

43 • Surveying and Official Mapping in the Low Countries, 1500–ca. 1670

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EARLY MAPPING OF THE LOW COUNTRIES AND THE HISTORICAL-POLITICAL BACKGROUND OF CARTOGRAPHIC DEVELOPMENT

The international reputation of official cartography in the Low Countries has always stood in the shadow of its commercial counterpart. One explanation for this phenomenon is that governmental agencies produced far fewer maps than did commercial publishers. In addition, official cartographic material enjoyed relatively limited distribution, both nationally and internationally. Non-Dutch historical cartographic literature primarily focuses on commercial maps, deemphasizing official cartography in the Low Countries.

Nevertheless, a history of mapping in the Low Countries would not be complete without consideration of the official branch of the mapmaking industry.¹ Indeed, official maps often provided significantly more information about origin, purpose, and function than did commercial maps, and this had to do with the process of mapmaking. A review of the history of mapmaking in the Low Countries in the sixteenth and seventeenth centuries ought to begin with a description of the official surveying and mapping in the area.

Such an account is difficult to understand, however, without knowing the complex historical-political development of the Low Countries after the Middle Ages. Sweeping changes in the political establishment of the Low Countries after the sixteenth century led to equally comprehensive changes in the governing bodies that were responsible for the publication of maps. Given this institutional variety, political concepts such as “the Netherlands” (Nederland), “the Low Countries” (Nederlanden or Lage Landen), “the Seventeen Provinces” (Zeventien Provinciën), “the Seven Provinces” (Zeven Provinciën), and “Holland” (Holland) tend to cause considerable confusion outside the Low Countries and even among people within the Dutch language region. Therefore, we first examine the constitutional background of the Low Countries in the sixteenth and seventeenth centuries before discussing official mapping during this era.

The geographical term “the Netherlands” in its narrow sense refers to the modern kingdom of the Netherlands.

In the wider sense in which the term was used in the late Middle Ages, the area included the whole of the modern kingdom of the Netherlands (broadly coinciding with the Northern Provinces) and Belgium together with the grand duchy of Luxembourg and small parts of northern France and western Germany (broadly coinciding with the Southern Provinces). That group of seventeen provinces constituted the so-called Burgundischer Kreis (Burgundy Circle), under the political influence of the Burgundian and Habsburg dynasties (fig. 43.1).

The toponymic explanation of the term “the Netherlands” refers to the word *neder*, which is ancient for *neer*, meaning low (cf. German, *nieder*). But to translate the term “Low Countries” as “the Netherlands” is not correct. In order to avoid confusion in this chapter dealing with the sixteenth and seventeenth centuries, “Low Countries” is used rather than “the Netherlands” because the latter term was not used until 1815.

Another toponym that can be confusing is “Holland.” Many people today, primarily foreigners, use the term “Holland” when they mean “the Netherlands” (Nederland). Historically, “Holland” was used to denote the province that included only the territory now known as the provinces of North and South Holland.

With regard to the names used for the Low Countries on sixteenth-century maps, Sebastian Münster, in his *Cosmography* (1544), included the Low Countries in “Die drit Tafel des Rheinstroms, inhaltend das nider Teutschlandt.” Gerardus Mercator, in his *Tabula geographicae Galliae, Belgii Inferioris & Germaniae* (the precursor of his *Atlas*) of 1585, named his special section of province maps “Belgii Inferioris geographicae

Abbreviations used in this chapter include: MCN for Günter Schilder, *Monumenta cartographica Neerlandica* (Alphen aan den Rijn: Canaletto, 1986–).

1. The most comprehensive work on the history of the cartography of the Low Countries is C. Koeman’s *Geschiedenis van de kartografie van Nederland: Zes eeuwen land- en zeekaarten en stadsplattegronden* (Alphen aan den Rijn: Canaletto, 1983). For a typology of the map material of the Low Countries, see Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland uit de 16^{de} tot en met de 19^{de} eeuw: Een typologische toelichting ten behoeve van het gebruik van oude kaarten bij landschapsonderzoek* (Alphen aan den Rijn: Canaletto, 1995).



FIG. 43.1. THE SEVENTEEN PROVINCES, 1543–67. The numbers correspond with the hierarchical order of the maps in Mercator’s atlas. Numbers 1–4 are duchies, 5–11 counties, 12 the margravate of the Holy Roman Empire, and 13–17 seignories.

Based on Peter Van der Krogt, “Dutch Atlas Cartography and the Peace of Munster,” in *La Paz de Münster/The Peace of Munster, 1648: Actas del Congreso de Commemoración organizado por la Katholieke Universiteit Nijmegen, Nijmegen-Cleve 28–30. VIII. 1996*, ed. Hugo de Schepper, Christian Tümpel, and J. J. V. M. de Vet (Barcelona: Idea Books, 2000), 113–26, esp. 118.

tabul[a]e.”² The term “Belgica” was generally accepted in the classical literature and more broadly until 1585; “Germania Inferior” was sometimes used, and “Nederland” was seldom used.³

Centuries before the kingdom of the Netherlands was formed, the seventeen provinces of the Low Countries were at the point of being welded into one united state (the last province, Gelder, came under the control of the Low Countries in 1543) by the efforts of the Burgundian and Habsburg dynasties. But the outbreak of a civil war with Spain in 1567 not only prevented unification but ended in a final separation. A rebellion of all the provinces against Spanish centralization under the rule of King Philip II of Spain led to an uprising in which the Reformation played a dominant role.

The national history of the northern part of the Low Countries, later called the kingdom of the Netherlands, has its roots in the so-called Religievrede (religious peace) of 1578, followed by a political integration of those provinces no longer under Spanish rule in the Union of Utrecht, concluded in 1579. This union united the sovereign provinces of Holland, Zeeland, Utrecht, Groningen, Friesland, Gelderland, and Overijssel in defense against the Spanish administration’s forceful and cruel persecution of the Protestant religion,⁴ renouncing Philip II in 1581. After failed experiments with other sovereigns, the Republic of the Seven United Provinces was proclaimed in 1588. In addition to the seven provinces just mentioned, of which Holland was the most powerful, this confederation included the province of Drenthe—which had its own government but did not enjoy comprehensive voting rights—and the conquered areas in Brabant, Limburg, and Flanders. Within the republic, political power was held by the states of each province, which governed its territories independently. Only those issues that extended across borders, such as foreign policy and defense, were resolved communally by means of the States General in The Hague, where every state had representatives.

In 1648, by means of the Treaty of Münster, Spain officially recognized the Republic of the Seven United Provinces. From then on, the idea of seventeen united provinces was abandoned. Yet the idea was kept alive on several maps, as demonstrated by the title of Frederik de Wit’s *Belgii XVII Provinciarum tabula*, published before 1661 (fig. 43.2).⁵ Every general map from the sixteenth century featured the Seventeen Provinces. Separate maps of the northern or southern Netherlands were not published before 1600, even though the northern Netherlands was, in large measure, independent from 1579 onward. It was not until well into the seventeenth century that publishers dared to produce and sell maps of the Seven Provinces, whereas general maps of the Seventeen Provinces were still distributed widely until about 1800.⁶

2. See Peter van der Krogt, *Koeman’s Atlantes Neerlandici* (’t Goy-Houten: HES, 1997–), 1:44–49 (no. 1:001).

3. Van der Heijden, for example, mentions fifty-three maps of the Low Countries that have survived from the sixteenth century, twenty-four of which bear the name “Belgica” or some variant thereof (“Gallia Belgica,” “Belgium,” “Leo Belgicus”). At least eighteen times, however, the Low Countries are designated as “Germania Inferior.” The term “Nederland” is used only twice. See H. A. M. van der Heijden, *Oude kaarten der Nederlanden, 1548–1794: Historische beschouwing, kaartbeschrijving, afbeelding, commentaar/Old Maps of the Netherlands, 1548–1794: An Annotated and Illustrated Cartobibliography*, 2 vols. (Alphen aan den Rijn: Canaletto/Repro-Holland; Leuven: Universitaire Pers, 1998), 1:67.

4. See Jonathan Irvine Israel, *The Dutch Republic: Its Rise, Greatness, and Fall, 1477–1806*, 2d ed., rev. (Oxford: Clarendon, 1998).

5. Regarding this map, see Van der Heijden, *Oude kaarten der Nederlanden*, 1:479.

6. See Van der Heijden, *Oude kaarten der Nederlanden*, 1:95–122.

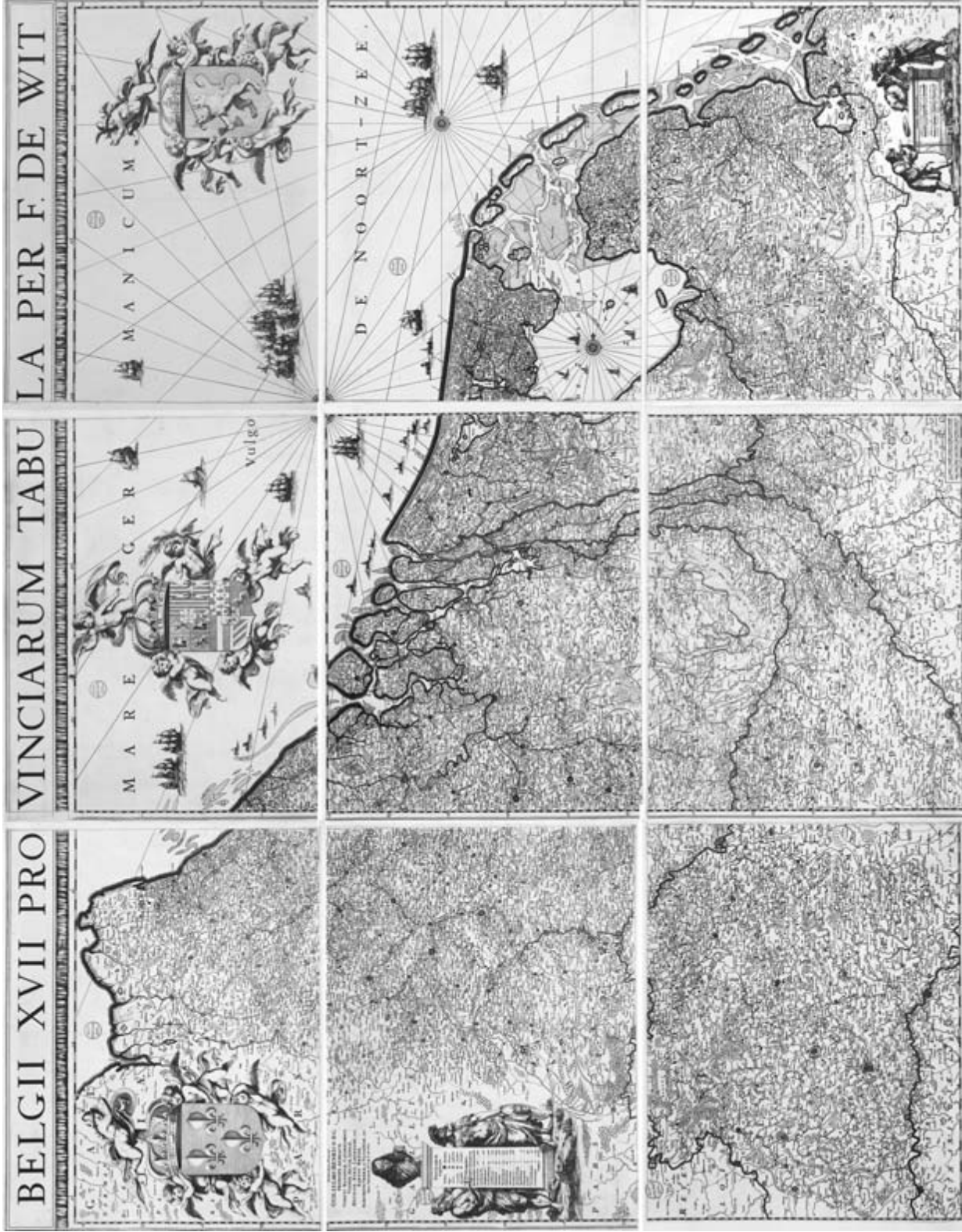


FIG. 43.2. *BELGII XVII PROVINCIAARUM TABULA*, BY FREDERIK DE WIT, BEFORE 1661. Nine sheets. Size of the original: 132 × 168 cm. Photograph courtesy of the Universiteitsbibliotheek Leiden (VI.10.66/75).

FROM PICTURE TO MAP: THE BIRTH OF A MODERN CARTOGRAPHY

THE OLDEST NATIONAL, REGIONAL, AND LOCAL MAPS

The emergence of Dutch cartography—and of a Dutch contribution to cartographic science and map production—corresponds to the early mapping of the Low Countries.⁷ Until recently, it was believed that the first map of the Low Countries in their entirety appeared in the Italian (Venice) edition of Ptolemy's *Geography* in 1548. *Flandria Barbantia E. Holanda Nov.* provided a fairly complete view of the territory of the Low Countries, although various place-names were misspelled and the external shape, specifically of the Zuiderzee and Friesland, left something to be desired.⁸ Recently, however, Meurer found an older manuscript map of the Low Countries, which he cautiously attributes to the London printer and publisher Reynier Wolfe (see fig. 54.8).⁹ This map, from about 1539, is based on a map from the 1520s—which has not survived—by Jan van Hoirne (also known as Jan de Beeldsnijder) of Antwerp.¹⁰ Beginning in 1570, Abraham Ortelius included mention of this map in the “Catalogus Auctorum” in his *Theatrum* under the title “Ioannes à Horn, Germaniæ Inferioris Tabulam: Antverpiæ.” Although Ortelius did not supply a date, the English “copy” of Van Hoirne's map leaves no doubt that it is the oldest map of the Low Countries. The precise representation of certain territories on Wolfe's map suggests that it was based on a survey, but this cannot be proved.¹¹

It is thus not clear whether the previously mentioned maps were the results of surveys, and this same uncertainty applies to the oldest printed regional maps. Only two known printed regional maps of the Low Countries are dated before 1530. One is a woodcut map of the coastal area of the Low Countries extending into the German Bight and including Denmark. It was sold at Antwerp by Jan van Hoirne without a title. In 1525, the privilege was granted to Van Hoirne to print a “Kaart van de Oosterscher Zee”; three fragments of one of the sheets are known: a fragment with a portion of a cartouche and two fragments depicting the Low Countries and a set of compass lines radiating from the town of Hoorn (fig. 43.3).¹² It is debated whether this map was intended to be used as a nautical chart, because it also contains information of value for land travel. Although the coastline of Flanders, Holland, the Zuiderzee, and Friesland were fairly well sketched, the map was not based on a survey; Van Hoirne must have relied on an existing map.¹³

The second printed regional map of the Low Countries before 1530 consists of two fragments of a woodcut map of an extension of the Bishopric of Utrecht, presumably printed in 1524, discovered in the binding of a book (fig. 43.4). In his analysis of this map, Van 't Hoff associ-

ates its origin with the political outcome of the election of a new bishop of Utrecht in 1524.¹⁴ The province of Utrecht, at that time a bishopric not under the administration of King Charles V, had chosen a foreigner, Hendrik II of Bavaria, as its new bishop. In the records of the bishopric, mention is made of a deputation from Utrecht to Bavaria to invite Hendrik II to move into the Low Countries. The woodcut map of the diocese was presumably made to demonstrate to the new bishop the densely populated extension of Friesland and Overijssel. The mapmaker thus placed a great deal of emphasis on churches and cloisters by depicting the buildings true to life. This perspective drawing demonstrated, as did no other technique, the power of the church.

Presumably, just enough copies of this woodcut map were printed to be distributed at the court of Bavaria. A second edition or a derivative map is not known. Such an ad hoc presentation of topographic information in the form of a woodcut map was luxurious, when a neatly drawn map on parchment would have been sufficient.¹⁵

7. The adjective “Dutch” is used in the Netherlands as well as Belgium, and is here referring to the whole of the Low Countries.

8. Van der Heijden also mentions the woodcut map of the Oosterscher Zee by Jan van Hoirne from 1526 (*Oude kaarten der Nederlanden*, 1:12–16).

9. See Peter H. Meurer, “Op het spoor van de kaart der Nederlanden van Jan van Hoirne,” *Caert-Thresoor* 21 (2002): 33–40. The map was drawn on the occasion of the journey made by Anne of Cleves in the autumn of 1539 to London, where she was to marry Henry VIII.

10. On Van Hoirne, see 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), 316.

11. This possibility was not ruled out by Arend W. Lang in “Traces of Lost North European Sea Charts of the 15th Century,” *Imago Mundi* 12 (1955): 31–44.

12. Van der Heijden, *Oude kaarten der Nederlanden*, 1:137–38; Bert van 't Hoff and L. J. Noordhoff, “Een kaart van de Nederlanden en de ‘Oosterscherzee’ gedrukt door Jan de Beeldsnijder van Hoirne te Antwerpen in 1526,” *Het Boek* 31 (1953): 151–56; and Bert van 't Hoff, “Jan van Hoirne's Map of the Netherlands and the ‘Oosterscher Zee’ Printed in Antwerp in 1526,” *Imago Mundi* 11 (1954): 136. The fragments are located in the Gemeentearchief, Groningen.

13. See Van der Heijden, *Oude kaarten der Nederlanden*, 1:16–18.

14. Bert van 't Hoff, “The Oldest Maps of the Netherlands: Dutch Map Fragments of about 1524,” *Imago Mundi* 16 (1962): 29–32, and Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750: Handgetekende en gedrukte kaarten, aanwezig in de Nederlandse rijksarchieven* (Groningen: Wolters-Noordhoff and Bouma's Boekhuis, 1981), 128 (no. 646). Grenacher has suggested that the woodblocks for this map were cut by the same person who did the cutting for the map “Tabula Nova Heremi Helvetiorum” in Martin Waldseemüller's edition of Ptolemy's *Geographia* (Strasbourg, 1513); see Franz Grenacher, “The Woodcut Map: A Form-Cutter of Maps Wanderers through Europe in the First Quarter of the Sixteenth Century,” *Imago Mundi* 24 (1970): 31–40.

15. It is likely that such manuscript maps “for the occasion” were frequently enclosed in the official mail of those years. An example of a manuscript map discovered in the file of correspondence between the

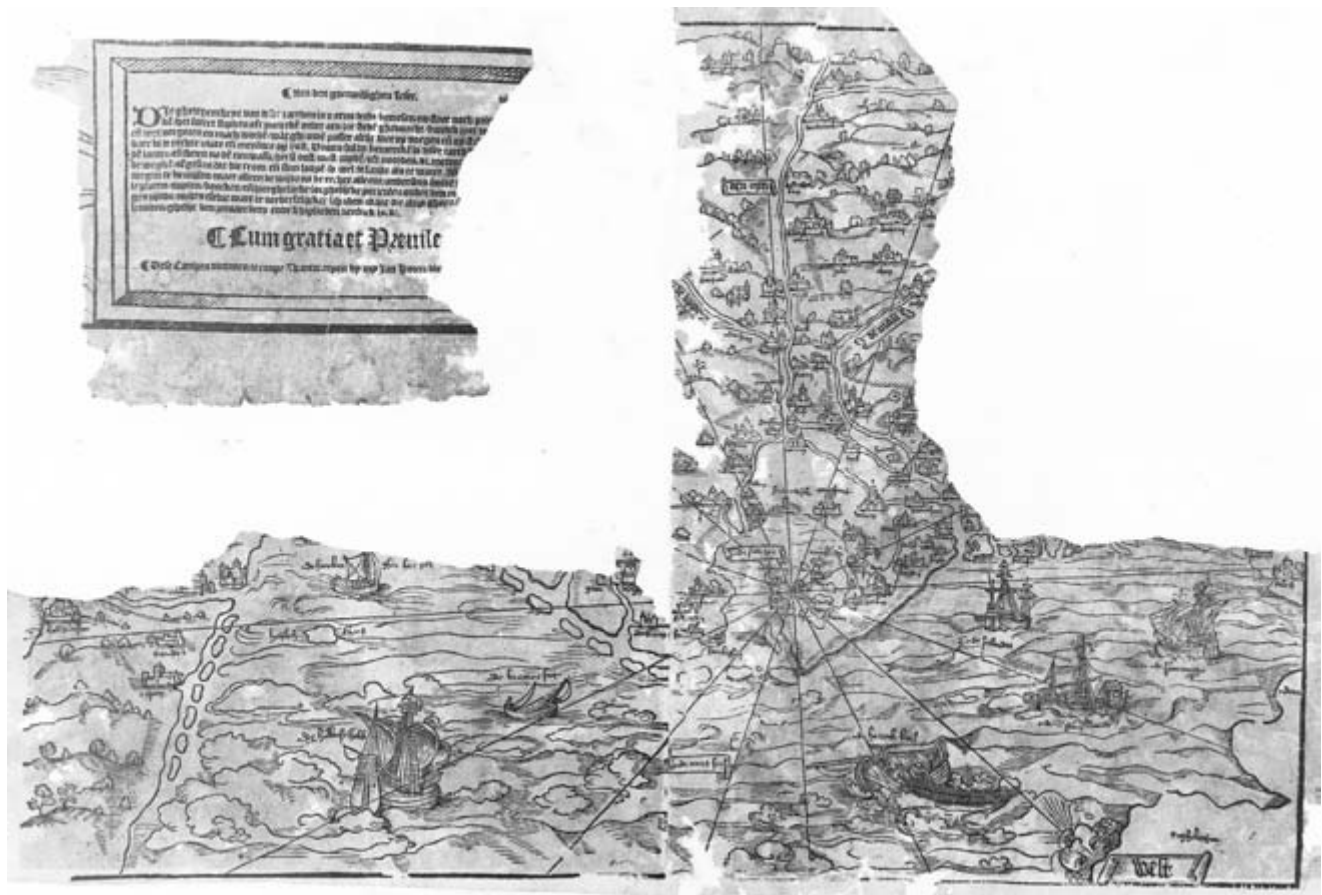


FIG. 43.3. KAART VAN DE OOSTERSCHER ZEE, BY JAN VAN HOIRNE, 1526.
Size of the original: ca. 42 × 62 cm. Photograph courtesy of

the Regional Historical Center, Groningen Archieven, Groningen (THAG 6835).

Local mapmaking developed first in the Southern Provinces, and records of surveying activity in Flanders predate those in the Northern Provinces by about a century. More or less as a consequence, the oldest surviving manuscript property map, representing a piece of land in Flanders, dates from 1307, while the oldest surviving cartographic document from the Northern Provinces dates from a half century later, 1357.¹⁶ This chronology parallels the economic and cultural development in the Low Countries. The period of Antwerp's supremacy was approximately one century earlier than that of the cities in the Northern Provinces. A representative map of Antwerp's period of dominance is a five-meters-long manuscript map from 1468 of the Scheldt River, the artery for commerce and trade in the Low Countries.¹⁷

court at Brussels and the court at Vienna, dated 1524, covers the river district of Gelre (Gelderland), the last "hostile" area in the Low Countries of King Charles V. The map is now in Vienna, Österreichisches Staatsarchiv, Section Belgien, D.D.237, fol. 387. See the illustration in Koeman, *Geschiedenis*, 82, and on the dust jacket.

16. On the former, see M. K. Elisabeth Gottschalk, *Historische geografie van westelijk Zeeuws-Vlaanderen*, 2 vols. (Assen: Van Gorcum, 1955–58), 1:148–49, and Antoine De Smet, "Oude landmeterskaarten, bronnen voor de historische geografie," in *Bronnen voor de historische geografie van België: Handelingen van het Colloquium te Brussel, 25–27 April 1979* (Brussels: A.R.-A.G.R., 1980), 228–40, esp. 228–29. On the latter, see M. K. Elisabeth Gottschalk, "De oudste kartografische weergave van een deel van Zeeuwsch-Vlaanderen," *Archief: Vroegere en Latere Mededelingen Voornamelijk in Betrekking tot Zeeland Uitgegeven door het Zeeuwsch Genootschap der Wetenschappen* (1948): 29–39. See also P. D. A. Harvey's chronological list of local maps and plans from the Low Countries before 1550 in his "Local and Regional Cartography in Medieval Europe," *HC* 1:464–501, esp. 499–500. For a list of manuscript maps of the Low Countries from the period 1300–1500, see also Donkersloot-De Vrij, *Topografische kaarten . . . 16^{de} tot en met de 19^{de} eeuw*, 9.

17. M. K. Elisabeth Gottschalk and W. S. Unger, "De oudste kaarten der waterwegen tussen Brabant, Vlaanderen en Zeeland," *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap*, 2d ser., 67 (1950): 146–64, and Jan van der Stock, ed., *Antwerpen: Verhaal van een metropool 16^{de}–17^{de} eeuw* (Ghent: Snoeck-Ducaju & Zoon, 1993), 151 (cat. 5). The map is located in Brussels, Algemeen Rijksarchief, Kaarten en Plattegronden (inv. nr. 351). Apart from the copy of 1468, another map of the Schelde of 1505 has been preserved in Antwerp, Stadsarchief. See Van der Stock, *Antwerpen*, 151 (cat. 6).

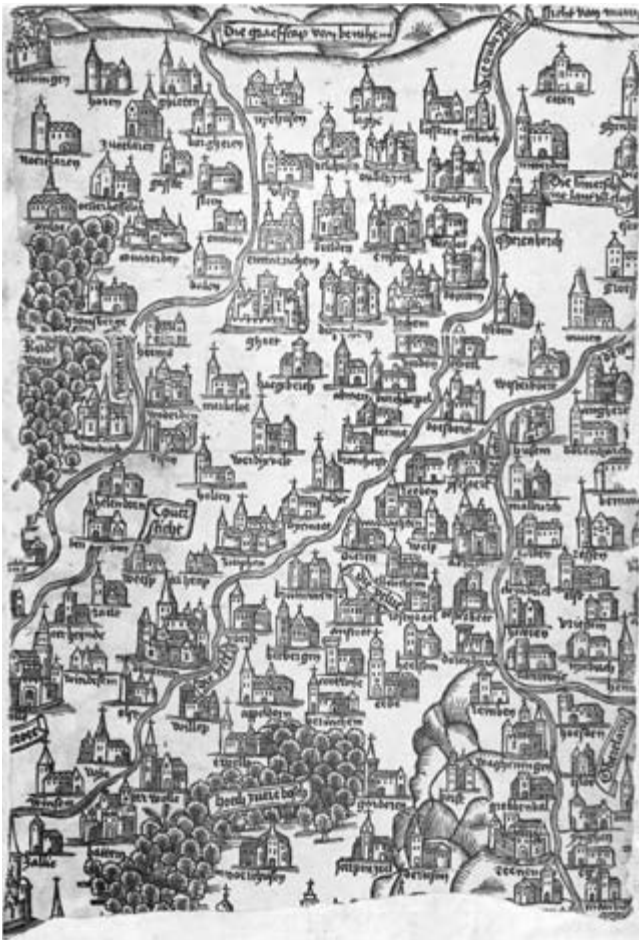


FIG. 43.4. PART OF THE BISHOPRIC OF UTRECHT, CA. 1524. One of the two preserved fragments of the woodcut map of an extension of the bishopric. Depicted are the IJssel and Vecht regions. Size of the original: 34.5 × 21.5 cm. Photograph courtesy of the Universiteitsbibliotheek Leiden (Collection B.N. 20071 M4 [2]).

THE DEVELOPMENT OF A DUTCH CARTOGRAPHIC STYLE

As elsewhere in medieval Europe, few maps were made in the Low Countries and people were relatively unfamiliar with maps and their use; only fifteen local maps and plans from the Low Countries before 1500 have survived. These medieval maps—often no more than rough sketches—were produced for official purposes, such as the settlement of border conflicts or the location of property.¹⁸ There is a close resemblance between them and French fifteenth-century boundary dispute maps discovered by Dainville.¹⁹

One of the most striking examples of early Dutch topographic maps is the set of manuscript town plans surveyed by Jacob van Deventer in the years 1555–75. Only in Italy was a similar early style of orthogonal represen-

tation of the cities' topography present, first exemplified by Leonardo da Vinci's manuscript plan of Imola of 1502.²⁰ The resemblance between Leonardo's style and that of Van Deventer is apparent because the orthogonal view of town plans was quite uncommon during the entire sixteenth and seventeenth centuries; the use of oblique perspectives prevailed, following an Italian tradition from the fifteenth century.²¹

Another model of pictorial representation of towns favored by Dutch artists was profiles, supplemented by a larger-scale depiction of the terrain in the foreground. The earliest known printed town profile in the Low Countries is the large two-meters-wide profile of Antwerp (ca. 1515) representing what would become a quintessentially Dutch style in the early seventeenth century.

The painter Antoon van den Wijngaerde (Antoin de la Vigne, Antonio de las Viñas) was instrumental in developing a perspective style of drawing.²² He started painting and drawing in the southern part of the Low Countries and Italy, then moved to London, and ended up, about 1562, in Spain. From his Dutch/Italian period stem the drawings of several towns in perspective view

18. For a list of these maps, see Harvey, "Local and Regional Cartography," 499–500.

19. François de Dainville, "Cartes et contestations au XV^e siècle," *Imago Mundi* 24 (1970): 99–121; C. Koeman, "Die Darstellungsmethoden von Bauten auf alten Karten," in *Land- und Seekarten im Mittelalter und in der frühen Neuzeit*, ed. C. Koeman (Munich: Kraus International, 1980), 147–92; and John A. Pinto, "Origins and Development of the Ichnographic City Plan," *Journal of the Society of Architectural Historians* 35, no. 1 (1976): 35–50. See also chapter 21 in this volume, on cartographic signs.

20. Plan of Imola, in the collection of Her Majesty Queen Elizabeth II, Windsor Castle (MS. 12284); see figures 27.1 and 36.16 and Pinto, "Ichnographic City Plan," 37–42.

21. For example, the large engraving of an oblique view of Florence from about 1485, by Francesco Rosselli (illustrated and described in Van der Stock, *Antwerpen*, 154 [cat. 9]), was an inspiration, as is apparent from the large view of Antwerp from about 1515 (Antwerp, Stedelijk Prentenkabinet, inv. nr. 20.839). The unprecedented and monumental oblique view of Venice by Jacopo de' Barbari from 1500 inspired a plan of Amsterdam by Cornelis Anthonisz., painted in 1538 and printed in 1544. See Giandomenico Romanelli, Susanna Biadene, and Camillo Tonini, eds., "A volo d'uccello": *Jacopo de' Barbari e le rappresentazioni di città nell'Europa del Rinascimento*, exhibition catalog (Venice: Arsenale Editrice, 1999), esp. 168. On the use of perspective in the painted plan of Amsterdam of 1538, see Maikel Niël, "De perspectivische ruimtweergave van het Gezicht in vogelvlucht op Amsterdam van Cornelis Anthonisz.," *Caert-Thresoor* 19 (2000): 107–13.

22. Van den Wijngaerde's life has recently been well documented; see Montserrat Galera, *Antoon van den Wijngaerde, pintor de ciutats i de jets d'armes a l'Europa del Cinc-cents: Cartobibliografia raonada dels dibuixos i gravats, i assaig de reconstrucció documental de l'obra pictòrica* ([Madrid]: Institut Cartogràfic de Catalunya, 1998), and Stefaan Hautekeete, "Van Stad en Land: Het beeld van Brabant in de vroege topografische tekenkunst," in *Met passer en penseel: Brussel en het oude hertogdom Brabant in beeld* (Koninklijke Musea voor Schone Kunsten van België, Brussel) (Brussels: Dexia Bank, 2000), 49–51.



FIG. 43.5. PERSPECTIVE VIEW OF UTRECHT BY ANTHON VAN DEN WIJNGAERDE, CA. 1558. In three sheets.

(fig. 43.5).²³ Unlike the oblique views of Jacopo de' Barbari (Venice, 1500) and Cornelis Anthonisz. (Amsterdam, 1538), Van den Wijngaerde's were plotted on a large scale in the foreground and on a small scale in the distance.²⁴ The impressive dimensions of his oblique views allowed for a detailed topography, most useful for the study of historical geography. For example, his perspective of the island of Walcheren with the Scheldt River [1550] consists of twenty-three sheets that are more than ten meters in length when put together.²⁵ Although in a different class than artists who produced town plans, property or cadastral surveyors of the fifteenth and sixteenth centuries also sketched a lot of pictorial detail in their maps, such as steeples of church towers, windmills, and locks in canals, which were abundant landmarks in the flat terrain of the Low Countries.

Some sixteenth-century mapmakers employed much larger scales, giving rise to maps of enormous dimensions. Pierre Pourbus was a mapmaker and painter active mainly in Flanders who had been employed as a cartographer by various authorities in the province of Flanders to produce manuscript river maps, property maps, and town plans. In 1561, he was commissioned by the government of the Vrije van Brugge (Freedom of Bruges) to map the territory around the town and under its jurisdiction, an area of about 35 by 70 kilometers.²⁶ The project required him to measure the boundary of the jurisdiction with all the villages, roads, rivers, bridges, and individual houses, and to draw a detailed topographical map based on a highly precise survey. In Pourbus's progress reports,

Size of the entire original: 14.4 × 83.6. Photograph courtesy of the Ashmolean Museum, Oxford (acc. no. WA.C. IV. 105b).

he described his techniques: a type of triangulation between church towers and traversing the roads.²⁷ The re-

23. Van den Wijngaerde drew town plans of Amsterdam [1550?], Brussels (1558), Utrecht [1554–58], Dordrecht [1544], 's-Hertogenbosch [ca. 1544], and Sluis (1557–58); see Galera, *Antoon van den Wijngaerde*, 207, and the series *Historische plattegronden van Nederlandse steden* (Alphen aan den Rijn: Canaletto, 1978–), esp. vol. 1, *Amsterdam*, with an introduction by W. Hofman. The town view of Amsterdam (150 × 43 cm) is in the Gemeentearchief. The other views of Dutch towns are in Oxford, Ashmolean Museum, where the three-meter drawing of London is also kept, and in Antwerp, Nationaal Scheepvaartmuseum. A facsimile of the city view of Utrecht is in *Historische plattegronden van Nederlandse steden*, 3:1.

24. For the purposes of his perspective views, Van den Wijngaerde made use of three types of preparatory studies: (1) a sketch of the town's surroundings; (2) a view of a portion of the whole town, either true to life, from a natural height or from a tower, or based on an existing model; and (3) detailed studies of individual buildings or groups of buildings. See Hautekeete, "Van Stad en Land," 50, and Bert van 't Hoff, "Une vue panoramique inconnue de Bruxelles dessinée en 1558 par Anthonis van den Wyngaerde," *Annales de la Société Royale d'Archéologie de Bruxelles: Mémoires, Rapports et Documents* 48 (1948–55): 145–50.

25. See Galera, *Antoon van den Wijngaerde*, 192–93. A facsimile of eighteen numbered segments is in M. P. de Bruin, "De Zelandiae Descriptio": *Het panorama van Walcheren uit 1550* (Maastricht: Deltaboek, 1984).

26. Antoine De Smet, "A Note on the Cartographic Work of Pierre Pourbus, Painter of Bruges," *Imago Mundi* 4 (1947): 33–36; idem, "Oude landmeterskaarten, bronnen voor de historische geografie," 228–40; and Paul Huvenne, *Pieter Pourbus: Meester-schilder, 1524–1584*, exhibition catalog ([Brussels]: Gemeentekrediet, 1984).

27. See Paul Huvenne, "De kaart van het Vrije in het kader van leven en werk van Pieter Pourbus," in *Het Brugse Vrije in beeld: Facsimile-*

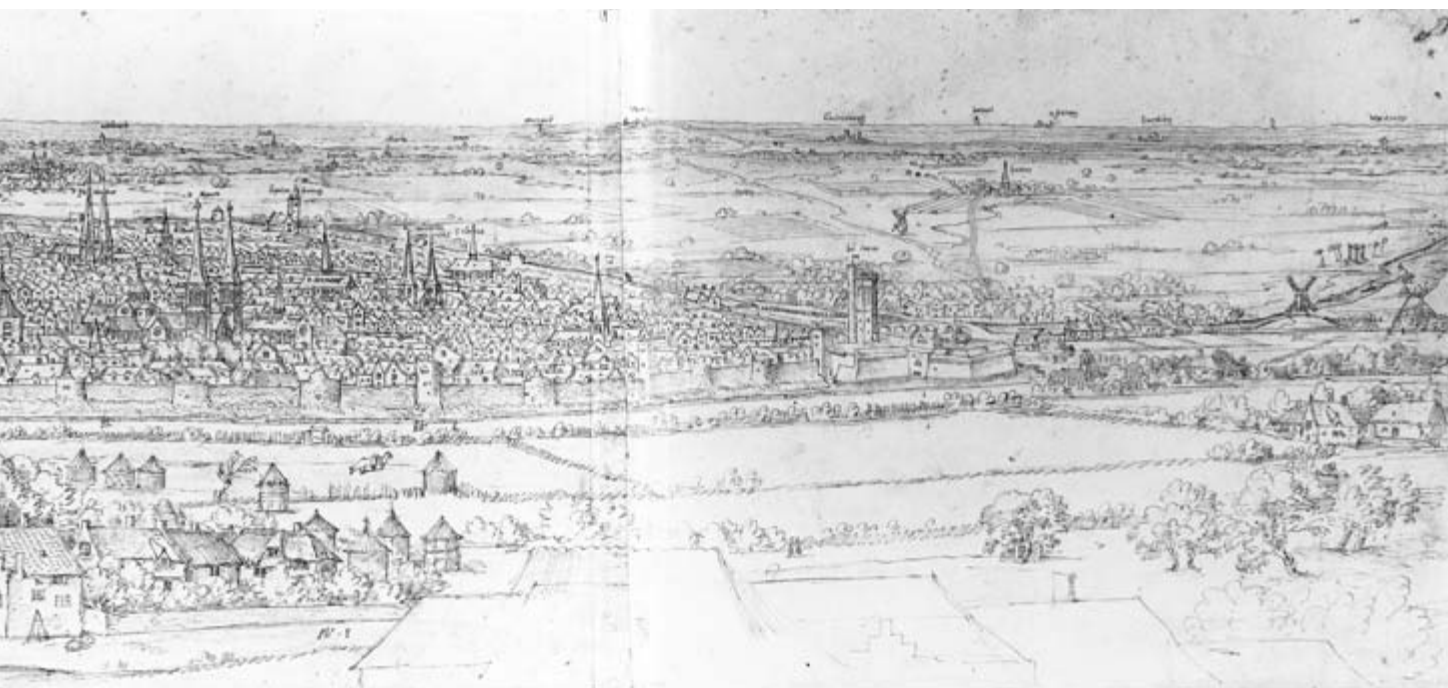


FIG. 43.5. (continued)

sult of his work, finished in 1571, was a very large map at a scale of about 1:12,000. It was painted in oil and intended to be hung, in this case in the governor's residence. Unfortunately, the original was damaged and in 1601 was replaced with a copy by Pieter Claeissens (fig. 43.6).²⁸

MAPS BY LAND SURVEYORS

The designation “surveyor” is sometimes misused in the literature. Frequently, those who conduct measurements in one way or another are identified as surveyors. The early surveyor, however, was concerned with land accounting, made measurements in connection with real estate, was sworn (a “sworn land surveyor” or, later, an “admitted land surveyor”), and had to prove his competence before receiving an appointment.²⁹ Geographers, fortress builders, city architects, monks, and military engineers certainly made measurements at this time, but they were not surveyors in the professional sense.

The earliest use of the word *landmeter* (land surveyor) in Dutch can be found in the city archive in Bruges (Brugge) and dates from 1282.³⁰ Early survey activities were registered by the Diocese of Utrecht in 1312 in connection with land reclamation.³¹ Central administration of property was at that time conducted by the bishop of Utrecht in his domain and by the count of Holland in his province. A land surveyor called “Monekijn die Landmeter” was permanently employed by the count of Holland between 1300 and 1320.³²

uitgave van de Grote Kaart geschilderd door Pieter Pourbus (1571) en gekopieerd door Pieter Claeissens (1601), ed. Bart van der Herten (Alphen aan den Rijn: Canaletto/Repro-Holland, 1998), 21–25, esp. 21–23.

28. A fragment of the original and the whole copy of 1601 are in Bruges, Stadsarchief. For a facsimile of the preserved fragment, the copy from 1601, and a lithograph from 1852 with a summary of the sheet arrangement, see *Het Brugse Vrije in beeld*. Among other things, the text of this work includes an analysis of the accuracy of the map of the free region of Bruges, which is placed in historical-geographical perspective, and there is a list of toponyms. Other maps by Pourbus include *Kaart van de wateringen van Broucke en Moerkerke-Zuid-over-Leie* (1573), Bruges, Rijksarchief; *Kaart van de watering van Romboutsverve* (1578), private collection; *Kaart van het eiland Cadzand* (1578), Bruges, Stadsarchief; and the plan of the so-called Duinenabdij (1580), Bruges, Stedelijke Musea, Arentshuis.

29. H. C. Pouls, *De landmeter: Inleiding in de geschiedenis van de Nederlandse landmeetkunde van de Romeinse tot de Franse tijd* (Alphen aan den Rijn: Canaletto/Repro-Holland, 1997), 9, and E. Muller and K. Zandvliet, eds., *Admissies als landmeter in Nederland voor 1811: Bronnen voor de geschiedenis van de landmeetkunde en haar toepassing in administratie, architectuur, kartografie en vesting- en waterbouwkunde* (Alphen aan den Rijn: Canaletto, 1987), 10–19 (a repertory of admissions of sworn land surveyors at the courts of the Dutch provinces, fifteenth century to the nineteenth).

30. Antoine De Smet, “Landmeterstraditie en oude kaarten van Vlaanderen,” *Verslagen en mededelingen van De Leiegouuw: Vereniging voor de studie van de lokale geschiedenis, taal en folklore in het Kortrijkse* 8 (1966): 209–18, esp. 210, and Muller and Zandvliet, *Admissies*, 7.

31. Jan Willem Berkelbach van der Sprenkel, *Regesten van oorkonden betreffende de bisschoppen van Utrecht, uit de jaren, 1301–1340* (Utrecht: Broekhoff n.v. v/h Kemink, 1937), 91, 98, and 100.

32. C. Wijffels, “De oudste rekeningen der stad Aerdenberg (1309–1310) en de opstand van 1311,” *Tijdschrift Archief van het Zeeuws Genootschap*, 1949–50, 10. For a more complete review of the earliest surveyors' activities, see Pouls, *De landmeter*, 36–40.

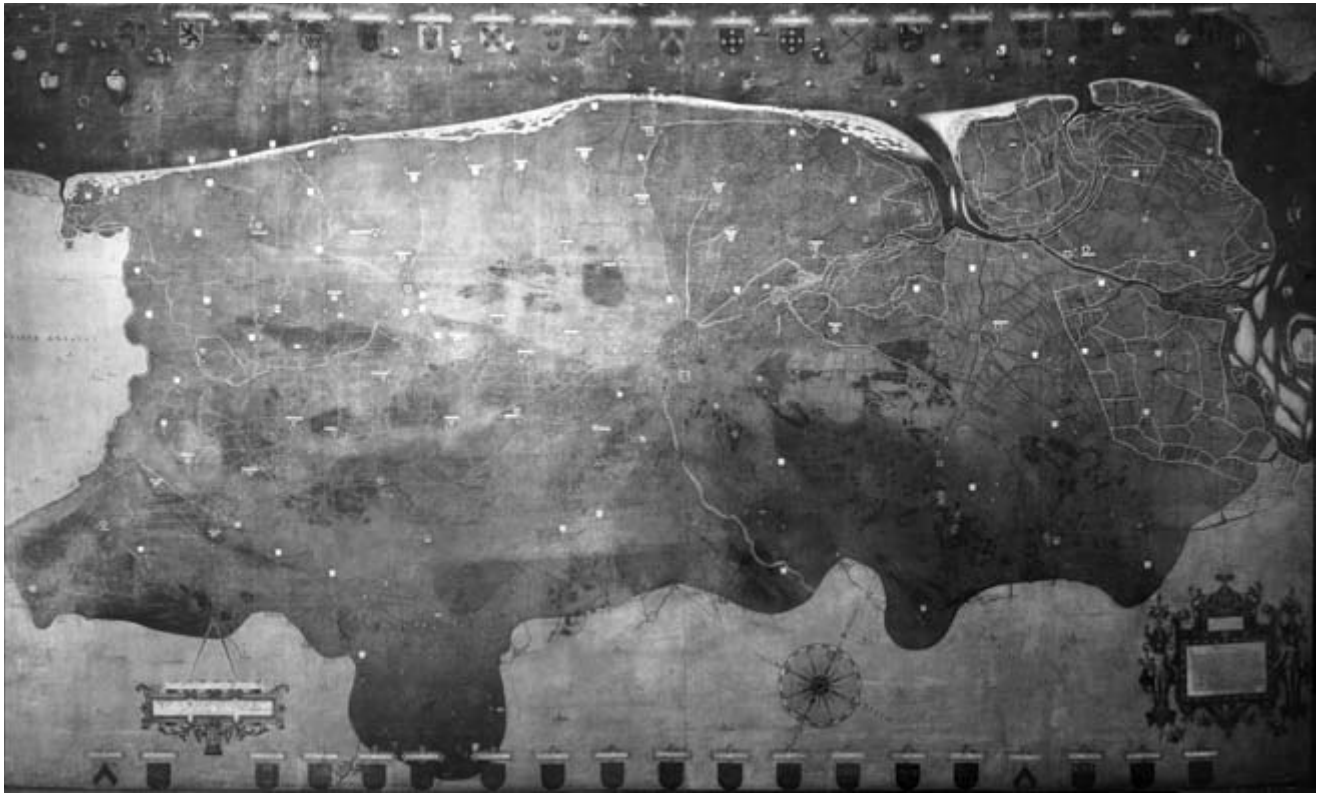


FIG. 43.6. COPY BY PIETER CLAEISSENS OF THE 1571 MAP OF THE VRIJE VAN BRUGGE BY PIERRE POURBUS, 1601.

Size of the original: 361 × 614 cm; size of the copy: 151 × 322.5 cm. Photograph courtesy of the Stadsarchief, Bruges.

The primary activities of the medieval surveyor consisted of boundary definition, surface area measurement, and land allotment. In addition, surveyors participated in making judicial decisions concerning disputes over property and grazing rights. Training schools for land surveyors did not exist: knowledge was acquired from older, more experienced surveyors.

Although surveyors were active in the Low Countries as early as the fourteenth century, it is not likely that they were involved in mapmaking during the Middle Ages. At most, they might have made simple field drawings of a parcel with a complex shape, outlining a geometric figure. They preferred written reports over illustrated maps as a way of handling their survey data.³³ The records were open to interested parties for their perusal, and in cases of disagreement, measurements were redone or judicial proceedings were eventually initiated. Only very gradually did maps come into use in registration of deeds, the demand for which began in the western provinces and subsequently spread to the more eastern regions.

Indeed, shortly after 1500, the realization swept through Europe that maps offered untold possibilities, and this burgeoning consciousness ushered in an explosive increase in the demand for cartographic information

in the Low Countries. Maps were increasingly used for land accounting, military operations, and water control. Parallel to this development, sixteenth-century sworn land surveyors became involved in mapmaking, while geographers and fortress builders became proficient at measuring terrain. It was especially during the second half of the sixteenth century that many certified surveyors mastered the measurement techniques necessary for making reliable maps. These activities, however, still fell outside the normal exercise of their profession. Separate contracts were thus also negotiated between surveyors and their patrons.³⁴ At first, surveyors mapped mainly smaller parcels of land using a measuring chain and Dutch circle,³⁵ while larger parcels of land were mapped by geographers. With the increasing use of the measuring chain and compass, surveyors were gradually able to measure larger areas and map them without too much distortion. Nonetheless,

33. See Dirk de Vries, "Official Cartography in the Netherlands," in *La cartografia dels Països Baixos* (Barcelona: Institut Cartogràfic de Catalunya, 1995), 19–69, esp. 21, and Pouls, *De landmeter*, 55.

34. Pouls, *De landmeter*, 75–76.

35. For an extensive review of the instruments that surveyors in the Low Countries have used throughout history, see Pouls, *De landmeter*.

measuring plots and developing, maintaining, and improving the registries for traditional employers—the *waterschappen* (water control boards; can also refer to the area controlled by the board) and the provincial authorities—remained the primary duties of sixteenth-century land surveyors. In addition, they became involved in the settlement of boundary disputes at the provincial level more often than they had been in the Middle Ages.

Beginning in the middle of the sixteenth century, religious institutions as well as private individuals in the Low Countries began to have their properties measured and mapped by surveyors.³⁶ It is unclear whether this was because surveyors had already become involved in map-making or whether demand was the cause of their increased activity. The purpose of the resulting maps is that *kaartboeken* (map books: sets of precadastral manuscript maps bound in a book) were produced for land accounting and for the administration of property. A *kaartboek* generally consisted of assembled maps and registries bound together (plate 48). It often included blank pages intended for later notations to be made by the land authorities. Small notations were sometimes also made on the maps themselves. Although the functions of these precadastral maps cannot always be determined, they were largely related to the administration of institutional landownership. As such, they provided the admitted surveyors a significant source of income.³⁷

In the course of the sixteenth century, Gemma Frisius, professor of mathematics at Louvain, published the first principles of triangulation, which he called the “voorwaartse snijding” (forward section; see pp. 483 and 1297–98). This new method was not suitable for measuring small numbers of parcels. Larger areas, however, could be measured reliably with the aid of the forward section. Surveyors thus made increasing use of this method over time, with the *waterschappen* their most important customers.

By the beginning of the seventeenth century, the land surveyor had finally established a clear place for himself in the social order of the Low Countries. Whereas he had worked primarily in the service of the sovereign during the Middle Ages, he had now developed into an independent tradesman. Various provinces granted individuals permission to practice as surveyors within those provinces once they had demonstrated their competence.³⁸ Surveyors played an important role in dike building and the large land reclamation projects, which led to more civil and technical tasks. Beginning in 1600, more and more geography books began to appear in the Dutch language, and these were of considerable assistance in the theoretical and mathematical education of aspiring surveyors. The most common task of the seventeenth-century surveyor remained the measurement of real estate for the purposes of purchase, sale, lease, or tax increase. Other survey activities during this period had to do with land reclamation,

boundary definition, and hydraulic works.³⁹ As a result of these activities, there was an increasing demand for technical drawings, plans, and maps.

Geography books of the seventeenth century pay little attention to the careful measurement and mapping of outlying areas. Such work was apparently not part of the usual responsibilities of surveyors, and large-scale regional mapping by surveyors was probably never done outside the *waterschappen*.⁴⁰ It was primarily military engineers who surveyed and mapped the larger areas.

MAPS FOR LEGAL USE AND THE INTRODUCTION OF THE SCALE MAP

Many maps were produced in the Low Countries as a result of judicial questions. These maps were almost exclusively manuscripts used in legal proceedings and boundary adjustments. Printed maps were used in a few cases, and handwritten notes were made on them. The very oldest local and regional maps of the Low Countries belong to the category of judicial maps.

In Dutch law, in matters of property boundary cases it was not customary for the judge himself to visit the spot or to know it personally. Only witnesses and documents were used to arrive at a judgment. Maps produced for legal proceedings were supposed to provide insight into a specific, disputed local situation. The proceedings might concern, for example, the construction of a dike, fishing rights, or lease arrangements. In most cases, little attention was paid to the production of the accompanying sketch maps, which may have been prepared by a trained

36. See, for example, the map book of the royal family of Nassau, with the maps of their possessions in Westland (in the western portion of present-day South Holland), which has appeared in facsimile with extensive explanation: A. P. van Vliet, G. Beijer, and A. F. Middelburg, *Kaartboek van het Westland: Kaartboek van de domeinen in het Westland vervaardigd door landmeter Floris Jacobszoon in de jaren 1615–1634* (Naaldwijk: Stichting Stimulering Historische Publikaties Westland, 1999). See also Peter van der Krogt and Ferjan Ormeling, “Een handleiding voor kaartgebruik met een legendalandje uit 1554,” *Caert-Thresoor* 21 (2002): 41–46. In this connection, Donkersloot–De Vrij mentions sixty-seven map books and map series that are located in one of the Dutch state archives; see *Topografische kaarten van Nederland vóór 1750*, 162–74. Work is currently being done at the Universiteit Utrecht by M. Storms and E. Heere that will lead to historical cartographic and geographic dissertation research on this topic. Currently about 350 of these map books are known.

37. Pouls, *De landmeter*, 91, and Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750*, 39.

38. For a regional view of surveyor admissions, see Muller and Zandvliet, *Admissies*.

39. See, for example, the monograph on the activities of surveyors in the northern part of Holland: Chris Streefkerk, Jan W. H. Werner, and Frouke Wieringa, eds., *Perfect gemeten: Landmeters in Hollands Noorderkwartier ca. 1550–1700* (Holland: Stichting Uitgeverij Noord-Holland, 1994).

40. Pouls, *De landmeter*, 227.

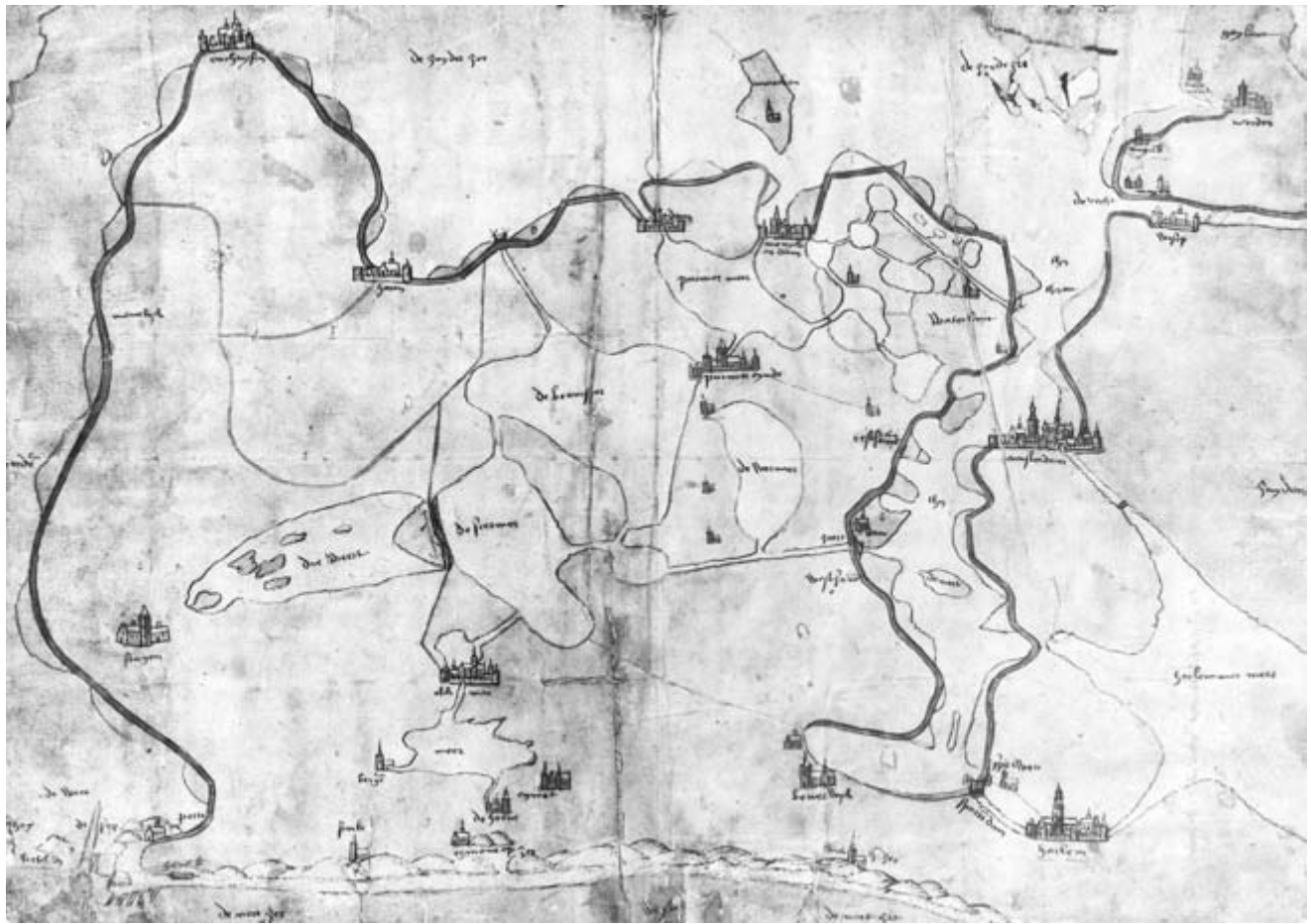


FIG. 43.7. MANUSCRIPT MAP OF THE NORTHERN PART OF HOLLAND BY WILLEM HENDRICKSZ. CROOCK, 1529/30. One of two maps by Croock, it clearly shows con-

cern for scale. Size of the original: 94×107 cm. Photograph courtesy of the Nationaal Archief, The Hague (VTH 2460).

surveyor, but often were not. Given the fact that the majority of these maps have been lost from the archives over time, chiefly because they have been filed away separately in special map collections, it is no longer easy to tell to which judicial questions they may have related.⁴¹

There is a clear record of at least one superficial survey of the province of North Holland (the main roads and dikes only) in 1508. This region was critical for the country's defense against the sea. The two earliest manuscript maps of this province date from 1529 and were drawn by the versatile town architect and the director of the Board of Public Buildings of Amsterdam, Willem Hendricksz. Croock, and both documents were used to inform the judges in a lawsuit in the high court at Mechelen.⁴² Croock was an important pioneer with respect to the use of scale in maps, and his two manuscript maps of the northern portion of Holland are reliable from a geometric point of view (fig. 43.7). Despite their crude appearance, the maps provide reasonably precise distances and orientations.

41. Donkersloot–De Vrij, *Topografische kaarten . . . 16^{de} tot en met de 19^{de} eeuw*, 13–14. The archives of the high court of the Spanish Netherlands at Mechelen are a rich source of information on cartographic illustration of boundary disputes. However, the largest holdings of manuscript maps covering the Low Countries, over three hundred maps dated between 1472 and 1600, are to be found in the Nationaal Archief at The Hague. The majority are maps of property surveys of the court's domains in Holland and illustrate disputed boundaries: Brussels, Algemeen Rijksarchief GRM (Groote Raad van Mechelen), dossiers 475–92, the so-called Beroepen uit Holland (the cases in the province of Holland). See P. J. Margry, "Drie proceskaarten (Geertruidenberg versus Standhazen) uit 1448," *Caert-Thresoor* 3 (1984): 27–33, and A. H. Huussen, "Kartografie en rechterlijke archieven," *Nederlands Archievenblad* 82 (1978): 7–15. For a summary and illustrations of the maps in the trial dossiers, see A. H. Huussen, *Jurisprudentie en kartografie in de XV^e en XVI^e eeuw* (Brussels: Algemeen Rijksarchief, 1974).

42. The map not shown in figure 43.7 is located in the Algemeen Rijksarchief, Brussels (GRM BH no. 610 sub ww 1529/1530). Croock also made a mathematically reliable map of Amstelland, which is located in the Gemeentearchief, Amsterdam (Top. Atlas no. G 110-6). Regarding these maps, see Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750*, 129 (no. 649 and no. 653). See also A. H. Huussen,

REGIONAL TOPOGRAPHICAL MAPPING OF THE LOW COUNTRIES

Even before the unification of the Northern Provinces, very precise maps of Brabant, Holland, Gelderland, Friesland, and Zeeland (1536–47) were commissioned from Jacob van Deventer by the provincial council or the ruling sovereign. They were made not for strategic purposes but for general objectives such as administration. These printed maps marked the beginning of a rich tradition of regional topographical mapping in the Low Countries. Between the second half of the sixteenth century and the end of the seventeenth century, multisheet wall maps were produced for all relatively autonomous areas within the Republic of the Seven United Provinces. Not infrequently, these wall maps were based on the large-scale mapping done by the water control boards. The extensive mapping of polders and *waterschappen* in the second half of the sixteenth century was due partly to the reclamation of several lakes and the associated land accounting (see the section that follows on *waterschap* maps). Provincial mapping and the surveying done by the polder boards were interdependent.

THE FIRST PROVINCIAL MAPS TO CA. 1550

Thanks to the new mapping methods developed by Gemma Frisius, official mapping of the Low Countries was able to commence under Charles V. Cartographers such as Jacob van Deventer in the Northern Provinces and Jacques Surhon and his son Jean in the Southern Provinces now had the scientific guidelines necessary for reliable measurement at their disposal.⁴³

Maps of the Northern Provinces by Jacob van Deventer

Jacob van Deventer was likely born in the Hanseatic city of Kampen around 1505,⁴⁴ studied in Louvain, and was the first to apply triangulation to provincial maps. Information on his life and activity is limited despite his impressive cartographic legacy.⁴⁵ Beginning in the 1530s, Van Deventer was commissioned by the government to survey and map five northern provinces in the Low Countries.⁴⁶ The first editions of the five provincial maps—of Brabant (1536), Holland and Utrecht (1542), Gelderland (1543), Zeeland (1547), and Friesland, Groningen, Overijssel, and Drenthe (1545)—were engraved (three in woodcut, two in copper) at a scale of 1:180,000 and probably printed in Mechelen (fig. 43.8 and appendix 43.1), but no impressions of these five maps survive, and they are known only through archival records and a note in Ortelius's "Catalogus auctorum," which mentions "Iacobus à Dauentria, Brabantiae, Hollandiae, Gelriae; Frisiae; Zelandiae Tabulas descripsit & edidit, Mechliniae."



FIG. 43.8. COVERAGE DIAGRAM OF JACOB VAN DEVENTER'S PROVINCE MAPS.

Based on Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750: Handgetekende en gedrukte kaarten, aanwezig in de Nederlandse rijksarchieven* (Groningen: Wolters Noordhoff and Bouma's Boekhuis, 1981), blw. I.

⁴³ "Willem Hendricxz. Croock, Amsterdams stadsfabriekmeester, schilder en kartograaf in de eerste helft van de zestiende eeuw," *Jaarboek van het Genootschap Amstelodamum* 64 (1972): 29–53, and De Vries, "Official Cartography," 24.

⁴⁴ Van der Heijden (*Oude kaarten der Nederlanden*, 1:28–31) provides a clear overview of the first Dutch maps of the provinces of the Low Countries in the sixteenth century (1538–81).

⁴⁵ See J. C. Visser, "Jacob van Deventer alias Van Campen? De jonge jaren van een keizerlijk-koninklijk geograaf," *Caert-Thresoor* 12 (1993): 63–67, and C. Koeman and J. C. Visser, *De stadsplattegronden van Jacob van Deventer* (Landsmeer: Robas, 1992–), introductions to the different parts.

⁴⁶ According to Bert van 't Hoff in *Jacob van Deventer: Keizerlijk-koninklijk geograaf* (The Hague: Martinus Nijhoff, 1953).

⁴⁷ It is possible that the Dutch statesman Viglius van Aytta played a role in their commissioning and thus also in Van Deventer's being named imperial geographer, and, later, royal geographer. See Bart van der Hertten, "De connectie tussen Jacob van Deventer en Viglius van Aytta in de jaren 1530–1540: Een hypothese," *Caert-Thresoor* 14 (1995): 59–61. On Van Deventer, see Van 't Hoff, *Jacob van Deventer*, 4–6. For an illustrated summary of Van Deventer's province maps, with commentary, see *MCN*, 1:76–88, and Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750*, 128, index I.





Copies of these five provincial maps were issued by various publishers between 1556 and 1560, but with the exception of the maps of Gelderland (fig. 43.9) and Zeeland, most impressions of them were destroyed in Breslau (Wrocław) during World War II. Fortunately, facsimiles of the others had been published in 1941.⁴⁷ In 1994, Koeman issued new and improved reproductions, adding related maps, such as Mercator's map of Flanders (1540) and the Italian versions of the lost first editions engraved by Jakob Bos and published by Michele Tramezzino between 1555 and 1558.⁴⁸

In addition to these Italian derivations, Van Deventer's province maps enjoyed a considerable number of later editions as well as copies.⁴⁹ Sebastian Münster was the first to rework Van Deventer's basic material into his work. In his 1550 *Cosmography*, he included a very generalized Holland and Friesland map and mentioned "Jacobus Daventriensis Phrisia." In 1570, Ortelius incorporated some of Van Deventer's province maps in his *Theatrum orbis terrarum* in reduced form, acknowledging Van Deventer's authorship in the title.⁵⁰ Gerard de Jode may also have copied Van Deventer's province maps. Several of his two-sheet province maps have survived from 1565: those of Flanders, Holland, and Brabant.⁵¹

The emphasis of Van Deventer's maps was on the location of towns and villages, and consequently the representation of rivers, lakes, woods, and rural roads was deficient. Van Deventer depicted churches, cloisters, and abbeys in a pictorial style, although he strove for the mathematically precise location of every object. More important, he drew each building systematically in an oblique, parallel projection and differentiated the buildings according to their true size and form.⁵² The surveys were undertaken by Van Deventer himself. Proof appears in the legend of the map of Gelderland, where he mentioned the church towers of the villages that he had used as triangulation points. Obviously, Van Deventer applied the method of intersection of sights to establish a geometrically correct network of fixed points connected with one or more baselines or with two or more churches of which the geographical coordinates were known.⁵³

The strong emphasis on towns, villages, and castles was ordered by Emperor Charles V. The instructions of His Majesty were incorporated into the legend of the map of Gelderland:

Map of the famous duchy of Guelders, with the boundaries of all the adjacent countries, depicted and made by order and at the expenses of His Imperial

Majesty as there are: Towns , villages , monasteries , castles , with all the fine and excellent rivers, measured plotted according to the true

art of Geography. But those places that do not have this symbol ☉ are not so well and perfectly plotted as the others because one was not free to move and take measurement everywhere. However, those places have a more reliable position than in any other map so far published.

Van Deventer's impressive multisheet maps were designed and used to decorate the walls of mansions, castles, and palaces. These maps substituted for tapestries and were made accessible by the invention of letterpress and copperplate printing.⁵⁴ These sixteenth-century wall maps hung in the houses of well-to-do citizens and were considered modern maps. Today, one very seldom finds large, framed, modern topographic maps or road maps

47. Bert van 't Hoff, *De kaarten van de Nederlandsche provinciën in de zestiende eeuw door Jacob van Deventer* (The Hague: Martinus Nijhoff, 1941), a facsimile edition of the maps that were destroyed in Breslau made from photographs ordered by Van 't Hoff in 1939, a most fortunate action for the documentation of the history of cartography of the Low Countries. The map of Gelderland is in the Herzog August Bibliothek, Wolfenbüttel, and the map of Zeeland is in the Biblioteca Nazionale Centrale, Florence. In *Imago Mundi*, Bagrow reports on the losses during World War II. He mentions the losses of the map collection in what was then the Municipal Library, Breslau, but discusses only the loss of the map of Friesland; however, the maps of Brabant, Holland, and Zeeland were also destroyed. See Leo Bagrow, "With Fire and Sword," *Imago Mundi* 4 (1947): 30–31; 5 (1948): 37–38 (A. Codazzi); and 6 (1949): 38.

48. C. Koeman, *Gewestkaarten van de Nederlanden door Jacob van Deventer, 1536–1545: Met een picturale weergave van alle kerken en kloosters* (Alphen aan den Rijn: Stichting tot bevordering van de uitgave van de stadsplattegronden van Jacob van Deventer–Canaletto, 1994), which contains an English summary. See also R. V. Tooley, "Maps in Italian Atlases of the Sixteenth Century, Being a Comparative List of the Italian Maps Issued by Lafreri, Forlani, Duchetti, Bertelli, and Others, Found in Atlases," *Imago Mundi* 3 (1939): 12–47 (items 142, 218, 231, 298, and 300).

49. For a list of later editions and copies, see Koeman, *Gewestkaarten van de Nederlanden*, 18–20.

50. See M. P. R. van den Broecke, *Ortelius Atlas Maps: An Illustrated Guide* ('t Goy-Houten: HES, 1996), 109 and 122–24.

51. On De Jode's maps, see MCN, 1:89–108.

52. Koeman makes a detailed comparison of the illustrations of church buildings in Van Deventer's maps with illustrations in prints and photographs from later centuries (*Gewestkaarten van de Nederlanden*, 26–36).

53. Peter Mekenkamp and Olev Koop, "Nauwkeurigheid-analyse van oude kaarten met behulp van de computer," *Caert-Thresoor* 5 (1986): 45–52. Comparison with identical landmarks on modern maps has resulted in a computer method for performing an accuracy analysis of the relative positions of the church towers on the Van Deventer province maps.

54. C. Koeman, *Collections of Maps and Atlases in the Netherlands: Their History and Present State* (Leiden: E. J. Brill, 1961), 19–20. See also the map inventory of Viglius de Zuichen described in [Leo Bagrow], "Old Inventories of Maps," *Imago Mundi* 5 (1948): 18–20; the inventory was first published in Bagrow's article "The Origin of Ptolemy's Geographia," *Geografiska Annaler* 3–4 (1945): 318–87.

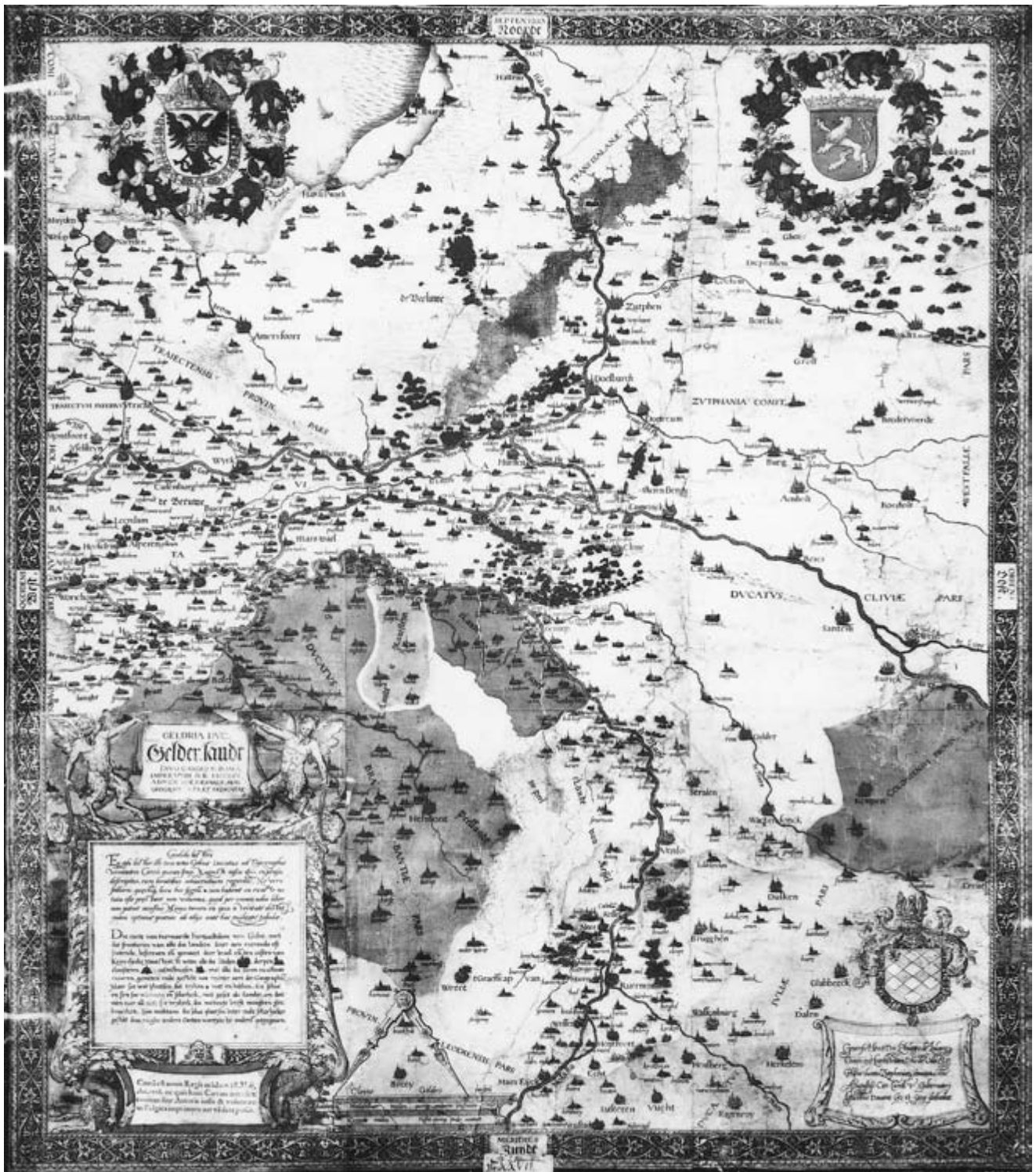


FIG. 43.9. COPY OF THE MAP OF THE PROVINCE OF GELDERLAND BY JACOB VAN DEVENTER, 1556.

Size of the original: 92.2 × 78.3 cm. Photograph courtesy of the Herzog August Bibliothek, Wolfenbüttel (Kartenslg. K 2,3).

on the living room walls of private houses. Clearly, the emotional effect of a modern wall map in the sixteenth century was considerable—and it continued to be so until the nineteenth century.

Regional maps, when pieced together, could provide coverage of an extensive area. This joining of survey maps was proposed and urged by Münster as early as 1528 and was ultimately carried out in almost every European country.⁵⁵ It is possible that Van Deventer produced a printed, simplified map of the Seventeen Provinces based on his surveys.⁵⁶ A small map from the period 1560–65, titled *La vera descrizione della Gallia Belgica* and ascribed to the Italian Paolo Forlani, must have been taken directly from a model of Van Deventer's.⁵⁷

Van Deventer's province maps laid a firm foundation for future cartography with their mathematically correct representation of the complex land-water distribution in the Northern Provinces. In addition to printed maps, Van Deventer also produced many manuscript maps. Aside from his town maps, almost nothing remains of this manuscript material. Only one handwritten map, of *Het Bildt* in Friesland from 1545, can currently be attributed to him.⁵⁸

Maps of the Southern Provinces by Jacques Surhon and Jean Surhon

No such maps as the multisheet maps of the Northern Provinces seem to have been printed of the provinces in the southern part of the Spanish Netherlands in this early period. However, topographical surveys of limited extent were undertaken in the provinces of Hainaut, Artois, Picardy, Luxembourg, Namur, and Vermandois. All these provinces are shown on single-sheet maps at scales of between 1:300,000 and 1:400,000 that were drawn by Jacques Surhon and his son Jean in the period from about 1548 to 1570.⁵⁹ Jacques Surhon, born at Mons, was a goldsmith and a cartographer whose surveys in Luxembourg, Artois, and Hainaut are mentioned in the emperor's records.⁶⁰ Jean Surhon is known from his map of Vermandois mentioned in the Plantijn account books of 1558 and the following years and from his maps of Namur and Picardy in the 1579 edition of Abraham Ortelius's *Theatrum orbis terrarum*.⁶¹ Denucé believes the Surhons were of the same rank and importance in the survey and mapping of the Southern Provinces as Jacob van Deventer was with regard to the Northern Provinces,⁶² but there is little evidence to support this opinion. This is not simply because the Surhons lacked Van Deventer's title of *géographe royal*, but because records do not provide evidence of comprehensive surveys of the Southern Provinces. The only references we possess concern surveys in Luxembourg and payments for the maps of Hainaut and Artois.

For the map of Hainaut (fig. 43.10), Jacques Surhon received 350 Carolus guilders in 1548 and another 400

livres in 1549. This map was drawn in three copies: one for the king, one for the queen, and one for the governor of Hainaut.⁶³ Surhon was forbidden to show his work to anyone else, and the map did not appear in print. More than twenty years later, the restriction was no longer valid, and the map was published by Ortelius in 1572. For security reasons, the secret council of Brussels ordered the destruction of the copperplate engraved by Frans Hogenberg. Ortelius therefore made use of a new copperplate of Hainaut for publication in his *Theatrum* of 1579.⁶⁴ In the same edition of the *Theatrum*, four maps of the Surhons were published (appendix 43.1).⁶⁵ No impressions of these maps dated before 1579 have been preserved.

Jacques Surhon's map of Luxembourg also appeared for the first time in the *Theatrum* of 1579.⁶⁶ This was not a large-scale map, and one may doubt whether Surhon ever made a large-scale map of the area. Although the emperor's decree of 1551 (the only known record of the mapping) ordered local authorities in Luxembourg to assist

55. Sebastian Münster, *Erklerung des neuen Instruments der Sinnen nach allen seinen Scheyben und Circeln: Item eyn Vermanung Sebastiani Münnster an alle Liebhaber der Künstern im Hilff zu thun zu warer unnd rechter Beschreybung Teütscher Nation* (Oppenheim: Iacob Kobel, 1528).

56. See Van der Heijden, *Oude kaarten der Nederlanden*, 1:39–66, and Koeman and Visser, *De stadsplattegronden van Jacob van Deventer*, introductions to the different parts.

57. Van der Heijden, in *Oude kaarten der Nederlanden*, 44–47, provides a summary of the copies of this map that have survived; see also David Woodward, *The Maps and Prints of Paolo Forlani: A Descriptive Bibliography* (Chicago: Newberry Library, 1990).

58. This map is located in The Hague, Nationaal Archief (VTH 3044). See J. G. Avis, "Het auteurschap van de 16^{de}-eeuwsche kaarten van het Friesche Bildt," *Tijdschrift voor Geschiedenis* 49 (1934): 403–15; Van 't Hoff, *De kaarten van de Nederlandsche provinciën*; and Koeman, *Gewestkaarten van de Nederlanden*, 11–12.

59. For a biographical sketch of Jean Surhon, see Karrow, *Mapmakers of the Sixteenth Century*, 517–19.

60. See Peter H. Meurer, *Fontes cartographici Orteliani: Das "Theatrum orbis terrarum" von Abraham Ortelius und seine Kartenquellen* (Weinheim: VCH, Acta Humaniora, 1991), 250–51, and Jean Denucé, "Jean & Jacques Surhon, cartographes Montois, d'après les archives Plantiniennes," *Annales du Cercle Archéologique du Mons* 42 (1914): 259–79.

61. See Meurer, *Fontes cartographici Orteliani*, 251–52 and fig. 70.

62. Jean Denucé, *Oud-Nederlandsche kaartmakers in betrekking met Plantijn*, 2 vols. (Antwerp: De Nederlandsche Boekhandel, 1912–13; reprinted Amsterdam: Meridian, 1964), 1:39.

63. Denucé, *Kaartmakers*, 1:35.

64. Peter H. Meurer, "De verboden eerste uitgave van de Henegouwen-kaart door Jacques de Surhon uit het jaar 1572," *Caert-Thresoor* 13 (1994): 81–86.

65. Denucé, *Kaartmakers*, 1:32–33; privileges for the maps of Namur and Picardy had been granted more than twenty years earlier.

66. Van den Broecke, *Ortelius Atlas Maps*, 102. See also Emile van der Vekene, *Les cartes géographiques du Duché de Luxembourg éditées au XVI^e, XVII^e, et XVIII^e siècles: Catalogue descriptif et illustré*, 2d ed. (Luxembourg: Kripler-Muller, 1980), 6–13 (figs. 1.02.A–1.02.d).



FIG. 43.10. PROVINCIAL MAP OF VERMANDOIS BY JACQUES SURHON, 1558.

Size of the original: 52.5 × 38 cm. Photograph copyright Royal Library of Belgium, Brussels (Classmark II-22.736, Blad, 12).

Surhon in his survey work, the amount of Surhon's remuneration was only 28 livres for five days to complete the map of Luxembourg,⁶⁷ which does not sound like payment for a map of great detail. Another payment, 36 livres for the fair drawing of a map of Artois in 1551, is also not a convincing amount for a detailed topographical survey of that province.⁶⁸ The opinion that the Surhons had not accomplished large-scale mapping is further strengthened by the lack of entries in Plantijn's account books. Only Jean Surhon's map of Vermandois (1558), of which several hundred impressions were sold, is listed. Indeed, it was the first map printed on Plantijn's press.⁶⁹

Ortelius used the map of Vermandois for the composite map in the first edition of the *Theatrum* (1570),⁷⁰ but maps by the Surhons were not only found in Ortelius's atlases. They were also copied in Gerard de Jode's *Speculum orbis terrarum* of 1593, Lodovico Guicciardini's *Descrittione di tutti i Paesi Bassi* of 1581, and Maurice Bouguereau's *Le theatre francoys* of 1594. About 1595, Baptista van Doetecum, son of Joannes van Doetecum of Antwerp (later Deventer), who lived in Haarlem, en-

graved two maps by the Surhons: *Artesiae descriptio Johanne Surhonio Montensi auctore Baptista Doetecomius sculpsit* and *Nobilis Hannoniae Comitatus descriptio auctore Jacobo Surhonio Montano Baptista Doetecomius sculpsit*.⁷¹

Other Maps of the Southern Provinces

There is still some doubt as to whether Van Deventer surveyed the province of Flanders. Kirmse has argued that Gerardus Mercator's map of Flanders from 1540 (fig. 43.11) was based on a Van Deventer survey because the accuracy of the locations of the towns and villages suggests triangulation.⁷² Further, the scale of the map, approximately 1:172,000, accords with those of the other provincial maps by Van Deventer; the representation of churches, cloisters, and abbeys is identical to that in Van Deventer's maps; and several circular symbols also indicate that one of these buildings served as a sight. Finally, other arguments that support Van Deventer's authorship are the similarity in the overlapping portions of the maps of Brabant, Zeeland, and Flanders as well as the handwriting on the maps.⁷³ It is possible that Mercator and Van Deventer worked together on the mapping of Flanders in the years before 1540. The map is assumed to have been printed by Mercator, because it does not carry the name

67. Denucé, *Kaartmakers*, 1:36.

68. Denucé, *Kaartmakers*, 1:38.

69. Denucé, *Kaartmakers*, 1:28.

70. Van den Broecke, *Ortelius Atlas Maps*, 85–86.

71. Copies are in Leiden, Universiteitsbibliotheek. See *The New Hollstein Dutch & Flemish Etchings, Engravings and Woodcuts 1450–1700*, vols. 7–10, *The Van Doetecum Family*, 4 pts., comp. Henk Nalis, ed. Ger Luijten and Christiaan Schuckman (Rotterdam: Sound & Vision Interactive Rotterdam, 1998), pt. 4, 236–37. See also MCN, 1:27, and Dirk de Vries, "Eerste 'staten' van B. van Doetecum's Artesia en Hannonia," *Caert-Thresoor* 4 (1985): 45.

72. Rolf Kirmse, "Die Große Flandernkarte Gerhard Mercators (1540)—Ein Politicum?" *Duisburger Forschungen* 1 (1957): 1–44. Only an incomplete copy of this map is known. This copy was purchased in 1877 by the city of Antwerp from the estate of the canon C. B. de Ridder of Mechelen and has since been preserved in the Museum Plantin-Moretus in Antwerp. The section between Bruges and Heist is missing from the map. The text of the scroll directly underneath—the address to the reader—has not been preserved either, which makes determination of the origin of the map difficult. For a facsimile of the map, see Koeman, *Gewestkaarten van de Nederlanden*, Bijlage 1 (1–9). For his reproduction, Koeman used the facsimile by Jean van Raemdonck, *De groote kaart van Vlaanderen vervaardigd in 1540 door Geeraard Mercator / La grande carte de Flandre dressée en 1540 par Gérard Mercator* (Antwerp: Wed. De Backer, 1882). See also Alfred van der Gucht, "De kaart van Vlaanderen," in *Gerardus Mercator Rupelmundanus*, ed. Marcel Watelet (Antwerp: Mercatorfonds, 1994): 284–95. Furthermore, with respect to toponyms, Mercator's map agrees in large measure with current use of Dutch and French names. See L. N. J. Camerlynck, "De taalgrens op Mercators kaart van Vlaanderen (1540)," *Caert-Thresoor* 13 (1994): 23–26.

73. See also Koeman, *Gewestkaarten van de Nederlanden*, 22–25.

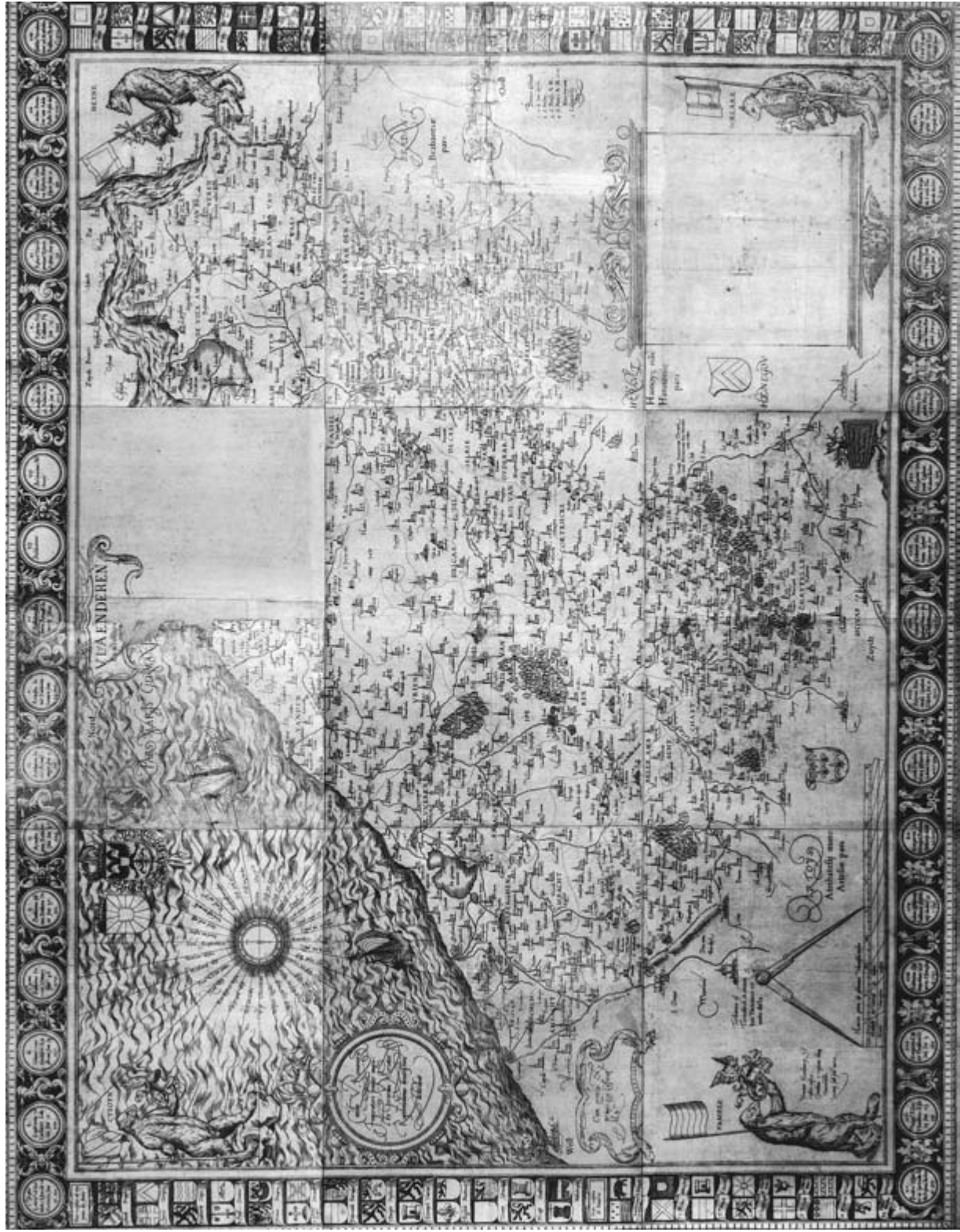


FIG. 43.11. MAP OF FLANDERS BY GERARDUS MERCATOR, 1540. Map in nine sheets. Photograph courtesy of the Plantin-Moretus Museum/Prentenkabinet, Antwerp (MPM-BL 301).

and address of any other publisher or printer; however, several sales addresses are recorded.⁷⁴ Furthermore, there is a shield directly underneath with the name of the engraver: “Gerardus Mercator Rupelmundanus faciebat.”

Kirmse has also demonstrated that Mercator’s map of Flanders is not a copy of Pieter van der Beke’s map of Flanders, a woodcut printed by Pieter de Keyser at Ghent in 1538. Van der Beke’s map is less accurate and has French place-names, while on Mercator’s map most of the place-names are Flemish. From the viewpoint of toponymic policy, the map has been labeled by Kirmse “a politicum.”⁷⁵ There is a credible reason for the production of a second map of Flanders after an interval of only two years. In 1539, the town of Ghent had revolted against Mary of Hungary, its governor, and consequently against its emperor, Charles V of Spain. The style of the Van der Beke map reflected Flanders’ spirit of independence. The heraldic shields of the counts of Flanders in a long genealogical table with four bears in the corners representing the four oldest families were interwoven with topography in a sexually provocative manner.⁷⁶ Mercator, however, drew a map that omitted these provocative elements to appease the emperor, who, with the obvious intention of punishing the disobedient town, had announced his imminent arrival. To please this powerful patron, Mercator also signed his map thus: “Dedicated to Charles V most Holy Roman Emperor by the most devoted Gerardus Mercator of Rupelmonde.” Until sometime in 1570, Mercator’s map is reported to have been copied primarily by Italian publishers.⁷⁷ From that time on, copies of the map also appeared in Ortelius’s *Theatrum orbis terrarum*.⁷⁸

INDEPENDENT TRADITIONS OF DUTCH REGIONAL SURVEYING AND MAPPING

The period from 1600 to 1670 was characterized by chaotic topographic mapping resulting from the political structure of the Low Countries as a confederation of independent states. Surveying and mapping fell under provincial and not federal authority. In addition, within the same provinces the *waterschappen* had independent jurisdiction over matters concerning water and dike management, including surveying and mapping of the territory.⁷⁹ For this sort of management, large-scale topographical maps were indispensable. In most instances, the private initiative of scholars, not necessarily land surveyors, lay at the base of provincial and local mapmaking in the seventeenth century. Therefore, the accuracy of the maps varies according to the qualities of the surveys. Unfortunately, the surveying methods used for these regional maps are seldom revealed to us, and in some instances we do not know if a survey was carried out or if the regional map was composed from existing base maps.

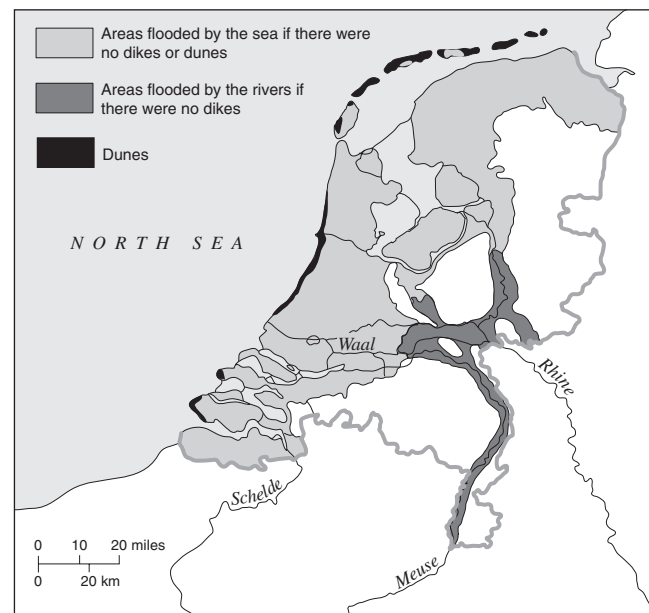


FIG. 43.12. THE NETHERLANDS WITHOUT DIKES AND DUNES.

Waterschap Maps (1572–ca. 1650)

The Netherlands is one of the most densely populated areas of Europe, and 27 percent of it is situated below sea level. More than half of the land would be under water if there were no dunes or dikes to protect it against flooding from the sea or from the larger rivers, which together form a gigantic delta (fig. 43.12). In the past, the areas below sea level belonged to the sea or to lakes, but they were eventually drained by pumping out the water and constructing dikes high enough to prevent flooding. Drainage and land reclamation has taken place since the twelfth century and has developed into a most disciplined tech-

74. “In Antwerp in the Red Castle. In Ghent in front of the holy Pharahildis. In Louvain in the Golden Sun.”

75. Kirmse, “Die Große Flandernkarte Gerhard Mercators (1540)—Ein Politicum?” The only copy of the Van der Beke map known is in Nuremberg, Germanisches Nationalmuseum (La 281-284). An illustration of the map can be found in Van der Gucht, “De kaart van Vlaanderen,” 286–87.

76. J. B. Harley and K. Zandvliet, “Art, Science, and Power in Sixteenth-Century Dutch Cartography,” *Cartographica* 29, no. 2 (1992): 10–19.

77. Marcel Destombes, “La grande carte de Flandre de Mercator et ses imitations jusqu’à Ortelius (1540–1570),” *Annalen van de Oudheidkundige Kring van het Land van Waas* 75 (1972): 5–18, and Koeman, *Gewestkaarten van de Nederlanden*, 21.

78. Van den Broecke, *Ortelius Atlas Maps*, 119–21.

79. The *waterschappen* are local jurisdictions responsible for water management. Most local water problems are limited to a geographical unit called a polder. A polder is a piece of low-lying land surrounded by dikes in which the water levels are controlled using inlets and outlets.

nology.⁸⁰ Given the expertise of the Dutch in water management, it goes without saying that they had also become expert in the field of maritime cartography.

The Low Countries have struggled against the water for centuries, and the struggle continues to this day. Not only is there a danger of flooding from storm tides in the North Sea and high water levels in the larger rivers, but the difficulty of draining low-lying areas also presents problems. Geologically speaking, the Low Countries lie in an area of subsidence, and because of this—combined with a significant rise in sea level—the soil sinks about ten centimeters every hundred years. Many dikes, canals, ditches, windmills, channels, and other hydraulic arrangements are necessary to keep the land habitable. The first *waterschappen*—relatively independent governing bodies that were responsible for dike maintenance, water management, and land and water routes—were thus already in existence during the Middle Ages, located in the low-lying western part of the Low Countries. Because water problems in the eastern Low Countries are much less significant, it was not until about 1850 that *waterschappen* were established there.

Beginning in the twelfth century, special administrative structures were developed in response to a vigorously rising sea level, increasing soil subsidence, and population growth. Pioneer hamlets developed, under the leadership of a dike reeve (*dijkgraaf*) who was supported by counselors of the control board (*heemraden*), and these supervised the maintenance of the still primitive dikes. In order to achieve good water management, the various settlements had to work together. They organized themselves into diverse water management bodies, each with its own territory and taxing authority: polder boards and water control boards (*waterschappen*, *heemraadschappen*, and *hoogheemraadschappen*, more or less in order of the size of the district). There was also a dike district (*dijkgraafschap*) upon which a number of polders and *waterschappen* might have depended. In general, the administrative areas of the *heemraadschappen* were smaller than those of the *hoogheemraadschappen*. Both concepts date from the twelfth and the thirteenth centuries and continue to be useful. Finally, most of the *waterschappen* consisted of a number of polder boards.⁸¹ The following three *hoogheemraadschappen*, together covering three quarters of the area of the modern province of South Holland, constituted the earliest administrative organizations in matters of water management in the Low Countries: Rijnland (chartered in 1255), Delfland (1290), and Schieland (1296).

In the northern part of Holland, medieval geographical conditions were different: by means of open inlets, salt water from the North Sea penetrated the country via the Zuiderzee. By closing the inlets, step by step, and by building dikes, northern Holland developed into a fertile coun-

tryside. The administration of water management was in the hands of the Hoogheemraadschap de Uitwaterende Sluizen van Kennemerland en West-Friesland, which got its charter in 1319.⁸² After the inlets had become lakes, surrounding dikes were built, windmills erected, and the water pumped out. When drained, the fertile clay lands were sold to wealthy citizens for agriculture.

In Noord-Holland, as the province is called today, over seventy lakes, some not larger than twenty hectares and some more than six thousand hectares, were drained in the years between 1546 and 1650.⁸³ When drained, the lakes became polders and obtained a governing institution: a polder or *waterschap* authority. These seventeenth-century *waterschappen* obtained the privilege of self-administration from the company that had invested the capital for the drainage.

The larger *waterschappen* were administered by courts or boards, which originated in premedieval boards of elder men who maintained law. The board of a *waterschap* had the power to impose taxes, the right of jurisdiction, and the authority to enlist workers in times of emergency. Traditionally, the chairman was the *dijkgraaf*; his counselors were the *hoogheemraden* (representatives of the property owners), and the members of the board were the *hoofdingelanden* (property owners). The autonomy in matters of jurisdiction and financial administration was more or less forced on the sovereign (the count of Holland) because the larger part of his territory was at the mercy of the dikes and the seashore and depended on the

80. See G. P. van de Ven, ed., *Leefbaar laagland: Geschiedenis van de waterbeheersing en landaanwinning in Nederland* ([Utrecht]: Matrijs, 1993); Johan van Veen, *Dredge, Drain, Reclaim: The Art of a Nation*, 5th ed. (The Hague: Nijhoff, 1962); and R. H. A. Cools, *Strijd om den grond in het lage Nederland: Het proces van bedijking, inpoldering en droogmaking sinds de vroegste tijden* (Rotterdam: Nijgh and van Ditsmar, 1948).

81. Marc Hamelers, "Repräsentativität und Funktionalität von holländischen Polder-, Deichgenossenschafts- und Deichgrafschaftskarten," in *5. Kartographiehistorisches Colloquium Oldenburg 1990, 22–24 March 1990: Vorträge und Berichte*, ed. Wolfgang Scharfe and Hans Harms (Berlin: Reimer, 1991), 59–70.

82. See Marc Hamelers, *West-Friesland in oude kaarten* (Wormerveer: Stichting Uitgeverij Noord-Holland, 1987).

83. In North Holland, the following major lakes were drained between 1597 and 1635: 1597, Zijpe (6250 hectares); 1608, Wogmeer (690 hectares); 1610, Wieringerwaard (1800 hectares); 1612, Beemster (7100 hectares); 1622, Purmer (2760 hectares); 1626, Wormer (1620 hectares); 1630, Heerhugowaard (3500 hectares); and 1635, Schermer (4770 hectares). For a review of the (cartographic) development of de Kop van Noord-Holland in particular, see Dirk Blonk and Joanna Blonk-van der Wijst, *Hollandia Comitatus: Een kartobibliografie van Holland* ('t Goy-Houten: HES & De Graaf, 2000); Henk Schoorl, *Zeshonderd jaar water en land: Bijdrage tot de historische geo- en hydrografie van de Kop van Noord-Holland in de periode 1150–1750* (Groningen: Wolters-Noordhoff, 1973); and J. Westenberg, *Oude kaarten en de geschiedenis van de Kop van Noord-Holland* (Amsterdam: Noord-Hollandsche Uitgevers Maatschappij, 1961).

discharge of excess water. A poorly maintained dike in a small polder could jeopardize an entire province. Neither the count of Holland nor the emperor possessed the technical expertise necessary either to administrate the polders or to replace a polder board. As a consequence, the *waterschappen* were granted partial sovereignty.

By its autonomy, a *waterschap* could afford the survey and the mapping of its territory. A cartographic discipline thus developed that was specific to the Low Countries: *waterschap* cartography. This discipline includes the cartographic documents that were produced as polder boards, dike districts, water control boards, and district water control boards carried out their various tasks.⁸⁴ The oldest *waterschap* maps date from the fifteenth century, and they are still being published today.

The *waterschap* archives are among the best-preserved archives in the Low Countries, and probably only a few maps have been lost throughout many centuries. Moreover, there are still many copperplates in the possession of the *waterschappen*, a situation that certainly does not apply to the commercial publishers in the Low Countries. *Waterschap* archives thus yield a complete picture of the variety of maps that were made at the behest of the *waterschap* administration and offer much more than just the printed and generally richly illustrated simplified maps that can be found in other map collections both domestically and abroad (see appendix 43.2 and fig 43.13). By far the largest portion of the water district maps are in manuscript form.⁸⁵

Administrators of *waterschappen* made extensive use of maps for a variety of reasons, including the construction and maintenance of roads, channels, and dikes and land reclamation. Many maps—mostly large-scale maps—were also produced for the purposes of land accounting. Hameleers differentiates among *waterschap* maps produced for various purposes, including water management, administration, settlement of judicial questions, response to “requests” or applications for permission, and the management of building projects.⁸⁶

The impetus for making polder maps for purposes of water management did not always come from the *waterschap* administration, but also came from individuals, private local organizations, and public governmental agencies. Polder maps are predominantly forms of functional cartography. All lines, colors, and symbols relate in one way or another to the maritime purpose of the map. From a historical-geographical point of view, polder maps can be divided into four groups:

1. Maps of the old polders, which were characterized by a peat substratum and by the settlement of subsiding soil and medieval land allotment. This kind of polder was artificially drained and was at most one to one and a half meters deep.

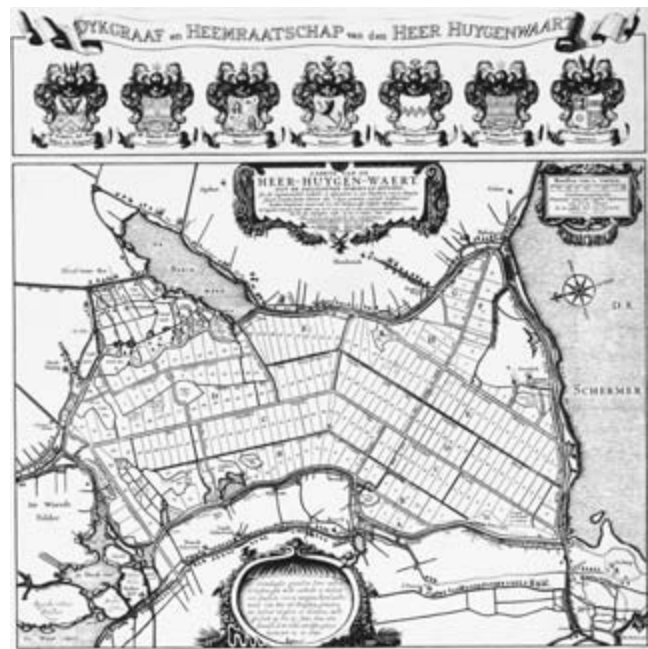


FIG. 43.13. PRINTED *WATERSCHAP* MAP OF HEER-HUGOWAARD BY CLAES JANSZ. VISSCHER, 1631. Size of the original: ca. 56 × 56 cm. Photograph courtesy of the Universiteitsbibliotheek Amsterdam (120.23.18).

2. Maps produced for the purposes of damming and draining natural lakes. Many lakes were drained, especially in the first half of the seventeenth century, including the Beemster (1612) and the Schermer (1635).
3. Maps that were related to the reclamation of land from the sea. The building of dikes took place specifically in the southwest and the north of the Low Countries.
4. Maps that were related to peat cutting in the northernmost areas of the Low Countries (fig. 43.14). It was due to peat harvesting—peat was used, among other things, for fuel—that much land was initially lost. Later, this land was reclaimed by draining most of the peat lakes. The original, medieval allotments have completely disappeared in these meter-deep polders.⁸⁷

Only a small portion of the *waterschap* maps are the well-known and richly illustrated printed general maps made up of multiple sheets that could be mounted as large wall maps. A banner title often extended across the top sheets of the map, and the decorative margins represented the coats of arms of the dike reeve and the dike board, among other things. Next to the administrative and judi-

84. Hameleers, “Repräsentativität und Funktionalität,” 60.

85. For a good selection of various types of *waterschap* maps, see C. G. D. de Wilt et al., *Delflands kaarten belicht* (Delft: Hoogheemraadschap van Delfland; Hilversum: Uitgeverij Verloren, 2000).

86. Hameleers, “Repräsentativität und Funktionalität,” 61.

87. See Hameleers, “Repräsentativität und Funktionalität,” 63–64, and De Vries, “Official Cartography,” 46–49.

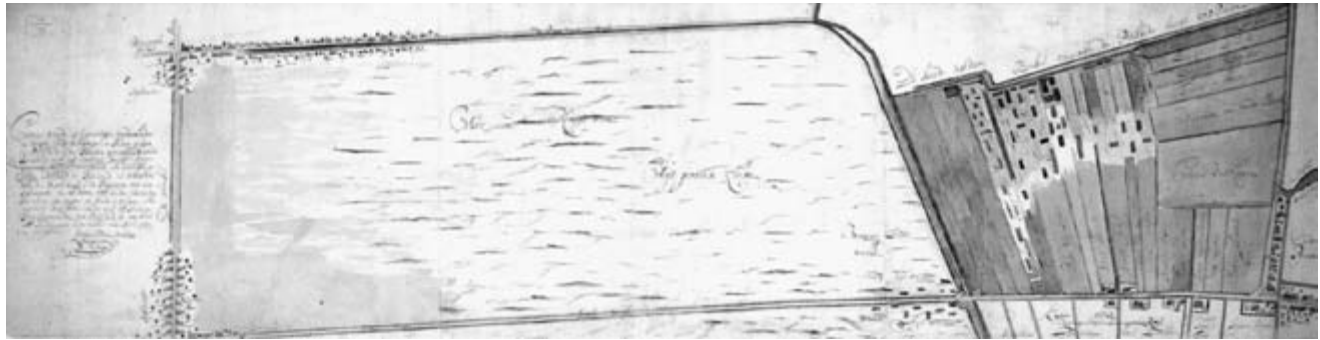


FIG. 43.14. MANUSCRIPT *WATERSCHAP* MAP OF PEAT DIGGING IN THE OUDE POLDER VAN PIJNACKER AND THE OUDEWEGSCHE POLDER, 1691. On the right are irregular parcels of land resulting from peat digging. On these parcels, the peat was to be dried and consequently could be

used as fuel.

Size of the original: 40 × 153 cm. Archief Hoogheemraadschap van Delfland (OAD inv. no. 722). Photograph courtesy of the Gemeentearchief, Delft.

cial function of these large maps, their primary purpose was to represent the territory and promote the name and fame of the *waterschap* administrators. The level of detail did not always match the size and scale of the map; in some cases format, scale, and map content contradicted one another.⁸⁸

The earliest mapping activities commissioned by a *waterschap* date from the fifteenth century. From about 1400 onward, the *waterschappen* employed a land surveyor for both property and engineering surveys and, in case of disputes, for drawing maps.⁸⁹ Although the oldest known oath of a land surveyor, administered by the board of the Hoogheemraadschap Rijnland, is dated 1453,⁹⁰ the duties of a land surveyor were recorded at an earlier date in a “corpus of law” (1405) of the town Brielle in the province of South Holland.⁹¹ First, mention is made of the units of lengths and the compulsory education of the surveyor in mathematics; next are given the rules and laws governing the transfer of land and houses by sale and purchase. In particular, the rules for the measurement of property are given in great detail, but no mention is made of drawing a plan from the survey. Apart from *waterschap* archives, various records refer to surveys in the fifteenth century, but maps are not mentioned.⁹² The drawing of plans and topographical maps seems to have been rather exceptional in the period before 1500.⁹³

This changed about 1520–30, when textbooks and foreign examples of topographic mapping introduced the art of surveying to the Low Countries. In 1539, the best-known professional of his time, Jacob van Deventer, was ordered to survey and draw a map of the territory of Delfland. Although six copies of this (most likely) manuscript map were ordered, no copy has been preserved.⁹⁴ Thanks to the precise instruction of the commission, we know what the map looked like: “First, Master Jacob named before shall make a map on a small scale of all the

polders within the *waterschap* and to plot all the wind mills, dikes, and canals at their correct place with the names of each polder and wind mill. . . . Further, he shall plot all the churches at their proper place on the small-scale map, according their dimensions on the large-scale map.”⁹⁵ This very important statement proves that detailed large-scale maps of villages with their churches did exist. Van Deventer probably compiled his small-scale topographical map of Delfland from two sources: a geo-

88. In the cases of changes in administration, the coat of arms might be changed, but not the map content. See Hamelers, “Repräsentativität und Funktionalität,” 66.

89. On earlier (ca. 1000–1300) large-scale drainage projects (but without maps), see Henk Schoorl et al., *Holland in de dertiende eeuw: Leven, wonen en werken in Holland aan het einde van de dertiende eeuw* (The Hague: Nijhoff, 1982).

90. Muller and Zandvliet, *Admissies*, 7.

91. Jacobus Antonie Fruin and M. S. Pols, eds., *Het rechtsboek van Den Briel: Beschreven in vijf tractaten door Jan Matthijssen* (The Hague: Nijhoff, 1880).

92. P. S. Teeling, *Repertorium van oud-Nederlandse landmeters, 14^e tot 18^e eeuw*, 2 vols. (Apeldoorn: Dienst van het Kadaster en de Openbare Registers, 1981); for an index to this work, see Peter van der Krogt, *Index op het Repertorium van Oud-Nederlandse landmeters, 14^e tot 18^e eeuw*, van P. S. Teeling (Apeldoorn: Hoofddirectie van de Dienst van het Kadaster en de Openbare Registers, 1983). Mentioned are farmlands surveyed near Gouda, 1432 (Teeling 1161); property on the island of Putten, 1462 (Teeling 1180); dikes between Edam and Oosthuizen, 1456 (Teeling 1124); and property boundaries near Rotterdam, 1482 (Teeling 1153).

93. This is also confirmed by the chronological list of local maps and plans from the Low Countries before 1550 with its fifteen items compiled by Harvey (“Local and Regional Cartography,” 499–500). In this list, only one map, number 6, originated from the archives of a *waterschap*.

94. Lamberta J. Ruys, “De oude kaarten van het Hoogheemraadschap Delfland,” *Het Boek* 23 (1935–36): 195–209.

95. Van ’t Hoff, *Jacob van Deventer*, 33. The documents related to the map (Jacob van Deventer’s signed receipt included) are in the Archief van het Hoogheemraadschap Delfland at Delft.

metrical survey of a network of intersections of sights on church towers and a reduction of large-scale plans, available from the map collection in the archives of Delfland.

In 1548, Van Deventer was paid 100 pounds for his six copies. This sum was collected from the thirteen polder districts of Delfland. Presumably this map was used as a wall map until 1606, when it was replaced by a wall map by Matthijs Jansz. de Been van Wena (also known as Mathijs Janssoon van Delff) painted in oil on panel, which has been preserved.⁹⁶ This painted map was soon followed by the first printed map of Delfland.

The earliest existing printed *waterschap* map is a small engraved map of the polder Zijpe in North Holland, which was the first large polder (66 square kilometers) reclaimed from the North Sea (see appendix 43.2).⁹⁷ The Zijpe was an inlet before its closure from the North Sea in 1572. The modest engraved map of about 1572, with lots marked by the letters *a* through *k*, was presumably intended for use in dividing the property and in stimulating the sale of lots in the newly acquired fertile land. More ostentatious printed wall maps of polders and *waterschappen* appeared after 1611, with decorative coats of arms of the members of the court of the *waterschap* on top.⁹⁸

In a short period of time, between 1611 and 1615, maps of the three largest *hoogheemraadschappen* of Holland—Rijnland, Delfland, and Schieland—appeared in print.⁹⁹ They are all multisheet wall maps at a large scale. This set of *waterschap* maps, surveyed and engraved by Floris Balthasarsz.¹⁰⁰ and his sons, marks the beginning of a great period of polder cartography in the Low Countries. The measurements taken by Floris Balthasarsz. were not based on an integrated triangulation of the whole territory; he produced the wall maps by combining the maps of local communities (*Ambachten*), which he measured and mapped individually.¹⁰¹ Because the mathematical foundation of Floris Balthasarsz.'s maps was unrigorous, Rijnland commissioned Jan Jansz. Dou less than thirty years later to measure and map the area anew.¹⁰²

Ornamental lettering dominates Floris Balthasarsz.'s maps. The lettering was both decorative and functional; the size of the lettering distinguished the administrative status of the polders. Polder names and names of dikes, canals, and sluices were essential to those who were in charge of water management and the upkeep of the dikes. A subdivision of the land into parcels, as found on cadastral plans, was not required for the *waterschap* maps and was never introduced. The *waterschap* map was an administrative map requiring administrative codes, not a cadastral map with its characteristic numbering. Dikes, canals, and subdivisions of polders were all named; windmills for pumping and locks for discharging water at low tide were also depicted. Within each *waterschap* territory, several units with a specific water level existed. These units were shown and named on the map. Figures indicating the

water level, however, were never shown on seventeenth-century printed maps, but were kept as written records.

Gradually every large *waterschap* and polder in the Low Countries was mapped and a printed map produced, generally at a large scale, about 1:30,000. At the beginning of the eighteenth century, the coverage was complete but lacked uniformity.¹⁰³ The *waterschap* authorities did not have any problem financing the survey and mapping of their territory: just a few cents' extra land taxation per

96. C. Postma, *De kaart van het Hoogheemraadschap van Delfland van 1606 geschilderd door de landmeter Mathijs de Been van Wena* (Alphen aan den Rijn: Canaletto, 1978), with facsimile. See also De Wilt et al., *Delflands kaarten belicht*, 24–25. The map measures 124 by 124 centimeters.

97. *Caert van het Hontbos ende Zijplant met huare omleggende landen gedaen bij Adrianus Anthonij . . .*, 1:43,000. Engraved by P. J. Nagel, this map is dated 1572. Leiden, Universiteitsbibliotheek, port. 31 no. 69; Haarlem, Rijksarchief in Noord-Holland, nr. 1363 (incomplete). A facsimile edition was published by the Hoogheemraadschap Noordhollands Noorderkwartier (Alkmaar, 1971). There is a painted manuscript map (ca. 1550) by Jan van Scorel of the diking-in of the Zijpe and the area to the north as far as Texel. This map is located in The Hague, Nationaal Archief (VTH 2486; 80 × 240 cm) and has been reproduced in part in Henk Schoorl, *Ballade van Texel: Texel en omgeving in het midden van de zestiende eeuw: Toelichting bij de reproductie van een kaartfragment* (Den Burg: Het Open Boek, 1976).

98. This is described well by Walter W. Ristow in his article "Dutch Polder Maps," *Quarterly Journal of the Library of Congress* 31 (1974): 136–49. See also Henk Schoorl, *Kust en kaart: Artikelen over het kaartbeeld van het Noordhollandse kustgebied* (Schoorl: Pirola, 1990).

99. On the printed maps of Delfland and Schieland by Floris Balthasarsz., see Marc Hameleers, "De kaarten van Delfland en Schieland uit 1611 door Floris Balthasarsz.," *Antiek* 20, no. 8 (1986): 435–43. Facsimiles of the printed maps of the three district water control boards, with commentary, are found in G. 't Hart et al., *Kaarten van Rijnland, Delfland en Schieland 1611–1615* (Alphen aan den Rijn: Canaletto, 1972). There is likewise a facsimile of the original manuscript map of Rijnland in K. Zandvliet, ed., *Prins Maurits' kaart van Rijnland en omliggend gebied door Floris Balthasar en zijn zoon Balthasar Florisz. van Berckenrode in 1614 getekend* (Alphen aan den Rijn: Canaletto, 1989). This work discusses the history of the map's development in detail. It also contains a bibliography of the maps and prints produced by Floris Balthasarsz. and his sons.

100. A summary of the activities of Floris Balthasarsz. and Balthasar Florisz. van Berckenrode is in Paul van den Brink, "De kaart van Rijnland door Floris Balthasar van Berckenrode," while full biographies of Floris Balthasarsz. and his sons can be found in K. Zandvliet, "Kartografie, Prins Maurits en de Van Berckenrodes," both in *Prins Maurits' kaart van Rijnland en omliggend gebied door Floris Balthasar en zijn zoon Balthasar Florisz. van Berckenrode in 1614 getekend*, ed. K. Zandvliet (Alphen aan den Rijn: Canaletto, 1989), 1–16, esp. 3, and 17–50, esp. 27–37.

101. See De Vries, "Official Cartography," 44; Pouls, *De landmeter*, 228; MCN, 5:296–98. The original plots that Van Berckenrode made of the communities in Rijnland have been bound together into an atlas. This atlas is located in the Oud Archief van Rijnland, Leiden.

102. The map, prepared by Dou in cooperation with Steven van Broekhuysen, appeared in 1647 on twelve sheets and at a scale of ca. 1:30,000. A second and third edition were published in 1687 and 1746.

103. For index sheets, see Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750*, 29–32.

acre was sufficient to pay for it. Accordingly, the authorities generously distributed impressions of the multisheet polder or *waterschap* map at no cost. Local and state authorities received painted copies, and a few copies were printed on silk. Members of the board, as well as dike reeves and secretaries of neighboring polders, received free impressions. A detailed account of the printing, coloring, and binding of these maps, as well as of the plate revisions, is available from the *waterschap* archives.¹⁰⁴ Apart from offering the free impressions, the printer was allowed by contract to sell and advertise the map for a fixed price. The number of impressions printed of the map of Rijnland (1647) was only one hundred. A century later, six hundred impressions were printed for the third edition from the revised plates. These are maximum figures, because Rijnland was the most prominent among the *waterschappen*.

Reprints of *waterschap* maps were often made from the same plate, but the revisions were generally insignificant. Revisions of the plates with the coats of arms were most frequently made, in response to the death or reelection of *hoogheemraden*. Thanks to this type of genealogical data, the date of second, third, or fourth editions may be determined. Thanks also to the completeness of the archives, it has been possible to reconstruct the printing history of *waterschap* maps.¹⁰⁵ In addition, most of the larger *waterschap* maps have now been reprinted in facsimile, accompanied by a historical note.¹⁰⁶

Printed Province Maps (1575–ca. 1700)

The desire for self-representation expressed by provinces and local districts at the beginning of the sixteenth century resulted in a trend toward regional mapping in almost all the countries of Europe. Printed manuals for measuring large areas began to appear. Van Deventer and the Surhons had laid the foundation for regional mapping in the Low Countries. These maps formed the prototypes for maps that appeared in commercial atlases.

Beginning in the last quarter of the sixteenth century and lasting until 1700, individual maps appeared of almost every province in the northern Low Countries, the province of Flanders, and the duchy of Luxembourg (appendix 43.3).¹⁰⁷ These maps replaced the cartographic work that had become antiquated, especially that of Van Deventer. The mapping of each of the provinces was undertaken at different times and as a result of the initiative and interests of widely different groups. For example, the map of North Holland from 1575, by Joost Jansz. Bilhamer, was commissioned by the duke of Alba, the Spanish commander in chief at the time, for military purposes. Another example is the map of Zeeland from 1654/55, by Zacharias Roman and Nicolaas I Visscher, commissioned by the council of representatives for the province of Zeeland. Finally, the map of Groningen, Friesland,

Drenthe, and Overijssel from 1606, by Baptista van Doetecum, was dedicated to the mayors of the city of Deventer.

The secession of the northern Low Countries in 1579 provided a fertile seedbed for the flourishing of regional cartography, and around this time multisheet maps, most notably of the Northern Provinces, first made their appearance. Maps of Groningen and Friesland, by the monk Sibrandus Leo, appear in Ortelius's *Theatrum*.¹⁰⁸ Copies, enhanced with roads, appear in the *Itinerarium Belgicum*, an atlas of the Low Countries from 1587, likely by Frans Hogenberg in Keulen. The clergyman, amateur astronomer, and cartographer David Fabricius conducted completely new mapping work in the Northern Provinces, resting, in part, on a geometric foundation. In 1589, he had a map of East Friesland printed at a scale of 1:185,000.¹⁰⁹ A second, revised edition of this map followed in 1592, known only from a reprint made in 1613. Around 1600, Joannes van Doetecum Jr. engraved an expanded version on a smaller scale to include the province of Groningen.¹¹⁰ The historian, geographer, and scholar Ubbo Emmius is also closely identified with the cartography of East Friesland.¹¹¹ He made a geometrically reliable

104. For details from account books on fees and production time for engraving and coloring, see C. Postma, *Kaart van Delfland 1712* (Alphen aan den Rijn: Canaletto, 1977).

105. A comprehensive bibliography of printed polder maps from 1575 to the present is currently being prepared for publication by Marc Hamelers and Marco van Egmond.

106. Reprints of the following maps were published by Canaletto, Alphen aan den Rijn (see the list of *waterschap* maps in appendix 43.2): Delfland 1611, Schieland 1611, Rijnland 1615, Rijnland 1647, De Landen van Woerden 1670/71, Kennemerland en West-Friesland 1680, and Delfland 1712.

107. Almost all multisheet province maps from this period can also be found in one of the three giant atlases in London ("Klencke Atlas"), Rostock, and Berlin ("Atlas des Großen Kurfürsten"). See the discussion of these atlases on p. 1356. Illustrations and descriptions of many of these province maps can be found in H. A. M. van der Heijden, *Kaart en kunst van de Zeventien Provinciën der Nederlanden: Met een beknopte geschiedenis van de Nederlandse cartografie in de 16^{de} en 17^{de} eeuw* (Alphen aan den Rijn: Canaletto, 2001).

108. See J. J. Vredenberg-Alink, *De kaarten van Groningerland: De ontwikkeling van het kaartbeeld van de tegenwoordige provincie Groningen met een lijst van gedrukte kaarten vervaardigd tussen 1545 en 1864* (Uithuizen: Bakker's Drukkerij, 1974), no. II B 3, and Meurer, *Fontes cartographici Orteliani*, 184.

109. See Arend W. Lang, *Die "Nie und warhafftige Beschreibung des Ostfrieslandes" des David Fabricius von 1589: Eine wiederentdeckte Karte* (Juist: Die Bake, 1963). From the only known copy in Emden, Ostfriesische Landesmuseum; see Meurer, *Fontes cartographici Orteliani*, 141–42.

110. See Vredenberg-Alink, *De kaarten van Groningerland*, no. I B 31; MCN, 1:31–32; and Nalis, *Van Doetecum Family*, pt. 4, no. 993, with illustration.

111. On Ubbo Emmius, see W. J. Koppers, ed., *Ubbo Emmius: Een Oostfries geleerde in Groningen = Ubbo Emmius: Ein Ostfriesischer Gelehrter in Groningen* (Groningen-Emden: REGIO Projekt, 1994).

map of this area (at a scale of 1:200,000), which was engraved by Otto Friedman in 1595 but published only in a limited edition in 1599.¹¹² The map was included in Emmius's chronicle *Rerum Frisicarum historia* in 1616, in the form of a smaller copy engraved by Nicolaas van Geelkercken in Leiden. Adding productively to the work of Emmius as well as the older wall map by Jacob van Deventer, that same year Barthold Wicheringe completed a general map of the province of Groningen, which was published by Willem Jansz. Blaeu.¹¹³ Around 1629, Jodocus Hondius Jr. produced a copy of Wicheringe's map. The plate eventually came into the possession of Blaeu, who made a new version of it in 1630 and 1635.

In 1599, the province of Utrecht got its own general map, compiled by minister and administrator Cornelis Anthonisz. Hornhovius. He presumably carried out very little survey work for this project, making use of a number of base maps that have not survived.¹¹⁴ Although Hornhovius's map was no cartographic tour de force, copies were made in the seventeenth century by Pieter van den Keere, Willem Jansz. Blaeu, and Nicolaas I Visscher. Ultimately, the new map of Utrecht by geographer Bernard de Roij replaced that of Hornhovius in 1696.¹¹⁵

The historiography of the cartography of Limburg is complicated by its chaotic administrative organization before 1815. Only portions of the present territory figure primarily in older printed general maps. A map of southern Limburg dating from 1603 by Aegidius Martini is said to have been produced in support of the campaign of the Spanish commander in chief, Ambrogio Spinola.¹¹⁶ The original has been lost, although a reduction at a scale of 1:180,000 appeared for the first time in the English-language edition of Ortelius's *Theatrum* of 1606. After that year, the map appeared in atlases by Pieter van den Keere, Claes Jansz. Visscher, and Willem Jansz. Blaeu, among others.

The entire province of Limburg was also included in the wall map *Ducatus Brabantiae nova delineatio* (discussed later), published in 1656 by Nicolaas I Visscher—although the map is attributed to his father, Claes Jansz. Visscher, who died in 1652.¹¹⁷ The charter indicates that the compiler was Middelburg printer and bookseller Zacharias Roman, who based parts of it on the wall map of Zeeland that Visscher and Roman had published in 1654.

A general map of the province of Friesland appeared around 1618, at a scale comparable to that of Wicheringe's map of Groningen. This map, by Nicolaas van Geelkercken, represents the first improvement on Jacob van Deventer's rendering of the province.¹¹⁸ It continued to be reprinted well into the seventeenth century. In 1622, shortly after the publication of Van Geelkercken's general map, another map of Friesland came onto the market—this one produced by Adriaan Metius and Gerard

Freitag.¹¹⁹ The engraving, by Pieter Feddes van Harlingen, was not particularly well done. More professionally engraved copies were published after 1629 by Jodocus Hondius Jr. and Willem Jansz. Blaeu.

A new phase in the mapping of Friesland was ushered in with the arrival of thirty newly surveyed *grietenijen* maps by Bernardus Schotanus à Sterringa in 1664 (a “*grietenij*” was a typical Frisian form of district administration that enjoyed significant independence).¹²⁰ The maps were included in the *Beschrijvinge van de Heerlijckheydt van Friesland*, by Bernardus's father, Christiaan Schotanus à Sterringa, a professor from Franeker. Between 1682 and 1694, Schotanus à Sterringa mapped all the *grietenijen* anew and published the results in his *Friesche atlas*.¹²¹

112. See Arend W. Lang, *Die Erstausgabe der Ostfriesland-Karte des Ubbo Emmius (1595): Erläuterungen zur Lichtdruckausgabe* (Juist: Die Bake, 1962), describing the second state, and Reiner Sonntag, “Zur Ostfriesland-Karte des Ubbo Emmius und ihrer Zustandsfolge—Bekanntes und neue Erkenntnisse,” in *Ubbo Emmius*, 130–45. On the reported surveying done for the map and its mathematical reliability, see Heinrich Schumacher, “Ubbo Emmius: Trigonometrie, Topograph und Kartograph—Unter besonderer Berücksichtigung neuer Forschungsergebnisse,” in *Ubbo Emmius*, 146–65, and *MCN*, 7:416–24 and facsimile 48.

113. See Vredenberg-Alink, *De kaarten van Groningerland*, no. IV A 1–11, and *MCN*, 4:279–87 and facsimile 18.

114. See the bibliographical note to the facsimile edition: C. Koeman and N. S. L. Meiners, *Kaart van de provincie Utrecht door Cornelius Anthonisz. Hornhovius, 1599: Tweede uitgave door Clement de Jonghe, derde kwart 17^e eeuw* (Alphen aan den Rijn: Canaletto-reproducties, 1974).

115. See the bibliographical note to the facsimile edition: A. H. Sijmons, *Nieuwe kaart van den Lande van Utrecht* (Alphen aan den Rijn: Canaletto, 1973).

116. See Koeman, *Geschiedenis*, 103.

117. See the bibliographical note to the facsimile edition: W. A. van Ham and L. Danckaert, *De wandkaart van het hertogdom Brabant uitgegeven door Nicolaas Visscher en Zacharias Roman (1656)* (Alphen aan den Rijn: Canaletto/Repro-Holland; Leuven: Universitaire Pers, 1997). Reprints of the map from 1661 and 1703 have been preserved.

118. See *MCN*, 6:288–89 and facsimile 55 (second state, 1642), and Koeman, *Geschiedenis*, 97. On Nicolaas van Geelkercken, see also the *Catalogus van de tentoonstelling Nicolaas van Geelkercken* (Zutphen, 1972) and Peter H. Meurer, “Der Kartograph Nicolaas van Geelkercken,” *Heimatkalender des Kreises Heinsberg*, 2001, 79–97, esp. 86.

119. See Koeman, *Geschiedenis*, 98.

120. At the initiative of Christiaan Schotanus à Sterringa, these *grietenijen* were all surveyed between 1658 and 1662, but the Gedeputeerde Staten were not satisfied with the maps that were based on these surveys. Bernardus was subsequently commissioned to redo the maps.

121. See the bibliographical note to the facsimile edition: J. J. Kalma and C. Koeman, *Uitbeelding der Heerlijkheit Friesland . . . door d. Bern. Schotanus à Sterringa . . .* (Amsterdam: Theatrum Orbis Terrarum, 1979); the introduction to the facsimile edition: Dirk de Vries, *Nieuwe caert van Friesland (1739): Heruitgave van de wandkaart van Bernardus Schotanus à Sterringa* (Alphen aan den Rijn: Canaletto, 1983); and Johannes Keuning, “Bernardus Schotanus à Sterringa: Zijn leven en kartografisch oeuvre,” *De vrije Fries* 42 (1955): 37–87.

The wall map of the province of Holland by Balthasar Florisz. van Berckenrode, published in 1621 by Willem Jansz. Blaeu, represents a high point in regional cartography.¹²² It is based on the *waterschap* maps of Rijnland, Delfland, and Schieland, which Balthasar Florisz. van Berckenrode, together with his father, Floris Balthasarsz., and brother Cornelis produced between 1611 and 1615. The three *waterschap* maps already represented a large portion of Holland, and it was worth the effort to publish a combined wall map of all of Holland and West Friesland. The project was carried out by Balthasar Florisz. and his brother Frans Florisz. (their father Floris had since died). In the spring of 1620, Van Berckenrode obtained a nine-year charter to assemble the map, and that same year he delivered twelve impressions to the states of Holland.¹²³ Unfortunately, no copies of these proofs have survived.

Due to financial difficulties, Van Berckenrode was forced to sell the copperplates and the rights to the map to Willem Jansz. Blaeu in 1621. Blaeu was not satisfied with certain portions of the map and commissioned Van Berckenrode to remap a large area in the north of Holland.¹²⁴ The mapped image of the territories that fell outside the boundaries of the district water control boards was ultimately borrowed in large part from the maps by Joost Jansz. Bilhamer (portions of North Holland, South Holland, and Utrecht), Anthonius Adriaensz. Metius (Kop van Noord-Holland), and Lucas Jansz. Sinck (Beemster and Purmer).¹²⁵ Blaeu's edition of the map by Van Berckenrode has become world famous by its inclusion in three paintings by Jan Vermeer: *Officer and Laughing Girl* (ca. 1657), *Young Woman in Blue* (1662–64), and *The Love Letter* (ca. 1670).¹²⁶

The map by Van Berckenrode and Blaeu served as a model for the edition of the wall map of Holland and West Friesland published by Henricus Hondius in 1629, likewise drawn by Van Berckenrode.¹²⁷ Visscher published amended reprints of the Van Berckenrode–Blaeu map in 1637, 1651, and 1656 and between 1660 and 1682.¹²⁸ The 1637 edition by Claes Jansz. Visscher served, in turn, as a model for the forty-sheet map of Holland by Jacob Aertsz. Colom dating from 1639.¹²⁹ Around 1690, Nicolaas II Visscher created a new prototype, based on a compilation of regional maps: *Hollandiae comitatus*, with the orientation to the north.¹³⁰ This prototype defined the mapped image of Holland throughout the eighteenth century.

In Brabant, there was a changing frontier during the Eighty Years War. Only after 1648 was there a clear and permanent boundary between its northern and southern parts. Nevertheless, Michael Florent van Langren produced, even before that time, a map of Brabant in three parts: *Prima*, *Secunda*, and *Tertia pars Brabantiae*.¹³¹ The measurements must have been taken during the period

1627–30. The result was a wall map in four sheets, which appeared in 1635. Willem Jansz. Blaeu published an atlas map from it that same year. Shortly before that time, Blaeu had also published in his atlas a map of the Meierij van 's-Hertogenbosch (*Quarta pars Brabantiae cujus caput Sylvaducis*), drawn by Willebrordus van der Burght.¹³² The maps of Brabant and the Meierij were the only general maps of North Brabant up to the end of the eighteenth century and were often copied in late seventeenth-century atlases. Mapmakers continued representing the old entity, the duchy of Brabant, for quite a long time.

For its general map, the province of Drenthe probably has coincidence to thank. As a province, it played no significant role in the governmental organization of the sixteenth and seventeenth centuries. In addition, the number of its inhabitants—and the level of commercial activity associated with it—was too small to justify the publication of a general map. However, Professor Cornelis Pijnacker traveled in the province from 1634 to 1636 in connection with some boundary litigation, which likely

122. For a summary of the history of this wall map, see Jan W. H. Werner, "The Van Berckenrode–Visscher Map of Holland: A Wallmap Recently Acquired by Amsterdam University Library," in *Theatrum Orbis Librorum: Liber Amicorum Presented to Nico Israel on the Occasion of his Seventieth Birthday*, ed. Ton Croiset van Uchelen, Koert van der Horst, and Günter Schilder (Utrecht: HES, 1989), 105–23; MCN, 5:295–332 and facsimiles 7.1–7.11 and 8.1–8.19; and Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 36–48, and 221–28.

123. MCN, 5:300.

124. MCN, 5:300–305. Two copies of the Blaeu version are known: one mounted copy is located in the Westfries Museum, Hoorn, while an incomplete copy of the map in loose sheets—without text description—is in the collection of the Universiteitsbibliotheek, Leiden.

125. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 40–41 and 221–24.

126. *De soldaat en het lachende meisje* is located in New York (Frick Collection) and the *Lezende vrouw in het blauw* and *De liefdesbrief* in Amsterdam (Rijksmuseum). See MCN, 5:306–7; James A. Welu, "Vermeer: His Cartographic Sources," *Art Bulletin* 57 (1975): 529–47; idem, "Vermeer and Cartography," 2 vols. (Ph.D. diss., Boston University, 1977); idem, "The Map in Vermeer's *Art of Painting*," *Imago Mundi* 30 (1978): 9–30; and plate 52 in this volume.

127. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 42–43, and 233–37, and MCN, 5:307–13.

128. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 43–48 and 224–26, and MCN, 5:313–23 and facsimiles 8.1–8.18.

129. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 276–83, and A. J. Kölker, "Jacob Aertsz. Colom, Amsterdams uitgever," in *Jacob Aertsz. Colom's kaart van Holland 1639: Reproductie van de eerste uitgave*, ed. A. J. Kölker and A. H. Sijmons (Alphen aan den Rijn: Canaletto, 1979), 13–23. Later editions of this map followed in 1647, 1661, 1681 (two), after 1721, and after 1726.

130. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 49–53 and 342–47.

131. See Koeman, *Geschiedenis*, 64 and 103.

132. See S. J. Fockema Andreae and Bert van 't Hoff, *Geschiedenis der kartografie van Nederland van den Romeinschen tijd tot het midden van de 19^e eeuw* (The Hague: Martinus Nijhoff, 1947), 45, and Koeman, *Geschiedenis*, 103.

induced him to draw a map of Drenthe (including the Groningse Westerwolde) in 1634.¹³³ This map was published for the first time in 1636 by Johannes Janssonius. Copies were made by various publishers until well into the eighteenth century.

Mercator's map of Flanders (1540) had served as the model for the province for many generations of mapmakers. This model was replaced shortly before 1638, when a multisheet map of Flanders was published simultaneously by Henricus Hondius in Amsterdam and Alexander Serhanders in Ghent.¹³⁴ Willem Jansz. Blaeu relied greatly on it for his six-sheet wall map of Flanders in 1638.¹³⁵ The copperplates of the wall map of Flanders must have enjoyed various reprintings, because it appeared in numerous publishers' catalogs by Blaeu's son Joan up until 1672, the year of the devastating fire in Blaeu's workshop.

Gelderland is unique among the provinces of the Low Countries in that it is the only one for which Christiaan Sgrooten published a printed general map. The successor to this map, the general map of Gelderland by Nicolaas van Geelkercken from 1638, has the same map image.¹³⁶ He produced the map as part of the *Historia Gelria*, the historical and geographical description of Gelderland, which came into being under the direction of Johann Isaaksz. Pontanus in 1639. Van Geelkercken did extensive surveying for his map. In addition to a general map, this work also yielded maps of the four regions that make up Gelderland. Copies of the general map appeared in the form of four-sheet wall maps by Nicolaas I Visscher, Cornelis Danckerts, Hugo Allard, and the Covens & Mortier firm, successively.¹³⁷

Michael Florent van Langren took up the mapping of the duchy of Luxembourg, in addition to his previously mentioned mapping of Brabant. The resulting four-sheet map was published in Brussels in 1644 and determined the cartographic image of Luxembourg for many years.¹³⁸ In 1671 or 1672, there followed a reprinting in which several decorative crests were added and a portion of the masthead disappeared. There were no alterations to the content of the map.

A four-sheet general map of the province of Overijssel appeared in 1650, in the context of boundary litigation between Drenthe, on one side, and Groningen and Overijssel, on the other.¹³⁹ In 1639, the states of Overijssel gave the commission for new mapping to Nicolaas Ten Have, vice-rector of the Latin School in Zwolle. Reductions of the map at a scale of 1:200,000 appeared in many contemporary atlases beginning in 1652. The Deventer publisher Jan de Lat published a reprinting as late as 1743 with only a few, small changes.

Among the province maps by Jacob van Deventer, his map of Zeeland is the one that was in use for the longest period of time. It was not until 1654–55 that it was su-

perseded by the monumental wall map *Zelandia comitatus novissima tabula*, drawn by Zacharias Roman and published by Nicolaas I Visscher in nine sheets.¹⁴⁰ Its scale of 1:40,000 can be considered quite large for the time. Due to a lack of detailed triangulation, the waterways of Zeeland were depicted too narrowly throughout the map. The map by Roman and Visscher was reprinted in 1656, 1680, and about 1730. There are also many copies, including one made abroad in Le Rouge in 1748. With this last-mentioned map of Zeeland, every province in the Republic of the Seven United Low Countries had its own modern, nonmilitary general map, and the role of Jacob van Deventer had become a prominent one in the history of the cartography of the Low Countries.

MILITARY MAPPING OF THE LOW COUNTRIES (TO CA. 1648)

Soon after the union of the seventeen provinces under Charles V (in 1543), the mapping of the Low Countries began with the production of strategic manuscript topographical maps surveyed by geographers loyal to the crown. These mapping projects of the Spanish government were ambitious, even at a European level. Reliable large- and medium-scale maps were available for virtually all regions and towns in the Low Countries.

Shortly afterward, the Seven United Provinces of the Low Countries began their long-term struggle for independence, which was accompanied by numerous military

133. See Huibert Antonie Poelman, "De kaart van Drenthe en Westerwolde door Corn. Pynacker d.a. 1634," *Nieuwe Drentsche Volksalmanak* 47 (1929): 44.

134. See MCN, 5:357–63, with a reconstruction of the lost map of Hondius and of the map of Serhanders, only a few sheets of which have survived, located in the BNF (Ge D 15507) and in Ghent, Rijksarchief. Serhanders made use of Hondius's atlas map sheets, adding his own address and commission.

135. The only known copy of this wall map is located in the collection of the Zeeuwsch Genootschap voor Wetenschappen, Middelburg. See MCN, 5:355–67 and facsimiles 10.1–10.9.

136. See J. J. Vredenberg-Alink, *Kaarten van Gelderland en de kwartieren: Proeve van een overzicht van gedrukte kaarten van Gelderland en de kwartieren vanaf het midden der zestiende eeuw tot circa 1850* (Arnhem: Vereniging 'Gelre,' 1975), 26 (no. 8) and 43 (no. 39a).

137. Vredenberg-Alink, *Kaarten van Gelderland*, 45–46 (no. 42a–e). However, the order in which the maps appeared is given incorrectly in this work.

138. Van der Vekene, *Les cartes géographiques du duché de Luxembourg*, 102–7 (figs. 2.16.a–2.16.b).

139. See J. C. H. de Groot, "Overijssels 'landtafereel' van de zeventiende eeuw: De oorspronkelijke kaart van Nicolaas ten Have, conrector van de Latijnse School te Zwolle en kartograaf van Overijssel," *Overijsselse Historische Bijdragen* 105 (1990): 61–83, and Koeman, *Geschiedenis*, 101.

140. See the bibliographical note by J. Grooten to the facsimile edition: Claes Janz. Visscher, *Visscher-Romankaart van Zeeland* (Alphen aan den Rijn: Canaletto, 1973).

operations. Large campaigns and sieges took place, and cities acquired new fortifications. Obviously these developments required large-scale military cartographic representations, including news maps, maps of fortifications, and military topographical maps. Many topographical town maps and atlases with manuscript maps of fortifications also served as décor for various noble residences. Finally, technical drawings were used in the planning of, decision making for, and building of fortifications.¹⁴¹

MILITARY MAPPING ORDERED BY THE SPANISH CROWN

Geographers in the service of Spain, such as Jacob van Deventer, Christiaan Sgrooten, and Joost Jansz. Bilhamer, provided the earliest military topographical maps of cities and provinces in the Low Countries. Dozens of Italian engineers also went to the Low Countries to apply their well-known expertise to the building of fortifications. These engineers used numerous drawings, which ultimately ended up in Spain or in Italy. Commissioned by Spanish generals, including Caspar de Robles, they also produced many architectural plans for town fortifications during military campaigns.

The Earliest Town Mapping

Jacob van Deventer went to the University of Louvain in 1520 and returned to live in the Northern Provinces for only a short period.¹⁴² However, he was the first to draw an accurate plan of his native city, Kampen, as one of the 260 semimilitary town plans ordered by Philip II. After 1543, Van Deventer held the title of geographer to the Emperor Charles V and, after 1555, to Philip II as well. Contemporaries called him *grandissimo geografo*.¹⁴³ After August 1548, Van Deventer signed archival documents, such as receipts, “Jacob van Deventer, geographer to His Catholic Imperial Majesty acknowledges the receipt of . . .” As far as we know, at that time he was the only mapmaker in the Low Countries allowed to call himself “geographer to the emperor.” Later, in 1557, Christiaan Sgrooten was appointed as geographer to Philip II. Both Van Deventer and Sgrooten received an annual salary as well as allowances for expenditures in the field.¹⁴⁴ The services the king required from his geographer can best be described as follows: to be His Majesty’s royal geographer all by himself, surveying and drawing, alone, both large-scale and small-scale regional maps for administrative and military purposes.

In or shortly before 1558, Van Deventer was commissioned by the king to measure and draw all the towns in the Low Countries as well as the rivers and villages in the neighborhood, the access roads or districts, and the defense lines, and “to arrange all in one book that shall contain a map of each province followed by a plan of each town in particular.”¹⁴⁵ Expressed in modern terms, what

the king was requesting was a complete set of plans of towns in the Low Countries, each set in the context of its surrounding topography on a topographical map of each province.

Van Deventer fulfilled the first order, and most of his town plans have been preserved (fig. 43.15).¹⁴⁶ In some cases, both the original plot (*minuut*) and the fair-drawn

141. For a detailed classification of military-topographical representations, see Charles van den Heuvel, “*Papieren bolwercken*”: *De introductie van de Italiaanse stede- en vestingbouw in de Nederlanden (1540–1609) en het gebruik van tekeningen* (Alphen aan den Rijn: Canaletto, 1991).

142. De Vries claims that Van Deventer lived in the Dutch city of Dordrecht for a time following his studies (“Official Cartography,” 28). That was probably before 1542. He drew another map of Dordrecht in 1544 or 1545, commissioned by the city government. Only one copy of this map, made in 1674, has survived. See Koeman and Visser, *De stadsplattegronden van Jacob van Deventer*. On Van Deventer and his work, see Van ’t Hoff, *Jacob van Deventer*; Antoine De Smet, “De plaats van Jacob van Deventer in de cartografie van de 16^{de} eeuw,” *De Gulden Passer* 61–63 (1983–85): 461–82; and Karrow, *Mapmakers of the Sixteenth Century*, 142–58.

143. Lodovico Guicciardini, on the verso of an engraving of the town of Deventer in his *Descrittione di tutti i Paesi Bassi* (Antwerp: Guglielmus Silvius, 1567).

144. See, for example, the royal order dated 29 May 1559 given by the king at Brussels (Van ’t Hoff, *Jacob van Deventer*, 35–36): “The King, being informed that Mr. Jacob van Deventer, His geographer, was not paid his annual salary of 200 florins, accorded him by the Mechelen-invoice, and wishing that he shall be paid every year . . . orders that the salary and allowances . . . be paid off.”

145. Brussels, Algemeen Rijksarchief. See Van ’t Hoff, *Jacob van Deventer*, 36.

146. All 223 preserved maps (*minuten*, or plots, and *nettekeningen*, or fair-drawn copies) by Jacob van Deventer are currently being reproduced photographically at their actual size in the series by Koeman and Visser, *De stadsplattegronden van Jacob van Deventer*. Meanwhile, the maps of towns in the northern Low Countries and Germany have appeared in facsimile at their actual size, published with explanations by the present-day province. An atlas was also published in 1995 with smaller versions of the maps of the northern Low Countries, including legends for the towns illustrated: J. C. Visser, *Door Jacob van Deventer in kaart gebracht: Kleine atlas van de Nederlandse steden in de zestiende eeuw* (Weesp: Robas BV, 1995).

Lithographed reproductions of the Belgian town maps had already appeared in 1884, in *Atlas des villes de la Belgique au XVI^e siècle: Cent plans du géographe Jacques de Deventer*, 24 pts. in 4 vols., ed. C. Rue-lens, É. Ouverleaux, and Joseph van den Gheyn (Brussels, 1884–1924). The first lithographed reproductions of towns in the Low Countries were published by R. Fruin in *Nederlandse steden in de 16^e eeuw: Plattegronden van Jacob van Deventer. 111 tekeningen en 97 cartons in facsimile uitgegeven* (The Hague: Martinus Nijhoff, 1916–23).

In many cases, the maps by Jacob van Deventer provide the oldest, best-preserved illustrations of Dutch towns of the time. Modern cartobibliographies of these towns thus almost always begin with a description and illustration of Van Deventer’s map. See, for example, the series *Historische plattegronden van Nederlandse steden*. This series sketches the development of various towns in the Low Countries with reference to maps. The towns that have been featured up to now include Amsterdam, Rotterdam, Utrecht, Batavia, Haarlem, Leiden, and the towns of Holland’s Noorderkwartier, Gelderland (Rivierengebied and Veluwe), and northwest Overijssel.



FIG. 43.15. REFERENCE MAP OF CITIES MAPPED BY JACOB VAN DEVENTER.
 Based on C. Koeman and J. C. Visser, *De stadsplattegronden van Jacob van Deventer* (Landsmeer: Robas, 1992-).

copy (*netkaart*) intended for the eyes of the king have survived. Although 223 towns are represented, two neighboring towns are sometimes drawn on a single map, and the total number of maps is 213; of these, 114 have survived with both the original as well as the fair-drawn copy. Added to the fair-drawn copy, there is almost always a smaller inset—called a *carton* in the older literature—depicting the densely built-up portion of the town. Such insets identify specific buildings and the fortifications. Thus, for a large number of the towns mapped by Van Deventer, there are two overall plans and one detailed plan available, which are identical in design but may vary in the details. No trace has been found of the province maps that were to accompany the town plans. In 1572, Sgrooten obtained an order to perform measurements for a topographic map of the Low Countries. This would seem to provide evidence that the topographic maps ordered from Van Deventer were never produced.

The enormous task of surveying all of the towns in the Low Countries was completed within approximately twelve years. Remarkably, Van Deventer adopted a liberal interpretation of his orders. Thus, some settlements, such as Beverwijk, Grootebroek, and Hindeloopen, which had been favored with certain town privileges for more than a century despite the fact that they did not have walls and could not strictly be regarded as constituting towns, were mapped. Van Deventer was provided with letters of recommendation to the magistrates and obtained field assistance from local citizens. Presumably as a result of the burdens of age—he was nearly seventy—he was slow in completing the fair drawings. In 1572, due to the political upheaval caused by the arbitrary imposition of taxes by Spain's general, the duke of Alba, Van Deventer had to move to the city of Cologne, where he stayed until the end of his life. Just after his death in 1575, three volumes with fair-drawn town plans—all unsigned, supplemented by outline plans of the town's defense works and public buildings—and some of the original plots were impounded by the Spanish administration and later, after 1577, sent to Madrid. Two of the three volumes have been preserved, but the third volume, comprising the plans of thirty-six towns in the Southern Provinces, is missing.¹⁴⁷ The majority of the original plots on which the fair drawings were based were kept at Mechelen by Barbara Smets, a companion of Van Deventer with whom he had stayed since 1540.¹⁴⁸ By some unknown route, this set of loose plots reappeared almost three centuries later, in 1859.¹⁴⁹

All of the towns were plotted at about the same scale, 1:8000, and drawn in a uniform style (plate 49). They are all plans with structures in oblique parallel projection, are geometrically accurate, and contain no scale distortion. The specific buildings and fortifications were drawn vertically, which was fairly common in the first half of the sixteenth century. Van Deventer illustrated specific buildings,

including cathedrals in the towns, as realistically as possible (fig. 43.16). The unsigned plots give a clear impression of Van Deventer's method of surveying. He measured polygonic tracks along roads and streets, counting steps and taking sights with a compass.¹⁵⁰ A scale was shown in most of the plans, for instance, "500 paces of five feet," referring to a line 8.6 or 8.7 centimeters in length. One pace comprised two steps of approximately 75 centimeters (two and a half feet) each. A thousand (*mille*) paces was considered a mile. In some cases, Van Deventer also made use of older measurements and mapping. The oldest mapping—perhaps with later additions—was done of the

147. Madrid, Biblioteca Nacional, Manuscritos Reserve 200 and 207. On Van Deventer's maps in Madrid, see H. P. Deys, "De stadsplattegronden van Jacob van Deventer: Resultaten van recent onderzoek te Madrid," *Caert-Thresoor* 8 (1989): 81–95.

148. In a letter dated 23 November 1575 by Vigilius van Aytta, president of the king's council at Brussels (the same person whose large map collection is mentioned in Bagrow, "Old Inventories of Maps," 18) to Jacobus Hopper, representative of the Low Countries at the court at Madrid, notice is given of the set of manuscript plots kept "by a female in Mechelen, the housewife or mistress of Van Deventer," and, Van Aytta continues, "I have taken the trouble to try to obtain the plots, promising her a reward . . . and His Majesty will, as I hope, have no objections to pay." See Van 't Hoff, *Jacob van Deventer*, 47.

149. They appeared in a sale at the auction house of the Messrs. Nijhoff at The Hague. On 11 April 1859, a collection of 152 maps from the estate of François van Aerssen was offered for sale, described as follows: "Fragments of old maps of parts of Zeeland, Flanders, also North and South Holland and Friesland, plans of cities in these regions, etc. etc. All drawn and colored in the sixteenth century." The new owner was the Amsterdam antiquarian Frederik Muller, who in turn sold them in 1865 to Wopke Eekhoff, archivist of Leeuwarden in Friesland. Eekhoff recognized them as the town maps by Jacob van Deventer, described in the literature. See Frederik Muller, "De oorspronkelijke plantekeningen van 152 noord- en zuidnederlandsche steden, omstreeks 1550 door Jacob van Deventer geteekend, teruggevonden," *W. Eekhoff*, "Jacobus van Deventer, vervaardiger van de oudste kaarten van de Nederlandsche en Belgische provinciën en steden," and G. P. Roos, "Jacobus van Deventer," all in *De Navorscher* 16 (1866): 193–96, 225–28, and 289–90. The first two articles were reprinted in *Acta Cartographica* 2 (1968): 437–40, and 1 (1967): 33–36, respectively. Thanks to Eekhoff, almost all plot maps found a permanent home in state archives in the provinces of the Netherlands and in the Royal Library of Belgium in Brussels. The plot maps of the Frisian towns, however, are in the collection of the Friesch Genootschap, with the exception of the map of Leeuwarden; this map is located in the local city archives. Since 1866, sixteen plot maps either have been lost or their location is unknown: maps of Appingedam, Geervliet, and fourteen of the towns in Zeeland. The plot map of Middelburg in Flanders surfaced in 1994. It appeared to have been in the collection of the Rijksarchief in Ghent. About this find, see H. A. M. van der Heijden, "De minuutkaart van Middelburg in Vlaanderen van Jacob van Deventer teruggevonden," *Caert-Thresoor* 15 (1996): 107–8.

It was not until 1884 that two volumes with town maps in the Biblioteca Nacional in Madrid were identified as two of the three volumes of the atlas with the fair-drawn maps that Van Deventer had made in Keulen in 1575. The first volume, unfortunately, appears to have been lost.

150. On Van Deventer's method of surveying, see Pouls, *De landmeter*, 120–22.

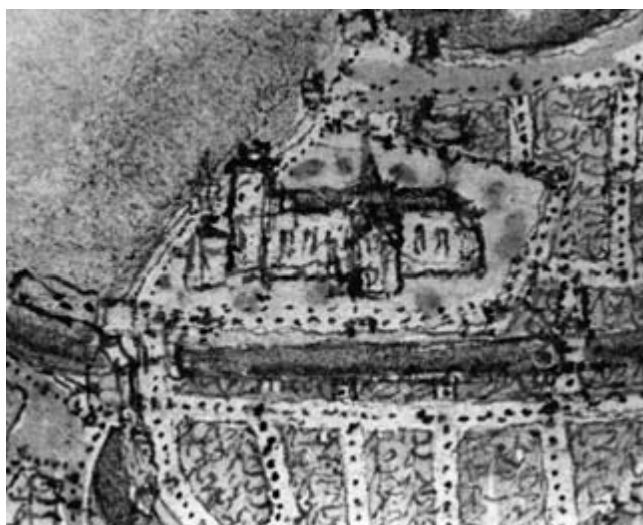


FIG. 43.16. DETAIL FROM THE TOWN PLAN OF DORDRECHT BY JACOB VAN DEVENTER, CA. 1560.

Size of the entire original: 41.5 × 47.5 cm. Photograph courtesy of the Nationaal Archief, The Hague (4.DEF, inv. nr. 1.2).

large towns in Brabant by Van Deventer himself in the early 1550s. After receiving his formal commission, Van Deventer traveled successively through Zeeland, Gelderland, Holland, Friesland, and Groningen and farther south. He did the mapping in Flanders last.¹⁵¹

It would be impossible for one person to survey 260 towns and depict every house. Consequently, in Van Deventer's plans he selectively depicted streets, canals, defense walls, windmills, public buildings, churches, and monasteries. Outside the town walls, he showed roads, waterways, and dispersed settlements. Marshy, wet terrain was distinguished from passable ground by the use of different colors. It is clear from their uniformity of scale and cartographic signs and from their selected topography that, in accordance with the king's instructions, these plans were drawn as military plans. Given the uniform capacity of guns, the value of plans at the same scale for an army, especially its artillery, is obvious. This is the earliest example of a collection of maps of walled towns within the Spanish-Habsburg empire. However, Van Deventer's plans were produced too late to assist the Spanish in quelling the rebellions in the towns.

Several plans in Georg Braun and Frans Hogenberg's *Civitates orbis terrarum* (1572–1618) were copied from Van Deventer's originals.¹⁵² It can be assumed that the maps were copied in Cologne, where the engraver Hogenberg, also living in exile, met Van Deventer.

Regional Military Mapping

Apparently Charles V's need for reliable topographical information in map form was not sufficiently met, despite

Van Deventer's efforts. After 1555, when Philip II succeeded Charles V as king of the Seventeen Provinces of the Low Countries, the mapmaker Christiaan Sgrooten was appointed as the king's geographer in a letter dated 2 December 1557:¹⁵³ "As our beloved Christiaan Sgrooten recently has made with great cost and labor the maps of the Veluwe [a region in the province of Gelderland] for which we want to reward him and further want to keep him in our service to employ him in similar matter . . . [we grant] him an annual support and pension of six *stuvers brabant*s a day."¹⁵⁴

Sgrooten was born about 1520 at Sonsbeck on the lower Rhine in the duchy of Cleve. After his education as a "master"—presumably also as a painter—he lived in Kalkar from 1548 on. After the uprising of the seven provinces in the north, the completion of a modern topographic map of the Low Countries became important, because the duke of Alba and his Spanish soldiers were not familiar with the infrastructure of the rebellious provinces. Armies had to move to besiege towns in Holland such as Haarlem, Alkmaar, and Leiden and to fight battles in Groningen and Brabant. Sgrooten received a commission from the duke of Alba in 1568. The newly appointed Spanish military chief of staff in the rebellious Low Countries asked for more than just a set of topographical maps of the Northern Provinces; he required maps of all the king's lands in Europe. This commission marked a new period in Sgrooten's career. Although he had been a paid geographer to the king since December 1557 and his commission was a lifelong task, he did not receive remuneration or permanent employment.

About six years later, around 1574, Sgrooten presented his work in the form of a manuscript atlas to the military commander at Brussels. To his disappointment, it was deemed lacking in detail, and he was asked to improve on it. The duke of Alba failed to specify a scale when he ordered "the description of the cities and the villages and

151. Koeman and Visser, *De stadsplattegronden van Jacob van Deventer*, introductions to the different parts.

152. Koeman and Visser, *De stadsplattegronden van Jacob van Deventer*, introductions to the different parts, and Peter H. Meurer, *Atlantes Coloniensis: Die Kölner Schule der Atlaskartographie 1570–1610* (Bad Neustadt a.d. Saale: Pfähler, 1988), 28–41.

153. On Sgrooten, see Rolf Kirmse, "Christian Sgrothen aus Sonsbeck, seiner Hispanischen Majestät Geograph," *Heimatkalendar Kreis Moers* 24 (1967): 17–41; idem, "Christian Sgrothen, seine Herkunft und seine Familie," *Heimatkalendar Kreis Moers* 28 (1971): 118–29; Karrow, *Mapmakers of the Sixteenth Century*, 480–94; Meurer, *Fontes cartographici Orteliani*, 237–40 and figs. 64–65; and Peter H. Meurer, *Die Manuskriptatlanten Christian Sgrootens* (Alphen an den Rijn: Canaletto, forthcoming).

154. Fernand van Ortruy, "Chrétien Sgrooten, cartographe, XVI^e siècle," *Annales de l'Académie Royal d'Archéologie de Belgique* 71 (1923): 150–306, esp. 274.

the countries of His Majesty, and of their boundary Limits.”¹⁵⁵ Sgrooten initially compiled a general map of the Low Countries at approximately 1:250,000 and the various maps of Germany, France, and other areas at a scale of approximately 1:400,000 or smaller. After the negative comments from Brussels, he improved on his map of the Low Countries merely by drawing another copy at a scale of 1:120,000, twice as large as the preceding one.

In 1592, the work came to an end. It was still not altogether to the satisfaction of Sgrooten’s superiors in Brussels. However, Sgrooten had produced a manuscript atlas composed of maps of excellent geometrical accuracy,¹⁵⁶ and a favorable opinion of his work was expressed as early as 1585 by Gerardus Mercator in the text on the verso of his atlas map of France when he referred to the mapmaker as “Sgrooten, who has traveled widely in France and who has mapped the country with greater precision than anyone before him.” Mercator had obviously seen the manuscript maps on which Sgrooten had worked at Kalkar.

In the preface to his work, dated December 1588, Sgrooten addressed himself to the king and suggested that he could enlarge the atlas with large-scale maps of the provinces in the Low Countries (see fig. 43.17 and table 43.1). His suggestion was accepted, and the payments were continued. In a supplementary preface, Sgrooten presented his amended work to the king. A comparison of these maps with Van Deventer’s province maps makes it clear that Sgrooten’s work was based on the geometric foundation laid by Van Deventer (plate 50). For repositories of Sgrooten’s maps, we depend on the collections of the rulers of the Spanish possessions in the Low Countries: the court at Brussels and the court at Madrid.¹⁵⁷

Sgrooten was one of the most aesthetically talented cartographers of the sixteenth century, of the same rank as Gerardus Mercator. In his maps, the graphic representation of topography reflects an understanding of the mor-

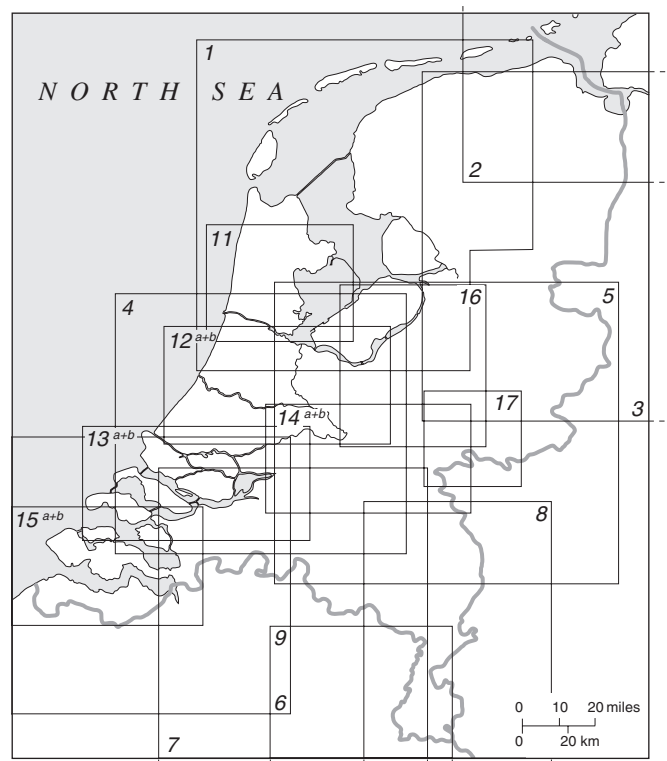


FIG. 43.17. REFERENCE MAP OF CHRISTIAAN SGROOTEN’S TOPOGRAPHICAL MAPS. See table 43.1 for the details of these maps.

Based on Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750: Handgetekende en gedrukte kaarten, aanwezig in de Nederlandse rijksarchieven* (Groningen: Wolters Noordhoff and Bouma’s Boekhuis, 1981), blw. III.

Unfortunately, the collection at Brussels of Viglius van Aytta, president of the king’s council, assembled in the period from about 1550 to 1575, has been lost; see E. H. Waterbolk, “Viglius of Aytta, Sixteenth Century Map Collector,” *Imago Mundi* 29 (1977): 45–48. A collection of maps of King Philip II at Madrid—if it ever existed—is never mentioned. Both the Koninklijke Bibliotheek and the library of the Escorial were explored by Wieder in 1914. His findings, published in 1915–16, are still a sourcebook for the study of Dutch cartography in Europe and in the overseas possessions; see F. C. Wieder, “Nederlandsche historisch-geographische documenten in Spanje: Uitkomsten van twee maanden onderzoek,” *Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap* 31 (1914): 693–724; 32 (1915): 1–34, 145–87, 285–318, 775–822, and second pagination 1–158; reprinted as *Nederlandsche historisch-geographische documenten in Spanje* (Leiden: Brill, 1915); also reprinted in *Acta Cartographica* 23 (1976): 115–464.

Among the king’s collections are the two bindings of town plans (previously mentioned) and a binding with manuscript maps of all the world’s countries drawn by Sgrooten. Once, there were two such bindings in the king’s library, but on a day in 1859, the archivist L. P. Gachard went home from a visit to Spain with the second Sgrooten atlas bought, as he said, from a friend of King Ferdinand VII; see Wieder, “Spanje,” 31. That was the binding with detailed manuscript topographical maps of the Low Countries and Germany. It is amazing that this private deal of 1859 involved property that had belonged to a royal library.

155. Van Ortoy, “Chrétien Sgrooten,” 290.

156. Donkersloot–De Vrij gives an overview of Sgrooten’s maps of the provinces of the Low Countries in *Topografische kaarten van Nederland vóór 1750*, 132–33.

157. The Sgrooten atlases in Madrid and Brussels contain, among other things, two sets of maps of the Low Countries at scales of approximately 1:230,000, and 1:120,000. The contents of the atlas in the Biblioteca Nacional at Madrid comprises thirty-eight maps of approximately 83 by 136 centimeters each. These include a world map in two hemispheres and maps of the Holy Land, northern Europe, Germany, Poland, Hungary, France, Belgium, Great Britain, and the Low Countries (which are represented twice). The atlas in the Royal Library of Belgium, Brussels, contains thirty-seven maps of approximately 58 by 100 centimeters each. These include three nautical charts of the North Sea and Zuiderzee; detailed topographical maps of the Low Countries; similar maps of the Belgian and west German provinces; and maps of south Germany, Austria, and northern Italy. Both atlases are illuminated in a most exuberant style. See Koeman, *Gewestkaarten van de Nederlanden*, 17–18.

TABLE 43.1 Christiaan Sgrooten's Topographical Maps of the Low Countries, 1568–1573

Number	Region Shown	Size and Scale
1	Zuiderzee and Waddenzee, North Holland, Friesland, and the coast of Gelderland	60 × 54.5 cm, ca. 1:200,000
2	Groningen, estuary of the Eems, Ost-Friesland (East Friesland), Jahde, Waddeneilanden from Schiermonnikoog to Wangeroog	56 × 59.5 cm, ca. 1:200,000
3	Overijssel, Drenthe, southeastern part of Groningen, Dollart	57 × 59 cm, ca. 1:200,000
4	Southern part of North Holland, South Holland, Utrecht, western part of Gelderland, northeastern part of Zeeland, northwestern part of North Brabant	46.5 × 53 cm, ca. 1:200,000
5	Gelderland and Cleves	53 × 56 cm, ca. 1:200,000
6	Islands of South Holland, Zeeland, western part of North Brabant, Zeeuws Vlaanderen (Dutch Flanders)	54 × 56.5 cm, ca. 1:200,000
7	Duchy of Brabant	60 × 57.5 cm, ca. 1:200,000
8	Area between the Meuse and the Rhine rivers, Limburg, Jülich, Cologne	59.5 × 58 cm, ca. 1:200,000
9	Diocese (Bishopric) of Liège	56.5 × 50 cm, ca. 1:200,000
[10]	Ardennes, Luxembourg, Namen (Namur) (not shown on fig. 43.17)	
11	North Holland	59 × 115 cm, ca. 1:80,000
12 a + b	Holland between Amsterdam/Haarlem, Delft/Gouda, and Utrecht	59.5 × 114.5 cm, ca. 1:80,000
13 a + b	South Holland to the south of Delft, Hollandsche IJssel River, estuary of the Rhine and Meuse, Schouwen-Duiveland, northwest North Brabant	58.5 × 97 cm, ca. 1:80,000
14 a + b	Area of the Meuse River, the Rhine, Lek, Betuwe and surroundings	59 × 97 cm, ca. 1:80,000
15 a + b	Zeeland, Ooster- and Westerschelde (eastern and western Scheldt), Zeeuws Vlaanderen (Dutch Flanders) (original title: <i>Descriptio exactissima effluxus Schaldis . . . Walachria, Zuijdt Bevelandiae . . .</i>)	113 × 58.5 cm, ca. 1:80,000
16	Veluwe	59.5 × 48 cm, ca. 1:120,000
17	County of Bergh and surroundings (Liemers, etc.)	58 × 58.5 cm, ca. 1:80,000

Source: Derived from Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750: Handgetekende en gedrukte kaarten, aanwezig in de Nederlandse rijksarchieven* (Groningen: Wolters-Noordhoff and Bouma's Boekhuis, 1981), 132 and blw. III. See figure 43.17.

phology of the land. Thus, he most successfully rendered a landscape with rivers, canals, polders, and small villages. Similarly, he superbly expressed the morphology of mountainous and forested terrain. A closer examination of his maps reveals the manner in which he miniaturized walled towns and rural villages, recognizable by the characteristic shape of their church towers. Every small settlement was stylistically integrated into the general style of the map. It is incomprehensible that the duke of Alba would be displeased with this magnificent cartography. A comparison of Sgrooten with his predecessor Van Deventer demonstrates that Sgrooten was a much more talented cartographer. Van Deventer may have had superior land surveying skills and greater efficiency in the straightforward plotting of his surveys, but his representation of landscape fell short of the work of Sgrooten in character and elegance.¹⁵⁸

Unfortunately, the majority of Sgrooten's work has not been made public. This is also in contrast to Van Deventer's manuscript town plans and printed province maps,

which were copied by contemporary engravers. Sgrooten's manuscript maps, made for the king of Spain, had no effect on the development of contemporary cartography. Around 1592, his maps were locked up in the royal cabinet and were not recognized as important until three centuries later. Sgrooten's manuscript atlas of all of Spain's lands in Europe was the last state-organized mapping of the whole of the country until the triangulation of the Bataafsche Republiek, ordered in 1798.

158. A complete facsimile reproduction of Sgrooten's great atlases is: Peter H. Meurer, *Die Manuskriptatlanten Christian Sgrootens* (Alphen an den Rijn: Canaletto, forthcoming). The maps of the Low Countries and of Germany have been reproduced in black and white: S. J. Fockema Andreae and Bert van 't Hoff, *Christiaan Sgrooten's kaarten van de Nederlanden in reproductie uitgegeven onder auspiciën van het Koninklijk Nederlandsch Aardrijkskundig Genootschap* (Leiden: Brill, 1961). See also Hans Mortensen and Arend W. Lang, eds., *Die Karten deutscher Länder im Brüsseler Atlas des Christian s'Grooten (1573)*, 2 vols. (Göttingen: Vandenhoeck & Ruprecht, 1959).

Another sixteenth-century producer of regional maps in the Low Countries was Joost Jansz. Bilhamer of Amsterdam, sometimes called Beeldsnijder. He made his name as a woodcutter, architect, and cartographer. Bilhamer was one of the few Dutch engineers among a large group of Italian tradesmen working for the Spanish crown. Several manuscript maps from his hand are known.¹⁵⁹

After the outbreak of a rebellion in 1567, the Northern Provinces were enemy territory for the Spanish troops. Because the main elements of the communication system were rivers and lakes, the Spanish urgently needed a complete picture of that complicated system. In 1571, the duke of Alba ordered Bilhamer, the municipal architect of Amsterdam at that time, to provide him with a detailed topographical map of the northern part of the province of Holland. The duke's order, with its specifications, has been preserved in the text of Pontanus's chronicle of Amsterdam of 1614:

Mr. Joost Jansz., engraver, also an inhabitant and resident of the town, famous for his many works of art. He was not only famous as an engraver, but also possessed a natural gift to depict lands, towns, rivers, and waters according the properties of the geography. Among his works is a map which about the year 1571 was ordered by the Duke of Alba, whose intention was to bring to obedience the northern part of Holland, for which he wished Joost Jansz. to show him on a map the whole area, with the district of Waterland; what Joost accomplished; and what is considered as correct and fine. Because not only towns, villages, churches, but also lands, streams, waters, dikes, roads, locks, etc., are depicted true to life. I have seen this map, which has recently been engraved and printed in Amsterdam.¹⁶⁰

The manuscript map that Pontanus saw has not been preserved, and no copy is known of the first printed edition of the map of 1575. Only the 1608 publication by the Amsterdam printer Harmen Allertsz. van Warmenhuysen has survived (fig. 43.18). This printed map is signed "Anno 1575, dd. 31st July completed and published by me Joost Janso[on]."¹⁶¹ The author, who used as his mark a builder's hammer (fig. 43.19), often signed as Joost Jansz. Beeldsnijder (meaning engraver, "picture cutter") but sometimes as *landmeter* (meaning land surveyor). Six copies are known of the printed map, two of which have a decorative border that was engraved by Claes Jansz. Visscher.¹⁶² All of these copies have as an imprint a dedication to the states of North Holland and West Friesland by the printer Harmen Allertsz. van Warmenhuysen. The two copies with a decorative border and text have the imprint "Tot Amsterdam, Ghedrukt by Herman Allertz. Koster van die Nieuwkerck. Anno M.D.C.VIII [i.e., 1608]." At the bottom of the map, the text of the privilege granted by the representative of Philip II is recorded: "By Royal Majesties Privilege accorded Joost Jansz. Beeldsnijder at Amsterdam that no-

body is allowed to counterfeit, print, or sell within three years from now without special permission of Joost Jansz. this map of North Holland, at forfeiture of all such maps and three karolus guilders, as explained in detail in the privilege granted to him at Antwerp. Signed Louys de Requesen and also Secretary Betij."

At this time, Joost Jansz. Bilhamer was in the service of the municipality of Amsterdam. Before 1578, the year when Amsterdam's magistrate changed to the opposition party, he rendered services to the military engineers of the Spanish army. On his map of North Holland, he gave the names of the entrenchments in front of the city of Leiden in Spanish. After 1578, he gave similar support and advice to the city of Amsterdam in its defense against the Spanish troops.

Bilhamer's map of North Holland is unique in its representation of the road and waterway systems. Although paved roads did not exist at that time, he drew with a double line all the dikes accessible to pedestrians and traffic. The scale of the map, about 1:100,000, is still today the preferable scale for tourists' maps in the Netherlands. The map resembles Christiaan Sgrooten's map of North Holland. The two men would have met each other and spoken in consultation with their Spanish superiors. But there is more than a resemblance: the scales are the same, and the northern and southern limits of both maps coincide exactly. Further, the east-west limits are the same, and the outline of North Holland (an outline readily misinterpreted due to unstable relations between land and sea) is identical. On Bilhamer's map, villages are marked by their churches, but names of minor places and names of land and water bodies are given by number and explained in a legend. Given the large number of names of land and water features, Harmen Allertsz., the printer, justly labeled his reprint a "land and water map."

The decorative border of Bilhamer's map was reprinted once more in 1620 by the Amsterdam engraver and art-

159. See the biographical note accompanying the facsimile editions of the map of North Holland in A. J. Kölker, *De kaart van Holland door Joost Jansz.* (Haarlem, 1971), and Jan W. H. Werner, ed., *Kaart van Noord-Holland door Joost Jansz. Beeldsnijder, 1575/1608* (Alphen aan den Rijn: Canaletto/Repro-Holland, 2002).

160. Johannes Isacius Pontanus, *Historische beschrijvinghe der seer wijt beroemde coop-stadt Amsterdam* (Amsterdam: Ghedruckt by Iudocum Hondium, 1614), 287.

161. On this map, see Kölker, *De kaart van Holland*; Werner, *Kaart van Noord-Holland*; and MCN, 5:291–95.

162. The Universiteitsbibliotheek, Amsterdam, and the Westfries Museum, Hoorn, contain a map by Joost Jansz., published by Van Warmenhuysen, including a decorative frame with a detailed text. The frame and text are missing from the copies in the Nationaal Archief in The Hague, the Universiteitsbibliotheek in Leiden, and the Rijksprentenkabinet and the Koninklijke Academie voor Wetenschappen in Amsterdam. On the illustrations by Claes Jansz. Visscher in the decorative frame, see Christiaan Schuckman, *Claes Jansz. Visscher to Claes Jansz. Visscher II* (Roosendaal: Koninklijke Van de Poll, 1991), and Nalis, *Van Doetecum Family*, pt. 1, 95–98 and 115–17.

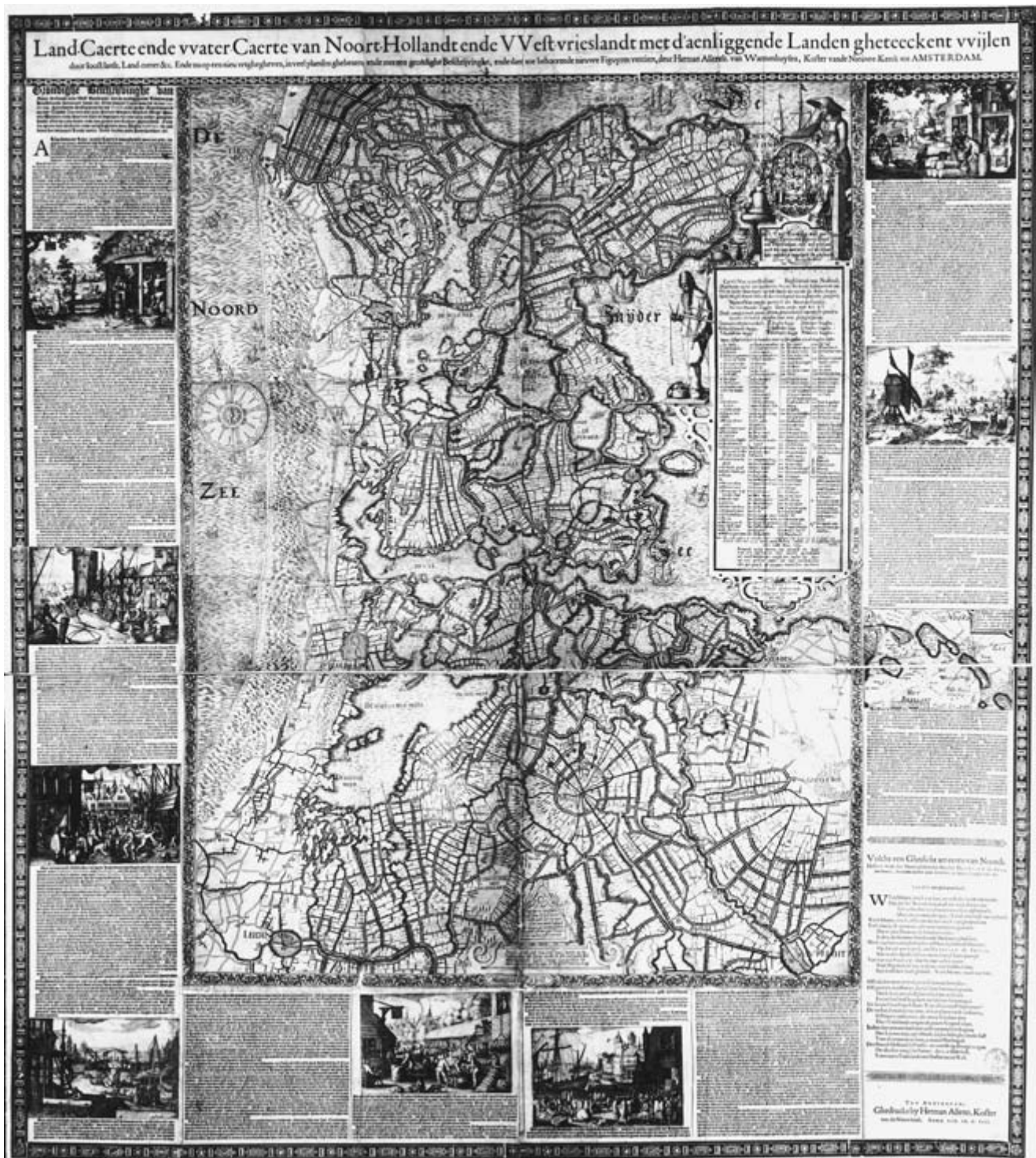


FIG. 43.18. 1608 WALL MAP OF NORTH HOLLAND AND WEST FRIESLAND, REPRINTED FROM THE ORIGINAL BY JOOST JANSZ. BILHAMER, 1575. In six sheets.

Size of the original: 116.5 × 103.5 cm. Photograph courtesy of the Universiteitsbibliotheek Amsterdam (W.X).

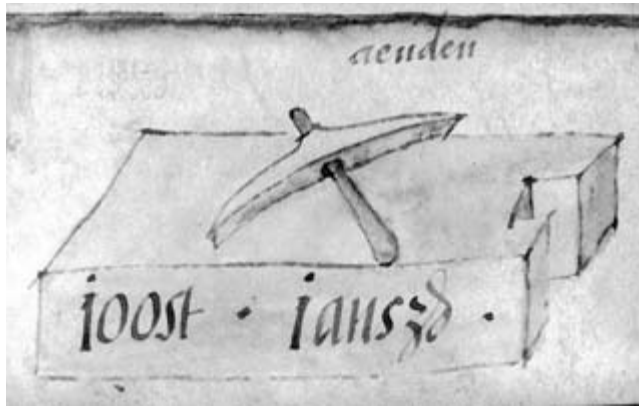


FIG. 43.19. PRINTER'S MARK OF JOOST JANSZ. BILHAMER. From the *Kaartboek het Gasthuis*, 1583. Photograph courtesy of the Gemeentearchief, Amsterdam.

seller François van den Hoeye. The surrounding text was newly set, and a poem to Hadrianus Junius was replaced by a description and map of Beemster, which had been diked in during the interim.¹⁶³ One last unique aspect of the map should be mentioned: it was reengraved in 1778 with the intention of demonstrating how early maps could contribute to a knowledge of historical geography.¹⁶⁴ This represents an early indication of the awakening of interest in that subject. Further, Bilhamer's map influenced the image of one of the maps in Christiaan Sgrooten's atlas, the folio map of Holland from 1608 by Willem Jansz. Blaeu, and the wall map of Balthasar Florisz. van Berckenrode.¹⁶⁵

Another map of the same period, also depicting the complicated system of waterways below sea level, is Hans Lieftrinck's manuscript map of Holland from 1578 (fig. 43.20).¹⁶⁶ Lieftrinck was employed by the town magistrates of Dordrecht, Gouda, and Haarlem to draw this map as a piece of evidence in a lawsuit against the town of Delft. The resemblance to the topography of the southern part of Bilhamer's map leads to the conclusion that in the period around 1570, a "master model" of the province of Holland was available to all who needed a basic configuration of the province's infrastructure. In the legend, Lieftrinck confirmed that he had copied from existing maps.

Italian Expertise in Military Mapping

In the sixteenth century, interest in the construction of defense systems noticeably increased in large parts of Europe. This was particularly true in the Italian states, although interest spread rapidly to neighboring countries. Given the superior knowledge and expertise of the Italian engineers in the building of fortifications, it is not surprising that there was a demand for them throughout Europe, including the Low Countries, where more and more Ital-

ian engineers offered their services over the course of the sixteenth century.¹⁶⁷ A total of approximately sixty Italian engineers ultimately worked in the Low Countries during the period from 1540 to 1609.¹⁶⁸ The first engineers were privately commissioned to work on the construction of castles. One of them, Alessandro Pasqualini, helped shortly after 1539 with the fortification of Buren, a small town in Gelre. The *fortificatiemeester* (master of fortifications) subsequently worked in various other cities in the Low Countries. The first Italian fortress builder in government service was Donato Boni di Pellizuoli. As head engineer to Charles V, he was responsible for the construction, maintenance, and repair of all fortifications. He inspected fortifications and plans made by other engineers. In addition, he produced designs, such as those for the strongholds of Ghent and Kamerrijk. Donato must have gained great fame as a fortress builder, because his design was selected for the walling in of Antwerp in 1540.

The number of military engineers working in the Low Countries in the second half of the sixteenth century was too small to supply all towns with fortifications where defense systems appeared necessary. But the influence of the Italian engineers was great, partly because the Dutch architects were under their supervision in the planning and construction of fortifications. These local Dutch experts were needed to lay the groundwork for the arrival of Italian engineers, because the defense systems used in Italy were only minimally appropriate for the geographical situation of the Low Countries. In addition, they became outdated quickly. Among the experienced military engineers was Giovanni Maria Olgiati, who traveled throughout the Low Countries in 1553 and 1554 and then left behind him a group of engineers prepared to modernize the fortifications according to the Italian system. Olgiati's contact with the chief engineer in the Low Countries,

163. See Günter Schilder, *Three World Maps by Francois van den Hoeye of 1661, Willem Janszoon (Blaeu) of 1607, Claes Janszoon Vischer of 1650* (Amsterdam: N. Israel, 1981), 7–8.

164. *Land- en waterkaert van Noord Holland* (Amsterdam: Yntema and Tieboel, 1778), engraved by J. van Jagen, with explanatory text, "Noodig berigt," by J. le Francq van Berkley. See Peter van der Krogt, *Advertenties voor kaarten, atlassen, globes e.d. in Amsterdamse kranten 1621–1811* (Utrecht: HES, 1985), 257–58 (no. 1391) and 264 (no. 1429).

165. Blonk and Blonk–van der Wijst, *Hollandia Comitatus*, 35–36.

166. Copy in Gouda, Streekarchief Midden Holland (2223 C 1). See C. W. Hesselink-Duursma, "De kaartencollectie in het Streekarchief Hollands Midden te Gouda," *Caert-Thresoor* 15 (1996): 99–104, and Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750*, 135.

167. For a comprehensive review of the influence of Italian town and fortress building on the building of fortifications in the Low Countries, see Van den Heuvel, "Papiere bolwercken." See also chapter 29 in this volume.

168. Van den Heuvel provides a description of each Italian engineer ("Papiere bolwercken," 149–59).



FIG. 43.20. MANUSCRIPT MAP OF SOUTH HOLLAND BY HANS LIEFRINCK, 1578.

Size of the original: 115 × 112 cm. Photograph courtesy of the Streekarchief Midden-Holland, Gouda (2223 C1).

Sebastiaan Van Noyen, must have been significant with regard to the practical application of Italian fortress-building methods (fig. 43.21).¹⁶⁹

With the arrival of the duke of Alba in 1567, a new group of Italian engineers went to the Low Countries who were specifically called in for the construction of fortresses. The duke of Alba preferred the Italian engineers over local builders, both in the planning and in the

execution of those plans. Under the Spanish commanders Alessandro Farnese and Ambrogio Spinola, the emphasis on fortress building gradually shifted toward temporary barricades in the field, and the tasks of the engineers changed along with it.

169. Van den Heuvel, "Papiere bolwercken," 27–29.

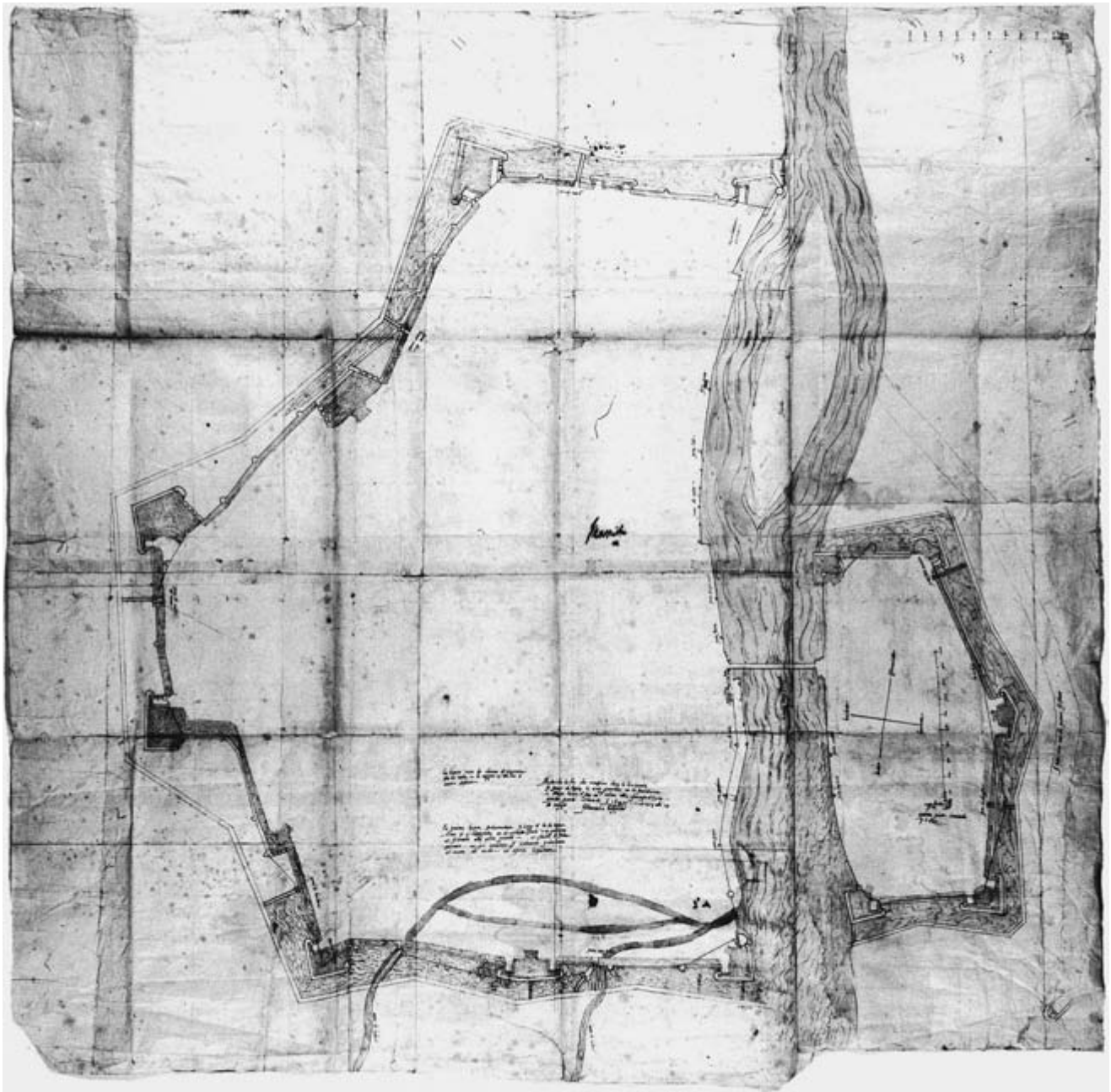


FIG. 43.21. GIOVANNI MARIA OLGATI, DRAWING OF MAASTRICHT, 1553. With advice on fortification by Olgiati. Size of the original: 98 × 114 cm. Photograph © Biblioteca

Apostolica Vaticana, Vatican City (Barb. Lat. 4391A, XLII [43]).

During the period when the Italian engineers were occupied in the Low Countries, they sent many depictions of military activity to their patrons in Spain and Italy. Drawings and models were a significant aid in the various phases of planning and construction of new fortifications. In addition to making these drawings, which were directly related to the construction of fortresses, the engineers depicted war events and technical military innovations in drawings that they sent to the Spanish and Ital-

ian courts. The best preserved illustrations, which include many maps, are found in Spanish and Italian collections.¹⁷⁰ These collections show great variety in the draw-

170. There are more than two hundred representations in all, which are primarily located in the Archivo General de Simancas; the Archivo de la Casa de los Duques de Alba, Madrid; the Archivo di Stato, Turin; the Biblioteca Nazionale, Turin; the Biblioteca Apostolica Vaticana, Vatican City; and the Biblioteca Nazionale, Florence. See Van den

ing of fortifications.¹⁷¹ Drawings of fortifications were frequently copied, and several groups of maps, copied from other drawings, were made into an atlas showing fortresses in the Northern and Southern Provinces at the end of the sixteenth century.¹⁷²

In addition to making atlases with manuscript maps, Italian engineers also made themselves useful in the area of mapping military operations. They drew maps during or after battles, campaigns, and sieges, and numerous beautifully colored maps of various sieges thus found their way to the Italian courts.¹⁷³ One example is the set of sixty-three manuscript maps of fortresses and areas of the Low Countries in two different volumes, probably copied from an (as yet) unknown atlas, which may have been produced on commission from the Spanish-Portuguese commander Caspar de Robles,¹⁷⁴ who was governor of Friesland, Groningen, and Ommelanden from 1573 to 1576.¹⁷⁵ These maps, probably drawn by Italian cartographers or engineers, concern mainly both large and small cities in Friesland. In addition to providing topographical information about sites, they also depict military activity during one of de Robles's battles in 1572. Moreover, there are fortress plans from larger towns elsewhere in the Low Countries, such as Deventer, Zwolle, Maastricht, Bergen op Zoom, Bruges, Halle, Cambrai, and Lille. These atlases were—in addition to being collectors' items—expressions of a military culture. Beyond that, they were personal status symbols reflecting a patron's knowledge of the European war theater and emphasizing the significance of his personal role or his relationship to someone else of significance (fig. 43.22).¹⁷⁶

The aspect of cartography on which the Italian engineers left their greatest mark concerns the use of drawings and models in the various phases of the planning and construction of fortifications. Fortress building was a complicated process, through which the engineer made drawings and models at each step. The first stage was the production of technical drawings to test one's idea and to make it clear to the foremen. Later, during the decision-making process, the drawings were used to inform patrons and to monitor the progress of activity. The cartographic representation was thus closely tied to a specific phase of planning or construction. After the initial sketches came studies, survey drawings, detail drawings, written and illustrated instructions, designs on paper and wood, illustrations of the process, and then the illustration of the final design. Copies were often made of these final illustrations for a variety of reasons, both decorative and informative.¹⁷⁷

By the end of the sixteenth century, Italian theories about military architecture had completely penetrated the Low Countries. In practice, however, the Italian fortress system had to be revised. Under the influence of Daniel Specklin¹⁷⁸ and Simon Stevin (fortress builders from Germany and the Low Countries, respectively), a fortification

system developed that was better suited to the specific geographical situation of the Low Countries. Italian theories played a more and more limited role in the formation of ideas about architecture and town structure, and most of the Italian engineers left the Low Countries even before the beginning of the Twelve Year Truce in 1609, when Spain and the northern Low Countries concluded a temporary cease-fire. As a result, surveyors and fortress builders of the Low Countries became more active.

Dutch Military Engineers in Spanish Service

In addition to Italian engineers, engineers from the Low Countries also worked for Spain during the first period of the Eighty Years War up until the Twelve Year Truce. There were at least fifteen of these fortress builders.¹⁷⁹ The Amsterdam architect Joost Jansz. Bilhamer, for example,

Heuvel, "Papiere bolwercken," 49–50. This work also provides a review of handwritten maps and prints of towns and fortifications in the Low Countries from the second half of the sixteenth century and the beginning of the seventeenth century in Belgian, Italian, and Spanish collections.

171. The Biblioteca Nazionale in Turin contains an atlas with ninety manuscript maps of Italian and Dutch defenses (MS. q.II.57). Although the maps are not dated, they mainly show the situation before the middle of the sixteenth century. See Van den Heuvel, "Papiere bolwercken," 53–57.

172. Turin, Archivio di Stato (Architettura Militare, vol. 4.) See Van den Heuvel, "Papiere bolwercken," 58–61.

173. Turin, Archivio di Stato (Architettura Militare, vol. 4 [J.b.I.6]) contains, for example, various colored maps of sieges in the Low Countries: Antwerp, Bergen op Zoom, Geertruidenberg, Gulik, Haarlem, Hulst, Maastricht, Oostende, Rheinberg, and Wesel. See Van den Heuvel, "Papiere bolwercken," 66–67.

174. On de Robles, see Meindert Schroor and Charles van den Heuvel, *De Robles atlasen: Vestingbouwkundige plattegronden uit de Nederlanden en een verslag van een veldtocht in Friesland in 1572* (Leeuwarden: Rijksarchief in Friesland, 1998), 77–85.

175. The one volume is located in Dresden, Sächsisches Hauptstaatsarchiv (forty-two maps, including eight news maps on a total of sixty sheets); the other is in Austin, Harry Ransom Humanities Research Center, University of Texas–Austin (twenty-one maps of clearly Frisian towns and regions, including ten news maps on nineteen sheets). There is still a third atlas in Munich, Bayerische Staatsbibliothek, which contains illustrations that do not differ in any essential way from those in the Dresden atlas. It is possible that this atlas was copied from the same original as were those in Dresden and Austin. The maps in the atlases in Dresden and Austin are produced in facsimile, in color, and accompanied by exhaustive explanations in Schroor and Van den Heuvel, *De Robles atlasen*.

176. Schroor and Van den Heuvel, *De Robles atlasen*, 46.

177. Van den Heuvel, "Papiere bolwercken," 69–89. Van den Heuvel describes in detail the planning and construction of the fortification of Thionville, based on various manuscript maps.

178. On Specklin, see Albert Fischer, *Daniel Specklin aus Straßburg (1536–1589): Festungsbaumeister, Ingenieur und Kartograph* (Sigmaringen: Thorbecke, 1996), and Meurer, *Fontes cartographici Orteliani*, 243–44.

179. See Frans Westra, *Nederlandse ingenieurs en de fortificatiewerken in het eerste tijdperk van de Tachtigjarige Oorlog, 1573–1604* (Alphen aan den Rijn: Canaletto, 1992), 20–21.

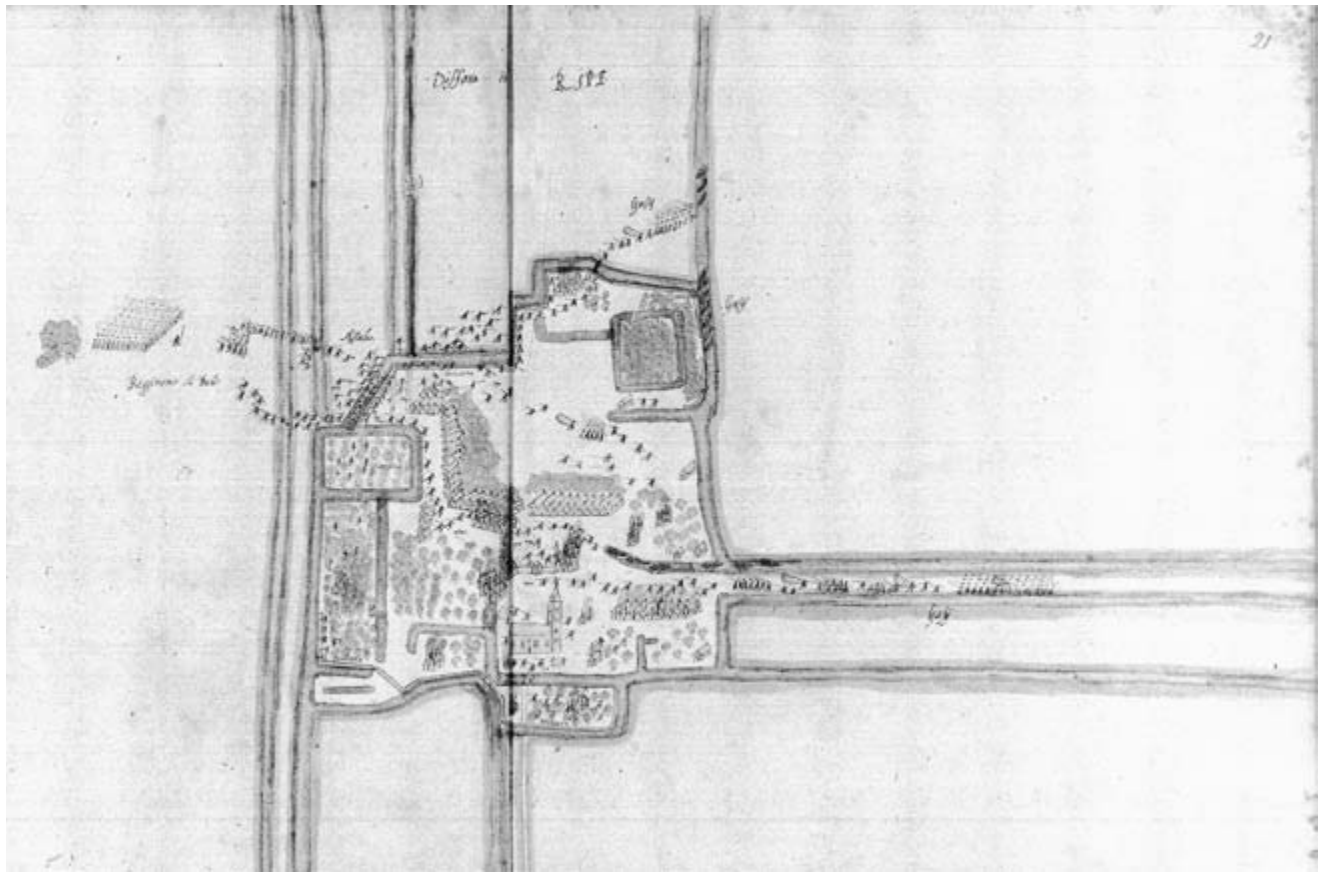


FIG. 43.22. MAP OF THE FRISIAN VILLAGE OF DRONRIJP FROM THE DE ROBLES ATLAS.

Size of the original: ca. 43 × 58 cm. Photograph courtesy of the Hauptstaatsarchiv Dresden (Schr. 26, F. 96, Nr. 10, Bl. 21).

made a design for a local fortress in 1573. Another engineer, Jan Faiet, worked under the command of Philip II in 1573 reinforcing the border and harbor town of Sluis. Some engineers from the northern Low Countries also changed their allegiance to the Spanish side.

A manuscript atlas dating from the beginning of the Eighty Years War contains, among other things, twenty fortress plans from the northern Low Countries from the period 1570–78, which were probably commissioned by Gilles de Berlaymont, commander of the southern Low Countries.¹⁸⁰ These fortress plans form an important link between Jacob van Deventer's maps and the later designs that Dutch engineers produced in response to the need for modernization of municipal fortifications. The fortresses mapped include those from the present-day provinces of North and South Holland (Muiden, Nieuwpoort, Schoonhoven, Vianen, and Weesp), Utrecht (Oudewater, Utrecht, Wijk bij Duurstede, and IJsselstein), Gelderland (Arnhem, Buren, Culemborg, Doesburg, Doetinchem, Elburg, Groenlo, Tiel, Wageningen, and Zutphen), and Overijssel (Kampen, Oldenzaal, and Zwolle). De Berlaymont—baron of Hierges and governor of Gelderland,

Overijssel, and Lingen (from 1572) and of Holland, Zeeland, and Utrecht (from 1574)—visited all of these places during his campaigns between 1570 and 1578. Van den Heuvel cautiously attributed the drawings in the atlas to someone from outside the area, the royal artist Jacques Dubroeuq.¹⁸¹

In the period between 1580 and 1680, a number of Dutch officers were recruited by the Spanish to serve as military engineers. Contrary to the history of the military surveys in France, which developed into a *Dépôt de la*

180. The manuscript atlas contains a total of fifty sepia drawings on forty-two sheets, embellished with carefully executed cartouches with place-names in French, dates, and scale markings. In addition to the maps of fortifications in the northern Low Countries, the drawings consist of designs for modern fortifications and views of distant battles in the Mediterranean Sea area and along the Danube. Since 1997, the atlas has been in the collection of the Universiteitsbibliotheek Leiden (Atlas 440). See Charles van den Heuvel, "Een atlas voor Gilles de Berlaymont, baron van Hierges: Belegeringsscenes, stadsplattegronden en fortificatie-ontwerpen voor een 'soldat-gentilhomme,' 1570–1578," *Caert-Thresoor* 15 (1996): 57–69. There is also a description for every drawing in the atlas.

181. Van den Heuvel, "Een atlas voor Gilles de Berlaymont," 61–64.

Guerre, it was not until 1709 that the Spanish army created a corps of military engineers, founded by George Prosper Verboom.¹⁸² But the political situation in the Southern Provinces forced the Spanish government to defend their territory both against the armies of the United Provinces in the north that were revolting and, after the Treaty of Westphalia in 1648, against the armies of France in the south.

Military topographical maps and plans of fortresses and of fortified towns in the Southern Provinces dating from the period 1580–1680 are preserved in various collections, the best known of which is the Lepoivre collection.¹⁸³ Pierre Lepoivre, born at Bergen (Mons), served as an architect and engineer under the duke of Alba and the duke of Parma. After his retirement, he copied plans and maps for which he received payment from the royal council.¹⁸⁴ There is another collection of manuscript drawings of fortifications, supplemented by a text on military engineering by Lepoivre.¹⁸⁵ A manuscript atlas with sixty-three town plans and topographical maps of the Southern Provinces of the Low Countries was drawn by an officer named Bernard de Gomme, who served under Prince Frederik Hendrik of Orange between 1640 and 1645.¹⁸⁶ Other military engineers included Salomon van Es, known as the architect of the fortress of Charleroy.¹⁸⁷ One of his assistants, the Spaniard Sebastián Fernández de Medrano, was a teacher at the military academy at Brussels.

Several collections of topographical maps and town plans of the Southern Provinces dating from the period 1580–1680 (a period of almost continuous warfare) are preserved in Spanish archives. These cartographic documents were promptly dispatched to Madrid by the Raad van State (Council of State) from Brussels.¹⁸⁸

In the war with Spain, the Seven United Provinces held two vital strategic positions: they maintained dominance over the Scheldt River, effectively blockading Antwerp from the sea, and the Rhine River, affording them open access to central Europe. In response, the Spanish government had two solutions to neutralize the advantages of the north: a project to dig a new canal between the seaport of Grevelingen in Flanders and the Scheldt River¹⁸⁹ and the completion in 1628 of the remarkable Fossa Eugenia, a canal connecting the Rhine with the Meuse. The name of Michael Florent van Langren is inextricably tied to the mapping of this canal. Van Langren, a wartime engineer and cartographer, was the author of regional maps of the Belgian provinces and a map of Brabant from 1635. However, he was a representative of the Spanish interests and carried out mapping in the Southern Provinces. As an engineer, he surveyed the Meuse and Rhine canal between Venlo and Rheinberg.¹⁹⁰ With this canal, the Spanish planned to divert northbound traffic on the Rhine into Spanish-occupied territory. It was completed in two years (1626–28), but, due to a shortage of water,

never worked. Given the limited knowledge and technology of hydrology of the time, the surveying of the canal was most ambitious. Leveling, in particular, suffered from imprecise instruments.

Van Langren's map of the canal was the first on which the scale was expressed as a representative fraction, in this case 1:140,000.¹⁹¹ At that time, scale was traditionally expressed as so many *roeden op de duim* (rods in one inch). Willem Jansz. Blaeu reduced the scale of this map to approximately 1:400,000 for incorporation in Hugo Grotius's *Grollae obsidio cum annexis* and in his own atlas of 1630, but Blaeu did not acknowledge Van Langren as the author.¹⁹²

DUTCH MILITARY MAPPING FROM 1579, MAINLY IN THE NORTHERN PROVINCES

In the long-term struggle for independence by the Seven United Provinces, large battles and sieges were carried out, while almost all towns built new fortifications. Military scholarship flourished, especially after 1590, when Governor Johan Maurits van Nassau began to force the Spanish out of the northern Low Countries. Fortress building comprised one of the most important parts of this scholarship, and its most distinguished representatives were Simon Stevin and Adriaan Anthonisz.

At the time of the Republic of the Seven United Provinces, military cartography differentiated itself from general cartography. Due to the lack of any strong central

182. Claire Lemoine-Isabeau et al., *Belgische cartografie in Spaanse verzamelingen van de 16^{de} tot de 18^{de} eeuw: 1 oktober–17 november 1985*, Koninklijk Museum van het Leger en van Krijgsgeschiedenis, Brussel, exhibition catalog (Brussels: Gemeentekrediet, 1985), esp. 20 and 97.

183. Now in Brussels, Royal Library of Belgium. See Léopold Devillers, "Le Poivre (Pierre)," *Biographie nationale de Belgique* (Brussels: Thiry-van Buggenhoudt, 1866–), vol. 2, cols. 888–91.

184. Joseph van den Gheyn et al., eds., *Catalogue des manuscrits de la Bibliothèque Royale de Belgique* (Brussels, 1901–), 11:234–42, contains the complete inventory of the Lepoivre collection.

185. Madrid, Palacio Real, MS. II 523.

186. BL, Map Collection of George III, 4 Tab. 48.

187. His collection of manuscript plans of fortified towns is preserved in Madrid, Biblioteca Nacional, MS. 12792.

188. A selection from this Spanish material was published in Lemoine-Isabeau et al., *Belgische cartografie*.

189. A manuscript dated 1616 showing the design of the project is at Simancas, Archivo General, MPD VI, 29; see Lemoine-Isabeau et al., *Belgische cartografie*, 59–60.

190. A. J. Veenendaal, "De Fossa Eugenia," *Bijdragen voor de geschiedenis der Nederlanden* 11 (1956): 2–39, esp. 36–37, and H. A. M. van der Heijden, "Nogmaals: De Fossa Eugenia," *Caert-Thresoor* 17 (1998): 25–31.

191. See Peter van der Krogt, "Het verhoudingsgetal als schaal en de eerste kaart op schaal 1:10000," *Kartografisch Tijdschrift* 21, no. 1 / *Nederlands Geodetisch Tijdschrift: Geodesia* 37, no. 1 (1995): 3–5.

192. MCN, 4:107–8.

authority, general cartography rarely exceeded the boundaries of a single province. Thanks to the Union of Utrecht in 1579, defense became one of the few areas in which there was some centralization. Military mapmakers were not limited by provincial boundaries and thus produced maps that went beyond them. Moreover, there were fewer civilian maps available of areas of interest to the military—the “frontiers”—than there were of the economic center of the republic.¹⁹³ This kind of mapping thus occupied a special place in the development of the cartography of the Low Countries.

Military Engineers and Land Surveyors

Land surveying as a profession grew in connection with the growth of the Dutch economy and infrastructure and the reclamation of land from lakes and the sea.¹⁹⁴ Engineers in the Low Countries had to be adept at all aspects of their profession—designing and building fortifications, carrying out the flooding of defense lines (inundations), designing trenches, and, finally, preparing maps.

In the southern portion of the areas in revolt, the first requests for engineers to aid them against the Spanish enemy were made to the States General beginning in 1576. In that year, the city of Namen requested an engineer who was experienced in putting explosives under fortifications.¹⁹⁵ Many engineers from the northern and southern Low Countries—who had originally worked for Spain—were subsequently engaged by the States General to work in the Southern Provinces. Some Italian experts were also employed by the States General. After the loss of Antwerp in 1585, some engineers moved to the northern Low Countries, while other fortress builders (again) opted to work for Spain. Long-term service was not usual, and specific professional training was not yet available; experience as a surveyor, architect, carpenter, or bricklayer was usually the decisive factor in employment.¹⁹⁶

Holland, the most important province in revolt, was the first to employ a permanent engineer. Adriaan Anthonisz. was named master of fortifications in 1579. Not long after that, in 1584, he was appointed superintendent of fortifications when the provinces of Holland and Utrecht were threatened by Spanish invasions and plundering. In this way, the province of Holland took the first steps toward centralization of a fortification system. Under Maurits van Nassau, commander in chief of the state army beginning in 1589, this development was speeded by military reforms. Military technology was given high priority, and engineers began to play a more important role in it. The number of military engineers increased: in 1590, there were thirteen engineers working for various authorities, but by 1598, there were more than twenty-five.¹⁹⁷ A fresh impetus was provided in 1599, when Maurits expanded the job description for engineers. Their

training appears to have been completely directed toward the building of fortifications.¹⁹⁸

The foundation for a corps of military engineers was thus laid. Part of this development included the establishment of a program in engineering at the University of Leiden in 1600.¹⁹⁹ Maurits had this kind of background himself, for it was his friend and teacher Simon Stevin who put the program together. This program included courses in mathematics, engineering, and land surveying. A similar course was founded in the Frisian Academy at Franeker, where from 1598 to 1635 the lectures were conducted by Adriaan Metius, son of Adriaan Anthonisz. A crucial innovation, in view of the period, was the use of the Dutch language in these university courses. The recruitment of military engineers depended more and more on the availability of young men without a Latin school education.

Stevin himself did not lecture at the university, but instead two professors were appointed: Symon Franz. van der Merwen and Ludolf van Ceulen, both well-known land surveyors who were each given the title *meester in de Duytsche Mathematicque* (master of Dutch mathematics). In 1600, the first Dutch textbooks on land surveying were published: *Practijck des lantmetens* (fig. 43.23) and *Van het gebruyck der geometrische instrumenten* (Leiden: Jan Bouwens) by Johannes Sems and Jan Pietersz. Dou (or Douw).²⁰⁰ The works of Sems and Dou provided a good foundation for the beginning engineer, although practical experience continued to be of great importance. A more didactically sound course in surveying appeared during the seventeenth century, developed by Mattheus van Nispen: *De beknopte lantmeetkonst* (Dordrecht, 1662).²⁰¹

The influence of the works of Stevin on the development of applied mathematics in the Low Countries is of fundamental importance.²⁰² Stevin introduced the deci-

193. F. W. J. Scholten, *Militaire topografische kaarten en stadsplattegronden van Nederland, 1579–1795* (Alphen aan den Rijn: Canaletto, 1989), 5.

194. Westra gives an overview of fifty engineers, including their salaries and activities, in the Low Countries for the period 1572–1604 (*Nederlandse ingenieurs*, 98–107). Scholten also provides a list of engineers, but for the period 1579–1795 (*Militaire topografische kaarten*, 168–95). His survey includes other preparers of military maps as well.

195. Westra, *Nederlandse ingenieurs*, 22.

196. Westra, *Nederlandse ingenieurs*, 22–35.

197. Westra, *Nederlandse ingenieurs*, 62.

198. Scholten, *Militaire topografische kaarten*, 14.

199. See Westra, *Nederlandse ingenieurs*, 82–89.

200. For a complete description of these surveying books, see Pouls, *De landmeter*, 246–51.

201. See Th. W. Harmsen, *De Beknopte Lant-Meet-Konst: Beschrijving van het leven en werk van de Dordtse landmeter Mattheus van Nispen (circa 1628–1717)* (Delft: Delftse Universitaire Pers, 1978), and Pouls, *De landmeter*, 251–54.

202. Dirk Jan Struik, *Het land van Stevin en Huygens* (Amsterdam: Pegasus, 1958).



FIG. 43.23. TITLE PAGE OF *PRACTIJK DES LANTMETENS*, BY JOHANNES SEMS AND JAN PIETERSZ. DOU, 1600.

Photograph courtesy of the Universiteitsbibliotheek Amsterdam (2404 F 13 [1]).

mal fraction, for which he is known in the history of mathematics, but he also wrote fundamental treatises on the art of navigation, on draining by windmills, on cosmography (in 1608, before Galileo, he published a preference for the Copernican solar system), on practical geometry and, most extensively, on fortification (*De sterctenbouwing*).²⁰³ Several of his pupils, after careers in the army, were hired by foreign princes to conduct fortification works in their territories or to organize the reclamation of marshlands; for example, Cornelis Vermuyden was employed for the drainage of the fens in England about 1630–40.

The program at the University of Leiden started with about thirty students and continued until 1681. In addition to military engineers, several land surveyors preparing themselves for the examination took the courses. Moreover, other courses in land surveying were given at Franeker and at Groningen as well as at private schools in towns all over the country. Of the 187 land surveyors in the province of Holland who were admitted as *gesworen landmeter* (sworn land surveyor) at the court of Holland

in the period 1602–41, 69 had studied at Leiden in the *Duytsche Mathematicque*.²⁰⁴ The reputation of the Leiden program increased in direct proportion to the increase in fortress-building expertise achieved in the republic, and many engineers from the northern Low Countries thus also found employment abroad.²⁰⁵ During the course of the seventeenth century, however, the training began to lose prestige. Partly as a result of later competition between the professor Frans van Schooten Jr. and the examiner Johan Jansz. Stampioen, in 1648 the *Duytsche Mathematicque* stopped admitting surveyors.²⁰⁶

Four years after the establishment of the *Duytsche Mathematicque*, in 1604, the States Council (Raad van State) decided to apply the *Rijnlandse Roede* as a standard unit of measure for fortress building and cartography. Given the countless local standards in existence, the definition of a single standard for a group of engineers operating nationally was necessary. Also, at the instigation of Maurits van Nassau, a special corps of military engineers (*ingenieurs-géographes*) was founded with the task of supervising the fortification works. Stevin was appointed army mapmaker from 1604;²⁰⁷ from 1599, Floris Balthasarsz. and his son Balthasar Florisz. van Berckenrode had accompanied the armies of the United Provinces as their surveyor and mapmaker.

The work of Balthasar Florisz. van Berckenrode is representative of the period after 1620. As a land surveyor, he was employed in the army of Maurits van Nassau and later Prince Frederik Hendrik. Land surveyors, who were also military engineers, were called on to play a more active role in warfare through the construction of fortifications and the development of techniques for besieging fortified towns. In 1636, this versatile land surveyor was promoted to the states' surveyor and mapmaker.

The province of Holland was already adequately covered by maps detailed enough to allow the compilation of a topographical map at a scale of about 1:110,000. That was the scale deemed fit for a military topographical map, an opinion that prevailed during the next two centuries. However, a military survey of the United Provinces did not exist and was in fact impossible during that period of independent provincial sovereignty. It was already a great sacrifice for the provinces to agree to rely on one army

203. See Ernst Crone et al., eds., *The Principal Works of Simon Stevin*, 5 vols. (Amsterdam: C. V. Swets and Zeitlinger, 1955–66).

204. See Muller and Zandvliet, *Admissies*, 25–26.

205. See Westra, *Nederlandse ingenieurs*, 75–81, and Pouls, *De landmeter*, 288–331. In addition to engineers, Pouls mainly discusses the activity of Dutch surveyors abroad.

206. Scholten, *Militaire topografische kaarten*, 16.

207. About several maps that may have been produced by Simon Stevin, see Frans Westra, “Bestaan er getekende militair-topografische kaarten of vestingplannen van Simon Stevin?” *Caert-Thresoor* 12 (1993): 82–86.

commander and one supervisor for the fortification works. Not until 1815 was a military survey founded to survey and prepare a uniformly drawn topographical map at a scale 1:25,000.²⁰⁸

Mapping of Fortifications and Inundations (Flooding of Defense Lines)

The history of Dutch military cartography is similar to that of other countries in the making and use of plans of fortified towns and topographical maps for military campaigns. It differs in one respect: mapmaking for inundations.

In 1579, by means of the Treaty of Utrecht between the provinces of the Low Countries in revolt, an administration was established that encompassed all the joint military activities in the union, including the military surveys. Under the authority of the States Council, several newly appointed military engineers renewed the fortifications of the walled cities in the Northern Provinces. Instead of the old Dutch method of building a strong wall with a moat in front, the modern Italian method of building fortification outside the city wall was applied. As the union was at war with Spain, the towns had to withstand Spanish sieges, and the rural country had to be protected by defense lines against ransacking armies. Both kinds of defense operations necessitated terrain surveys and the drawing of topographic maps and town plans. These were undertaken not only by the engineers and land surveyors under the command of the States Council but also by engineers and land surveyors of the individual provinces appointed by the states.

The land surveyor and fortress engineer Adriaan Anthonisz. of Alkmaar introduced the Italian system of fortification.²⁰⁹ During his lifetime, he was the most important engineer employed by the government. Anthonisz. not only provided a large number of fortified towns with new defense systems, but also made significant contributions in cartography. Plans of almost all of the towns in the Northern Provinces dating from the period 1579–1620 (the period when Anthonisz. was at work) have been preserved (fig. 43.24).²¹⁰ A large number of these plans were drawn by Anthonisz., although Johan van Rijswijck, Jacob Kemp, and David van Orliens were also among the distinguished mapmakers. Town plans from this period were characterized by a heavy emphasis on fortifications; they seldom showed the topography of the inner city. The contemporary strategic preference for sieges with rather static armies explains the relatively large number of plans that have survived in comparison to the number of topographical maps. The actual hostilities took place around the border towns, such as Oostende (1601–4), Bergen op Zoom (1622), Breda (1625 and 1637), and 's-Hertogenbosch



FIG. 43.24. ADRIAAN ANTHONISZ.'S PLAN OF THE FORTIFIED CITY OF AMERSFOORT, 1594. Photograph courtesy of the Nationaal Archief, The Hague (VTH 3 516).

(1629), which had been changed by expanded fortifications at strategic points.

Another defense operation that required terrain surveys and engineering works was inundation. By flooding strips of low land, the Dutch were able to more effectively and less expensively build defense lines by which they successfully checked foreign invaders. The defense of cities against Spanish armies resulted in the first planned inundations in the military history of the Low Countries. The relief of Leiden from the Spanish besiegers in 1574 impressed and encouraged the Dutch population but was important news in Europe as well. To commemorate this exceptional military operation, a large topographic map in the form of a wall tapestry was woven at the workshop of Joost Jansz. Lanckaert at Delft (fig. 43.25).²¹¹ It shows

208. The resulting maps were made by the royal decree of Willem I and were published between 1850 and 1864 at a scale of 1:50,000.

209. On Adriaan Anthonisz., see Scholten, *Militaire topografische kaarten*, 19–20, and Westra, *Nederlandse ingenieurs*, 36–44.

210. Scholten, *Militaire topografische kaarten*, 22–23, and W. H. Schukking, "Over den ouden vestingbouw in Nederland in de zestiende, zeventiende en achttiende eeuw," *Oudheidkundig Jaarboek*, 4th ser., vol. 6, no. 6 (1937): 1–26. Westra gives an overview of seventy hand-drawn military maps and military-topographical maps made by Dutch engineers during the period from about 1570 to about 1600 (*Nederlandse ingenieurs*, 108–12). Scholten's work also contains a list of about 400 (hand-drawn and printed) military town maps, which cover the period 1579–1795 (pp. 203–25). The same applies to his review of 176 military topographical maps. The town maps and the topographical maps are all located in The Hague, Nationaal Archief.

211. A reduced reproduction of this wall tapestry (a facsimile with an overlay) appeared in 1974: Studio Loridan et al., [*Het Lanckaerttapijt*] [Leiden: Stedelijk Museum de Lakenhal, 1974].

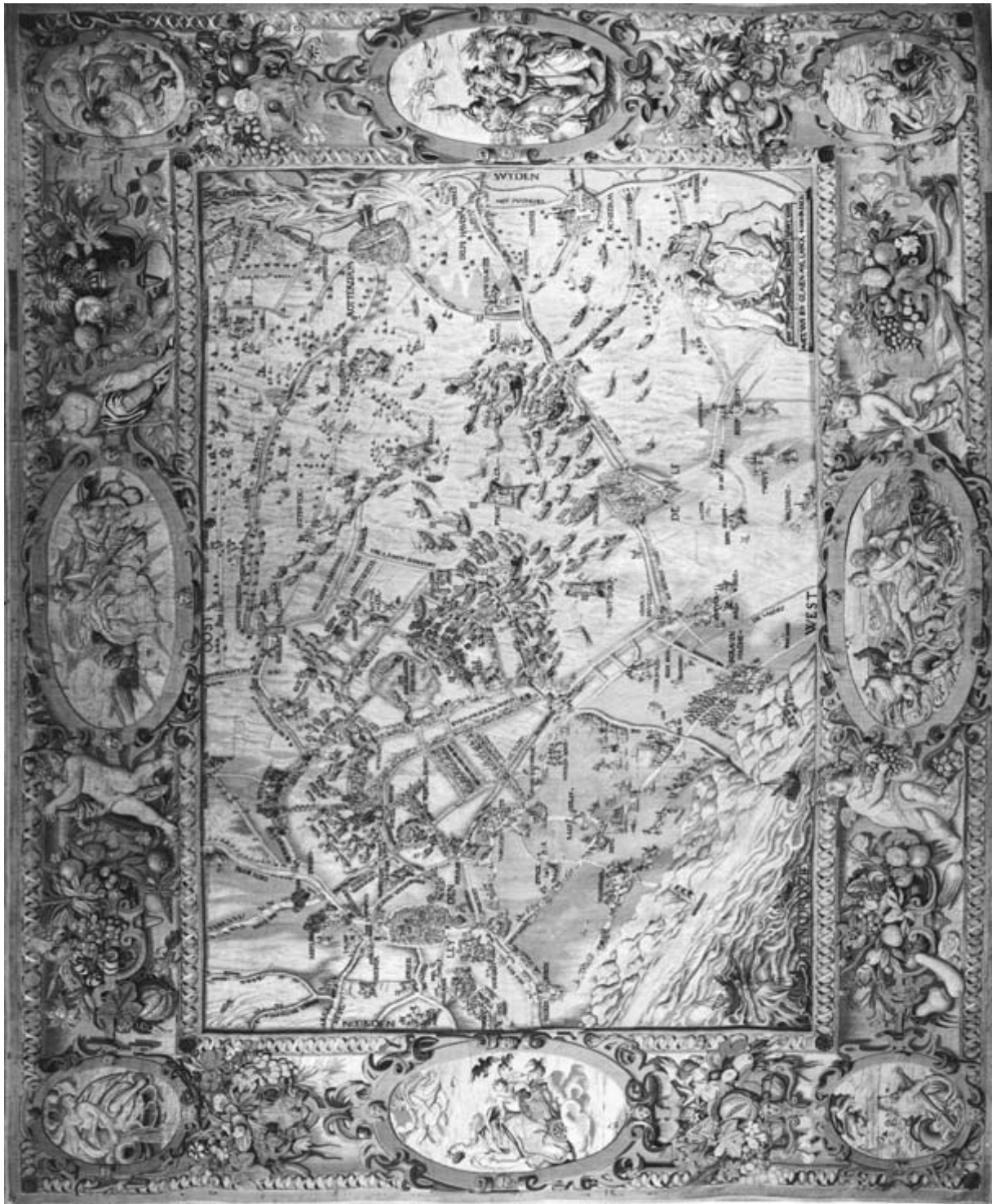


FIG. 43.25. THE TAPESTRY OF LEIDEN BY JOOST JANSZ. LANGCKAERT, 1587. The tapestry now hangs in the Guild Hall, Leiden. Size of the original: 297 × 366 cm. Photograph courtesy of the Stedelijk Museum De Lakenhal, Leiden (inv. 3358).

the purposely inundated environment of the walled town with the Dutch marine troops in barges attacking the Spanish troops in their entrenchments from behind, causing them to retreat.

Later, strips of land extending over hundreds of square kilometers were surveyed, leveled, and put onto manuscript maps to serve as a base for inundation works. Thanks to those survey operations, the Dutch historians of today have at their disposal detailed topographical maps of the so-called *Hollandse Waterlinie* (Holland water defense system), which protected the province of Holland, the *Gelderse Waterlinie*, and the water defense systems in Flanders and Brabant. By making their enemy, the sea with its tides, into their ally, the Dutch stopped foreign invaders several times.²¹²

In addition to maps of the planned inundations, military topographical maps of natural barriers that functioned as defense lines were also produced. These maps generally show a sharply defined area, such as that bordered by the rivers Rhine, IJssel, and Waal. Beyond the topography of the rivers themselves, little of the surrounding terrain is depicted. The mapped image is not much different from those of civilian surveyors' maps of the time; the style of illustration is that of the landscape scene. However, the emphasis of the military topographical map was on the natural barriers formed by rivers, swamps, and salt marshes.²¹³

SUMMARY REMARKS

Until the mid-sixteenth century, official cartography in the Low Countries was no different from that developing elsewhere in Europe. In the Middle Ages, the use of maps was not yet commonplace, and few of them have been preserved. Primarily produced by artists, most of these maps were not based on systematic measurement. The result was a combination of pictorial and abstract cartographic elements.

The development of a cartographic consciousness that began to appear in Europe about 1500 affected the Low Countries, and maps were used more and more in land accounting, water maintenance, jurisprudence, and military operations. During the course of the sixteenth century, surveyors began to occupy themselves with map production. Geographers and fortress builders became adept at measuring terrain. This development expressed itself, among other ways, in one of the characteristic and rejuvenating high points of sixteenth-century cartography in the Low Countries: the creation of manuscript plans of all cities of the Low Countries by geographer Jacob van Deventer.

Van Deventer's printed maps of the Northern Provinces and Jacques and Jean Surhon's maps of the Southern Provinces provided the seedbed for a rich tradition of regional topographical mapping in the Low Countries from

the second half of the sixteenth century until the end of the seventeenth century. At the end of the sixteenth century, the political constitution of the Low Countries was subject to drastic changes. These changes also involved changes in the authorities responsible for official mapping. During the main part of the sixteenth century, the Seventeen Provinces were centrally ruled by the Habsburg-Spanish empire under Charles V and by the Spanish kingdom under his successor, Philip II. The revolt of the seven Northern Provinces led to the development of a federal political structure. Consequently, different political bodies were now responsible for official mapping. Surveying and mapping fell under provincial and not federal authority. The period from 1600 to 1670 was therefore characterized by rather chaotic topographic mapping. In the mapping of the western provinces, a cartographic phenomenon unique to the Low Countries arose: *waterschap* mapping. The struggle against the sea allowed the people of the Low Countries to become true experts in the area of maritime cartography beginning in the sixteenth century. Because of its specific nature, *waterschap* mapping remained a Dutch phenomenon. The influence of the resulting detailed topographic maps did not reach beyond Dutch borders.

An important impetus in the development of official cartography in the Low Countries was military mapping. In the beginning, strategic surveying of towns and provinces was done on commission from the Spanish crown. Italian engineers were involved in these efforts on more than one occasion. Beginning in 1579, the year in which the revolt of the northern Low Countries got its political start, engineers and surveyors from the Low Countries also began mapping with renewed vigor. They produced maps of fortifications, battles, and border areas. Distinctive inundation maps were also produced. Military cartography during the period of the Republic of the Seven United Provinces was more centrally organized than other types of official mapping. Military mapmakers were therefore able to produce interregional maps.

The official cartography of the Low Countries became increasingly rigorous during the course of the sixteenth century. In the Southern Provinces, commercial cartography joined this development at an early stage. For the northern Low Countries, a solid cartographic foundation developed which would result in a worldwide cartographic monopoly in seventeenth-century Amsterdam.

212. Indeed, since the beginning of the uprising against Spain in 1567, the Low Countries have been invaded eight times, by Spanish armies in 1568–1648; French armies in 1672, 1702–13, 1747–49, and 1795–1813; Prussian armies in 1787; German armies in 1940; and Allied armies in 1944–45. In all of these wars, the Dutch waterlines were in operation.

213. Scholten, *Militaire topografische kaarten*, 23–25.

APPENDIX 43.1 THE FIRST PRINTED DUTCH MAPS OF THE (MAINLY) DUTCH PROVINCES IN THE MIDDLE OF THE SIXTEENTH CENTURY, 1538–1581

Region Shown	Year	Designer	First Printed	Reprint or Copy	Copy (Copper Engraving)
Flanders	1538	Pieter van der Beke (Torrentinus)	Pieter de Keysere (Ghent, 1538), woodcut, 4 sheets, 75 × 99 cm	Bernard van den Putte (1558)	Gerard de Jode (Antwerp, ca. 1565), 2 sheets, 54 × 73 cm
	1540	Gerardus Mercator	Gerardus Mercator (Louvain, 1540), copper engraving, 9 sheets, 95 × 123 cm		Remigius Hogenberg (Mechelen, ca. 1562), 1 sheet, 36 × 49 cm
Brabant	Before 1536	Jacob van Deventer	Jacob van Deventer (ca. 1536), woodcut, 6 sheets	Arnold Nicolai (Antwerp, 1558), woodcut, 6 sheets, 82.5 × 76.5 cm	Gerard de Jode (Antwerp, 1565), 2 sheets, 56 × 62.5 cm; Gerard de Jode (Antwerp, ca. 1568), 1 sheet, 35 × 49 cm; Frans Hogenberg (Cologne, 1581), 1 sheet, 36 × 42 cm
Holland	Before 1542	Jacob van Deventer	Jacob van Deventer (1542), woodcut, 9 sheets	Bernard van den Putte (Antwerp, 1558), woodcut, 9 sheets, 110.5 × 79 cm	Gerard de Jode (Antwerp, 1565), 2 sheets, 72.5 × 54 cm; Cornelis de Hooghe ([Antwerp], 1565), 1 sheet, 50 × 36 cm; Joannes and Lucas van Doetecum, Nicolaas Liefrinck (The Hague, 1569), 6 sheets, 86 × 82 cm
Gelderland	1543	Jacob van Deventer	Jacob van Deventer (1543), copper engraving, 9 sheets	Anonymous (Antwerp, 1556), copper engraving, 9 sheets, 93 × 79 cm	Gerard de Jode (Antwerp, 1574)
	1558	Christiaan Sgrooten	Hieronymus Cock (Antwerp, 1564?), copper engraving, 6 sheets, 82 × 77 cm; Bernard van den Putte (Antwerp, 1564–70), ? sheets		
Zeeland	1547	Jacob van Deventer	Jacob van Deventer (1547–50), copper engraving, 4 sheets	Willem Sylvius (Antwerp, 1560), copper engraving, 4 sheets, 51 × 70 cm	
Friesland Groningen Drenthe Overijssel	1545	Jacob van Deventer	Jacob van Deventer (1545), woodcut, 9 sheets	Bernard van den Putte (Antwerp, 1559), woodcut, 9 sheets, 89 × 79 cm	Gerard de Jode (Antwerp, before 1568), 53 × 44 cm
Hainaut	1548	Jacques de Surhon	Frans Hogenberg (Cologne, 1572), copper engraving	Abraham Ortelius (Antwerp, 1579), copper engraving, 1 sheet (<i>Theatrum</i>)	
Namur	1555	Jean de Surhon		Idem (1579)	
Luxembourg	1551	Jacques de Surhon		Idem (1579)	Christiaan Sgrooten (1567)
Artois	Ca. 1554	Jacques de Surhon		Idem (1579)	
Picardy	1557	Jean de Surhon		Idem (1579)	
Vermandois	1557?	Jean de Surhon	Arnold Nicolai (Antwerp, 1558), copper engraving	Idem (1579)	

Sources: Derived from H. A. M. van der Heijden, *Oude kaarten der Nederlanden, 1548–1794: Historische beschouwing, kaartbeschrijving, afbeelding, commentaar / Old Maps of the Netherlands, 1548–1794: An Annotated and Illustrated Cartobibliography*, 2 vols. (Alphen aan den Rijn: Canaletto/Repro-Holland; Leuven: Universitaire Pers, 1998), 1:28–31, and Y. Marijke Donkersloot–De Vrij, *Topografische kaarten van Nederland vóór 1750: Handgetekende en gedrukte kaarten, aanwezig in de Nederlandse rijksarchieven* (Groningen: Wolters-Noordhoff and Bouma's Boekhuis, 1981).

APPENDIX 43.2 PRINTED *WATERSCHAP* MAPS, 1572–1650

Year	Maker	Title	Size and Scale	Copies (Not Inclusive)	References ^a
[Ca. 1572]	Adriaan Anthonisz.	<i>Caerte van het Hontbos ende Zijplant . . .</i>	35 × 27 cm, ca. 1:43,000	Haarlem, Rijksarchief in Noord-Holland (nr. 1363); Leiden, Universiteitsbibliotheek (Port. 31, nr. 69)	Kamp (1971), with facsimile; Donkersloot–De Vrij (1981), no. 674
1600	Baptista van Doetecum	<i>Zypae</i>	47 × 58.5 cm, ca. 1:25,000	Amsterdam, Universiteitsbibliotheek (O.K. 67); Leiden, Universiteitsbibliotheek (Port. 31, nr. 70)	Donkersloot–De Vrij (1981), no. 96
1607	Pieter Cornelisz. Cort	<i>Caarte vande gheleghenthey vande Beemster . . .</i>	37 × 45.5 cm, ca. 1:40,000	Amsterdam, Rijksprentenkabinet (RP-P-AO-7a-1); Leiden, Universiteitsbibliotheek (Port. 30, nr. 62)	De Vries (1983), 1, with facsimile; Donkersloot–De Vrij (1981), no. 711
1611	Adriaan Anthonisz.	<i>Wieringer Waert</i>	63 × 74.5 cm, ca. 1:13,000	Amsterdam, Universiteitsbibliotheek (21-14-01, I-2-A-5[47], I-2-A-5[46] and 23-04-05); The Hague, Algemeen Rijksarchief (VTH 2498A and VTH 2498B)	Donkersloot–De Vrij (1981), no. 100
1611	Floris Balthasarsz.	<i>VVare Afbeeldinghe Vant dyckgraefschap Van Delfland</i>	98 × 92 cm (11 sheets), ca. 1:28,000	First edition in The Hague, Nationaal Archief (VTH 2338A)	Postma (1972), with facsimile; Donkersloot–De Vrij (1981), no. 719; Hamelers (1986), 435–43
1611	Floris Balthasarsz.	<i>. . . Caert van Schielandt . . .</i>	99 × 150 cm (15 sheets), ca. 1:19,000	Amsterdam, Universiteitsbibliotheek (10-B-21 and 1801-A-14); Delft, Oud Archief Delfland (K.V.D.:1.006)	Crol (1972), with facsimile; Donkersloot–De Vrij (1981), 720; Hamelers (1986)
[Ca. 1612]	Lucas Jansz. Sinck	<i>[Kaart van de Beemster]</i>	60 × 84.5 cm (2 sheets), ca. 1:23,000	First edition in Archiefdienst voor Kennemerland (51-301); Leiden, Universiteitsbibliotheek (Port. 30, nr. 41)	De Vries (1983), 2A–2E, with facsimile; Donkersloot–De Vrij (1981), no. 131
[1613]	Anonymous	<i>[Kaart van de Beemster]</i>	18 × 23 cm, ca. 1:50,000	First edition in Leiden, Universiteitsbibliotheek (Thysius pamflet 1830); private collection	De Vries (1983), 7A and 7B, with facsimile.
1615	Floris Balthasarsz.	<i>[Kaart van het hoogheemraadschap Rijnland]</i>	165 × 162 cm (20 sheets), ca. 1:30,000	First edition in Leiden, Universiteitsbibliotheek (Port. 13, nr. 9 and Atlas 184); BL (Klencke Atlas)	Hart (1972), with facsimile; Donkersloot–De Vrij (1981), 715
1622	Lucas Jansz. Sinck	<i>Caerte van de Purmer</i>	85 × 100 cm (4 sheets), ca. 1:10,000	First edition in The Hague, Nationaal Archief (VTH 2635)	Donkersloot–De Vrij (1981), no. 147

APPENDIX 43.2 (*continued*)

Year	Maker	Title	Size and Scale	Copies (Not Inclusive)	References ^a
1624	Jan Pietersz. Dou	<i>Caerte vande Lisser Polder . . .</i>	19.5 × 32.5 cm, ca. 1:14,000	Leiden, Oud Archief Rijnland (A.1219); Leiden, Universiteits- bibliotheek (IV-8-2)	
1626/27	Reijer Cornelisz. et al.	<i>Caerte vande Wormer . . .</i>	46 × 72 cm, ca. 1:13,000	First edition in Leiden, Universiteits- bibliotheek (Port. 29, nr. 141); Wageningen, Landbouwniversiteit (RKK 87)	Donkersloot–De Vrij (1981), no. 146
1628	S. N. Boonacker	<i>Caarte vande Buyckslooter, Broecker ende Belmer Meeren . . .</i>	26 × 47 cm, ca. 1:18,000	Amsterdam, Rijksprentenkabinet (RP-P-AO-7a-21); Leiden, Universiteits- bibliotheek (Port. 29, nr. 164)	Donkersloot–De Vrij (1981), no. 151
1629	Nicolaas Bonifatius	<i>Caerte vande Naerder ofte Uijtermeerse Meer</i>	47 × 71.5 cm, ca. 1:15,000	Amsterdam, Rijksprentenkabinet (RP-P-AO-8-59); Leiden, Universiteits- bibliotheek (Port. 24, nr. 5)	Donkersloot–De Vrij (1981), no. 180
1631	Anthonis Adriaensz. Metius et al.	<i>Caerte van de Heer-Huygen- Waert . . .</i>	56 × 56 cm, ca. 1:25,000	Amsterdam, Universiteitsbibliotheek (23-05-29, I-2-A-5 [63] and I-2-A-5 [64]); The Hague, Nationaal Archief (VTH 2626A and VTH 2626B)	Donkersloot–De Vrij, (1981), no. 118; Hameleers (1987), 126–29
1631	Cornelis Danckertsz. de Rij	<i>Ware afbeeldinge vande Watergrafs Meer . . .</i>	18.5 × 18.5 cm, ca. 1:28,000	Haarlem, Rijksarchief in Noord-Holland (nr. 1294); Wageningen, Landbouwniversiteit (RCt 232)	Donkersloot–De Vrij (1981), no. 162
1635	Pieter Wils	<i>Caerte vande Scher-Meer . . .</i>	48 × 62 cm, ca. 1:20,000	The Hague, Algemeen Rijksarchief (VTH 2638); Leiden, Universiteitsbibliotheek (Port. 30, nr. 68)	Donkersloot–De Vrij (1981), no. 129
1638	Jan Jansz. Backer	<i>Caerte van de Einghe-Wormer . . .</i>	28.5 × 32 cm, ca. 1:12,500	Haarlem, Rijksarchief in Noord-Holland (nr. 1065); Leiden, Universiteitsbibliotheek (Port. 29, nr. 140)	Donkersloot–De Vrij (1981), no. 145
1639/40	Jacob Bartelsz. Veris	<i>Provisioneel concept ontwerp ende voorslach dienende tot de bedyckinge vande groote water meeren</i>	47.5 × 70 cm, ca. 1:56,000	First edition in Leiden, Universiteitsbibliotheek (Port. 23, nr. 44)	Donkersloot–De Vrij (1981), no. 716b

APPENDIX 43.2 (*continued*)

Year	Maker	Title	Size and Scale	Copies (Not Inclusive)	References ^a
1641	Cornelis Lennartsz. Kouter	<i>Kaarte van de vry-beerlyckheyd Velgers Dyck</i>	45 × 56 cm, ca. 1:4000	Amsterdam, Rijksprentenkabinet (RP-P-AO-14b-65); Brielle, Waterschap de Brielse Dijkkring (Inventaris Polder Drenkwaard, Velgersdijk nr. 230); The Hague, Koninklijke Bibliotheek (1041 B 37)	Hordijk (1984), with illustration of the map
[1641?]	Jan Adriaansz. Leeghwater	<i>Caerte ende voorbereydunge tot het bedyke vande Haerlemmer-Meer</i>	16.5 × 37.5 cm, ca. 1:165,000	Haarlem, Archiefdienst voor Kennemerland (Lade X, nr. 813); Leiden, Universiteitsbibliotheek (Port. 23, nr. 39)	Donkersloot–De Vrij (1981), no. 716d
1643	Nicolaas Stierp	<i>Caerte vande Starnmeer . . .</i>	46 × 51.5 cm, ca. 1:9000	Amsterdam, Universiteitsbibliotheek (61-01-33); Leiden, Universiteitsbibliotheek (Port. 29, nr. 156)	Donkersloot–De Vrij (1981), no. 127
1644	Daniël van Breen	<i>Ware afbeeldinge vande bedyckte Beemsterlanden . . .</i>	92 × 117 cm (6 sheets), ca. 1:11,500	No copies of first edition known. Second edition in Amsterdam, Universiteitsbibliotheek (63-03-[33/38] and I-2-A-5[72/77]); Wageningen, Landbouwuniversiteit (RKK 85 and RCt 241)	De Vries (1983), 10, with facsimile
1647	Jan Jansz. Dou and Steven van Broeckhuysen	<i>Het hooge heymraetschap van Rhymland</i>	196 × 230 cm (12 sheets), ca. 1:30,000	First edition in Leiden, Oud Archief Rijnland (Atlas 8); Leiden, Universiteitsbibliotheek (Port. 13, nr. 9)	Hart (1969), with facsimile of the third edition; Donkersloot–De Vrij (1981), no. 715
1647	Anonymous	<i>Caerte ende afbeeldinge vande ghelegentheyd der heerlyckheyd van Nieukoop . . .</i>	57 × 92 cm (2 sheets), ca. 1:10,000	The Hague, Nationaal Archief (VTH 2285 and OBGK L2-28); Leiden, Universiteitsbibliotheek (Port. 15, nr. 59 and Port. 15, nr. 60)	Donkersloot–De Vrij (1981), no. 312
[1650]	Claes Vastensz. Stierp	<i>Afbeeldinge van de Stommeer . . .</i>	84 × 72 cm, ca. 1:3000	First edition in Amsterdam, Universiteitsbibliotheek Vrije Universiteit (LL.02745gk: 16232/od/1650); Haarlem, Rijksarchief in Noord-Holland (nr. 1988)	Donkersloot–De Vrij (1981), no. 172

^aThe references for this column are as follows:

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- Postma, C. 1972. *De kaart van het Hoogheemraadschap van Delfland door Floris Balthasars, 1611*. Alphen aan den Rijn: Canaletto.

APPENDIX 43.3 PROTOTYPES OF PRINTED PROVINCE MAPS, 1575–1698

Date	Region Shown	Scale	Maker	Reprint or Copy
1575	North Holland	Ca. 1:100,000	Joost Jansz. Bilhamer and Harmen Allertsz. van Warmenhuysen	Reprinted in 1608 and 1778
1579 (Ortelius's <i>Theatrum</i>)	Groningen and Friesland	Ca. 1:260,000	Sibrandus Leo	Copied in later years
1599	Utrecht	Ca. 1:180,000	Cornelis Anthonisz. Hornhovius	Reprinted second half seventeenth century
1600	Groningen and Friesland	Ca. 1:180,000	David Fabricius and Joannes van Doetecum	Later copied as atlas maps
1603	Limburg (duchy)	?	Aegidius Martini	Copied in later years since 1606
1606	Groningen, Friesland, Drenthe, and Overijssel	Ca. 1:270,000	Baptista van Doetecum	
1616	Groningen	Ca. 1:170,000	Barthold Wicheringe	Copied after 1629
1618	Friesland	Ca. 1:200,000	Nicolaas van Geelkercken	Reprinted 1642 and 1665
1621	Holland	Ca. 1:110,000	Balthasar Florisz. van Berckenrode	Reprinted 1637, 1651, 1656, and [1660–1682]; copied after 1629
1622	Friesland	Ca. 1:170,000	Adriaan Metius and Gerard Freitag	Copies in atlases by Jodocus Hondius and Willem Jansz. Blaeu
1625–35	Brabant quarter of Antwerp	Ca. 1:200,000	Michael Florent van Langren	Copied after 1634
1634	Meierij van 's-Hertogenbosch	Ca. 1:180,000	Willebrordus van der Burght	Copied after 1634
1634	Drenthe	Ca. 1:200,000	Cornelis Pijnacker	Copied after 1636
[Before 1638]	Flanders	Ca. 1:190,000	Henricus Hondius and Alexander Serhanders	Copied 1638 by Willem Jansz. Blaeu
1639	Gelderland and its four quarters	Ca. 1:170,000–1:210,000	Nicolaas van Geelkercken	Many copies in later years
1644	Luxembourg	Ca. 1:250,000	Michael Florent van Langren	Reprinted 1671/72
1650	Overijssel	Ca. 1:100,000	Nicolaas ten Have	Reprinted 1734; copied 1652 and later
1654/55	Zeeland	Ca. 1:40,000	Zacharias Roman and Nicolaas I Visscher	Reprinted 1656, 1680, and ca. 1730
1656	Brabant (duchy)	ca: 1:110,000	Zacharias Roman and Nicolaas I Visscher	Reprinted 1661 and 1703
1664	Friesland	Ca. 1:65,000–1:100,000	Bernardus Schotanus à Sterringa	Copied as atlas maps
1677/78	Groningen	Ca. 1:100,000	Wilhelm and Frederik Coenders van Helpen	
Ca. 1681–85	Groningen	Ca. 1:125,000	Ludolf Tjarda van Starckenborgh and Nicolaas II Visscher	Reprinted and copied after 1719
Ca. 1690	Holland	Ca. 1:300,000	Nicolaas II Visscher	Reprinted and copied after 1690
1696	Utrecht	Ca. 1:40,000	Bernard de Roij	Reprinted 1743
1698	Friesland	Ca. 1:25,000–1:43,000	Bernardus Schotanus à Sterringa	Reprinted 1718

Source: Based mainly on C. Koeman, *Geschiedenis van de kartografie van Nederland: Zes eeuwen land- en zeekaarten en stadsplattegronden* (Alphen aan den Rijn: Canaletto, 1983), 79–109.