1542. The Old World is represented on the title page of the 1530 Cracow edition of the *Rudimenta* (left). The New World was introduced on the globe in the 1542 edition (right). Both hemispheres could not be represented in a single perspective view. The meridians, drawn at thirty-degree intervals, also indicate the globe was a tool to visualize an extended, global world.
Diameter of the original, left: ca. 6 cm; right: ca. 4 cm. Photographs courtesy of the Biblioteka Jagiellońska, Cracow (Cim. 155), and Országos Széchényi Könyvtár, Budapest (Collection of Early Books, RMK II.28).

in the west to the river Tanaïs (Don) in the east. There are considerable overlaps between maps, possibly for didactic reasons. The map of the Holy Land is a very early representation of the region. Luther wanted to include a map of Palestine in his reformed Bible of 1522. The inclusion of such a map in a geographical book shows the importance of the real locational knowledge that the Reformed Church demanded from students of the Bible. On the last page, Honter included a representation of Sicily and Malta, which he could not fit on the map of Italy. The page size allowed a larger scale here (two and a half times larger than the scale of the map of Italy). This final map is the only one on which city names begin with capital letters, possibly indicating that its woodblock was the last completed by Honter.

THE LATER EDITIONS OF THE *RUDIMENTA*

The 1542 *Rudimenta cosmographica* was the first modern European geographical textbook and atlas. The atlas was published in a cosmographical book, clearly indicating that in this period such subjects as cosmography, geography, and astronomy were loosely defined.[154] The inherent heterogeneity of the *Rudimenta cosmographica* resulted in the later expansion and subsequent publication of the different parts of the work.[155] This separation

154. Uta Lindgren, "Was verstand Peter Apian unter 'Kosmographie'?" in *Peter Apian: Astronomie, Kosmographie und Mathematik am Beginn der Neuzeit,* ed. Karl Röttel (Buxheim: Polygon, 1995), 158–60.

155. Zsolt Török, "Honterus: *Rudimenta cosmographica* (1542)—Kozmográfia és/vagy geográfia?" in *Honterus-emlékkönyv,* 57–72.

started during Honter's lifetime, not for any theoretical reasons but for the practical need to print the text and woodblocks separately.[156]

That Honter's work was a great success is indicated by the sheer number of subsequent editions. Engelmann summarized 126 different editions and derivatives of the *Rudimenta* published between 1530 and 1692. The most important publishers were Petri, who had published the first edition in Basel in 1530, and Christoph Froschauer (the Elder) in Zurich.[157] Froschauer, who had founded the first printing workshop in Zurich in 1519, reprinted the 1542 Braşov edition as early as 1546. Froschauer took the text directly from Honter but had new maps cut by Heinrich Vogther. He placed his monogram (HVE) as well as the place and date (Tiguri [Zurich], 1546) on the world map, which has led to much confusion among researchers.

Later Printed Maps of East-Central Europe

wacław grodecki's maps of poland

Bernard Wapowski's work affected Polish cartography so substantially that until the seventeenth century most maps of Poland were copied from his works or from copies of his works. One of the only known direct copies was made by Wacław Grodecki in 1557.[158] Grodecki, born in about 1535 into the Silesian nobility, entered the University of Cracow in 1550 and later received the master of arts degree. In 1566 he settled in Brno where, as a devoted Catholic and protector of the Jesuits, he became a leader of the Counter-Reformation in Moravia, until his death in 1591.[159]

Grodecki's large woodcut map, which specified neither an author nor place of publication, was printed from two blocks. Identification of the work as Grodecki's is made possible by a small booklet, published by Johannes Oporinus in Basel, that comprised a list of the map's placenames together with Philipp Melanchthon's discourse on the origin of the Slavic people. The booklet's title (*Vuenceslai Godreccii in tabulam Poloniae a se descriptam nuncupatoria ad Sigismundum II Augustum Poloniae regem*) specified Grodecki as the map's author (even if it misspelled his name); the dedication to Sigismund II of Poland was dated 1 January 1558. According to Buczek, the map was also ready to be printed at that time, but it was not actually published until probably 1562.[160]

Judging from the spelling of the river and other placenames, Grodecki used a version of Wapowski's map that was different from the edition known only in fragments. Grodecki used other sources for the area not represented on Wapowski's map—the rivers Dnieper, Dniester, Boh, and the eastern parts—possibly the itineraries of Sigismund von Herberstein, who recorded his travels there in 1517–18. A characteristic feature of Grodecki's map is the almost directly north-south direction of the Dnieper as it flows from Smolensk. This error distorted the geography of Ukraine and has often been noted by early historians of cartography. The explanation is certainly that Grodecki or the publisher did not want to extend the map beyond the meridian of Kiev to an area that had little content. Perhaps for the same reason large parts of the Grand Duchy of Lithuania were also omitted.

Grodecki drew a reduced version of his large map in 1568. This new map was to be engraved on copper to accompany the historical and geographical description of Poland by Bishop Martin Kromer. The dioceses, principal cities, and borders of the provinces were marked by special symbols.[161] For some reason, possibly the death of the publisher Oporinus in 1568, this map was never printed. A second edition of Grodecki's large map was published in Basel in 1570 by Oporinus's heirs; for this edition, the laudatory poem in the large cartouche was replaced by publication data and a new title, *Poloniae, Litvaniae, Rvssiae, Prvssiae, Masoviae et Scepusii Chorographia* (fig. 61.12).[162] Finally, the 1589 edition of Kromer's complete *Poloniae, sive de situ . . .* was illustrated with a version of the large Grodecki map. The engraver, Frans Hogenberg, used the Ortelius version, and in the title he gave the correct spelling, "Grodeccius," instead of the corrupted "Godreccius," indicating that Hogenberg knew the name of the author from the second Oporinus edition.

156. The effect of the separation was demonstrated by the fact that several editions of the text part were printed, whereas separate editions of the atlas are less known, and the preserved copies are extremely rare.

157. Engelmann, *Johannes Honter,* 85–90, esp. 84. For a recent bibliography, see Gernot Nussbächer, "Versuch einer Bibliographie der ausländischen Ausgaben der Werke des kronstädter Humanisten Johannes Honterus (Stand 25. April, 2000)," in *Honterus-emlékkönyv,* 150–90. Jadwiga Bzinkowska called attention to the unknown Cracow edition of Honter's 1542 world map. The map, *Vniversalis cosmographia,* was presumably copied from the 1546 Zurich edition and printed in Bielski's chronicles: Marcin Bielski, *Kronika wyszytkiego świata na sześć wiekow . . .* (Cracow: H. Ungler, 1551); the map is not listed in Shirley, *Mapping of the World.*

158. The unique copy was formerly in Munich, Bayerische Armeebibliothek, where it was found in 1938 by Karol Buczek. The map was reproduced but the original was lost during World War II. Buczek, *History of Polish Cartography,* 41 n. 134.

159. Buczek, *History of Polish Cartography,* 41 n. 134, and Karrow, *Mapmakers of the Sixteenth Century,* 280–82.

160. Buczek, *History of Polish Cartography,* 41 n. 135.

161. The map was mentioned in the letter of Jan Grodecki, the brother of Wacław, to Martin Kromer on 2 June 1568. Excerpted in Buczek, *History of Polish Cartography,* 42 n. 139.

162. The unique copy in the Houghton Library was discovered and described in 1986 by Tomasz Niewodniczański, "Eine zweite Auflage der Polenkarte von Waclaw Grodecki (Basel 1570): Notizen zu einem sensationellen Kartenfund in der Harvard University," *Speculum Orbis* 2 (1986): 93–95.

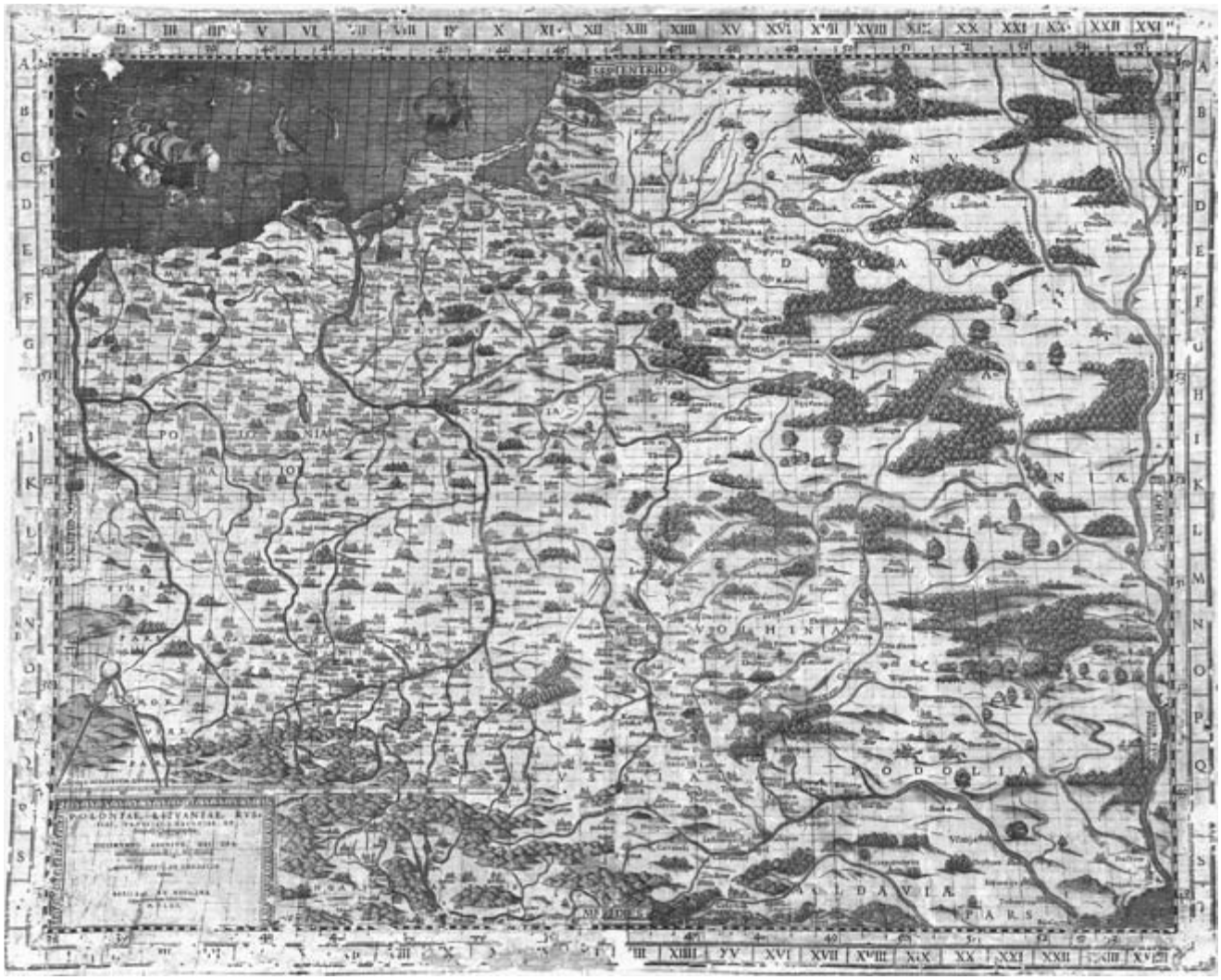

FIG. 61.12. WACŁAW GRODECKI, MAP OF POLAND, 1570. The second edition of Grodecki's map was printed from two woodblocks and colored. The place-names were cut in remarkably different styles on the two blocks. The geographical grid was redrawn by hand.
Size of the original: 63 × 79 cm. By permission of Houghton Library, Harvard University (51-2504 PF).

WOLFGANG LAZIUS'S MAP OF HUNGARY (CA. 1552/56)

Wolfgang Lazius (Latz), the personal physician to Ferdinand I, king of Hungary and also Holy Roman emperor from 1558, published some influential cartographic works in Vienna. A fragmentary sketch of Lake Fertő/Neusiedler[163] may be the forerunner to his later series of regional maps, the most important being the first regional atlas *Typi chorographici Provinciarum Austriae* (Vienna, 1561). As "Veltdoctor," Lazius participated in the unsuccessful attempt by the Habsburgs in 1541 to recapture the Hungarian capital, Buda. He then revised Lazarus's map of Hungary from his personal knowledge, and possibly reconnaissance sketches, as well as from information he collected from the twenty-four prominent Hungarians he listed on the map when it was printed in about 1556.

Lazius's *Regni Hvngariae descriptio vera,* with all its text in Latin, was printed from ten woodblocks in the workshop of Michael Zimmermann in Vienna (fig. 61.13). The map bears two dates: 1552 in the dedication to Ferdinand I (and his son, Maximilian) in the center and 1556 in the upper-left corner. The dual dating implies that Lazius compiled the map by 1552, but it was printed ca. 1556. Alternatively, the confusing dates may suggest the 1552 map was reprinted four years later with some changes in the textual explanations.

A German edition of Lazius's large map, with its explanatory text, was published as a booklet in 1556 under the title *Des Khünigreich Hungern sampt seinen eingeleibten Landen gründliche und warhafftige Choro-*

163. Cod. 8664, Österreichische Nationalbibliothek, Vienna, was reproduced in Lazius, *Karten der österreichischen Lande,* 15.

FIG. 61.13. DETAIL FROM WOLFGANG LAZIUS'S MAP OF HUNGARY, 1552/56. Detail of Lake Balaton and its surroundings; woodcut with stereotype(?). The most striking characteristic of the map is its representation of this lake. Lazius misplaced the Tihany peninsula on the southern coast, which is a common feature of all the derivatives of Lazius's map. The relative position of the settlements is also confusing: as if two different maps, presumably with different orientations, were compiled into one representation. Note the village Z. Hedwig (at the left bottom end of the lake) and its counterpart Z. Hidwig on the opposite side. Lazius certainly had some problem with the Hungarian names and may have mistaken the settlement name Hidwig (a village at the bridge) on the river Zala (Zalahídvég) for the personal name Saint Hedwig. He apparently used the same Christian name for other settlements called Hidwig, see Z. Hidwig on the river Rába (Rábahídvég) in the upper left corner.
Size of the entire original: 76 × 129 cm; size of the detail ca. 21.2 × 20 cm. Photograph courtesy of the Öffentliche Bibliothek der Universität, Basel (Kartensammlung AA 86-87).

graphica Beschreybung . . . , a fragment of which was found and recorded in Vienna in the nineteenth century.[164] More fragments were identified in Budapest in 1988, found by restorers within book bindings. From those fragments the title was reconstructed and found to be identical with Lazius's 1556 booklet.[165] In 1995 one sheet of Lazius's map with part of its German title was discovered in an antiquarian bookshop in Budapest.[166] From the German dedication on the map it is clear that Lazius was ordered to translate his Latin map into German. A comparison of the fragments of the German and the Latin editions reveals no change in the map's content. The same woodcut blocks were used for printing the Latin (1556) and the German (1556) editions and only the title and explanatory text, set in metal type, were changed.

Lazius "corrected" the orientation of the 1528 printed version of Lazarus's map and placed the Kingdom of Hungary, the territory claimed by Ferdinand I, into a horizontally expanded rectangle, with margins corresponding to the cardinal directions. The new format and the different proportions for the map further deformed the spatial structure of the Lazarus map. Lazius's limited geographical knowledge and his attempt to strike a compromise with contemporary geographies can account for this misguided revision. Despite its problems, Lazius's map was more user friendly than the strangely oriented printed work of Lazarus and its later copies. The clarity of Lazius's map contributed to its popularity; contemporary readers were interested in a geographical overview and not in the accuracy of coordinates. Moreover, the geographical names on Lazius's map were written in Hungarian with generally excellent contemporary orthography, because of the many Hungarian contributors who checked the spelling of names.

Below the woodcut illustration of the Virgin Mary, the Son, and the two canonized Hungarian kings, Saint Stephen and Saint Ladislaus, is a poem that makes explicit the map's ideological message: Mary and the sainted kings should defend the Christian people of Hungary against the infidel enemy, the Turks. The author of the poem may have been János Sylvester, a printer in Sárvár, Hungary, and a humanist professor of Hebrew at the University of Vienna. Lazius also included a legend to explain the meaning of the map's signs in three languages: Latin, German, and Hungarian. In addition to settlements (cities, market places, and villages), castles and cloisters were also represented. Places of economic importance, such as vineyards, mines, and natural spas, were marked with pictorial symbols, and ancient ruins were marked with black dots. Like Wapowski's map of Poland, Lazius's map marked the seats of bishops with mitres and croziers. In the map's dedication, Lazius mentions an "observation of the Pole," the first documented determination of geographical latitude in Hungary. Lazius emphasized the civil content of his map, remarking on its usefulness not only for "men of war" (*Kriegssleuten*) but also for merchants and historians.

In 1557 Lazius had Johannes Oporinus in Basel print a military map of the western Hungarian campaign. This war map, with remarkable geographical differences from Lazius's large map of Hungary, was dedicated to Ulrich Fugger of Augsburg, who supported the military defense of Hungary because of his interest in the mining industry.

164. The manuscript notes and a sketch of the fragment by the Hungarian historian Flóris Rómer are preserved in Budapest, Országos Széchényi Könyvtár, fol. Hung. 1111 52–58.

165. Katalin Plihál, "Egy 'ismeretlen' Wolfgang Lazius térkép," *Geodézia és Kartográfia* 41 (1989): 200–203.

166. Tibor Szathmáry, "Egy ritka lelet," *Cartographica Hungarica* 5 (1996): 52.

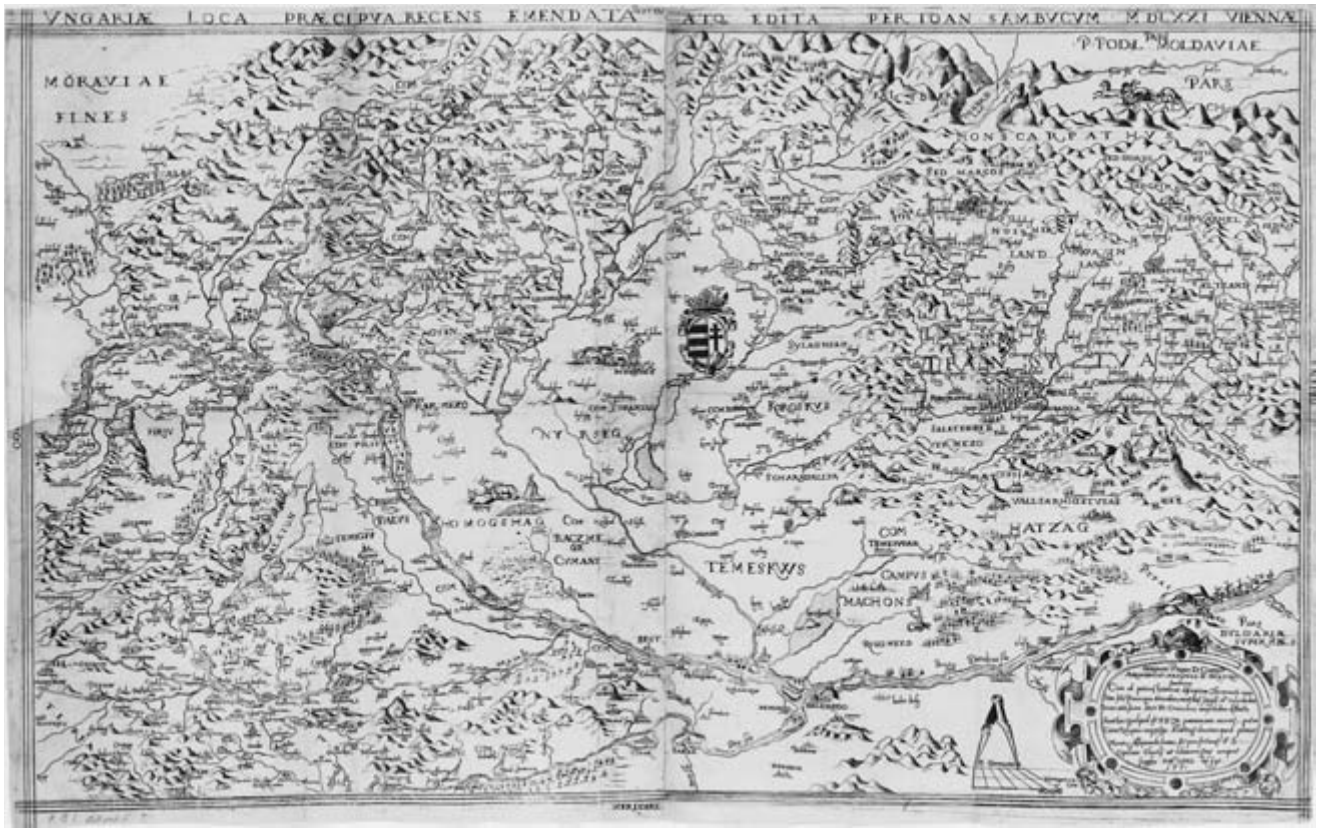

FIG. 61.14. JOHANNES SAMBUCUS, MAP OF HUNGARY, 1571. The *Vngariæ loca præcipva recens emendata,* a copperplate engraving compiled and printed in two sheets in Vienna, represents a revolutionary development. The source of this map is unknown, but a comparison with the contemporary manuscript work of the Angielinis, military architects, suggests a common origin. Conditions during the Turkish wars would not allow any survey in central Hungary, and the map was based on earlier, unknown works to which Sambucus had access after 1566. Although he corrected and added geographical names and positions, his efforts to correct the orientation resulted in another overall distorted image of the country. Ortelius included Sambucus's 1579 map as an alternative to Lazius's map of Hungary in his atlas.
Size of the original: 30 × 45 cm. Photograph courtesy of the Bildarchiv, Österreichische Nationalbibliothek, Vienna (a.B.9.A.1).

Another version with a different dedication was published by Adam Henricpetri (Heinrich Petri's son) in Basel in 1577.

JOHANNES SAMBUCUS: DIFFERENT MAPS OF HUNGARY 1566 AND 1571

The Hungarian János Zsámboky, better known by his humanist name Johannes Sambucus, began his studies in Vienna in 1543. Two decades later, after wandering and studying across Europe, he returned to Vienna to take a position in the court as historian and physician to the king. Sambucus was a keen collector of books and manuscripts and an internationally acknowledged humanist scholar who had access to the best sources of his time. His first publication was the printed edition of the historical work of Pietro Ransano in 1558.[167] After Lazius's death in 1565, Sambucus published a map of Transylvania, a new edition of Honter's chorographical map. Based on an image from a revised edition of the *Rudimenta* (ca. 1546) and on other sources, Sambucus's compilation was printed from an engraved copperplate in 1566 in Vienna.[168]

167. The historical works of the Italian humanists could be among the sources Sebastiano Compagni, a humanist of Ferrara, Italy, used when he wrote the description of the world. His manuscript (Biblioteca Apostolica Vaticana, Codex 3844) included eighty-five Hungarian settlements, whereas there were only thirty-six on the map of Martellus or Rosselli (ca. 1491). The written form of the names reveals, at the same time, that Compagni did not use these maps. His description seems to have remained unknown to contemporary mapmakers as well. See Roberto Almagià, "Uno sconosciuto geografo umanista: Sebastiano Compagni," in *Miscellanea Giovanni Mercati,* 6 vols. (Vatican City: Biblioteca Apostolica Vaticana, 1946), 4:442–73.

168. Versions of Sambucus's *Transilvania* were published by Ortelius (from 1570), Münster (from 1588), and Mercator (from 1595). Georg von Reichersdorff's description of Moldavia was published in Chrystophor Philaleth (Martinus Broniovius), *Tartariae descriptio,* part

In that same year, Sambucus published *Ungariae Tanst(eteri) descriptio . . .* , a new edition of Lazarus's 1528 map of Hungary. Printed in Vienna from two engraved plates, Sambucus's edition mistakenly attributed the Lazarus map to Georg Tannstetter, evidence that Sambucus had no information about Lazarus or his original manuscript. Following Lazius, Sambucus included a trilingual (Hungarian, German, and Latin) list of the most important geographical names. The artist's monogram DH (Donat Hübschmann) is in the title cartouche. Sambucus's "corrections" included deriving some significant errors from Lazius's map. One example is the misplacement of the large peninsula (named as Thian) on the southern shore of the unnamed Lake Balaton next to the Habsburg-Christian coat of arms.

Sambucus is best thought of not as an independent mapmaker but as a good compiler, as can be seen in the map he published of Hungary in 1571 (fig. 61.14). With this map he corrected the distorted geographical image of the country, as is made clear if we compare its course for the Danube with that on the Lazius map. Lake Balaton took on a new and more realistic shape for the Tihany peninsula on its northern shore. The sources for this map are unclear, but Sambucus seems to have had access to reliable and convincing material after 1566. The style and content of his map seem to closely follow the pattern of Nicolo Angielini's manuscript map of Hungary (plate 76 below).[169] A thorough comparison of the two maps shows, however, that both makers copied a third, unknown model—even though the orientation of Sambucus's 1571 map was strongly influenced by the orientation error of Tannstetter and Lazius.[170] The evidence that Sambucus was actually a compiler and used earlier manuscript maps of Nicolo and Natale Angielini and Augustin Hirschvogel is explicitly given in the cartouche of the map of *Illyricum* printed in Ortelius's *Theatrum* in 1573.[171]

The Local Use of Foreign Maps

The Turkish wars attracted much attention throughout Europe, as is demonstrated by John Dee's comments on contemporary map use.[172] Dee's particular mention of East-Central European matters suggests that in England maps were considered important visualization tools. In continental Europe, maps must have played an even more important role in communicating military-political events. Without geographical context, the places and events were meaningless. In addition to geographical texts, maps, sketches, and views appeared in a number of more ephemeral pamphlets. These prints, such as the map by Dominicus Custos (Augsburg, 1598) to illustrate the campaigns of 1593–98, are extremely rare today.[173] East-Central Europe was less well known to western editors and publishers, and they were eager to find local sources. New cartographic information from the region was insufficient for the preparation of new maps and was instead incorporated into existing maps.

Although the sixteenth-century chorographical maps of the countries or regions in East-Central Europe added little to the original and autochthonous works of Wapowski, Lazarus, and Honter, by the second half of the century the European representation of the region was dominated by derivatives of these works, which were included in Ortelius's *Theatrum* and other modern atlases.[174] Some printed maps do deserve attention for the traces of unknown maps they suggest. The fragmentary information they preserved refers to earlier maps now lost. An anonymous mapmaker published a version of Sambucus's work, for example, adding more than one hundred settlements from Mercator's map of Hungary. That map, in turn, was originally compiled by another unknown, but probably Hungarian, cartographer as a wall map representing a large region, including Hungary, which was itself eventually printed after 1595 (fig. 61.15).[175]

of Antonius Possevino, *Moscovia, et alia opera* (Cologne, 1595). The map *Transilvania* in the Possevino volume, attributed to Reichersdorff, was possibly based on the Ortelius edition (1575).

169. For the problem of dating Angielini's map, see below.

170. Tibor Szathmáry, "Nicolaus Angielus Magyarország-térképe," *Cartographica Hungarica* 3 (1993): 2–13.

171. Hirschvogel's woodcut map, known from Bagrow's reproduction, was printed in 1565 in Nuremberg and copied as *Sclavonia* by Ortelius (Szathmáry, *Descriptio Hungariae,* 1:146). This lost work was south oriented, which may suggest other contemporary works with this orientation. If not realized during compilation, this unusual configuration could result in confusing images (for example, Lazius's, map, 1552/66).

172. "Some other, presently to view the large dominion of the Turk: the wide Empire of the Muscovite: and the littel morcel of Christiandom (by profession) is certainly known, . . . liketh, loveth, getteth and useth, Maps, Charts and Geographical Globes." From the preface of John Dee to the English translation of Euclid's *Elements* (1570), cited in R. A. Skelton, *Maps: A Historical Survey of Their Study and Collecting* (Chicago: University of Chicago Press, 1972), 27. Among the numerous foreign mercenaries serving in Hungary in 1601–2 was captain John Smith, later governor of the Virginia colony.

173. Peter H. Meurer, "Eine Kriegskarte Ungarns von Dominicus Custos (Augsburg 1598)," *Cartographica Hungarica* 1 (1992): 22–24.

174. Ortelius included Lazius's map of Hungary (1566), *Hungariae descriptio . . .* , in more than fifty editions between 1570 and 1612. Lazius's map was the source for the maps of Hungary by Gerard de Jode (Antwerp, 1567), Matthias Zündt (Antwerp, 1566; published in de Jode's atlas, 1578), Joannes van Doetecum, Jr. (Amsterdam, 1596), Jacob von Sandrart (Nuremberg, 1664), and Georg Matthias Visscher (Vienna, 1682). From 1573 Sambucus's *Vngariæ loca præcipva* was also included in the *Theatrum.* Ortelius was aware of the problem of competing images of Hungary, explaining that neither of the maps "of it selfe absolute inough for the worth of this so goodly a country" (quoted from Karrow, *Mapmakers of the Sixteenth Century,* 461). Sambucus's map was copied by Matthias Quad (Cologne, 1592).

175. *Descriptio regni Hungariae una cum aliis finitimis regionibus ac provinciis,* known as the "Woldan" map, is in Vienna, Österreichische Akademie der Wissenschaften. Katalin Plihál, "Hazánk ismeretlen

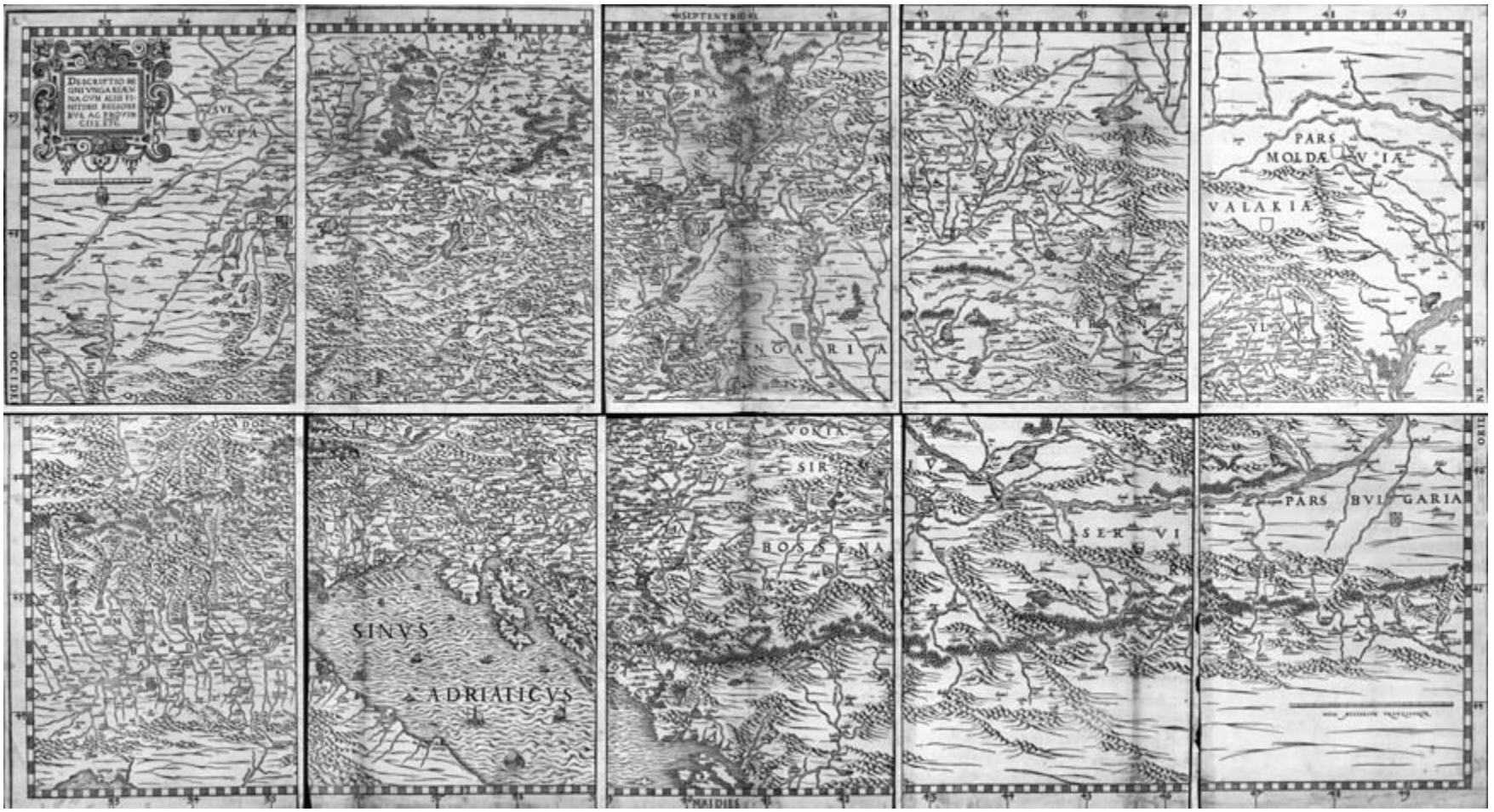

FIG. 61.15. *DESCRIPTIO REGNI HUNGARIAE . . .*, CA. 1595. Despite its title, this large, anonymous woodcut represents a much larger territory than Hungary: it covers a huge region from Bavaria to Moldavia and from Bohemia to Dalmatia. East of Corona (Braşov, Romania) a dashed line marks the border of Transylvania including the settlement Bukhereskh (Bucharest, Romania). This border indicates the situation after princeps Batori's successful 1595 military campaign against the Turks.
Size of the original: 89.5 × 169 cm. Photograph courtesy of the Woldan Collection, Österreichische Akademie der Wissenschaften, Vienna (K-V[B1]: OE/Hun 15 [1–10]).

Sporadic references to map use in contemporary literature demonstrate a general acceptance of the use of maps. Márton Szepsi Csombor, a Hungarian traveler to Europe, wrote in his diary, published in 1620 in Košice (Slovakia), that he had used the Honter map for planning a journey in Poland in 1616, reflecting that map's staying power and the lack of a detailed map of the region. The diary of Hungarian landlord and military leader Ádám Batthány makes a special note of purchasing two German and Dutch maps in 1637 in Vienna. Batthány retained an interest in cartography, because in 1646 he paid a sum for an "old book with maps."[176] As he was not a collector of antiquities, we might suppose that his reason for the purchase was to obtain relevant geographical information. It is apparent, however, that the representation of Hungary in the printed atlases did not develop substantially over time. In 1654 Batthány received a letter and a map of Hungary sent from Vienna. He forwarded it to the addressee, the Croatian Nicholas Zrinski, and the latter expressed his gratitude in a reply. This example illustrates the result of a lack of commercial cartography: locals used foreign maps.

Military Maps of the Eastern Frontiers

matthias strubicz and stefan batori's campaigns

The general downfall of Polish cartography—according to Buczek—is readily apparent after 1650, although it had stopped developing much earlier, after Wapowski.[177] After all, Wapowski's works had, apparently, been completely forgotten in Poland by the late sixteenth century; in the catalog of cartographers whose maps were used in his atlas, Ortelius mentioned only Grodecki and Andrea Pograbski (Andreas Pograbka) for Poland. This view, derived from printed maps, is challenged by the achievements of military architects, engineers, and surveyors after the mid-sixteenth century that reveal a significant corpus of manuscript maps in East-Central Europe.

This work began with Matthias Strubicz (originally Strobica), a Silesian who was ennobled in Poland in 1563. Nothing is known of his education, but he was accepted to the Royal Chancellery in 1559 as a learned and talented man. He was commissioned to translate the work of the Prussian prince Albrecht on the art of warfare (*Von der Kriegsordnung oder der Kunst Krieg zu führen*) into Polish. In 1567 he moved to the newly acquired Livonia and was secretary to the regional court there in Kokenhausen. In 1577 he entered the service of Stefan Batori (Stephen Báthory), king of Poland, and wrote a description of Livonia, which he dedicated to the king.

In 1579, Strubicz informed Jan Zamoyski, the Polish chancellor, that he had completed "the lands and domains of His Royal Majesty illuminated separately and on different maps."[178] Strubicz evidently intended to join the maps and depict the whole territory on one sheet that could be printed for the public. To finish off this project, he also asked Zamoyski for a map of Lithuania in the possession of the king. This map, which Strubicz had already requested from Stefan Batori as well, was in all probability the *Descriptio Ducatus Polocenis* (Rome, 1580), made by Stanisław Pachołowiecki, the royal secretary and distinguished Polish military leader who fought in the war against Muscovy from 1579 to 1581. During the expedition against the fortress of Polock, he drew a map of the duchy and plans of the seven fortresses captured by the Poles, which, with the exception of the plan of Polock, were engraved by Peter Franco (Francus), Italian surveyor, engraver, and printer. Both Pachołowiecki and Franco were admitted to the nobility as reward for their military cartographic work. The *Descriptio,* known only from a nineteenth-century fragment, is the first example of Polish military cartography.[179]

Strubicz's only surviving cartographic work is *Magni Ducatus Lithuaniae Livoniae et Moscoviae descriptio,* printed in the 1589 Cologne edition of a book by historian Martin Kromer. The map shows the northern parts of the Lithuanian territory and extends to encompass Livonia and a considerable part of the Grand Duchy of Muscovy. Strubicz was asked to make his map more detailed and "to extend it to show" from Ruthenia to Transylvania.[180] The map covers the entire theater of the war fought with the Russian czar Ivan the Terrible. Strubicz compiled his map from different sources, including descriptions, itineraries, sketches, and plans. Among earlier maps, he probably used Caspar Henneberger's lost map, first printed in 1555, and Henneberger's description of Livonia (1564) translated into Polish in 1567.

As king of Poland and prince of Transylvania, Stefan Batori systematically collected every piece of locational information available for planning military campaigns against the Turks. His military intelligence service operated effectively, and geographical knowledge was represented in the form of a detailed map. After the victorious war against Muscovy, Józef Wereszczyński, bishop of Kiev, wrote in 1592 with news that he "spent much time" with Batori's chorography, on which were inscribed "all

térképe a XVI. század végéről," *Cartographica Hungarica* 3 (1993): 32–41.

176. The documents are quoted in Lajos Kiss, *Magyar írók a térképről* (Budapest: Magyar Térképbarátok Társulata, 1999): 9–10.

177. Buczek, *History of Polish Cartography,* 80 ff.

178. The letter was published in *Archiwum Jana Zamoyskiego: Kanclerza i Hetmana Wielkiego Koronnego,* 4 vols. (Warsaw, 1904–48), 1:371–74.

179. Karol Buczek, *Kartografja Polska w czasach Stefana Batorego* (Warsaw, 1933), 80–82.

180. Buczek, *History of Polish Cartography*, 53.

situs locorum, Turkish towns and castles, seas, rivers, mountains, hills, forests, and fields."[181] Another possible major source of information was Matthias Stryjkowski, a member of the 1574 Polish mission to Constantinople, who was instructed to make plans of Turkish castles and towns according to the "rules of geometry and cosmography."[182] During the reign of Stefan Batori there was certainly strong interest in maps in Poland. In a eulogy after the king's death in 1586, the politician and historian Krzysztof Warszewicki showed a map of the country and mentioned another that the king had ordered.[183] Serving as icons, these maps would have demonstrated the glory of Batori's country and victories.

PRINCE NICHOLAS CHRISTOPHER RADZIWILL AND HIS MAP

Work on a new map of Lithuania began in about 1597. This ambitious project was initiated by Prince Nicholas Christopher Radziwill, a learned and powerful man who had been involved in making Strubicz's 1579 map.[184] This new map was published in Amsterdam in 1613 under the title *Magna Ducatus Lithuaniae* (fig. 61.16). Although Strubicz contributed to the work, in that he had traveled in 1599 with Prince Radziwill's son to search for an engraver and printer for the large map, Strubicz's name is not mentioned on the map itself, whereas that of Thomas Makowski appears twice.[185] Makowski was an engraver and printer of city views and battle scenes who illustrated the book that Prince Radziwill published in 1601 while on pilgrimage.[186] Makowski entered the prince's service thereafter and worked as book illustrator and printer. The problem of finding a printer for the map of Lithuania was a serious obstacle. Despite the involvement of both Strubicz and Makowski, the map had to be printed abroad. A letter from Prince Radziwill, dated 1597, demonstrates that he thought of having the map printed at an intermediate stage of the work. From the same letter we learn that the prince directed the work and was an active collaborator.[187]

Although the question of the map's authorship has not been answered, it is apparent that the map was a collaborative work.[188] The method of survey and mapmaking involved sending a clerk to each region with instructions to make a list of the places and the distances between them. The errors in latitudes and longitudes rarely exceed twenty minutes. Taking into account the more serious difficulties in determining longitude, this relatively high accuracy seems to suggest that astronomical observations were not used in favor of measures on the ground.[189] For a century and a half, this map remained the source map of Lithuania. Indeed, Jan Nieprzecki's map, based on the Radziwill map, was published for the first time in 1749 and for the last time in 1812.

GUILLAUME LE VASSEUR DE BEAUPLAN AND OTHER MAPMAKERS IN EASTERN EUROPE

Beginning in the early seventeenth century, Poland became involved in a series of wars. Cartographic activity was stimulated by the military campaigns of King Ladislaus IV, as eminent foreign military engineers and officers were recruited for the army. The most remarkable of these was the French military engineer Guillaume le Vasseur de Beauplan. Working in Poland from about 1630 to March 1647, he was active mainly on the eastern frontiers, where he supervised the building of fifty fortresses and set out hundreds of villages. He took part in many battles with the Cossacks and Tartars. In 1639 he participated in a surveying expedition down the river Dnieper. About this time he drew a sketch map of southern Ukraine, the "Tabula geographica Ukrainska," which has been preserved in the "Topographica practica," a collection of manuscript maps and charts assembled by Frederick Getkant by order of Ladislaus IV.[190] Beauplan made a general map of Ukraine, *Delineatio generalis camporum desertorum vulgo Ukraina cum adiacentibus provinciis,* which was published in Gdańsk in 1648 by the engraver Willem Hondius.[191] It is reasonable to suppose that the publication of the work was connected to Beauplan's return to France. The printing plate of the general map was probably engraved by the time he left, and Hondius had also begun to work on the plates for a special map of Ukraine.[192] In 1651 Beauplan also published

181. Józef Wereszczyński, *Exitarz . . . do podniesienia woyny przeciwko Turkom y Tatarom* (Cracow, 1592).

182. Buczek, *History of Polish Cartography,* 52.

183. *Christophori Varsevici: Post Stephani regis mortem . . .* (Cracow, 1587), 30.

184. The son of the chancellor of the Grand Duchy of Lithuania, Nicholas Christopher Radziwill attended the university in Strasbourg in 1563–64 and afterward traveled in Germany, France, and Italy. He fought in the wars with Muscovy (1568, 1579, and 1582) as a military leader, and in 1582 he went on a pilgrimage to the Holy Land.

185. The comment to the inset map of the river Dnieper reads: "Thomas Makowski on his map of Lithuania gives Kiev the latitude 50 degrees and 10 minutes." The engraver of the 1613 map, Hessel Gerritsz., obviously attributed a map of Lithuania to Makowski. Besides the textual description of Lithuania, the initials and the title ("T.M. Pol. Geograph.") offer further evidence for Makowski's authorship.

186. Nicholas Christopher Radziwill, *Hierosolymitana peregrinatio . . .* (Braunsberg: Georgium Schönfels, 1601).

187. Buczek, *History of Polish Cartography,* 58 n. 199.

188. Buczek, *History of Polish Cartography,* 59.

189. Merczyng, "Mappa Litwy."

190. Preserved in Stockholm, Krigsarkivet. Getkant, a German artillery officer, served first in the Polish army and later, from 1655, the Swedish army. His chart of the Prussian coasts as well as some fortification plans have been preserved, but his collection of documents was lost in a fire.

191. See pp. 727 and 729 in this volume.

192. Beauplan's *Delineatio specialis et accurata Ukrainae;* see Czesław Chowaniec, "Une carte militaire polonaise au XVII^{e} siècle (Les

FIG. 61.16. DETAIL OF RADZIWILL'S MAP OF THE GRAND DUCHY OF LITHUANIA, 1613. The map represents a large region extending beyond the 1569 boundaries of the territory of Lithuania. The depiction of central and western Lithuania was detailed: of the 1020 settlements shown on the map, 511 towns, 31 villages, and one monastery are within the duchy. This concentration resulted in the density of content required by contemporary cartographic representation. The manuscript was engraved on four copperplates by Hessel Gerritsz. in Amsterdam.
Size of the entire original: 75 × 106 cm; size of the detail: ca. 45.1 × 48.5 cm. Photograph courtesy of the Vilniaus Universiteto Biblioteka, Lithuania.

a description of Ukraine, which was limited to the Crimea and the lower course of the Dnieper and was printed in only one hundred copies.[193]

After years of work, Beauplan had expected a generous reward for his services, but King Ladislaus IV died in March 1648, dashing any hope of compensation. In 1654 John II (John Casimir) of Poland granted Gdańsk printer Georg Förster and historian Joachim Pastorius the privilege to print the maps and the description of the kingdom's provinces—in other words, to finish the work

origines de la carte de l'Ukraine dressée par Guillaume le Vasseur de Beauplan)," *Revue Internationale d'Histoire Militaire* 12 (1952): 546–62.

193. Guillaume le Vasseur, sieur de Beauplan, *Description des contrées du royaume de Pologne, contenués depuis les confins de la Moscovie, iusques aux limites de la Transilvanie* (Rouen, 1651).

Hondius and Beauplan had started. The eleven maps (discovered in 1952 in the city library of Gdańsk), originally in book format, covered the same regions of Ukraine that were described in Beauplan's book. Apparently they were constructed from his larger maps but remained more or less unfinished: titles, names, and details are missing except for two maps of the lower Dnieper, with the name of the author Beauplan given as *Architectus militaris et Capitaneus.*[194] After the death of Hondius, John II ordered everything at Hondius's workshop be put under seal. In the document ordering this, there is special attention given to a certain "Atlante Polonico" (or "Theatrum Poloniae") and related materials. Although the Polish king did not know much about the materials, he clearly wanted to keep some documents secret.

Several other contemporary but less well-known mapmakers should be noted. Joan Blaeu published the work of Georg Freudenhammer, a physician of the palatine of Poznań, *Palatinatus Posnaniensis in Maiori Polonia primarii nova delineatio,* in Amsterdam in 1645. According to the Latin explanation, the map was constructed on the basis of latitude measurements and a list of distances between the seventy-four towns shown on the map.[195] Actually, the measurement of the latitude of Poznań was incorrect, and the whole region was displaced southward. Mathias Głoskowski, magistrate and surveyor of palatinate Kolisz, reported his plan to make a map of Poland in a 1648 letter to the Gdańsk astronomer Johannes Hevelius. Hevelius also did not realize his plan to make his own map based on geographical coordinates. By contrast, Daniel Zwicker was able to publish his map, *Nova et nunc primum edita Paludum Polesiae Tabula,* which Wilhelm Hondius engraved in Gdańsk in 1650.[196] Joseph Naronowicz-Naroński was a talented surveyor and productive mapmaker with a special interest in practical geometry. His 1659 manuscript on mathematics, written in Polish, dealt with the problems of surveying, mapping, and military engineering. Naronowicz-Naroński's activity in east Prussia marked the beginning of the development of military topographic mapping.

In Defense of Europe: Military Mapping During the Turkish Wars

The expansion of the Ottomans toward the Habsburg Empire made the importance of Hungary very apparent to Ferdinand I, who needed Hungary to defend Vienna and his Habsburg lands in Austria and Bohemia. Hungary became Christendom's last bastion. The agricultural products of the Hungarian plains (corn and cattle) were also vital, as were the most famous gold mines in Europe, in Transylvania. The war against the Turks up to this point had been a regional conflict in European politics, but as soon as Hungary became part of the Habsburg empire in 1526, the balance of power was never the same. For almost two centuries, the Ottomans and Habsburgs would battle mainly across the former Kingdom of Hungary.

The transformation of the military border of the Kingdom of Hungary began in the 1530s and 1540s. The new military organization was similar to the two parallel chains of fortified places, castles, and fortresses built along the southern border of Hungary in the fifteenth century, a system that had repelled the Turkish armies for more than a century. The new organization placed a diagonal line of defense from the Adriatic Sea in the southwest to the Carpathian mountains in the northeast. The hundreds of kilometers of construction required massive financial support. Income from the Hungarian crown could not cover the costs alone, so the Habsburg territories behind the border zone contributed substantial sums of money as well as material and men. In 1556 the central institution of the Aulic War Council (*Wiener Hofkriegsrat*) was founded in Vienna to organize and operate the system. This important and powerful institution, the forerunner of the ministry of defense, existed until 1848.

The work of military fortifications required spatial knowledge of the extensive theater of war. The leaders of the Habsburg army were foreigners; for them Hungary was unknown. The new method of warfare included the extensive use of natural land barriers, especially rivers, swamps, and mountains. Thus concrete local geographical information became important for the headquarters staff in Vienna. To be able to make spatial decisions, existing military maps, views, and sketches were collected and new ones made in large quantity. Systematic fortification required the plans of castles and fortresses as well. The makers of these maps were foreign military architects commissioned for construction works, mainly in connection with fortification projects but also with building bridges, mills, and the like; they planned, organized, and supervised the projects.

These developments had important implications for military mapping after 1550. Older maps of the country remained in general use, but new maps made for military purposes functioned as secret military documents in Vienna. Thus, these maps had little influence on contemporary academic geography and commercial map publishing except in rare cases in which mapmakers had access to military information (for example, Lazius, 1556, and Sambucus, 1571). Not until 1664, almost one hundred years after the first generation of Renaissance mapmakers, was Martin Stier's military map printed for general geo-

194. Stanisław Herbst, "Prace kartograficzne Beauplana-Hondiusa z r.1652," *Przegląd Historyczny* 43 (1952): 124–28.

195. "Benevolent reader, you may be warned of two [things]: one, about the latitude of places, or the height of the pole, the other about the distances of places in miles. From our own observations and [those] of our friends we are giving that [map] as more accurate than ever before."

196. Buczek, *History of Polish Cartography,* 76.

graphical reference. By the end of the seventeenth century, Habsburg military mapping became more independent from civil cartography. The central role of the state resulted in a more effective and long-term policy of secrecy.

The printed maps of the sixteenth century were all based on information collected before the 1520s. The result had been Lazarus's pioneering 1528 map, representing the country before the Turkish invasion. Once the wars began, special maps were needed to represent the spatial distribution and geographical environments of strategically important fortifications. These military maps, showing the system or part of the border-fortresses including the districts needing defense, might be called border-zone maps. In the sixteenth and seventeenth centuries, the border between Hungary and the Ottoman Empire was not a well defined line, and the system of castles, fortresses, and fortified places in Hungary, Croatia, and Slavonia defended a military zone. The military maps focused on these local zones or regions and the scope of the actual military operation under contemplation—not on the entire country.[197]

THE OLDEST MILITARY SKETCH OF THE BORDER

The earliest representation of the border zone between Lake Balaton and the Danube in Hungary is a military sketch of 1563 (fig. 61.17). The map was drawn, presumably by the order of the War Council, by János Choron, a Hungarian noble. Choron's fortified home, Devecser, is in the center of the drawing. The map shows the region from a northwesterly direction, with distances between the castles given in miles. The map was attached to Choron's 22 January 1564 letter to Ferdinand I. The construction of the border zone was then at an early stage, and defense was financed and organized partly by the local landlords. Choron's own forces were supported by regular troops financed by the imperial territories. Around the time Choron sent his map to Vienna, the first maps were being made by foreign military architects, who had started to survey the conditions of the border fortresses.[198]

In 1566 the Habsburg army advanced and regained territories and castles southeast of Devecser, ending its importance as the last frontier. For financial reasons, the locally financed castles gradually gave way to a new, more centralized system of defense. Imperial support was needed to maintain castles owned by noble families, who had exhausted their resources in the first decades of war.

THE ANGIELINIS AND THE FIRST GENERATION OF MILITARY MAPMAKERS

Natale and Nicolo Angielini, talented Italian military architects, were certainly among the important early military mapmakers. Before 1564 Natale Angielini, probably with his brother, was architect of Prince Karl, governor of

FIG. 61.17. THE MILITARY BORDER ON A 1563 MANUSCRIPT MAP. Representing much of the Transdanubian part of Hungary, the map is not drawn to scale but is a well-proportioned geographical image. The hydrography is sketchy, but the representation of Lake Balaton and its peninsula is correct. The hills and mountains are shown by wavy lines; the large forests are emphasized by the label "montes et silvae." The castles are shown by pictorial signs according to their importance, with a clear graphical expression of their situation. The castle of the map's maker, Devecser, is depicted in ground plan. The map's military importance is emphasized by its representation of the region from the Viennese point of view. Size of the original: 44.5 × 32.5 cm. Photograph courtesy of the Kriegsarchiv, Österreichisches Staatsarchiv, Vienna (Alte Feldakten 1564/2/ad 11c).

197. The use of the modern German term *Grenzfestigungsliniekarte* (maps of the border-fortresses) suggested by Pálffy in his monograph (Géza Pálffy, *Európa védelmében: Haditérképészet a Habsburg birodalom magyarországi határvidékén a 16–17. században* [Budapest: Magyar Honvédség Térképészeti Hivatala, 1999], 24–25), is no better than the contemporary German term *Grenzmappe* (border map). The inclusion of *Festigung* (fortification) may make the concept clearer, but *linie* (literally, line) is potentially misleading. Because these are a special type of border map, the translation "border-zone maps" seems more appropriate and is used here. Such maps made for the Aulic War Council were secret and kept in manuscript; György Kisari Balla, *Karlsruhei térképek a török háborúk korából* (Budapest: Kisari Balla, 2000), is an illustrated catalog of this unique map corpus, as preserved in the archives in Karlsruhe.

198. In 1564 a sum of twenty-four *taller* was paid for the illumination of a map of the Croatian and Slavonian borders. Johann Loserth,

Styria, Carinthia, and Craina. In the following year he became master builder (*Baumeister*)[199] for Emperor Maximilian II, and after years in military service he was nominated in 1573 to be superintendent master builder of the mining district in northern Hungary. In 1565 a remarkable war map appeared in a printed pamphlet concerning the campaign of Lazarus von Schwendi in eastern Hungary; the German text was written by "Natal de Angelini," imperial "Paumeister" (fig. 61.18). The titles of the engraved map—in Latin (*Loca in Ungaria recepta ab invictiss. Imp. Max. II*) and in German (*Die Orter so neulich in Ungern eingenommen sein*)—as well as the style and the pictorial elements on the map (including the Habsburg eagle) suggest the style of the Angielini workshop.[200] Nicolo, the younger brother, was less successful as an architect, although from 1567 he also served the emperor and was a member of commissions inspecting the fortifications of the military border. He was active in 1577 in Vienna, and he apparently not only survived his brother but became the better known mapmaker of the Angielini family. There is printed cartographic evidence of Nicolo Angielini's activity in Hungary: the perspective view of the castle of Győr (German Raab) printed in the *Civitates orbis terrarum* in 1592 was based on Nicolo's 1566 manuscript.[201]

The cartographic activity of the Angielinis followed along the Habsburg-Ottoman border, from the Adriatic coast to upper Hungary. Their cartographic output is preserved in four manuscript military atlases in Vienna, Karlsruhe, and Dresden (two copies).[202] Along with plans and views of the fortifications of the Habsburg border, the Vienna and the Karlsruhe atlases include a series of similar maps, each representing a section of the border. On the chorographical maps the Croatian and Slavonian, as well as the Kanizsa and Győr border districts in western Hungary, the Danube island at Győr, the castles of the mining district in the Carpathian mountains, and upper Hungary are all represented. These maps were all drawn in the same style and possibly by the same hand. The title of the last map—*Superior Vngaria-Nicolo Angielini*—identifies the original mapmaker. Similar military atlases were compiled probably by Nicolo (or both Angielinis) from different sources, including their own works.

In the larger of the two atlases in Dresden (Nr. 11) there is a general map of Hungary, which is a most remarkable work (plate 76). At first glance, this manuscript is very similar in style to the 1571 printed map of Sambucus. The titles are close and many decorative elements are almost identical. The Angielini map is undated, but its content suggests it was compiled in the 1570s.[203] These country maps suggest now-lost representations of Hungary in the second half of the sixteenth century. The contact between Angielini, Sambucus, and the surveyor-mapmaker Augustin Hirschvogel is explicit in the dedicatory cartouche of Sambucus's 1572 map of Illirycum, but their connection has not been revealed.

Hirschvogel's great contribution to the Renaissance cartography of southern East-Central Europe is known from secondary sources only. He first became acquainted with the cartography of fortification while in Ljubljana in 1536. Living in Vienna, Hirschvogel made a map of the city in 1547, which was printed on six sheets in 1552.[204] He was a military mapmaker and a typical Renaissance scholar and artist. A well-known geometer, he was highly appreciated, and he maintained good personal contacts in the imperial court. Some of his pioneer works were published, his border maps only after considerable delay. In 1552 Hirschvogel traveled to Hungary to prepare a map of Hungary, a commission probably made by the imperial court. He had made some progress with the ambitious project when he died in February 1553.[205]

"Miszellen aus der Geschichte des 16. und 17. Jahrhunderts," *Blätter für Heimatkunde* 7 (1929): 9–12, esp. 11.

199. In contemporary documents they were called master builders (*Paumeister*), that is, military architects. Military engineers per se appeared in the seventeenth century. Military cartographer is a much later term, used here only in connection with the military purpose of mapmaking activities of experts, whose duties involved mapmaking.

200. Natale Angielini's printed map was first described by Pál Hrenkó in "Térképészettörténeti kutatásunk helyzetképe," *Térképbarátok Körének Műsorfüzete* 1 (1982): 3–40, esp. 7, reproduction on 36. Earlier the two Angielini brothers were not clearly identified and were thought to be just one person. Szathmáry, "Nicolaus Angielus Magyarország-térképe." Recent study of archival documents by Géza Pálffy in Vienna resulted in the reliable identification of members of the Angielini family.

201. The title of the view of Győr in the *Civitates orbis terrarum* (1592) refers to the 1566 work of the Italian master "Nicolao Aginelli," clearly a spelling mistake.

202. Vienna, Österreichische Nationalbibliothek (Cod. 8609 and Cod. 8607), Karlsruhe, Generallandesarchiv (Hfk., Bd. XV.), Dresden, Sächsisches Hauptstaatsarchiv (Atlas Schr. XXVI., F. 96, Nr. 11 and Nr. 6).

203. Zsolt Török, "Angielini Magyarország-térképe: Az 1570-es évekből—Die Ungarnkarte von Angielini: Aus den 1570er Jahren," *Cartographica Hungarica* 8 (2004): 2–9. The earlier date, suggested by Brichzin, was based on a letter referring to another map of Hungary. Hans Brichzin, "Eine Ungarnkarte von Nicolaus Angielus, sowie Grund- und Aufrisse ungarischer Festungen aus dem Jahr 1566 im Sächsischen Hauptstaatsarchiv zu Dresden," *Cartographica Hungarica* 2 (1992): 39–43.

204. Hirschvogel's quadrants were not for mapmaking but for aiding heavy artillery to fire on the Turks at any place under the fortified walls of the city. See Karl Fischer, "Augustin Hirschvogels Stadtplan von Wien, 1547/1549, und seine 'Quadranten,'" *Cartographica Helvetica* 20 (1999): 3–12.

205. Hirschvogel's 1539 map of the southern border zone, from the Adriatic coast to the Danube, which he had dedicated to his hometown of Nuremberg, was published in the same city in 1565 by Hans Weigel; the unique copy kept in the library of Wrocław disappeared in World War II. This work was not, however, the same as his 1552 map of Hungary, as Karrow stated (*Mapmakers of the Sixteenth Century*, 299) following Banfi's earlier speculations ("Sole Surviving Specimens"); the

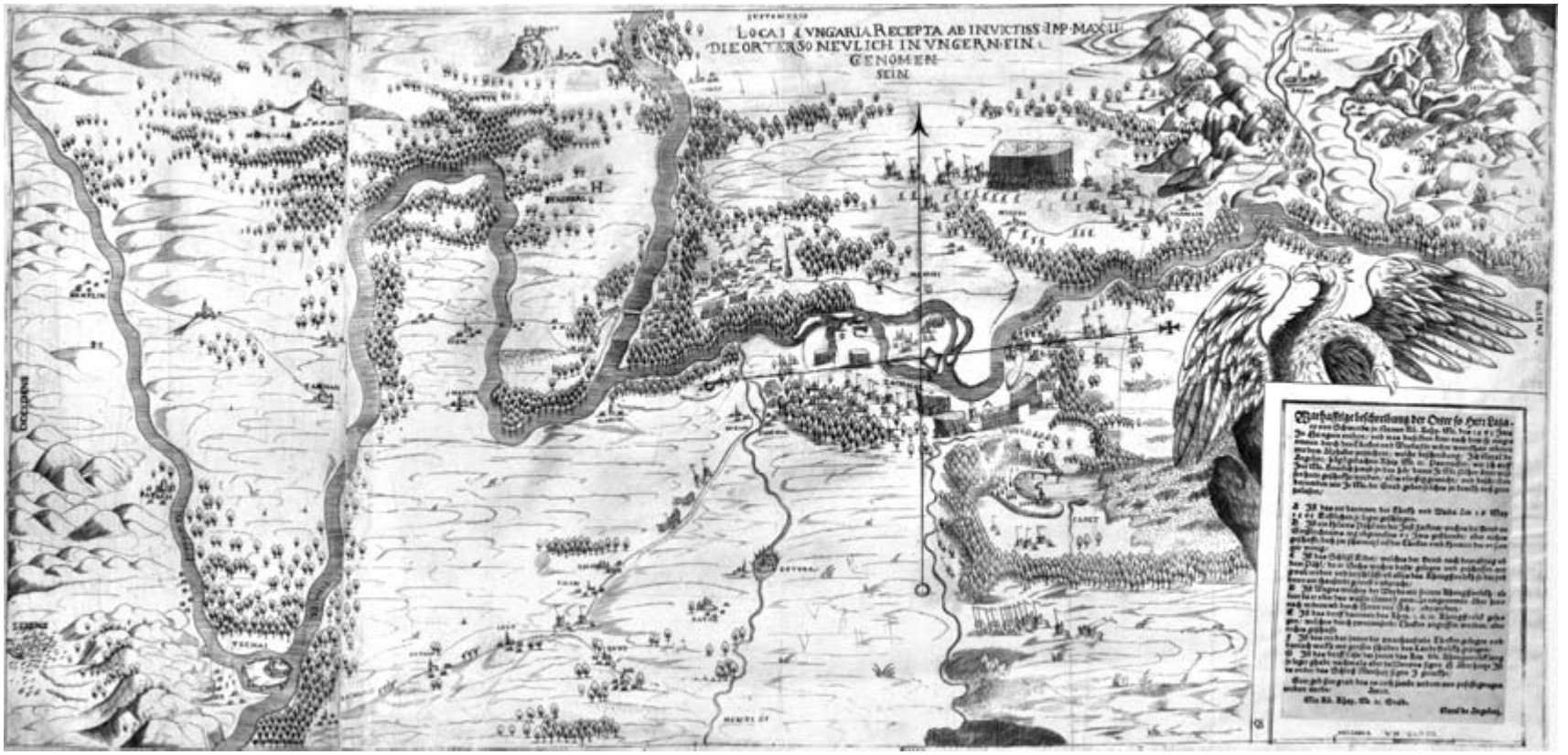

FIG. 61.18. NATALE ANGIELINI'S PRINTED LEAFLET, 1565. This engraving shows the 1565 Habsburg military campaign of Lazarus Schwendi in upper Hungary. In the center of the map is the fortification of Zachmar (Satu Mare, Romania), enhanced by the crossing line of cardinal directions. Note the small figures symbolizing moving troops along the road and the other dynamic elements of the representation.
Size of the original: 35.6 × 73 cm. Photograph courtesy of the Országos Széchenyi Könyvtár, Budapest (Collection of Early Books, App. M. 131).

THE ITALIAN MASTER BUILDER OTTAVIO BALDIGARA

The border fortress system in Hungary proved to be the only effective military strategy to stop the Ottoman army. Among the Italian master builders called to Hungary by the War Council to develop the defense zone was Ottavio Baldigara.[206] Baldigara modernized two major fortresses according to the Italian pentagonal bastion system: Eger (Hungary) and Nové Zámky (Slovakia). The documents and ground plans for the modernization of Eger indicate that serious discussions took place prior to actual work (fig. 61.19).[207] The unfavorable geographical site for the medieval castle did not allow Baldigara a perfect solution, and he indicated the problems he foresaw in his notes. He cooperated with Franz von Poppendorf, high commissioner of fortifications (*Oberstbaukommissar*), whose plans also contributed to the project.

The most modern fortress of the entire defense system was built by Baldigara at Nové Zámky. Its symmetrical hexagonal structure with six pentagonal bastions represents Italian fortification theory. In 1583, before he visited the fortifications in the mining district, Baldigara applied to the War Council for permission to take a painter (*Maler*) who could "draw the landscape."[208] Apparently, Baldigara felt the art of mapmaking beyond his capacity, although he certainly made plans and sketches. In his 1584 report he mentioned that he had given his accounts verbally as well as in written and in graphic form,[209] which was obviously the general contemporary practice for communicating information.[210]

The importance of Baldigara's work was recognized not only in the imperial court in Vienna. In 1583, Stefan Batori asked Emperor Rudolf II to send the Italian master builder to Varadinum (modern Oradea, Romania). There Baldigara supervised the construction of fortifications. Military leaders appreciated his contribution, frequently seeking his advice on construction matters.[211] He worked often with his fellow Italian master builders, especially with the talented Pietro Ferabosco.[212]

A PROPAGANDA MAP OF THE HABSBURG-OTTOMAN BORDER (1570)

After the peace treaty of Drinapolis in 1568, the Habsburgs sought further financial support for fortifications from the imperial territories. A proposal was prepared for the 1570 *Reichstag* (imperial gathering) at Speyer, Germany, enclosing a list (*Descriptio locorum*) of the ninety-one castles in the defense zone.[213] For the noble orders of the Holy Roman Empire, however, the names of the remote places were completely unknown. Their location and spatial distribution was demonstrated on a now-lost map, known only from a description. Even without the map, this evidence is an important contribution to our knowl-

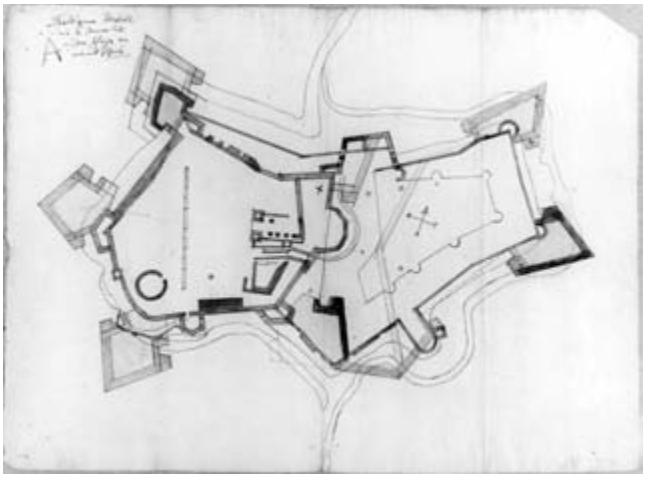

FIG. 61.19. OTTAVIO BALDIGARA, FORTIFICATION PLAN OF THE CASTLE OF EGER, HUNGARY, 31 MARCH 1572. Manuscript pen and ink on paper. This plan is from a file of six, all created during the discussion between Baldigara and General Franz Poppendorf on the problem of modernizing the castle. This large-scale map, called "Modell" in the marginal note, demonstrates how the Italian military architect had to adapt the ideal Renaissance fortification design to local geographical conditions. Traces of lines on the paper reveal further modifications that would lead to the final project, as presumably approved by the emperor.
Photograph courtesy of the Kriegsarchiv, Österreichisches Staatsarchiv, Vienna (Kartensammlung, G.I. h. 158, fol. 17).

1552 map was actually never published. Hirschvogel's 1542 map of upper Austria is known from the 1583 atlas of Gerard de Jode, whereas his 1544 map covering Carinthia, Slawonia (Slovonia), Croatia, and Bosnia was copied for post-1597 editions of Ortelius's *Theatrum*.

206. György Domokos, *Ottavio Baldigara: Egy itáliai várfundáló mester Magyarországon* (Budapest: Balassi Kiadó, 2000).

207. This material consists of six plans of Eger: two represent the state of the castle before modernization in 1561 and 1568 (attributed to Pietro Ferabosco); two were drawn by Franz von Poppendorf in 1572 (fols. 13 and 18); and two were designed by Baldigara (fols. 12 and 17). From these plans the development of Baldigara's final project could be partly reconstructed (Vienna, Österreichisches Staatsarchiv, Kriegsarchiv, Map Collection, G.I. h. 158).

208. Request dated 14 March 1583. Vienna, Österreichisches Staatsarchiv, Kriegsarchiv, Protokolle des Wiener Hofkriegsrates, Bd. 173, Exp., fol. 216.

209. Vienna, Österreichisches Staatsarchiv, Kriegsarchiv, Akten des Wiener Hofkriegsrates, Akt. 1584 June, no. 117 Exp., fol. 1.

210. In modern terms these military reports could aptly be called multimedia presentations.

211. In 1585 Baldigara was even invited to visit Wrocław, Poland.

212. The cooperation between these master builders is demonstrated by the military report on the condition and state of the constructions in Kanizsa, western Hungary, which was signed by Pietro Ferabosco, Ottavio Baldigara, and Nicolo Angielini (Vienna, Österreichisches Staatsarchiv, Kriegsarchiv, Akten des Wiener Hofkriegsrates, Akt. 1577 July, no. 140. Exp).

213. Nuremberg, Staatsarchiv, Ansbacher Reichstagsakten (Rep. 136), Band 43, no. 19. The document speaks of the defensive line from one fortification to another, from Rijeka (Croatia) to Baia Mare (Romania).

edge of sixteenth-century map use. From its purpose we can imagine this map. The huge defense line of more than two thousand kilometers demanded immense resources. While it was to inform the German Orders of the system and organization of the border, the map was made to raise money for more soldiers and munitions. It would not therefore have been a detailed representation made for direct military use but rather a persuasive graphic: a small-scale, simple, easily comprehensible image, and an aid to Habsburg military-political propaganda.

military intelligence and the counterintelligence map of 1580

As on the Christian side, the Ottoman army required information about the theater of war, and geographical conditions became even more important when the Turks constructed a counter-line to the Habsburg defensive system in the second half of sixteenth century. The traditional way of acquiring information was intelligence, and secret information was collected by diplomats, merchants, and travelers. Captured soldiers were interrogated, and secret agents were sent to spy. The Habsburgs kept a diplomatic post in Constantinople, which was an important source of information. In 1580, the Habsburg representative, Joachim von Sinzendorf, enclosed a map with his report to Emperor Rudolf II in Vienna. The map was a military sketch of Hungarian castles and their surroundings that had reportedly been sent to Constantinople by the Turkish governor of Buda.[214] The castles and fortified places are accurately shown, and the fortifications and guard posts constructed between 1578 and 1580 are all included. Their newness is emphasized by inscriptions (for example, "La nuova fabricata Balanka"). The hydrography is also simplified. Because this hastily copied version contains so much military information, it is conjectured that the original map might have been exceedingly detailed.

gasparini's map of the border zone in hungary (after 1580)

A manuscript map of the border zone in Hungary was recently found in Vienna (fig. 61.20). The large map is not dated, but the inscription below the graphic scale, "giouã(nni) jachobo gasparinj fecit," identifies the mapmaker as Giovanni Jacobo Gasparini, but it is not possible to give a precise date for this map's construction. The map was part of a larger archival file, but its original documentary context has not yet been found. Gasparini first appeared in upper Hungary in 1580 as an Italian military architect, and he worked as an assistant to the chief architect, Giulio Ferrari, in the castle of Krupina, Slovakia. From 1583 he was responsible for the construction and modernization of the fortifications in upper Hungary. He was promoted in 1589 to be chief architect of the mining district in Hungary. He moved to Nové Zámky, Slovakia, the center and most important castle of the military border zone, where he is supposed to have died in 1595.[215]

His manuscript map represents the fortifications made by the commander of the Kanizsa region, Andreas Kielman, in 1579–80. To the northwest the smaller fortified place, Kethida (Kehida), is represented. It was destroyed by the Turks before November 1588, and thus Gasparini most likely made this map in the second half of the 1580s. The Habsburg territories of present western Hungary and western Slovakia can be seen to the north of the rivers Drava and Danube. Gasparini placed the town of Pest on an island, although it is actually situated on the bank of the river Danube, opposite Buda (German Ofen). That city, the former royal seat of Hungary, was occupied by the Turks in 1541, so at the time the map was made these places were no longer militarily relevant. Gasparini evidently focused on the fortifications of the border zone. Castles and fortified places are represented with detail and accuracy. He also represented, based partly on his own experience, those physical features of importance to military strategy. For example, swamps are depicted around Kanischa (Nagykanizsa, Hungary) and Papa (Pápa, Hungary).

the kanizsa border zone in 1582 and 1600

The castle of Kanizsa (Nagykanizsa) was of primary importance for the defense of the region between the rivers Mura and Drava and the province of Styria. The landowners of the region, the Croatian family Zrinski, protected the pass to Habsburg Styria and contributed financially to the defense against the Turks. In 1582 György Zrinski (Zrínyi), captain of the Kanizsa border region, asked the War Council to finance the recruitment of 1800 troops to man the newly established guardposts along the Mura River. To explain his proposal for the new defense system, he drew a schematic plan. Despite these efforts, the Kanizsa castle fell in 1600, and the reorganization of the border's defense system became an urgent and important military task. After the fall, the most powerful noble families whose properties were in immediate danger took different solutions to the War Council. For example, the Hungarian noble Ferenc Batthány submitted a detailed proposal, most likely featuring a map preserved among the papers of the War Council (fig. 61.21). The circumstances did not allow much time for preparation. Showing the

214. Vienna, Österreichisches Staatsarchiv, HHStA, Turcica Karton 43, Konv. 2, fol. 50.

215. Pálffy, *Európa védelmében,* 53–54.

FIG. 61.20. GIOVANNI JACOBO GASPARINI, BORDER ZONE MAP, CA. 1580. Manuscript, ink on paper, colored. From the second half of the 1580s, Gasparini's large map is an example of a border zone map, representing the castles and fortified places of the Habsburg defense system in the Kingdom of Hungary. The map of the Italian master builder is oriented east and shows the territory from an imperial perspective, as if seen from Vienna.
Size of the original: 43.4 × 58.6 cm. Photograph courtesy of the Haus-, Hof- und Staatsarchiv, Österreichisches Staatsarchiv, Vienna (Ke 3-5/1).

zone between the rivers Mura and Rába in western Hungary, this map was probably made not by a professional military engineer but a secretary in Batthány's court.

In the early seventeenth century more maps appeared in connection with the new military situation. In 1604 a payment order was issued for the painter of a map of the Hungarian borders.[216] Another documentary source supports the hypothesis that the frequency of mapmaking increased after the fall of Kanizsa. In 1609, the captain of the castle at Győr mentioned that the French military engineer Francesco de Couriers was ordered to Vienna with the map he had borrowed from the collection of the War Council. By the early seventeenth century, maps and plans were being actively conserved in Vienna, and the foreign military architects and engineers could use the works of their predecessors, including Angielini and Gasparini.

MARTIN STIER, MILITARY ENGINEER

The military revolution brought by new firearms and cannons after the Fifteen Years' War (1593–1606) had an important effect on fortifications along the Habsburg-Ottoman border. The new siege techniques required more sophisticated fortification plans, brought forth by the new generation of military engineers. One of the more talented of this generation was Martin Stier, German military architect, surveyor, and mapmaker.[217] In 1650 he was a lieutenant; the following year he was promoted to captain of the army in Styria. By 1654 he was chief mili-

216. Loserth, "Miszellen aus der Geschichte des 16. und 17. Jahrhunderts," 11.

217. Ernst Nischer, *Österreichische Kartographen: Ihr Leben, Lehren und Wirken* (Vienna: Österreichischer Bundesverlag, 1924), 25–26.

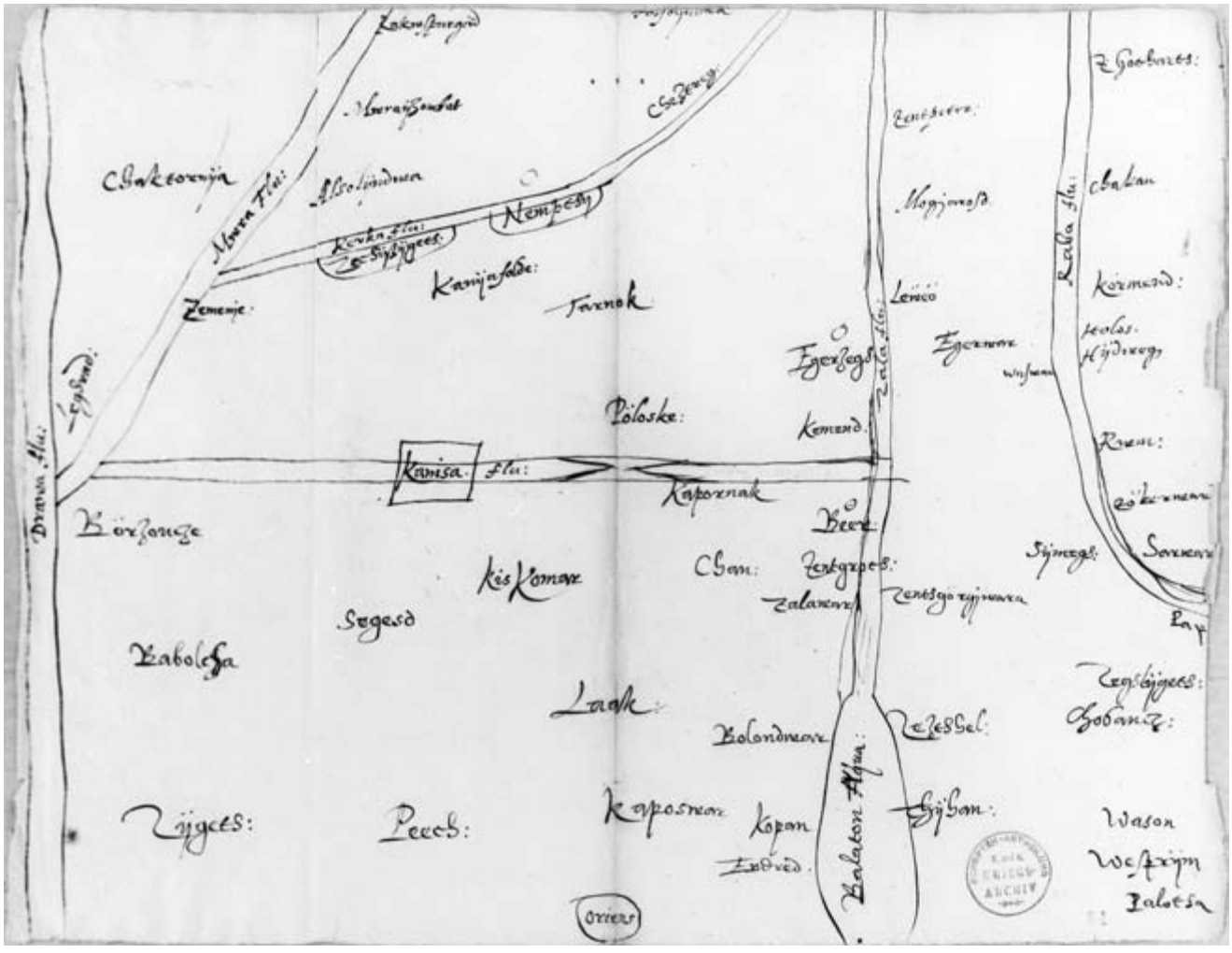

FIG. 61.21. FERENC BATTHÁNY, SKETCH MAP, CA. 1600. Pen drawing on paper. This map shows the defensive zone between the rivers Mura (left) and Rába (right side) in Western Hungary. The rivers are symbolized by double lines and the place-names represent the location of the fortifications in western Hungary. Proper names are given in Hungarian, although the abbreviation *flu.* (fluvis) for river and the cardinal direction *Oriens* (east) are written in Latin. The sketch is oriented to the west. The overall geography on the sketch is much better than the representation of the region on contemporary printed maps.
Photograph courtesy of the Kriegsarchiv, Österreichisches Staatsarchiv, Vienna (Akten des Wiener Hofkriegsrates Exp. 1601 März No. 187, fol. 34).

tary engineer (*Oberingenieur*) of the Imperial Army, but his career was cut short by his death from tuberculosis in Vienna in 1669. Stier's military career can be compared to that of Sébastian Le Prestre de Vauban, the most celebrated military engineer of the age. *Oberingenieur* Stier, however, died relatively young, without family, his military work clouded in secrecy. Until recently his work remained relatively unknown.[218]

After some relatively peaceful years, castles and fortresses had deteriorated so much that the War Council decided to reconstruct and modernize them. Stier's reports of his inspection of the border (*Gränicz-Visitation*) of January 1657 are well preserved in Vienna.[219] They include plans, views, tables, and a description of each place he had investigated. His manuscript atlas includes large-scale plans and views as well as some highly artistic, small-scale military topographical maps. The edited material was assembled and copied in 1658 and a special

218. Krompotič, in his recent monograph on the fortification works of the Habsburg-Ottoman border (actually on the surveying and mapping of the southern military border), writes that the only material document of Martin Stier's life, beyond his cartographic output, is the burial plate at the altar in the Serviten Monastery in Vienna. Further, he contends that Stier was involved in some kind of intelligence activity in connection with his journeys and surveys. This secret activity, Krompotič hypothesizes, could be the reason why Stier remained a well-paid but reatively obscure person (Louis Krompotič, *Relationen über Fortifikation der Südgrenzen des Habsburgerreiches vom 16. bis 18. Jahrhundert* [Hannover, 1997], XXIV).

219. Vienna, Österreichisches Staatsarchiv, Kriegsarchiv, Akten des Innerösterreichischen Hofkriegsrates, Vindica, June (no. 18, fols. 1–6)

copy was prepared and presented to Emperor Leopold I in 1660.[220] Although his work was apparently hurried (speed was always expected in military mapmaking),[221] his map of the Styrian border zone shows how much military mapmaking had developed since the sixteenth century (plate 77). By 1660 Stier had added three chorographical maps to his 1657 representation of the Styrian border zone.[222] From north to south, each map represented a section of the southern border region.

Apparently military inspection was neither demanded nor supported by local county or city administrations.[223] Hungary and Croatia still cultivated an ideology of independence from the Habsburgs. However, the effective military defense against the Turks was organized and financed from Vienna. This military-political activity increased the power of the Habsburg rulers, a point that may explain why no military maps of the whole system were made outside the imperial court. Local interest was limited to particular military actions, and these operations required only sections of the border region to be represented cartographically. From a local point of view, the border zone was not thought of as a coherent spatial unit, even if some kind of general map was used to review the military-political situation in a geographical context.

By 1661 Stier had completed a more ambitious project: a large map of Hungary. This work, drawn on twelve sheets, was a graphic summation of the information available about the entire Habsburg-Ottoman military border.[224] For the compilation, Stier certainly used his own manuscripts representing the southwestern part of the country. But the other regions required different sources, and for those Stier used the reports of other border inspections housed in secret War Council map archives in Vienna. In this single locale, Stier could find all the documents accumulated during the past century of the Turkish war.[225] In 1664 Stier was granted a fifteen-year privilege to engrave and print his map of Hungary in Vienna. The publication was a close copy of the manuscript with some minor changes.[226] The new title clearly referred to an extended focus, providing a clue to why the publication of the map was allowed. Specifically, the map was intended "for the use of the whole Christian world against the eternal enemy," the Ottoman Empire.[227] The rhetoric is explained by both the need for modern warfare and for the support of the German lands, without which the Habsburgs could not fight successfully. In addition, the leaders and soldiers of the established Christian army were unfamiliar with the geography of the extensive battlefield. Stier's published map was needed not only for wayfinding, but also for strategic planning.[228]

In the next phase of the Turkish wars a new generation of military engineers appeared and their duties already included mapmaking. The number of different plans and maps increased rapidly during the war of liberation (1683–99). The new surveys of the regained territories by Luigi Ferdinando Marsigli, Johann Christoph Müller, and other military engineers resulted in new maps of the whole region. During the Karlovač peace negotiations, the international Habsburg-Ottoman-Venetian border was mapped and marked in the field by Marsigli with the help of Müller. They created a geometrical line: a border in its modern sense. At the same time, the developing spe-

and March (no. 22, fols. 1–30) 1657, and March (no. 26, fols. 1–18) 1658.

220. This complete atlas is in Vienna, Österreichische Nationalbibliothek, Handschriftensammlung, Cod. 8608. Another example is in Karlsruhe, Generallandesarchiv, Hausfiedikommission, Band XII, which is dedicated to Hannibal Gonzaga, president of the War Council (1666–68). A second copy in the Österreichische Nationalbibliothek (Cod. 9225) does not include the Croatian material. The copy preserved in Vienna, Österreichisches Staatsarchiv, Kriegsarchiv (Kartensammlung, K VII b 1 d), is smaller in size and was left by Raimund von Montecuccoli.

221. From Stier's comment we know he did the work in a hurry (*etwas eilfertig*), and one can conclude that his task was pressing.

222. Vienna, Österreichische Nationalbibliothek, Handschriftensammlung, Cod. 8608: "Mappa der Wündische, Petrinianische vnd Banatishe granitzen" (fol. 32); "Mäppä vber die Croatische vnd Meer gräniczen, sambt den Cameralischen Stätten" (fol. 62); and "Abriß der Vöstung Carlstadt, Sambt den vorliegenden Wachten vnd Päßßen" (fol. 74). The map of the Styrian border zone is "Mappa vber die Steijeriche Frontier Platze gegen der Türckhischen Poste, Canischa (fol. 4).

223. In May 1657 General Montecuccoli reviewed Stier's report and wrote: "Agaram must not be visited without the permission of the Kingdom of Hungary"; see Krompotič, *Relationen über Fortifikation,* XXVIII–XXIX. The plan of the castle of Agaram (Zagreb, Croatia) was missing from Stier's manuscript atlas.

224. "Mappa Vber die Gränitzen Von der Adriatischen Meer, biß Siebenbürgen, Waß die Römische Kajserliche Maijestät vnd daß HochLöbliche ErtzHauß Öesterreich vor Vöstungen vnd Plätze gegen dem Türckhen stettig erhalten vnd In Allen Versehen lassen Müessen . . . 1661," 152 × 100 cm. (Vienna, Österreichische Nationalbibliothek, Handschriftensammlung, Cod. 8332). A register enclosed with the map contains a list of the border fortresses.

225. In 1657 Emperor Leopold expressed his opinion that the Hungarian border fortresses should be inspected by a military engineer (Vienna, Österreichisches Staatsarchiv, Akten des Innerösterreichischen Hofkriegsrates Vindica, 1657, June, no. 18, fol. 1). The plans and views of the fortresses in upper Hungary, drawn between 1653 and 1667, are indirect documentary evidence of similar surveys. Remarkably, the volume in which these works are collected has a chorographical map of the mining region by Johann Kleinwächter. This 1679 map is very similar in style to Stier's earlier manuscripts, and it could be the one sheet preserved in the atlas (Karlsruhe, Generallandesarchiv, Hfk. Bd. XIII.).

226. For example, the route of Turkish raiders to Friuli (Italy) and the actual Turkish border were not represented, apparently for military and political reasons.

227. "Landkarten des Königreichs Vngarn, vnd dennen andern angräntzenden Königreichen, Fürstenthumer vnd Landschafften, sambt dennen Gränitz Posten . . . von den Adriatischen Meer an, biß Sibenbürgen vor Vestungen vnd Plätze gegen dem Erbfeind Zu Nutz der gantzen Christenheit, stätig erhalten, vnd in allen versehen lassen mössen . . . 1664."

228. Twenty years after its first appearance a new edition was printed by Martin Endter in Nuremberg in 1684.

cialization in military mapping created a new discipline and profession: military cartography.

Conclusions

The objective of this chapter has been to give a historical overview of cartography in East-Central Europe during the Renaissance. The size and complexity of this task stands in sharp contrast to the general knowledge about the region among historians of cartography. This underrepresentation and neglect, however, is the inevitable result of problems mentioned in this chapter. The lack of authoritative reference works and the limited number of publications available for international readership cannot be explained by the immense loss of historical material, including the maps made or used in East-Central Europe itself. Despite the apparent bibliographic problems and sporadic cartographic archives, this synthesis was written to redefine the concept of Renaissance cartography in East-Central Europe.

I have traced the different traditions and contexts for cartography in the region from the early mathematical-astronomical traditions to local surveys to see how these different modes were adapted to the geographical-historical context. Although the chapter covers a cultural region, internal regional differences become increasingly pronounced by the end of the period. A most remarkable characteristic of the Renaissance cartographic history of East-Central Europe is the revolutionary development of chorographical mapping in the first decades of the sixteenth century. This early development of the new cartographic mode can be explained by the peripheral, but not provincial, situation of the cultural region within Europe, which allowed practical changes in the mapmaking paradigm. It is not surprising, however, that the first printed country maps of Lazarus, Wapowski, and Honter were not followed by similar works within the region. The line of development toward a modern, non-Ptolemaic cartography was apparently broken for several reasons.

The socioeconomic context of mapmaking changed in the period. The decline of powerful and centralized feudalism in Hungary and Poland in the second half of the sixteenth century is apparent. A general decline in Polish cartography—according to Buczek—can be identified after about 1650. Causing this regression were the increasing economic problems flowing from centralized feudalism. The weakness of royal power made the wealthy landowning oligarchs more independent and powerful. A map of the whole country, symbolizing its unity, was certainly not in their interest. Likewise, the detailed maps of individual provinces made occasionally by individuals lacked practical, economical, political, and military imperatives.

This traditional, simplified view of the history of cartography in East-Central Europe is challenged by the results of recent research, especially on the history of military cartography. The maps and plans made by the generations of military architects and surveyors after 1530 reveal a once secret, hidden, yet impressive, map corpus. The effect of that huge cartographic laboratory, the Habsburg-Ottoman border zone and the eastern borderlands, on the development of all-European cartography is only one of the subjects that need further, cooperative, and international research.

The perpetuation of the distorted geographical images of the Renaissance into the eighteenth century is another significant feature of the history of printed maps of the region. The rare examples of cooperation between military and commercial mapmakers can shed light on the policy of secrecy and the hidden channels of cartographic information acquisition. Apart from some remarkable exceptions, such as Honter's printing workshop, commercial cartographic production did not exist in the region; maps could not become a commodity for the locals. The use of maps was limited to the elite political and military leaders who constituted not a public but rulers and patrons. In light of these findings, the traditional concepts of "progress" or "continuity" in the history of cartography must be reconsidered.

Although special efforts were made, this essay could not include all the information available and is far from being complete. It should be read as the introduction to a more comprehensive work, one which requires intensive research to bridge the gaps between the overlapping and contradicting national map histories and the history of cartography in the region. Historians of cartography in East-Central Europe should recognize the importance of international cooperation as a fundamental step toward the better understanding of their common, European, cartographic heritage.