

29 • Warfare and Cartography, ca. 1450 to ca. 1640

JOHN HALE

The cartographic changes of the Renaissance coincided with a period when there was scarcely a year during which, somewhere in Europe, men were not fighting either to capture the territory of others or to retain or regain their own. From 1482, the year that witnessed not only the first printed edition of Ptolemy's *Geography* to contain *tabulae novae* but also Louis XI of France's war against Brittany and the beginning of the ten-year War of Granada, every cartographic advance in surveying, projection, the use of consistent scales, and methods of production and publication took place against a background of warfare.

There were not only the period's "long wars"—the thirty-six year Wars of Italy (1494–1530), the French Wars of Religion (1562–98), the Baltic Seven Years War (1563–70), and Spain's war in the Netherlands (1567–1609)—but persistent challenges from the Turks in southeastern Europe and the Mediterranean; England's invasions of France, its intervention in the Netherlands, and its "long war" in Ireland; wars between the Emperor Charles V and the Lutheran League of Schmalkalden; renewed fighting between Denmark and Sweden in 1611–13; and the 1613–18 War of Monferrat, which was the overture to the most devastating conflict of all, the Thirty Years War of 1618–48.

From Scotland to Cyprus and from Portugal to Lithuania, no country was unaffected by war, if not as protagonist then as ally or victim. The countries and regions that were being mapped with increasing precision and usefulness were at the same time being fought over by armies that had to find their way and were administered by governments that needed to reappraise their defensive systems. The English expedition to the Basses-Pyrénées in 1512 took with it a map of Gascony and Guienne and its author, Sebastian Cabot.¹ Fernando Alvarez de Toledo, duke of Alba, took a cartographer, Antoine Oliver, with him to the Netherlands—where he was killed in a skirmish after deserting to the other side.² Maps and conquest seemed to go together. Charles V, before his invasion of southern France in 1536, studied "the map of the Alps and the lower regions of Provence" so avidly that, according to one of his senior administrators, "he convinced himself that he already possessed the land in the

same way that he owned the map."³ This is the spirit in which Marlowe, in the most geography-drenched of Elizabethan plays, had the dying Tamburlaine call out:

Give me a map. Then let me see how much
Is left for me to conquer all the world.⁴

Other impressions strengthen the temptation to see cartography and warfare in terms of a positive connection: the prosecution of the artist-messenger Matteo de' Pasti, captured by Venetians off Crete in 1461 as he was conveying a map of Italy and the Adriatic to Sultan Mehmed II on behalf of Sigismondo Pandolfo Malatesta of Rimini, who was widely believed to be seeking Turkish intervention in support of his territorial ambitions in Italy;⁵ Pope Innocent VIII's commissioning of Pinturicchio (Bernardino Betti) in 1484–87 to depict the Italian capital cities—Milan, Genoa, Venice, Florence, Rome, and Naples—with whose diplomatic and military postures the Vatican was so enmeshed;⁶ the great wall map of Italy by Antonio Leonardi on which Venetian senators could trace the withdrawal of their army after its disastrous defeat at

Abbreviations used in this chapter include: *Monarchs, Ministers, and Maps for Monarchs, Ministers, and Maps: The Emergence of Cartography as a Tool of Government in Early Modern Europe*, ed. David Buisseret (Chicago: University of Chicago Press, 1992).

1. R. A. Skelton, "The Military Surveyor's Contribution to British Cartography in the 16th Century," *Imago Mundi* 24 (1970): 77–83, esp. 80–81.

2. William S. Maltby, *Alba: A Biography of Fernando Alvarez de Toledo, Third Duke of Alba, 1507–1582* (Berkeley: University of California Press, 1983), 227, 253–54.

3. Martin Du Bellay, *Mémoires de messire Martin Du Bellay, in Choix de chroniques et mémoires sur l'histoire de France*, vol. 11, ed. J. A. C. Buchon (Paris: A. Desrez, 1836), 303–801, esp. 582.

4. Christopher Marlowe, *Tamburlaine the Great, Parts 1 and 2*, ed. John D. Jump (Lincoln: University of Nebraska Press, 1967), 2.5.3, ll. 123–24.

5. Franz Babinger, *Mehmed the Conqueror and His Time*, trans. Ralph Manheim, ed. William C. Hickman (Princeton: Princeton University Press, 1978), 201. I owe this reference to Alison Brown. That the (lost) map was to be seen in a military context is further suggested by Sigismondo's other present to the Sultan: a manuscript of Roberto Valturio's *De re militare*.

6. Juergen Schulz, "Jacopo de' Barbari's View of Venice: Map Making, City Views, and Moralized Geography before the Year 1500," *Art Bulletin* 60 (1978): 425–74, esp. 465 and n. 139.

Agnadello in 1509;⁷ and Henry VIII's "large mappe of Dover and Calice of parchement sett in a frame of wodde."⁸ And from the same span of years, so crucial to the development of regional cartography, comes Machiavelli's insistence that for a military leader advancing through alien territory "the first thing he must do is to have the whole territory described and pictured so that he knows the places, the number [of them], the distances [between them], the roads, the mountains, the rivers and marshes, and the nature of them"⁹ and Castiglione's assertion that the courtier-warrior must know how to paint, "and not least for military purposes: thus a knowledge of the art gives one the facility to sketch towns, rivers, bridges, citadels, fortresses and similar things, which otherwise cannot be shown to others."¹⁰ Machiavelli's point was taken up over and over again, as by Leonard Digges: "The Generall is by good, especial, and perfite Plattes, Mappes, and Models, to know the Scituation, Nature, and propertie of the Countrey, and his parts, where he is to pass with his Armie."¹¹ And Castiglione's assertion led Francisco de Hollanda to devote a whole chapter of his 1571 treatise on painting to "how far an understanding of painting and drawing can be of use in time of war."¹² When in 1597–98 Shakespeare had his impetuous counterhero Hotspur sit at the table where he and his fellow conspirators were to plan their insurrection against Henri IV with the exclamation "A plague upon it, I have forgot the map!" the cultural connection between cartography and conquest appears to have been established.¹³

Before turning more specifically to the evidence for Renaissance military cartography, a further presumptive connection can be made. Alongside the private collectors who commissioned and purchased maps, such as the late sixteenth-century Venetian patrician Jacopo Contarini, statesmen responsible for diplomatic and military policy, whether monarchs (Philip II, Henri IV, and Rudolf II) or ministers (Lord Burghley and the duke of Sully), were exerting a major effort to accumulate printed and drawn maps and sketches and published views of cities of potentially strategic importance. Buisseret, the leading student of Sully as a war minister (Sully had first caught Henri IV's eye while serving with the artillery), has referred to him as "obsessed by maps,"¹⁴ and of Burghley, who bore the chief responsibility for the conduct of Elizabeth's campaigns, it has been said that "he clearly thought in a cartographic idiom and read or wrote his papers as if he had a map on his desk or in his mind."¹⁵ This cast of mind, itself a product of the cartographic revolution, is revealingly glossed by the literalness with which Shakespeare's warrior "contemporary," Hotspur, takes the visual notations on the conspirators' map, once it is produced:

Methinks my moiety north from Burton here
In quantity equals not one of yours.

See how this river [the Trent] comes me cranking in,
And cuts me from the best of all my land. . . .

He proposes altering its course so that

It shall not wind with such a deep indent,
To rob me of so rich a bottom here.

To which Glendower bluntly replies:

Not wind? It shall, it must; you see it doth.¹⁶

With so many references to maps in a military or politicomilitary context—and with such negative evidence as the confusion that at one point marked the English expedition to Rouen in 1591 because Burghley did not have the right maps with which to follow the army's movements¹⁷—it is natural that historians of cartography should see military maps as a species evolving alongside administrative, property, hydraulic, diocesan, and other

7. Eugenia Bevilacqua, "Geografi e cosmografi," in *Storia della cultura veneta*, 5 vols. (Vicenza: Neri Pozza, 1976–86), vol. 3 (*Dal primo quattrocento al Concilio di Trento*), pt. 2, 355–74, esp. 367–68, and Marino Sanuto, *I diarii di Marino Sanuto*, 58 vols. (Venice: F. Visentini, 1879–1903), vol. 8, col. 247.

8. Kew, The National Archives of the UK (E 315/160, fol. 59v), cited in Howard Montagu Colvin, "The King's Works in France," in *The History of the King's Works*, by Howard Montagu Colvin et al., 6 vols. (London: Her Majesty's Stationery Office, 1963–82), 3:335–93, esp. 374 n. 1.

9. Niccolò Machiavelli, *Arte della guerra e scritti politici minori* [1521], ed. Sergio Bertelli (Milan: Feltrinelli, 1961), 457.

10. Baldassarre Castiglione, *The Book of the Courtier* [1528], trans. George Anthony Bull (Baltimore: Penguin Books, 1967), 97. He had been anticipated in the Emperor Maximilian I's autobiographical *Weisskunig*: "The young hero learned to paint, for he heard a wise old man say that every good general should know this art." See Glenn Elwood Waas, *The Legendary Character of Kaiser Maximilian* (New York: Columbia University Press, 1941), 110.

11. Leonard Digges, *An Arithmeticall Militare Treatise, Named Stratoticos . . .*, finished by Thomas Digges (London, 1579), 142 [143r].

12. Francisco de Hollanda, "De quanto serve a sciencia do desenho e entendimento da arte da pintura na republica Cristã assim na paz como na guerra," chap. 5 (fols. 42r–45v); manuscript reproduced in facsimile in Jorge Segurado, *Francisco d'Ollanda: Da sua vida e obras . . .* (Lisbon: Edições Excelsior, 1970), esp. 149–56.

13. William Shakespeare, *King Henry IV*, 1.3.1, l. 5, in *The Norton Shakespeare*, ed. Stephen Greenblatt et al. (New York: W. W. Norton, 1997), 1157–1224 ("The History of Henry the Fourth") and 1304–77 ("The Second Part of Henry the Fourth"), esp. 1189. It should be noted, however, that the primary purpose of the map was to show how England was to be apportioned among them.

14. David Buisseret, "Les ingénieurs du roi au temps de Henri IV," *Bulletin de la Section de Géographie* 77 (1964): 13–84, esp. 80.

15. Skelton, "Military Surveyor's Contribution," 78.

16. William Shakespeare, *King Henry IV*, 1.3.1, ll. 93–96 and 101–3, in *Norton Shakespeare*, 1191.

17. Howell A. Lloyd, *The Rouen Campaign, 1590–1592: Politics, Warfare and the Early-Modern State* (Oxford: Clarendon, 1973), 27 nn. 50 and 65.

special-purpose maps.¹⁸ Lacking an overall survey, however, military cartography has thrown up some injudicious claims about its origin. The fifteenth-century picture map of the Venetian terra firma in the Topkapi Sarayı Müzesi Kütüphanesi at Istanbul is not, as has been asserted, “obviously one designed for purely military purposes” that is “to be connected with the Turkish raids during the second half of the fifteenth century,”¹⁹ but a generalized decorative commemoration of the Republic’s amassment of cities and towns on the mainland. The engraved post facto representation by the master “P. W.” of places concerned in the Swabian War of 1499, with its crammed-together pictured towns and its wealth of military and nonmilitary genre detail, which is where the artist’s interest chiefly lay, is misleadingly described as “the first printed military map.”²⁰ From the end of the period under consideration, Johann Heinrich Schönfeld’s painting of 1653 in the Liechtenstein Collection is still described as *Artilleryman Studying a Map*, whereas what are being studied are not topographical maps (in the plural) but large-scale plans to determine the correct siting of the siege guns.²¹ And there have been differences of opinion as to the establishment of the military map. Do the maps made by Robert Lythe during the late 1560s in conjunction with military campaigns in Ireland qualify? What about the “war cartography” of the Dutch of the 1570s and onward? Or the frontier and regional surveys organized by Henri IV and Sully from the late 1590s? Or must we wait another half century for the burst of cartographic activity associated with the defense works of Sébastien Le Prestre de Vauban and the campaigns of Louis XIV?²² Or still longer? “The ‘modern’ topographical map,” it has been written, “is first discernible in the eighteenth century—a century of almost continuous warfare on a continental scale in mainland Europe and one in which military commanders needed detailed maps for the movement and quartering of their troops. The design of the modern topographical map was a response to military necessity and was essentially the work of military engineers and surveyors.”²³

Chiefly, these differences of opinion about when military maps were first made arise from the definition of such maps. Today they are large-scale topographic maps overlaid with information of specifically military interest derived from spies, electronic navigation aids, and air photographs or satellite images, or, for defense purposes, obtained from a home source. This definition cannot be carried back into the sixteenth and early seventeenth centuries. Yet, as we have seen, a connection between war and maps was made then, and continues to be made. In checking these assumptions we must remember that wars had been fought for centuries, often involving quite complex long-range strategic plans projecting the linking up of allies or the pincer effect of initially widely separated

forces, without the benefit of any “useful” maps at all, and that respect for maps became something of a cult in the Renaissance, as did knowledgeable militancy, so that connections between the two were made uncritically. And we must have a definition of military cartography that fits both the production of maps and plans and their use.

Here an essential distinction should be made between the cartographic aspects of attack and those of defense. Both drew on the stock of printed maps, town views and plans, and commemorative prints of sieges and battlefields, all of which were available, in ever-increasing numbers, from the early sixteenth century. None of the material in this stock was produced as an aid to military planning before 1640, though it was accumulated by ministers as part of the body of information that could be used in the preparation of campaigns. It is with regard to material that can more strictly be defined as military cartography that the distinction between attack and defense arises. The former led to the production of reconnaissance and progress report sketch maps.²⁴ The latter drew on a much richer surviving body of maps and plans concerned with fortification schemes evolved in peacetime and, moreover, was able to take advantage of regional maps produced for administrative and jurisdictional purposes that contained far more information about communications and topography than was available in any printed source. Some of these, at least, were seen as hav-

18. For examples of ancient, medieval, and non-Western mapping of warfare, battle plans, and fortifications, see the indexes to previous volumes of *The History of Cartography*.

19. Rodolfo Gallo, “A Fifteenth Century Military Map of the Venetian Territory of Terraferma,” *Imago Mundi* 12 (1955): 55–57.

20. Leo Bagrow, *History of Cartography*, rev. and enl. R. A. Skelton, trans. D. L. Paisey, 2d ed. (Chicago: Precedent, 1985), 93.

21. See, for example, Herbert Péc, *Johann Heinrich Schönfeld: Die Gemälde* (Berlin: Deutscher Verlag für Kunstwissenschaft, 1971), 131 and pl. 65.

22. J. H. Andrews, “The Irish Surveys of Robert Lythe,” *Imago Mundi* 19 (1965): 22–31; Johannes Keuning, “XVIth Century Cartography in the Netherlands (Mainly in the Northern Provinces),” *Imago Mundi* 9 (1952): 35–63, esp. 54; David Buisseret, *Sully and the Growth of Centralized Government in France, 1598–1610* (London: Eyre and Spottiswoode, 1968), 120–39; idem, “Les ingénieurs du roi”; Franz Grenacher, “Die Anfänge der Militärkartographie am Oberrhein,” *Basler Zeitschrift für Geschichte und Altertumskunde* 56 (1957): 67–118, esp. 69; and Henri Marie Auguste Berthaut, *Les ingénieurs géographes militaires, 1624–1831*, 2 vols. (Paris: Imprimerie du Service Géographique de l’Armée, 1902), 1:3 ff.

23. Eila M. J. Campbell, “The Patterns of Landscape,” review of *The History of Topographical Maps*, by P. D. A. Harvey, in *Times Literary Supplement*, 7 November 1980, 1269.

24. For example, art historian Naomi Miller suggests that the urban map of Volterra in a codex of Ptolemy’s *Geography* derived from a strategic map used by Duke Federico da Montefeltro of Urbino as his troops attacked the city in 1472. See Naomi Miller, “Mapping the City: Ptolemy’s *Geography* in the Renaissance,” in *Envisioning the City: Six Studies in Urban Cartography*, ed. David Buisseret (Chicago: University of Chicago Press, 1998), 34–74, esp. 64–65.

ing a potential military relevance even if the movement of armies or the allocation of defensive forces was not what led them to be commissioned. As the Zurich chorographer Conrad Türost put it in the preface to his “De situ confœderatorum descriptio” of the early 1490s, “I have been asked to describe the regions of our Confederation and their environs so that you may realize . . . how useful such a description is to all those princes who are about to take the field with their armies.”²⁵ Significantly, the picture map that accompanied his text was not allowed to be printed. Defensive military planning could draw on a wealth of restricted manuscript material that was denied to an attacking force.

A medieval invading army, in the manner of a merchant convoy or a party of pilgrims—or, for that matter, any group of travelers—arrived at its destination by asking the way.²⁶ The destination was known by word of mouth (from kin, clerics, lawyers, seamen, and traders) and from the written records of travelers, chroniclers, marriages, and political treaties. There was an oral and literary gossip that reflected the high degree of sophistication reached by mercantile, clerical, and diplomatic contacts that, in an age as yet unbound to the literalness of maps, produced a sensory perception of space that was not a bad substitute for a graphic one. No chronicler had expressed surprise that European contingents from widely separated bases should arrive at the Holy Land at roughly the same time. And by the later fifteenth century that instinct for destination and the habit of asking the way had been supplemented not only by the rough and ready *tabulae novae* but by a notable accumulation of written itineraries, those place-named stepping-stones with ancestry back beyond the picture strips of the *itineraria picta* of antiquity,²⁷ and they can still enable a tourist to navigate a foreign subway system or a map-illiterate teenager to reach Katmandu.

By about 1500, even if we assume the existence of more maps of the Nicolaus Cusanus, Erhard Etzlaub, or Koblenz fragment type than have survived, a commander could not have directed the movement of a force of eight to twenty thousand men, and possibly as many camp-followers, simply with such maps and with itineraries, however full and detailed. Armies might encounter washed-out roads and bridges, unexpectedly steep grades, a tract of land incapable of provisioning the men, or the appearance of a hostile force a commander chose to veer away from; they required topographical detail not available throughout the period on general maps and only patchily covered in regional ones, most of which were, in any case, guarded by the administration and considered secrets of state.

It was because Renaissance maps were of little more use to armies than had been those of classical antiquity that Machiavelli and Digges could merely adapt the ad-

vice offered in the last quarter of the fourth century by Vegetius in his *Epitoma rei militaris*:

A general . . . should have an exact description of the country that is the seat of war, in which the distances of places specified by the number of miles, the nature of the roads, the shortest routes, by-roads, mountains and rivers, should be correctly inserted. We are told that the greatest generals have carried their precautions on this head so far that, not satisfied with the simple description of the country wherein they were engaged, they caused plans to be taken of it on the spot, that they might regulate their marches by the eye with greater safety. A general should also inform himself of all these particulars from persons of sense and reputation well acquainted with the country. . . . If any difficulty arises about the choice of roads, he should procure proper and skillful guides.²⁸

Writing in 1498, Philipp Eberhard, duke of Cleve, transferred this responsibility to the *maréchal des logis*, who was in charge of guiding as well as billeting the troops: “The said marshal should have a good knowledge of all the bridges, passes and roads that lie before the army . . . he should employ plenty of guides and scouts.” Significantly, when his manuscript was published in 1558, nothing was added about maps.²⁹

The fullest account of what information should be sought in a reconnaissance (though without reference to its being recorded in pictorial form) is contained in the translation by Philip Jones of Albrecht Meier’s *Methodus describendi regiones, urbes, et arces* . . . (Helmstedt, 1587). Jones dedicated his amplified translation (which, according to the title, was for “gentlemen, merchants, students, souldiers, marriners . . .”) to Sir Francis Drake on the eve of his departure for the elaborate—with more than twenty-three thousand troops and seamen—but abortive Lisbon expedition of 1589, remarking that “as for the men of service that are at this instant to be im-

25. Gerald Strauss, *Sixteenth-Century Germany: Its Topography and Topographers* (Madison: University of Wisconsin Press, 1959), 88. For a Latin and German edition, see Conradi Türost, “Conradi Türost De situ confœderatorum descriptio,” *Quellen zur Schweizer Geschichte* 6 (1884): 1–72. See also chapter 42, esp. figure 42.15.

26. For the planning of a European tour in 1517, see Antonio de Beatis, *The Travel Journal of Antonio de Beatis: Germany, Switzerland, the Low Countries, France and Italy, 1517–1518*, ed. J. R. Hale, trans. J. R. Hale and J. M. A. Lindon (London: The Hakluyt Society, 1979), 14ff.

27. Luciano Bosio refers to Strabo’s opinion of the military use of geography in his *La Tabula Peutingeriana: Una descrizione pittorica del mondo antico* (Rimini: Maggioli, 1983), 20.

28. Flavius Vegetius Renuatus, “The Military Institutions of the Romans,” trans. John Clarke, in *Roots of Strategy: A Collection of Military Classics*, ed. Thomas R. Phillips (Harrisburg: Military Service Publishing Company, 1940), 65–175, esp. 132–33.

29. Philipp Eberhard, Duke of Cleve, *Instruction de toutes manieres de guerroyer, tant par terre que par mer* . . . (Paris, 1558), 18.

played vnder your charge and gouernement what precepts are more conuenient?”³⁰

“Souldiers” are not the only audience addressed in the title, but in the age of the *Kavalierstour* and private service with foreign armies, the term “gentlemen” included men of birth who had either fought abroad or returned from their tour with news of fortifications, armories, and communications to pass on to their governments. In the fourth section of the book, under the heading “Chorographie,” the author stated the expectation that the traveler was, in addition to noting distances, roads, rivers, and other natural features, to record “the townes of warre, frontiers, castles, and defenses vpon the borders with their prouisions” and “whether the accesse, ingresse, and comming thereto be quiet, safe, difficult, or dangerous.”³¹ In the fifth section, “Topographie,” the concentration is on the siegability of fortified places:

Whether the cittie, towne, village, or what place else so euer it be, be built vpon the top, or side of a hill, or in a low ground.

Whether in a wet & marrish ground. . . .

Whether within the wals there bee any hils, or little hils, or some places higher, and lower than others. . . .

The ditch, or ditches that compasse it, how broad, and how deepe they be.

The castels, trenches, rampires, bulwarks, sconces, forts, towres, blockhouses, and fortresses therof.

The entrances and gates, how large, long, brode, high, their names, number and standing, with their distance also.

The wals, of what matter built, stone, or timber, of what compasse, height, or thicnesse, state and reparation, strong and faire, or ruinous.

Whether the wals be furnished with artillerie, ordinance, and watch, yea or no.³²

This is sound, practical stuff. And the point of these laborious quotations is to highlight the problem of the lack of an adequate “attack” cartography. Though printed maps became more accurate and informative during the sixteenth century and, from mid-century, more habitually possessed distance scales, their conventions were inadequate to show what a commander needed, concerned as he was with walls and the lay of the land when contemplating a siege or, on the march, with contours, the practicality of roads, river crossings, and mountain passes—all crucial to the calculation of that essential strategic ingredient, time—and with the nature of the terrain, whether it was open or forested or (with the baggage and artillery trains in mind) marshy. Renaissance maps from the earliest times had been generous, often exaggeratedly so, in showing rivers. This was useful, for whenever possible the guns were transported by water; even so, local knowledge of weirs, rapids, and the rate of currents was necessary. But

these maps remained stubbornly reticent in their depiction of roads. Etzlaub’s woodcut map of central Europe, first published in 1500, showed them—for the benefit, it would seem, of pilgrims—but generally roads were left to comments in itineraries and to local inquiry as to their condition.³³ Sebastian Münster’s map of the region around Basel showed no roads, rich as it was in detail: valleys, rivers, forests, and the names of places and districts.³⁴ Abraham Ortelius’s maps of Flanders of 1590 and 1592 showed rivers but no roads.³⁵ The first map of a much-mapped Tuscany to show roads was the 1596 “Geografia della Toscana” of Leonida Pindemonte.³⁶ Why published maps should have responded so little in scale and convention to the topographical interest so abundantly shown in travel journals and chorographical treatises is not a question to be pursued here. But we should emphasize the inadequacy of “stock” maps for the commander who did not have access to the administrative maps to which we shall turn, or even to the information that cartographers accepted as capable of representation on large-scale maps. Lucien Gallois was surely correct when, apropos of Elector John Frederick’s refusal to allow Peter Apian to draw up a new map of Saxony, for security reasons, he commented: “This cannot have been an isolated example.”³⁷ Giorgio Vasari portrayed Duke Cosimo I de’ Medici as planning the War of Siena (1552–55) in the calm of his study, working on a plan (fig. 29.1).³⁸ But his commander, the marquis of Marignano (Giangiacomo de’ Medici), spoke for every practical soldier when he told him, “These are drawing room plans, which do not work in practice,” and “If only you could see the ground, I know it would give you better understanding.”³⁹

30. Albrecht Meier, *Certaine Briefe, and Speciall Instructions for Gentlemen, Merchants, Students, Souldiers, Marriners, & etc. Employed in Seruices Abrode* . . . , trans. Philip Jones (London, 1589), dedication, p. 4.

31. Meier, *Speciall Instructions*, 6. In reference to “the townes of warre,” a note in the margin reads: “As Barwike vpon our borders.”

32. Meier, *Speciall Instructions*, 6–7.

33. See plate 44 and James Vann, “Mapping under the Austrian Habsburgs,” in *Monarchs, Ministers, and Maps*, 153–67, esp. 158.

34. Universitätsbibliothek Basel, *Oberrheinische Buchillustration 2: Basler Buchillustration 1500–1545* (Basel, 1984), 699 (folding plate).

35. Jozef Bossu, *Vlaanderen in oude kaarten: Drie eeuwen cartografie* (Tiel: Lannoo, 1983), 18, 57–58.

36. Maria Paola Rossignoli, “La Via Cassia: La più importante arteria commerciale dello Stato Senese e gli interventi medicei,” in *I Medici e lo stato senese, 1555–1609: Storia e territorio*, ed. Leonardo Rombai (Rome: De Luca, 1980), 283–91, discusses the notational difficulty of showing roads and illustrates parts of Pindemonte’s map (284–85).

37. Lucien Gallois, *Les géographes allemands de la Renaissance* (Paris: Leroux, 1890), 211.

38. T. S. R. Boase, *Giorgio Vasari: The Man and the Book* (Princeton: Princeton University Press, 1979), 304 (fig. 199).

39. Quoted in Simon Pepper and Nicholas Adams, *Firearms & Fortifications: Military Architecture and Siege Warfare in Sixteenth-Century Siena* (Chicago: University of Chicago Press, 1986), 126.



FIG. 29.1. COSIMO DE' MEDICI PLANNING THE ATTACK ON SIENNA, BY GIORGIO VASARI (DETAIL). This is one of the frescoes by Giorgio Vasari in the Sala dei Cinquecento, a great hall in the Palazzo Vecchio where the Medici family lived. The frescoes decorating the walls and ceilings of the palazzo explain the history of the Medici family. This portrait shows Duke Cosimo in his study planning the attack on Siena. In the full fresco, he is surrounded by allegorical figures—Patience, Vigilance, Fortitude, Prudence, and Silence. With permission from Fototeca dei Musei Comunali di Firenze.

In the correspondence between army leaders—commanding officers and the civilian commissioners who accompanied them—and their governments, references to maps are rare (though from the mid-fifteenth century the commanders received occasional requests for sketch maps to enable their dispositions to be visualized more clearly)—very rare indeed, in fact, compared with references to the employment of local guides (even, revealingly, when operating in their own country)⁴⁰ and to reports from spies sent ahead well in advance and from scouts dispatched daily; a scout on horseback could outstrip the average pace of a marching army, which was eight to ten miles a day, by a sufficient margin to be able to report back at nightfall on the prospect for the next twenty miles. Maps could suggest the strategic parameters of an expedition. “Maps and painted plans” brought by Italian exiles and malcontents appear to have convinced Charles VIII and his advisers of the practicability of his invasion of Naples, with an army traversing the peninsula shadowed by a fleet, in 1494.⁴¹ And he probably took maps

with him. At least Charles did his best, after the loss of his baggage on his return the following year, to recover portolan charts and portrayals of “certain cities and castles” done by “one of my painters” as well as—most tantalizingly of all—“still other recent things.”⁴² And there is evidence from the other, Italian, side of the conflict of the use of a map during a later stage of the same campaign. Alessandro Benedetti, a physician with the army planning an assault on the French-held city of Novara in August 1495, described the allied commanders’ discussing where to site their base camp: “On the table [*in mensa*] were drawn all the cities, roads, swamps, forests, rivers, ditches, towns.”⁴³ Charles VIII’s portrayals might have included working sketches prepared for strategic or logistic use, as when, before the duke of Alba’s expedition set off over the Mont Cenis en route to the Netherlands in 1566–67, “a painter accompanied the pioneers, by royal command, to paint the countryside so that the government might plan more effectively.”⁴⁴ It is more likely, however, that the king was anticipating Charles V, who took the painter Jan Cornelisz. Vermeyen on his Tunis expedition in 1535 to make sketches that were subsequently worked up into full-scale color cartoons for tapestries (plate 22).⁴⁵

Though the maps shown to Charles VIII (which have disappeared) may have helped to shape his overall strategic approach to the conquest of Naples—the most important military event of the Renaissance from the point of view of statecraft and international relations—oral and verbal cartography were, as they remained throughout the period, far more influential in the detailed planning. It was on the spoken and written topographical ac-

40. For an illustration of a guide showing the way to a military contingent, see the illustration from Diebold Schilling’s “Berner Chronik” of 1483 reproduced in Daniel Reichel, “L’art de la guerre à la fin du XV^e siècle: Analyse de quelques procédés de combat utilisés par les suisses,” in *Milano nell’età di Ludovico il Moro: Atti del Convegno Internazionale*, 28 febbraio–4 marzo 1983, 2 vols. (Milan: Comune di Milano, Archivio Storico Civico e Biblioteca Trivulziana, 1983), 1: 187–94, esp. 191 (summary in Italian on 185–86).

41. Yvonne Labande-Mailfert, *Charles VIII et son milieu, 1470–1498: La jeunesse au pouvoir* (Paris: C. Klincksieck, 1975), 191–92.

42. Quoted in Elizabeth Mongan, “The Battle of Fornovo,” in *Prints: Thirteen Illustrated Essays on the Art of the Print*, ed. Carl Zigrosser (New York: Holt, Reinhart and Winston, 1962), 253–68, quotations on 268. The French can be found in Paul Pélicier, ed., *Lettres de Charles VIII, roi de France*, 5 vols. (Paris: Renouard, 1898–1905), 4:321.

43. Alessandro Benedetti, *Diaria de bello Carolino (Diary of the Caroline War)*, ed. and trans. Dorothy M. Schullian (New York: F. Ungar, 1967), 147.

44. Geoffrey Parker, *The Army of Flanders and the Spanish Road, 1567–1659: The Logistics of Spanish Victory and Defeat in the Low Countries’ Wars* (Cambridge: Cambridge University Press, 1972), 81.

45. Hendrik J. Horn, *Jan Cornelisz. Vermeyen: Painter of Charles V and His Conquest of Tunis*, 2 vols. (Doornspijk: Davaco, 1989), esp. vol. 2, pls. XIX–XXXII.

counts of Charles's suitors from Milan and Naples and the Papal States, the Italian merchant communities in France, and his diplomatic agents in the peninsula that time scales, stopping points, and advance billeting arrangements depended. For the route taken across the Alps, he appears to have followed advice from his agent in Ferrara, Jacques Signot, and we can gain an impression of this advice from the book Signot later published describing alternative passes leading from the northwest into Italy.⁴⁶ This was accompanied by a map, pioneering in its subject matter, but, because of its lack of scale, indecisive placing of towns, and confusion between roads and rivers, no more than an impressionistic accompaniment to the text. Of the four passes Signot deals with, he points to the Montgenèvre as the easiest for the transport of artillery. Starting from Grenoble, he describes three possible routes, their advantages, and the branches from them in terms of place-names whence local distances and directions could be asked. On the other side of the pass, he indicates the two southern branches, one leading to Sisteron, the other (which Charles took) to Susa. The whole description occupies only sixty lines, but it gave armies what they needed: a scenario-itinerary to be animated by scouts—and through interpreters if necessary⁴⁷—as well as guides for each section. Charles VIII's *maréchal des logis* was a man qualified by considerable personal knowledge of Italy, Louis de Valetault.⁴⁸

That the pooling of topographical knowledge derived from written accounts and verbal reports remained an essential supplement to inadequate maps is shown by the continuing demand for strategic information by governments. Marco Foscarini, for instance, reporting to Venice in 1527 on his residence in Florence, supplied much of the information called for by Meier. He described the approach routes to Florence from all points of the compass, noting their practicability for men and artillery in various seasons; reviewed the fortified towns in the surrounding countryside into which rural dwellers could retreat, robbing an approaching army of the provisions it would require; and detailed the features of the fortifications of the city itself, noting their state of repair.⁴⁹ Interestingly, he made no reference to the large bird's-eye views of Florence published in the 1480s and 1490s by Francesco Rosselli, though these showed the city practically house by house, as well as the walls, and, in careful detail, the surrounding countryside visible from the artist's chosen viewpoint.⁵⁰ Nor have I found any reference to the military use of those later town views that betray, in so brilliant a tribute to the skill of sixteenth-century printmakers in Italy, Germany, and the Netherlands, information about walls, gates, and approaches—depictions revealing the victory of civic pride over political discretion, but needing, of course, in a century of continual updating of fortifications, glossing by written descriptions.

One example of the use of a town plan stands out because of its wholly exceptional nature. In 1529, Pope Clement VII, determined to punish his rebellious native city, Florence, with the support of Emperor Charles V, secretly commissioned, through his fifth column there, the noted clock- and instrumentmaker Benvenuto della Volpaia, who was also a talented surveyor, to produce a model that would enable him to follow the progress of the army sent to besiege the city: the planting of its batteries, its assaults, and the counterattacks it would have to deal with. Benvenuto della Volpaia, in turn, enlisted the aid of the versatile sculptor Niccolò Tribolo. It took them several months, working secretly and at night, to measure the city's streets and squares, the walls and their supplementary defenses, integrating these linear measurements with the help of compass bearings. In addition, they calculated the height of the tops of the towers and *campanili* and plotted the surrounding countryside for a mile around the city, using the cupola of the cathedral as a central reference point. Conflating their plans and elevations, Tribolo made a relief model in cork, which, cut into sections and boxed, was then smuggled to Rome concealed in bales of wool.⁵¹ A rare instance in which drawn town plans were commissioned specifically for potential military use was that of the plans of enemy Dutch towns ordered from Jacob van Deventer by King Philip II in or shortly before 1558.⁵²

46. Jacques Signot, *La totale et vraie descriptiō de tous les passaiges, lieux et destroitcz par lesquelz on peut passer et entrer des Gaules es Ytalies* (Paris, 1515 [the date of the privilege]). See David Buisseret, "Monarchs, Ministers, and Maps in France before the Accession of Louis XIV," in *Monarchs, Ministers, and Maps*, 99–123, esp. 101, and figure 48.14 in this volume.

47. For example, the Landsknecht companies' strength was said to include "an interpreter/translator in a foreign land." See Leonhardt Fronspenger, *Von kayserlichem Kriegssrechten* (Frankfurt, 1566; reprinted Graz: Akademische Druck- u. Verlagsanstalt, 1970), fol. LIIv.

48. Henri François Delaborde, *L'expédition de Charles VIII en Italie: Histoire diplomatique et militaire* (Paris: Firmin-Didot, 1888), 390.

49. Eugenio Albèri, ed., *Relazioni degli ambasciatori veneti al Senato*, 15 vols. (Florence: Società Editrice Fiorentina, 1839–63), vol. 2 (2d ser., vol. 1), 12–23.

50. For an example, see Arthur Mayger Hind, *Early Italian Engraving: A Critical Catalogue with Complete Reproduction of All the Prints Described*, 7 vols. (London: For M. Knoedler; New York: Bernard Quaritch, 1938–48), vol. 3, pl. 215.

51. Giorgio Vasari, *Le opere di Giorgio Vasari*, 9 vols., ed. Gaetano Milanesi (Florence: Sansoni, 1878–85), 6:61–63, and Leonardo Rombai, "Siena nelle sue rappresentazioni cartografiche fra la metà del '500 e l'inizio del '600," in *I Medici e lo stato senese, 1555–1609: Storia e territorio*, ed. Leonardo Rombai (Rome: De Luca, 1980), 91–109, esp. 102.

52. Jacob van Deventer, *Nederlandsche steden in de 16^e eeuw: Plattegronden van Jacob van Deventer*, ed. Robert Fruin (The Hague: M. Nijhoff, 1916–23). See also the discussion on pp. 1272–75 in this volume.

it may be that many more such sketches have been seen by campaign historians but not been thought worthy of record.

In addition to such reconnaissance sketches and the stock of materials of a nonmilitary nature that was assembled by governments, there was a third element within the cartography of attack: sketch map reports. On 2 August 1474, Cicco Simonetta, the head of the ducal chancery of the ruler of Milan, Galeazzo Maria Sforza, received a dispatch describing the disposition of the forces besieging Città di Castello east of Arezzo. It was accompanied by a clumsily drawn sketch that indicated the town's relationship to the neighboring hills and the river and showed the position of the besiegers and the emplacement of their—apparently solitary—cannon.⁵⁷ This is an early example of something that met a recurrent need: the addition of a visual to a written explanation of what was happening in the field for the benefit of those following events from afar.

The number of report maps increased as modernized fortifications and a more cautious attitude toward open battle slowed the progress of campaigns. As the war in the Netherlands stopped and started, as towns were taken and retaken after sieges that could last not just months but years, the needs of governments for information and of commanders for revisions of strategic policy grew, and stalemate gave time for the creation of a visual record. Apart from the sketches of sieges and skirmishes sent back by Walter Morgan to Burghley from the Netherlands between 1572 and 1574,⁵⁸ progress report sketch maps acquired a practiced notational nonchalance that was new. A rough sketch of the siege operations against Groningen sent to Burghley in 1594 (fig. 29.3) showed the town and the modifications the defenders had made to its walls (“Under this bulwarke ye Enemie hath made a half moone”), the artillery emplacements (and “ye oven for ye fiery bullets”), the approach routes (with the casually sufficient indications “A river” and “A bridge”), and the entrenched base camp of the English, Scottish, and Dutch troops under Maurits van Nassau, protected by “a fort built by our men since ye siege.” Though additional notations such as “Marishes” and “Gardens” help to demonstrate the advance in the communication of on-the-spot topographical reality since the sketch sent to Simonetta, the Groningen “plott,” like the other surviving reports sent back to Burghley (for instance, those recording progress during the English siege of Rouen in 1592), has yet to demonstrate sophisticated cartographic skills.⁵⁹ When Sir John Norris sent home a map of part of Brittany, commissioned—or at least obtained—from a French cartographer during his 1594 expedition against Brest, he did not ask for roads and bridges to be added to the standard conventions it employed.⁶⁰ The extent to which situation reports could reflect the cartographic skill

that military engineers added to their essential ability in surveying is shown, however, in the fine military plan of Rheinberg and the surrounding country, drawn after its surrender by the Spanish garrison on 1 August 1601, in the Cecil Collection,⁶¹ or, better still, in an Italian map of part of Holland prepared for Don Giovanni de' Medici when he was serving there.⁶² Using information from spies and patrols, it shows waterways and roads, which strong points were in whose hands, and the nature of the terrain. Stripped of their report inscriptions (in this case, “There the enemy is said to have nine cannon” and “Dykes and ditches whose further course can not be observed”), such maps, when they got into the hands of publishers, became the basis of the news or commemorative “historical” maps to which we will turn in conclusion.

It was not until 1648 that a surviving map, *Delineatio generalis camporum desertorum vulgo Ukraina cum adiacentibus provinciis* by Guillaume le Vasseur de Beauplan, was prepared (and published) with military expeditions against disputed and enemy territory in mind. This map was prepared for King Ladislaus IV of Poland's projects to push the Turks and Crimean Tartars once and for all from the bases from which they had been raiding deep into the Ukraine. It was based on surveys made from the 1630s, when Beauplan had been employed as military engineer by the grand hetman Stanislaw Koniecpolski, accompanying him on military expeditions and subsequently planning fortified settlements in the areas most vulnerable to raids. Reflecting the hetman's wish to have a cartographic record of the personal territorial empire he was accumulating in rivalry with other Polish warlords, the map was not conceived purely as a military one, but it is the best example the period has to offer. And Beauplan's description of how he went about creating it does much to explain the rarity of maps prepared for military aggression, emphasizing the cartographer's need for time and protection. For each cluster of settlements within a radius of eight to ten leagues, Beauplan used his astrolabe

57. Cicco Simonetta, *I diari di Cicco Simonetta*, ed. Alfio Rosario Natale (Milan: A. Giuffrè, 1962), 133 and fig. facing 132. I owe this reference to Evelyn Welch.

58. Duncan Caldecott-Baird, *The Expedition in Holland, 1572–1574: The Revolt of the Netherlands, the Early Struggle for Independence from the Manuscript by Walter Morgan* (London: Seeley Service, 1976), reproduced passim.

59. Peter Barber drew my attention to this (BL, Cotton MS. Augustus I.ii.93), and I am also grateful for the critical care with which he and J. B. Harley helped me revise this chapter as a whole.

60. BL, Cotton MS. Augustus I.ii.58.

61. R. A. Skelton and John Newenham Summerson, *A Description of Maps and Architectural Drawings in the Collection Made by William Cecil, First Baron Burghley, Now at Hatfield House* (Oxford: Roxburghe Club, 1971), 67 (cat. no. 113).

62. Renzo Manetti, *Gli affreschi di villa Arrivabene: Città ed eserciti nell'Europa del Cinquecento* (Florence: Salani, 1981), 23–24.

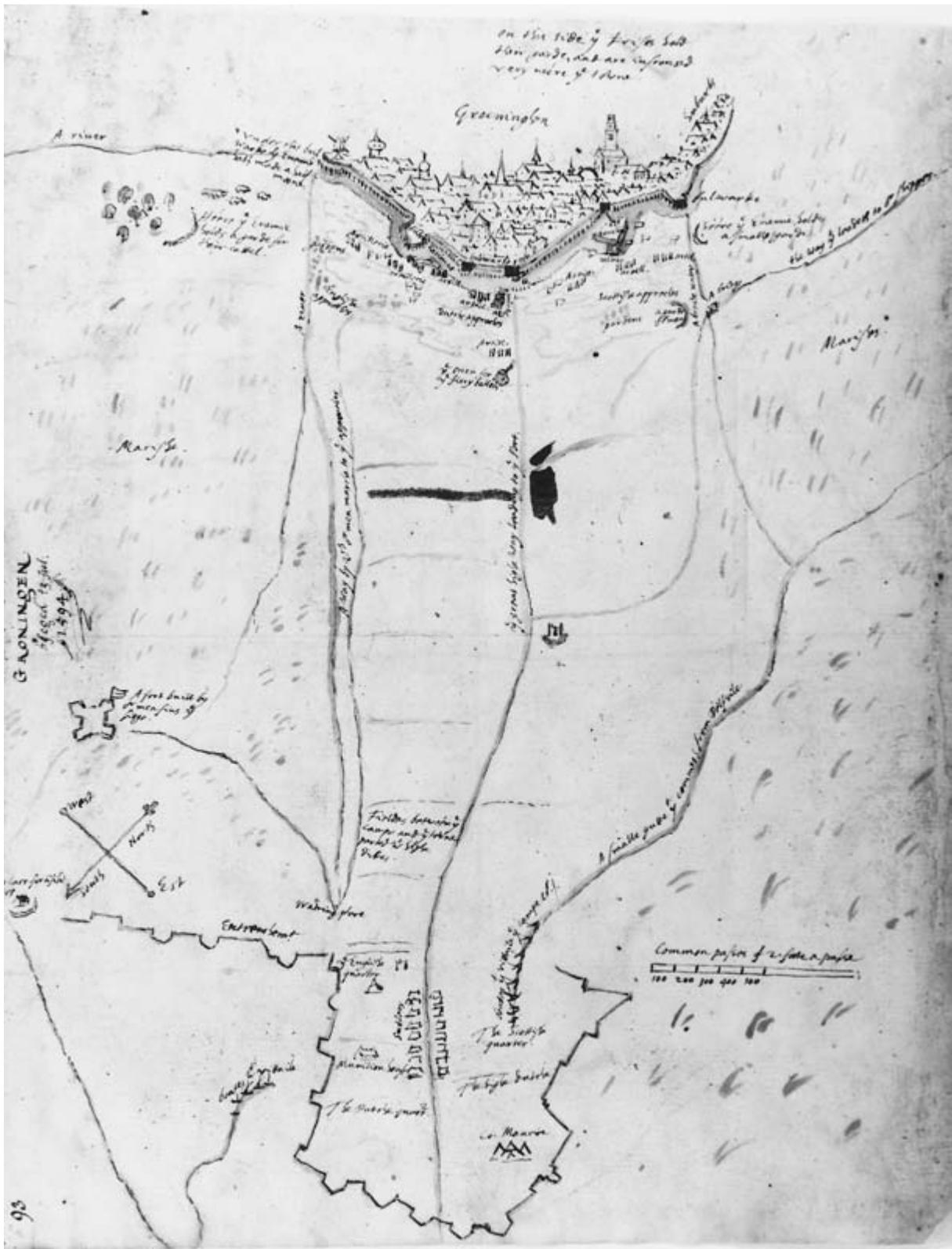


FIG. 29.3. PLAN OF THE SIEGE OF GRONINGEN, 1594. This plan of the siege, by the English and Scottish auxiliaries under Prince Maurits van Nassau, shows the several approaches of the English, Scottish, and Dutch at the attack on

13 July 1594. Size of the original: ca. 38.1 × 29.9 cm. Photograph courtesy of the BL (Cotton MS. Augustus I.ii, fol. 93).

at noon to fix the latitude. He then measured the distances between settlements with an odometer phased to the pace of his horse, compass in hand to record bends. He then surveyed the courses of rivers, the areas covered by mountains, and the dimensions of forests and plains, finally coordinating all this material on his map.⁶³

Nonetheless, it is when we turn from attack to defense that something like a consistently developing military cartography can be glimpsed. Defensive policy was centered on fortified towns and coastal or frontier fortresses, and the introduction in the later fifteenth century of a new, bastioned style of fortification created an interest that led to a steadily increasing flow of drawings between governments and military architects and their local military and civilian supervisors.⁶⁴ This traffic in designs—and also in three-dimensional models—not only coaxed from the mapmakers a refinement and communicative explicitness (for instance, by the mid-sixteenth century the use of hinged flaps to suggest alternative treatments of parts of a plan was common), but stimulated first representations of defensive centers within their immediate topographical and communications setting, then plans of zones containing mutually supportive fortifications, and finally maps of whole regions within which fortifications might have to be supplied with men and provisions or within which an attack might have to be repelled or absorbed. And this activity flourished within a country's own boundaries, where surveyors could draw on unpublished, restricted-use surveys and openly crouch over their graphometers, pace their distances, and—later—push mensuration wheels or ride in the wagons of the late sixteenth-century *Wegmessern*, with their cogwork recording machinery.⁶⁵

In the course of recording the defensive potential of Cesare Borgia's conquests in the Italian Romagna as his *architetto e ingegnere generale*, Leonardo da Vinci, in his astonishingly precocious plan of Imola, not only showed the housing and streets of the urban grid and the circuit of walls, but added bearings and distances to neighboring towns.⁶⁶ In the same spirit, he sketched the littoral north and south of Cesare's temporarily occupied Piombino.⁶⁷ By the 1540s, maps relating strong points to their hinterlands and maritime support routes, and to separate fortifications linked within a threatened strategic area, had become routine elements of counterattack or occupation cartography, as demonstrated by the military zone maps prepared for the English government, which covered areas of the channel coast, the Pas-de-Calais, the Boulonnais, and the Scottish lowlands.⁶⁸ These maps represented a tendency, nourished by the increasing planting of subsidiary forts, to cover enemy approach routes and to harass the places where the enemy might be expected to set up their siege artillery.⁶⁹ Throughout the period, however, there was a reluctance to extend the conventions appropriate

to military site or zonal maps to those covering larger areas. Thus, as late as about 1632, in a report by the military engineer Francesco Tensini on the fortification of the whole of Venice's mainland territory, though each site was drawn—covering a fairly large area because of the preference for outworks rather than the strengthening of existing walls and bastions (fig. 29.4)—and though the text discussed the supporting role of widely separated fortresses and walled towns, Tensini included no regional maps, assuming that the relationships among fortified places would be adequately “seen” from non-military maps.⁷⁰

In any case, evidence of too many stages in the absorption of local and zonal surveys into regional cartography is missing for the transmission process to be charted with any accuracy. There was the problem of summarizing zonal detail into smaller-scale maps. Thus, the detail neither in the aerial view of the Valle di Chiana, which Leonardo prepared for Cesare Borgia in 1502, nor in his 1503 map of the terrain covered by Florence's war against Pisa, affected Tuscan cartography, though both

63. Czesław Chowaniec, “Une carte militaire polonaise au XVII^e siècle (Les origines de la carte de l'Ukraine dressée par Guillaume le Vasseur de Beauplan),” *Revue Internationale d'Histoire Militaire* 12 (1952): 546–62.

64. See, for example, the two treatises by Giacomo Lanteri that discuss the design and construction of fortresses. Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: Johns Hopkins University Press, 2001), esp. 202–8.

65. Grenacher, “Die Anfänge der Militärkartographie,” 69.

66. Martin Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man* (Cambridge: Harvard University Press, 1981), 228–30. Leonardo's cartographic work is mentioned in several chapters in this volume; Imola is illustrated in figures 27.1 and 36.16.

67. BNF, MS. I, fol. 80v–81r. See Ludwig H. Heydenreich, “The Military Architect,” in *The Unknown Leonardo*, ed. Ladislao Reti, designed by Emil M. Bühner (London: Hutchinson, 1974), 136–65, esp. 142 and 304 nn. 3 and 4.

68. For maps of the English Channel, see J. R. Hale, “The Defence of the Realm, 1485–1558,” in *The History of the King's Works* by Howard Montagu Colvin et al., 6 vols. (London: Her Majesty's Stationery Office, 1963–82), 4:365–401, esp. 374, and BL, Cotton MS. Augustus I.i.35–39. For Calais and Boulognois, see Colvin, “King's Works in France,” 337ff; Lonnie Royce Shelby, *John Rogers: Tudor Military Engineer* (Oxford: Clarendon, 1967), 1–4, 51–85, and 145–57; and Skelton and Summerson, *Description of Maps*, cat. no. 92. For the lowlands, see Marcus Merriman, “Italian Military Engineers in Britain in the 1540s,” in *English Map-Making, 1500–1650: Historical Essays*, ed. Sarah Tyacke (London: British Library, 1983), 57–67, esp. 59–60 and figs. 19–20.

69. James R. Akerman and David Buisseret, *Monarchs, Ministers, & Maps: A Cartographic Exhibit at the Newberry Library*, exhibition catalog (Chicago: Newberry Library, 1985), 6 (cat. no. 7).

70. J. R. Hale, “Post-Renaissance Fortification: Two Reports by Francesco Tensini on the Defense of the Terraferma (1618–1632),” in *L'architettura militare veneta del Cinquecento* (Milan: Electa, 1988), 11–21.



FIG. 29.4. FORTIFICATIONS OF CREMA, CA. 1632. This is one of several fortification plans in an undated manuscript report by Francesco Tensini, “Trattato . . . sopra delle città e fortezze che possede la Serenissima Signoria di Venetia in Terra Ferma.” The “Trattato” details the state of Venice’s fortified sites in the early 1630s and provides realistic advice on the modernization of the fortifications, given the government’s limited power to impose ideal solutions and the restrictions on funds for defensive works in the terra firma.

Size of the original: 42.5 × 27.5 cm. Photograph courtesy of the Biblioteca Comunale, Crema (MSS. 9, fol. 3v).

maps were produced for public authorities, as his use of right reading—and not his normal mirror writing—shows.⁷¹ And the information supplied in defensive zone maps was in competition for space with other information required by increasingly centralizing governments. Thomas Petyt’s 1547 map of English-occupied Dumfriesshire, though prepared by a military surveyor, was as much a law and order map as a military one.⁷² And though the impulse was initially military for the regional Irish maps of the late 1560s and the 1570s that “afforded the training ground for English cartographers,”⁷³ their

chief usefulness was probably in the contexts of politics (the definition of county boundaries), administration, and colonization. The same can be said of the provincial defense maps produced for Sully. Their unprecedented accuracy and fullness of detail provided information at least as useful for governmental civilian needs (information on borders, communications, and population density) as for military ones.

From the mid-fifteenth to the late sixteenth century, many “administrative” maps contained far more information that would have been of use to a commander than those that have been dubbed military ones. The maps produced so that Venice could plan the fiscal, legal, and police administration of its terra firma, once its dominion was confirmed by the Italian peace treaty of Lodi in 1454, showed city street plans, walls and suburbs, waterways and connecting roads (sometimes with distances marked on them), and the contours of hills and mountains, which were depicted with a skill that drew in part on the practice of Lombard hydraulic surveyor-engineers. Similar maps were drawn of Verona in about 1453–59⁷⁴ and of Brescia in 1471–72⁷⁵ and their territories; both maps were of great potential strategic interest to the Republic’s hostile northern neighbors, but their use was carefully restricted. Comparable, though less rich, painted maps were produced following the extension of Nuremberg’s territory after that city’s successful campaigns of 1503–4.⁷⁶ In Italy, Eufrosino della Volpaia (Euphrosinus Vulpius) made a map in 1547 of the Roman Campagna that showed roads as well as rivers and all defensive castles and towers, but its purpose was jurisdictional, not military.⁷⁷ Protection of ju-

71. Heydenreich, “Military Architect,” 149 (fig. 149/2) and 150–51 (fig. 150/2), and figure 36.5 in this volume.

72. P. D. A. Harvey, “The Portsmouth Map of 1545 and the Introduction of Scale Maps into England,” in *Hampshire Studies*, ed. John Webb, Nigel Yates, and Sarah E. Peacock (Portsmouth: Portsmouth City Records Office, 1981), 33–49, esp. 35. See Peter Barber, “England I: Pageantry, Defense, and Government: Maps at Court to 1550,” in *Monarchs, Ministers, and Maps*, 26–56, esp. 41.

73. E. G. R. Taylor, *The Mathematical Practitioners of Tudor & Stuart England* (Cambridge: Cambridge University Press, 1954), 31, and chapter 55 in this volume.

74. P. D. A. Harvey, “Local and Regional Cartography in Medieval Europe,” in *HC* 1:464–501, esp. 478, fig. 20.13, and pl. 34, and Schulz, “Jacopo de’ Barbari’s View of Venice,” 443–44 (fig. 11).

75. Roberto Almagià, *Monumenta Italiae cartographica* (Florence: Istituto Geografico Militare, 1929), pl. VII. See also P. D. A. Harvey, *The History of Topographical Maps: Symbols, Pictures and Surveys* (London: Thames and Hudson, 1980), 59–60.

76. Fritz Schnelbögl, “Life and Work of the Nuremberg Cartographer Erhard Etzlaub (†1532),” *Imago Mundi* 20 (1966): 11–26, esp. 20–21 and figs. 5a and 5b.

77. Eufrosino della Volpaia, *La campagna romana al tempo di Paolo III: Mappa della campagna romano del 1547*, intro. Thomas Ashby (Rome: Danesi, 1914). See also Luciana Cassanelli, Gabriella Delfini,

risdictional rights similarly elicited the superbly visualized topographical regional maps drawn up by Paul Pfinzing and others in Germany in the 1590s, maps that would have been a godsend to an attack army had they not been unpublished and restricted.⁷⁸ Similarly, the Dutch regional maps that contain the most information that would have been useful to armies—information about roads, dikes, causeways, canals, and polders—were made to assist in the settlement of legal, not armed, conflicts.⁷⁹ The most dramatic example of an administrative map's being seen—through a shift of focus, as it were—as a military one came with the Venetian senate's decision not to place the huge map (13.5 × 35 feet) of the terra firma they had commissioned in 1578 from Cristoforo Sorte on the wall of their chamber, where it was to have been used to impress visitors with the extent of Venice's land empire, but to store a version of it in sections for reference purposes and commission a smaller and far less revealing one for their semi-public walls.⁸⁰

Finally, what of the printed commemorative maps and plans that might have been of use to the strategists? Topographical military illustrations drew on two interacting genres: the town view and the landscape panorama. These were followed, late in the sixteenth century, by military annotations on general maps, anticipating the standardized cartographic depiction of troop positions. Art took the lead in the first two, cartography in the third. All helped create the habit of putting military events “on the map.”

The oblique perspectives that became a conventional way of representing cities, enabling the draftsmen to render the urban texture as well as the city's profile and plan, had led to the depiction of the surrounding countryside that came within the draftsman's imagined angle of vision. Pioneered to a high standard of accuracy in such peaceable works as Jacopo de' Barbari's woodcut view of Venice (with its alpine horizon) of 1500,⁸¹ Albrecht Dürer's astonishingly realized bird's-eye view of the mountain passes that converged on the town of Chiusa (Klausen) in the southern Tyrol as the bottom part of his 1501–2 *Nemesis* engraving,⁸² or Hans Weiditz's 1521 woodcut view of Augsburg,⁸³ the townscape-in-a-landscape panorama went to war with maximum zest in Hans Sebald Beham's large (six blocks) woodcut depiction of the 1529 siege of Vienna, published the following year (fig. 29.5).⁸⁴ Sketched from the spire of the church of Saint Stephan at its center, the circular design takes in the city and a wide swath of the surrounding country, rendered in detail, up to the horizon in a complete sweep of 360 degrees. In a later woodcut (1549) of sixteen blocks, Hans Mielich depicted Charles V's encampment at Ingolstadt.⁸⁵ Mielich planned to depict Ingolstadt, as Beham had Vienna, from a high viewpoint, the parapet of the

tower of the Frauenkirche (where the artist portrays himself at work), but in fact, as had Beham, he adopted a far higher, imaginary viewpoint when he came to work up his sketches. So we have not only a depiction of the city walls and the army's tents, picket lines, and parading companies outside them, but the sweep of roads, rivers, woods, and settlements stretching to the horizon.

Works such as these exploited cartographic skills to develop the fifteenth-century impulse to provide a panoramic background to a military event. This impulse originated in the convention whereby Burgundian chronicle illuminators balanced the detail of camp and gun emplacements in the foreground of bird's-eye siege scenes with an unspecific spread of landscape at the top of the composition. It was reflected in Italian miniatures such as the panoramic view of a siege shown behind the triumphal figure of the condottiere ruler Federico da Montefeltro in his Bible of 1472⁸⁶ and also in larger compositions, such as the fresco of the 1460 siege of Marienburg

and Daniela Fonti, *Le mura di Roma: L'architettura militare nella storia urbana* (Rome: Bulzoni, 1974), fig. 67. For other examples of Italian administrative mapping, see John Marino, “Administrative Mapping in the Italian States,” in *Monarchs, Ministers, and Maps*, 5–25.

78. See Ernst Gagel, *Pfinzing: Der Kartograph der Reichsstadt Nürnberg (1554–1599)* (Hersbruck: Im Selbstverlag der Altnürnberger Landschaft, 1957), esp. 9–11, and Ruthardt Oehme, *Die Geschichte der Kartographie des deutschen Südwestens* (Constance: Thorbecke, 1961), color pls. V and VI.

79. C. Koeman, *Geschiedenis van de kartografie van Nederland: Zes eeuwen land- en zeekaarten en stadsplattegronden* (Alphen aan den Rijn: Canaletto, 1983), e.g., 137 (fig. 9.2).

80. Roberto Almagià, “Cristoforo Sorte, il primo grande cartografo e topografo della Repubblica di Venezia,” in *Kartographische Studien: Haack-Festschrift*, ed. Hermann Lautensach and Hans-Richard Fischer (Gotha: Haack, 1957), 7–12, esp. 8, reprinted in Almagià's *Scritti geografici (1905–1957)* (Rome: Edizioni Cremonese, 1961), 613–18, esp. 613ff., and Giuliana Mazzi, “La repubblica e uno strumento per il dominio,” *Architettura e Utopia nella Venezia del Cinquecento*, exhibition catalog, ed. Lionello Puppi (Milan: Electa, 1980), 59–62 with reproductions. On the defensive and administrative strains in English cartography, see Victor Morgan, “The Cartographic Image of ‘The Country’ in Early Modern England,” *Transactions of the Royal Historical Society*, 5th ser., 29 (1979): 129–54, esp. 136–37, on Henry VIII's and Elizabeth's “need for maps to assist in the maintenance of military preparedness, to facilitate the conduct of military affairs, and to supervise colonial activities in Ireland” (p. 137).

81. Schulz, “Jacopo de' Barbari's View of Venice.”

82. Erwin Panofsky, *The Life and Art of Albrecht Dürer*, 4th ed. (Princeton: Princeton University Press, 1955), 81–82 and fig. 115.

83. Max Geisberg, *The German Single-Leaf Woodcut: 1500–1550*, 4 vols., rev. and ed. Walter L. Strauss (New York: Hacker Art Books, 1974), 4:1493–97.

84. Geisberg, *Single-Leaf Woodcut*, 1:261–67.

85. Geisberg, *Single-Leaf Woodcut*, 3:892–909.

86. Vatican City, Biblioteca Apostolica Vaticana, MS. Urb. Lat. 491, fol. 11v. See Annarosa Garzelli, *La Bibbia di Federico da Montefeltro: Un'officina libraria fiorentina, 1476–1478* (Rome: Multigrafica, 1977), 30 (fig. 8).



FIG. 29.5. HANS SEBALD BEHAM'S SIEGE OF VIENNA, 1529. Published in 1530 by Niclas Meldemann, this 360-degree sketch on six woodblocks is centered on the church of Saint Stephen, from which it was drawn. The city walls are flattened out so that their inner surfaces are visible and show the placing of artillery and the perambulations of the watch.

Churches, garrison contingents (with the names of their commanders), and a ring of soldiers are some of the things shown within the city; the countryside shown reaches to the hilly horizon.

Size of the original: 81.2 × 85.6 cm. Photograph courtesy of the Albertina, Vienna (inv. 23134).

painted for the Artushof of Danzig (Gdańsk) in about 1487.⁸⁷ And this interaction between accurate town plans and cartographically influenced landscape panoramas continued to add to the maplike usefulness of siege depiction, not only in paintings such as Vasari's of the carefully surveyed siege of Florence in 1529⁸⁸ or the anonymous siege of Deventer in 1578,⁸⁹ but in the circulating

medium of prints that may be said to have culminated, from the point of view of art and cartography, in Jacques

87. Alfred Stange, *Deutsche Malerei der Gotik*, 11 vols. (Munich: Deutscher Kunstverlag, 1934–61), 11:114 and fig. 259.

88. See Vasari, *Opere*, 8:173–78, for his surveying method. His fresco is in the Salone del Cinquecento in the Palazzo Vecchio.

89. Koeman, *Kartografie van Nederland*, 75 (fig. 6.8).

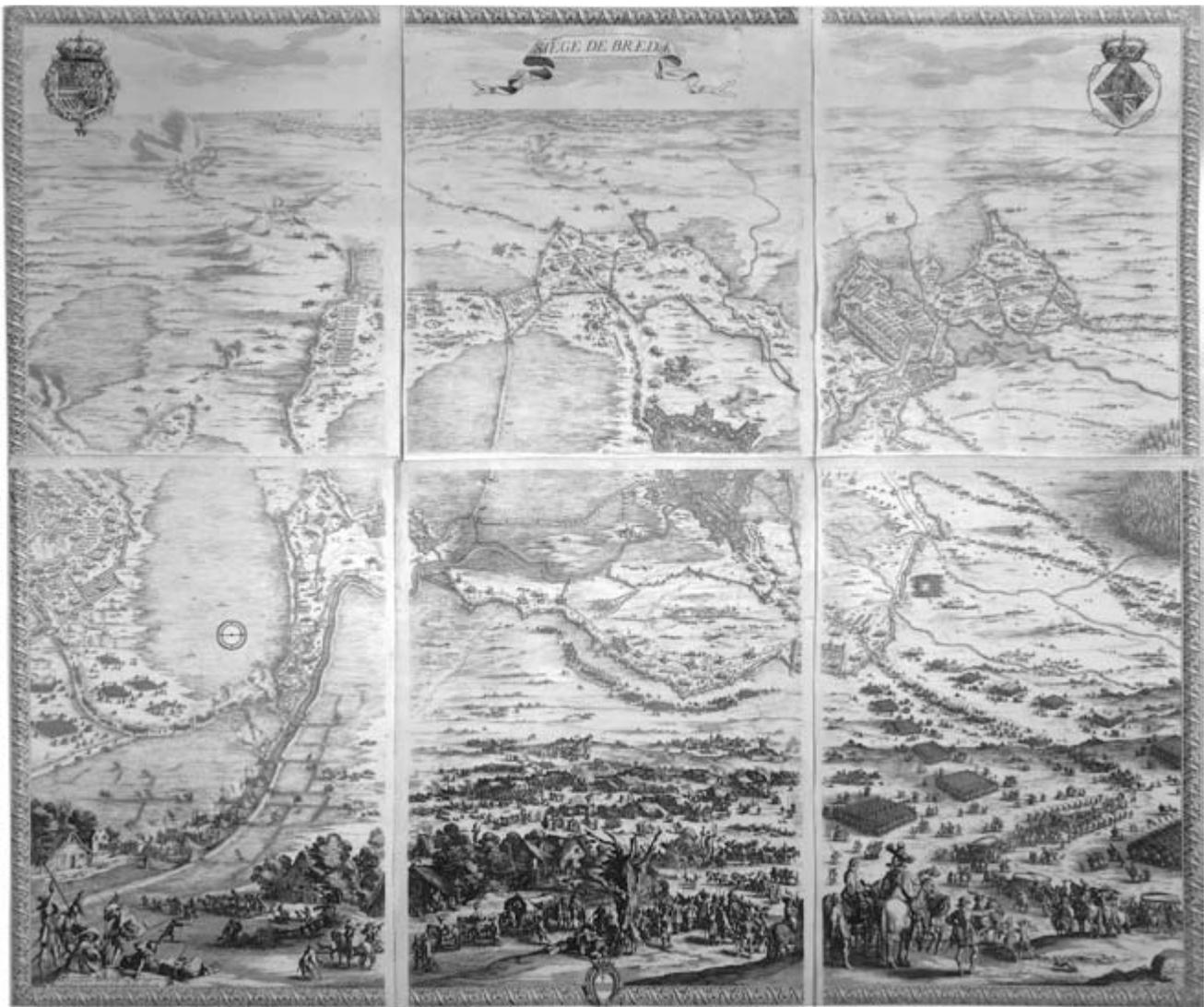


FIG. 29.6. JACQUES CALLOT'S *SIÈGE DE BREDA*, 1628. Breda was a fortified town at the confluence of two rivers, the Merk and the Aa. Spanish forces laid siege in 1624, with Dutch forces resisting for eleven months. The town was surrendered on 5 June 1625, and Callot, commissioned to record the siege, went to the Netherlands in July 1627. This elaborate

six-plate engraving was published in Antwerp in 1628. At lower left, the author is seen working; at lower right, the entourage of Queen Isabella is moving toward the fortified city. Size of the original: ca. 123 × 140.5 cm. Photograph © Board of Trustees, National Gallery of Art, Washington, D.C. (Rosenwald Collection, B-20303–B-20308).

Callot's *Siège de Breda* (1628) (fig. 29.6),⁹⁰ and which became a valuable component of a government's stock of material of potential military application.

The same cannot be said of the depiction of battles, which formed a parallel genre. For here, in painting and print, the drama of personal confrontation and the lack of the steadying specificity of a town caused the panoramic setting to remain a generalized one, largely or wholly imaginary even while including a notional hill or river known to have affected the nature of the conflict (fig. 29.7).⁹¹

90. See Georges Sadoul, *Jacques Callot: Miroir de son temps* (Paris: Gallimard, 1969), 213–31, for several details of this six-plate engraving. In the explanatory booklet accompanying the set, Callot says he has been concerned with "depicting all the towns and the siege with the distances of the places" (p. 214).

91. Edmond Pognon, "Les plus anciens plans de villes gravés et les événements militaires," *Imago Mundi* 22 (1968): 13–19. The subject can be followed up in such repertoires of reproduction as Geisberg, *Single-Leaf Woodcut*; Walter L. Strauss, *The German Single-Leaf Woodcut, 1550–1600: A Pictorial Catalogue*, 3 vols. (New York: Abaris Books, 1975); and F. W. H. Hollstein, *Dutch and Flemish Etchings, Engravings and Woodcuts, ca. 1450–1700* (Amsterdam: Menno Hertzberger, 1949–).



FIG. 29.7. JÖRG BREU THE YOUNGER, SIEGE OF ALGIERS, 1541. This woodcut, which formed the model for an Italian engraved version by Paolo Forlani in 1565 recording Charles V's siege of Algiers of 20 October 1541, combines an oblique view of the invasion of the city with a map of the west-

ern Mediterranean showing its general location.

Size of the original: 38.5 × 51.8 cm. Photograph courtesy of the Bildarchiv Preussischer Kulturbesitz / Kupferstichkabinett, Staatliche Museen zu Berlin / Joerg P. Anders (Hollstein 33, inv. 809–10).

Indeed, when considering the historical (or commemorative, propagandistic, or journalistic) element within the visual documentation of war, we are reminded that in this period topographical maps, which were the most useful in the conduct of campaigns, were common to two traditions, those of the land measurer or surveyor and the artist, and that the two overlapped—as we have seen in the cases of Leonardo and Dürer. Later the mantle of visual recorder of all things slipped down and fell on less distinguished shoulders, but in Germany Jörg Kölderer, court painter to Maximilian I, was employed to map parts of the Tirol in the late 1490s,⁹² and Hans Baldung, whose religious paintings reveal one of the most idiosyncratic visionary temperaments within northern Renaissance art, accepted a commission to delineate the fortifications of the Order of Saint John in Rhodes in 1522.⁹³

More typical of the union between the artist's gift for draftsmanship and the more easily learned skills of the surveyor was the career of Paul Dax of Innsbruck. Trained as a painter, Dax fought as a Landsknecht during the campaign that led to the sack of Rome in 1527 and was among the defenders of Vienna in 1529. By mid-century he had been appointed a court painter to Maximilian's successor, Ferdinand I. In 1544, he drew up what has been called “the first and oldest large-scale map of

92. Arnold Feuerstein, “Die Entwicklung des Kartenbildes von Tirol bis um die Mitte des 16. Jahrhunderts,” *Mitteilungen der K. K. Geographischen Gesellschaft in Wien* 55 (1912): 328–85, esp. 356–57.

93. Hans Baldung, *Skizzenbuch des Hans Baldung Grien: “Karlsruher Skizzenbuch,”* 2 vols., ed. Kurt Martin (Basel: Holbein, 1950), 1:53–57, 2:22v–25v.

the Achensee area and the Bavarian-Tirolean border-districts,” as remarkable for the liveliness with which the panorama of mountains, forests, rivers, towns, and villages was represented as for its overall accuracy.⁹⁴ At the request of Ferdinand, Dax mapped parts of the county of Tirol in 1555. The map was well received, and he was asked to extend its coverage to include the whole of the Habsburg patrimony in the Tirol. This he did not live to complete, partly because of ill health, but also because his request for financial assistance from the government of Tirol was denied in 1559.⁹⁵ Meanwhile, other painters such as the Italian Pirro Ligorio, by now specializing in decorative design rather than major altarpieces, mythological scenes, or portraits, were sent on surveying missions.⁹⁶ Their emblem is the self-portrait of the aristocratic English artist Nathaniel Bacon, which shows him lounging elegantly with a drawing in his hand and an atlas open on the table in front of him (plate 23). Though no map can be definitely associated with Bacon, he is brought firmly within the purview of this survey by the palette and sword that hang side by side from a rack on the wall and by the nearby picture of a helmeted goddess, Minerva.⁹⁷ Castiglione’s advocacy of the gentleman-soldier’s ability to use art in the service of war could hardly have been put more neatly.

The land-measuring aspect of cartography also responded to war, within its own developing conventions. For instance, the interest generated by the conflict between Florence and Siena from 1522 to 1555 was of crucial importance to the mapping of Tuscany, and from 1576 the forty years of campaigning in the Netherlands constituted as much a school for mapmakers as it was, in a phrase much used at the time, a school of war. Both stimulated the emergence of a taste for maps annotated with military events (fig. 29.8).

The earliest surviving evidence of this taste is the series of Italian regional maps painted between 1580 and 1583 under the supervision of Egnazio Danti in the Vatican, whereon otherwise objective surveys are superimposed miniature representations of battles or military scenes, chiefly ancient (e.g., Caesar’s crossing of the Rubicon and Cannae), but including some of more recent date (Fornovo, fought in 1495, and the march of a papal force from the Marche toward Rome in 1527).⁹⁸ More “modern”—because more schematic in their notations or because of their declarations that they were catering to an audience that wished to follow contemporary military events on maps—were some of the nontopographical maps produced in the Netherlands: Floris Balthasarsz.’s commemoration of Maurits van Nassau’s march toward the battle on the sands near Nieuwpoort in 1600, for instance, or Pieter van den Keere’s 1605 map of the environs of Ostend (Oostende), which was designed, as its cartouche announces, to enable its owner to follow mili-

tary events on the Sluis and against the town.⁹⁹ These maps, and maps modeled on them that were designed to help stay-at-homes follow the events of the Thirty Years War, while not produced for warmakers, were doubtless welcome additions to their stock of reference materials.

What, then, was the direct relationship between warfare and mapping? A balanced view of “attack” cartography has been given by Andrews with reference to the later sixteenth century: “In the heat of an Elizabethan campaign, maps were probably of limited importance. The Irish are not known to have used them . . . and the English armies in the field may be supposed to have depended on guides for most of their topographical intelligence.”¹⁰⁰ And we have seen that “defense” cartography, when it did not involve the hasty replanning of fortified zones (as in the case of Henry VIII’s French enclaves in the 1540s), became subsumed into governments’ growing appetite for visual accounts of the territories they administered, though it continued to act as a stimulus to such accounts. Even though the military engineer emerged as a key figure both in defensive planning and in the conduct of campaigns in this period, thus increasing the number of military professionals with mapping skills, and even though from the late sixteenth century some such men, while remaining military jacks of all trades, were seen as forming a cartographic cadre within the peacetime technical military establishment (representing fortifications, transport, and artillery)—a focus particularly apparent in France—the demand for multipurpose topographical information prevented the evolution of a cartography primarily geared to the needs of war.

In 1607, for instance, Jean de Beins produced five beautiful ink and watercolor topographical maps of the upper Rhône and the country through which it flowed south of

94. Feuerstein, “Die Entwicklung des Kartenbildes,” 365–68 and quotation on 358.

95. Feuerstein, “Die Entwicklung des Kartenbildes,” 363–65.

96. Ligorio designed a map of classical Rome for his patrons; see Christian Hülsen, *Saggio di bibliografia ragionata delle piante iconografiche e prospettive di Roma dal 1551 al 1748* (1915; reprinted Rome: Bardi, 1969), 17–18, 41–44, and 52–53.

97. Gervase Jackson-Stops, ed., *The Treasure Houses of Britain: Five Hundred Years of Private Patronage and Art Collecting*, exhibition catalog (Washington D.C.: National Gallery of Art; New Haven: Yale University Press, 1985), 140 (cat. no. 65).

98. Francesca Fiorani, “Post-Tridentine ‘Geographia Sacra’: The Galleria della Carte Geografiche in the Vatican Palace,” *Imago Mundi* 48 (1996): 124–48, and Roberto Almagià, *Monumenta cartographica Vaticana*, 4 vols. (Vatican City: Biblioteca Apostolica Vaticana, 1944–55), vol. 3, pls. IX, XII, XIV, XVI, and XXVII. See also chapter 32 in this volume.

99. Bossu, *Vlaanderen in oude kaarten*, 31 and 74–75.

100. J. H. Andrews, “Geography and Government in Elizabethan Ireland,” in *Irish Geographical Studies in Honour of E. Estyn Evans*, ed. Nicholas Stephens and Robin E. Glasscock (Belfast: Queen’s University of Belfast, 1970), 178–91, esp. 185.

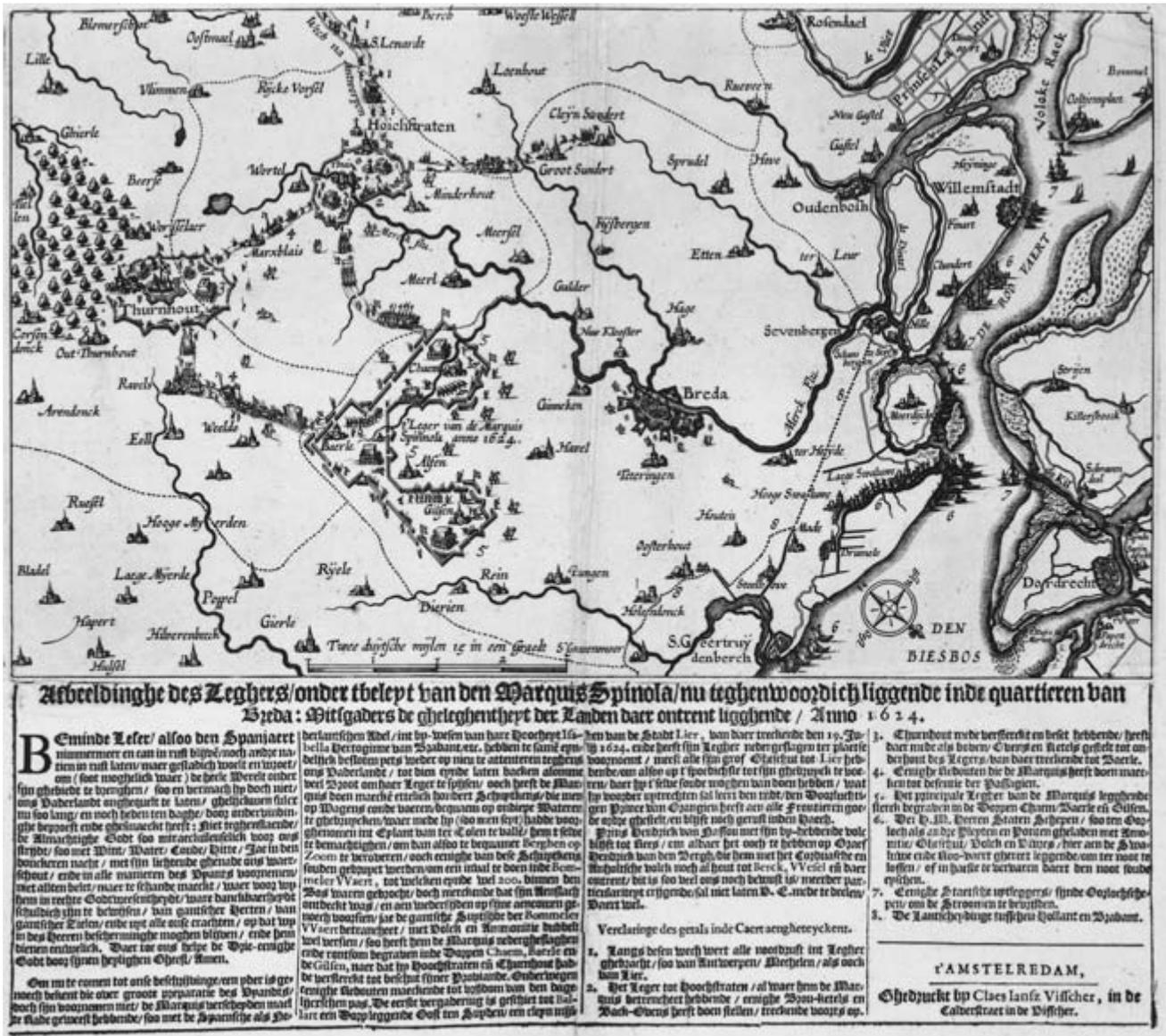


FIG. 29.8. CLAES JANSZ. VISSCHER'S SIEGE OF BREDA, 1624, ENGRAVING. This print records the lineup of armies in the 1624 siege and explicitly notes lines of fortifications and

the engagement of places of interest. Photograph © Rijksmuseum Amsterdam (FM 1511).

Lyons (fig. 29.9). He had served Henri IV in his campaigns between 1589 and 1594 and was a surveyor and fortifications expert, and his cartographic work in Dauphiné was carried out in his official role as *géographe et ingénieur du roi*.¹⁰¹ On a scale of about 1:70,000, the maps are rich in detail: tributaries and islands; woods and scattered trees; towns, villages, and hamlets; even individual fields. Careful shading indicates the relative heights of hills and mountains. Yet despite the auspices under which they were produced, nothing identifies them as military maps. While the main riverine roads are shown, secondary roads are either omitted or not treated systemati-

cally throughout the series. Inventive as are the relief conventions, none is used to indicate currents or practicable mooring or crossing points in the river.¹⁰² They constitute an advance on the 1602 maps of Ponthieu and the Boulonnais by Jean Martellier,¹⁰³ another employee of the French military establishment, which show no scale and

101. Buisseret, *Sully*, 129.

102. BL, Add. MS. 21,117, fols. 36–38.

103. BL, Add. MS. 21,117, fols. 6v and 7v. For more on the *ingénieurs du roi*, including Beins and Martellier, see chapter 49 in this volume.

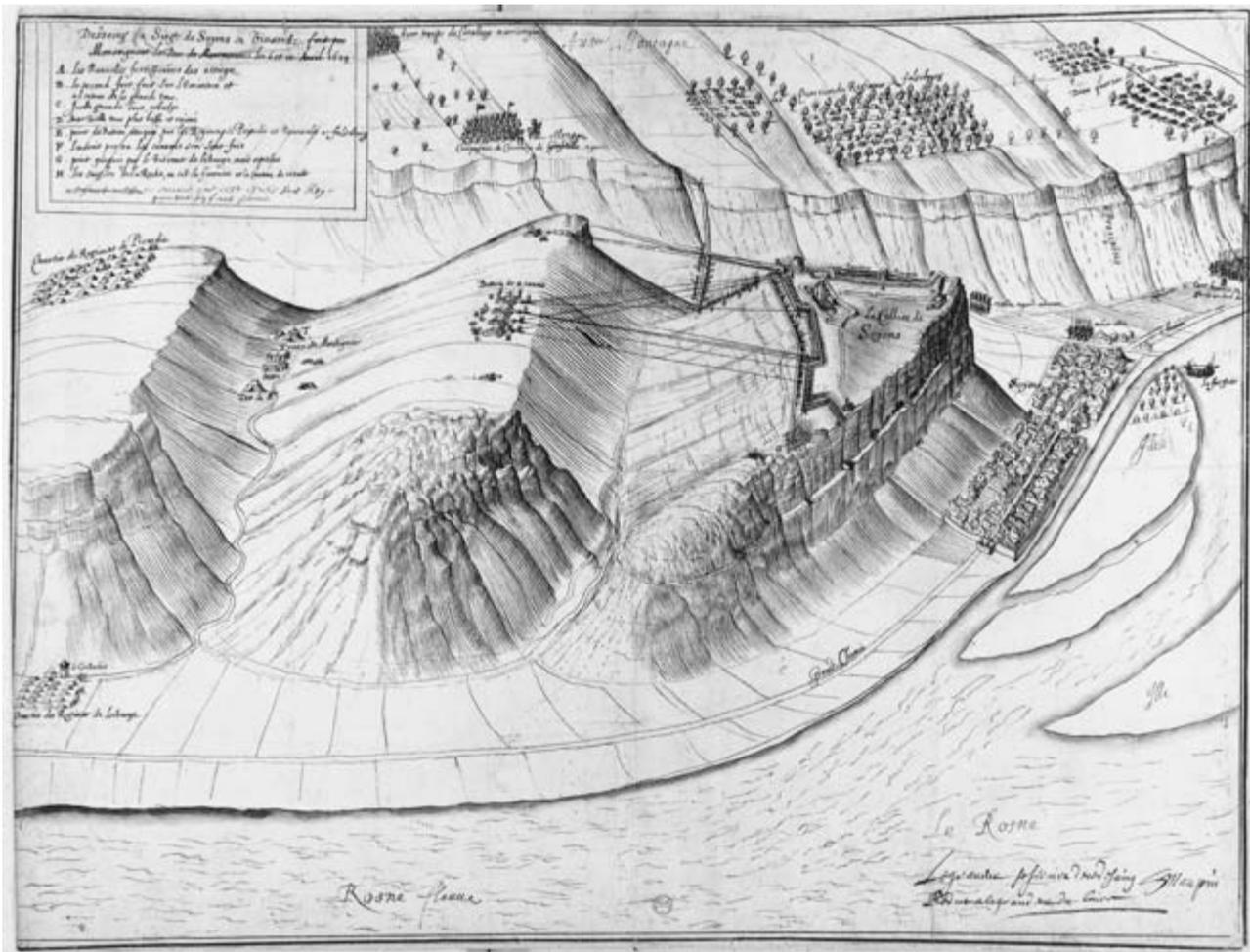


FIG. 29.9. JEAN DE BEINS, MAP OF THE SIEGE OF SOYONS, 1629. This map was drawn and signed by the royal military engineer Jean de Beins while in service at Montmorency. It elegantly shows the surrounding topography of the

city, positions of artillery battery, and troop encampments. The city's fortifications were later destroyed by the royal army. Photograph courtesy of the BNF (Estampes, Va 7, tome 2).

no roads at all, but they are a reminder that from this period we are not yet necessarily to expect military maps from cartographers employed by the military. So warfare battered on the cartographic instinct that was such a notable aspect of the imaginative and intellectual life of the

period. To some extent, it shaped its purposefulness. It established some specialized niches within it. But it did not create military cartography as a distinct, consistently pursued genre.