INTRODUCTION

The Revolutionary and New Demands of artillery siege warfare, and the passion for geometric order, created a distinct kind of urbanism in the seventeenth century whose influence was felt for centuries afterward. The imperatives of strategic representation and defense decisively transformed the architecture and public domain of cities, resulting in what I call *military urbanism*, a style of urban design based on uniformity, geometrical clarity, control, architectural economy, and unadorned monumentality. Even when the immense walls and bastions that defined the new urban structure were brought down in the industrial period, they nonetheless remained imprinted on, and continue to scar, the form of the city. Military planning created most of the significant spaces of the modern city: the orderly grid, the grand avenue, the square parade ground, and the beltway. The unified landscape of government in the Washington Mall as planned by L'Enfant – that inspired America's civic centers – derives ultimately from seventeenth-century military urbanism, as does the Pentagon. Although it is only in the twentieth century that cities became distinct targets and the destruction of civilian settlements stated military objectives (as in the "area bombing" practiced by enemy air forces on German and British cities), they had become the principal pawns of war already in the sixteenth century.

This book expands upon the central idea of my previous study of Turin, that the "military culture" of early modern Europe decisively altered the conception, representation, and design of the city.[1] Where before I analyzed a single site intensively, I now gather signs of military urbanism from across the whole of Europe, showing how a core of design ideas – generated in the treatises of Italian soldier-architects – evolves in local conditions both political and geographic. The planned towns, citadels, and urban expansions that I have studied, and when possible visited, range from the borders of Scotland to the borders of the Ottoman empire, from Malta and Cyprus to Scandinavia and the American colonies. They include Rome, Naples, and Milan in Italy, Strasbourg, Paris, and Lille in France, Antwerp, Hamburg, and Stockholm, though I bring in many smaller "fortress-cities" such as Wolfenbüttel and Palmanova.

Each chapter concentrates on a defining stage in the militarization of the city, as it is fortified, theorized, violated, rebuilt, celebrated, and sent up in smoke. I begin with the geometrically planned citadels, with special emphasis on the pentagon, which becomes the military symbol of the Baroque city. Other chapters explore the theoretical treatises used in the teaching of military architecture, the siege views commissioned by the winning parties after a successful encounter, the competing forms adopted for the street layout, and the typology of temporary architecture constructed for urban public ceremonies and entertainment. These large-scale public rituals turn the city into a trophy, symbolically offered and received, while elaborate engraved plans and

views capture this commemoration in print, defining the idealized aesthetic vision of the city in the seventeenth century. I conclude with a suitably explosive finale, on the uses of elaborate firework displays as an exorcism of popular fears associated with war, turning destructive force into urban spectacle.

Though I do not claim to have coined the term "military urbanism," this book establishes the phenomenon for the first time in detail and on a European scale. I agree with Giancarlo Severini that the military treatises represent "the confluence of military urbanism, urbanism in general, and architecture," but I study this confluence in actual cities, and their representations in all the theatres of war where "urbanistica militare" prevailed.[2] This comparative, transnational method differentiates my study from the best earlier publications on military architecture, such as the books and essays by John Hale and Horst de la Croix, and important contemporary studies by Nicholas Adams, Simon Pepper, and Amelio Fara, all largely focused on the Italian peninsula. (Fara's main contribution is his study of the bastion's form, especially the flank, which allows him to date and attribute them to individual military architects, an important distinction given the team-work involved in the fortification process.) My work also benefits from the publications of Marino Viganò and Alicia Cámara, who document the work of Italian military architects abroad.[3] I emphasize, however, that the theory and practice of military architecture was truly an international project, though it began in late-Renaissance Italy. As in other wars, one of the effects of conflict in the peninsula was that a large wave of Italian artists, architects, historians, diplomats, and military commanders became available for foreign employment. This often found natives of the various *stati antichi* on opposite sides of a conflict, normally between France and Spain, and later in the seventeenth century between France and the Holy Roman Empire or the Dutch republic. I highlight the achievement, not only of theorists like Francesco de' Marchi and strategists like Alessandro Farnese, Duke of Parma, but of many designers and engineers from the Low Countries, Spain, the German states, France, and Sweden.

I have learnt from many indispensable local studies, some of which offer suggestive generalizations and documentary evidence. Henning Eichberg, for example, who studies Swedish cities on the German mainland, proposes (as I do) that fortification constituted the "master discipline" of the sixteenth-eighteenth centuries, that it can be analyzed according to aesthetic criteria, and that it brought about "a new look and a new space." I have gleaned important materials from exhibition catalogues on the "architect-engineer," on the planned city, on the peace treaty of 1648, on Palmanova and the European fortress-city.[4]

General histories of urban design often recognize the military component but without giving it the central importance that I am claiming here. Siegfried Giedion, for example, classifies Palmanova among late, regressive ideal cities, insignificant because "merely a fortress."[5] One of my recurrent points is that the so-called "ideal city" expresses not some abstract religious or intellectual harmony, but the precise requirements of military order; I substantiate Pierre Francastel's passing remark that the principles of ideal-city planning found their best expression in cities built for military purposes.[6] A popular survey still insisted, in 1994, that the determining role of fortification has been unjustly "neglected by urban historians." Lewis Mumford addresses the effect of the military upon the city in his brief section suggestively titled "War as city-builder," where he sees the garrison exerting an enormous influence upon the Baroque city through its barracks, arsenals and drill-grounds, but this is only a glancing aside within his larger condemnation of the backward-looking seventeenth century.[7] Alone among the authors of the standard urban surveys, Pierre Lavedan is remarkable in seeing fortifications as effective engines in the development of urban form. He recognizes that if a city does not modernize its defenses it is likely to fall behind in the competition for a place within the grid of European urban hierarchy.[8] Enrico Guidoni and Angela Marino claim modernism for the Seicento, despite their assertion that there was a "retreat" in the seventeenth century from the numerous urban design projects of the Renaissance. They assemble a comprehensive array of city plans, aerial views and "ideal" design from military treatises, but their valuable work remains a survey without a dominant interpretation.[9]

Despite the unwillingness of historians to acknowledge the importance of military deterrence to the European city, the collected fragments of individual urban histories are now weighty enough to conclude that the ordered aesthetic of the bastioned walls, achieved through complete control of design and construction, comes to influence the civilian buildings and spaces of the city in the early modern period. Although the influential historian Spiro Kostof interprets the military defenses of the western city as merely the fringe of the city's edge, the fortified perimeter is not marginal, but central to the definition and identity of the early modern city.[10] While the military removed itself from occupying the center of the city to defining its increasingly broader perimeter, the bastioned walls tightened their controlling embrace of the city, preventing outward sprawl and the contamination that suburban and rural intermingling might promote. The increased depth of the defenses has been interpreted as "stifl[ing] any tendency toward urban growth" and forcing the city to remain in its medieval overcrowded condition.[11] But in fact modernization of the fortifications in the early modern period almost invariably brought about an expansion of the urban area, and promoted significant reconfiguration of the interior of the city.

Created by the defenders of the city, many among whom become the leading inhabitants, military architecture empowers the viewer by offering a dominant position from which relations within the city, and between city and surrounding countryside, are clarified. The ability to view, to look over, and to have a long vista – long before it was enshrined in French garden design – is an innovation of Baroque military urbanism. Although dominating positions from which to view the city and the countryside were available from tenuous perches on top of bell towers, and rare prescient interventions such as Pope Pius II's terraces at his palace in Pienza,[12] a solid commanding vista of the city's surroundings and of its profile could now be obtained from any point along its bastioned walls, offering the perfect viewing platform for interested civilians. Many of these walls were planted with trees to form a promenade, combining civil and military amenities. Thus the city is interpreted through its fortifications.

Early modern urban design and architecture inflected by defense concerns are defined by a clear set of formal characteristics. These include nearly obsessive concern with regularity and order, such as geometrical clarity in the definition of streets and in the layout of squares, the uniformity of buildings surrounding urban spaces achieved through consistent roof heights, the calculated repetitive rhythms of openings such as doors and windows, and the abandonment of the anthropomorphic system of proportions. Newly defined by austerity and economy of decorations, this architecture is the outcome of a stripping away of moldings, cornices, and all decorations that are not legible from great distances. The proliferation of urban fortifications promotes an immense jump in scale from preexisting to modernized fortifications, as shown in Chapter 1, in my analysis of the form and use of the polygonal bastion. The huge increase in the size of the city can be gauged through the comparison of plans of pre-existing cities before and after the construction and illustration of bastioned walls, and through twentieth-century aerial views. Determined by the range of cannon, the curtain wall between bastions lengthens in step with the improvement of artillery, transforming the legible module of urbanism, and altering the grid of movement within the walled city.[13] Consequently, in the early modern period the city is considered as a whole, an objective unit whose defense, urban layout, and architecture are planned as one entity.

Surveying and cartography played instrumental roles in the militarization of the early modern city. Significant material contributions of military urbanism are the new surveying techniques and the draughtsmanship demanded by the construction of these immensely scaled defenses: among the first accurate graphic depictions of the early modern city, eventually translated into engraved and widely available printed sheets, are manuscript drawings by military architects. The fundamental importance of fortification design, the ability to draw plans to scale as a basic requirement in the education of military architects, has been illustrated persuasively by Daniela Lamberini, who sees "design as the connecting thread that links the protagonists of the art of war."[14] The design project – or the scaled representation in ichnographic plan in a manuscript

drawing – explains all the secrets of the new military city, otherwise hidden from view, in a language understandable only to military practitioners.

In this way the representation of cities becomes a vital fringe benefit of the military enterprise of war preparation. Projects to fortify and defend the city begin with accurately measured ichnographic plans, while the newly conquered city is revealed in engraved siege views and paintings, the focus of Chapter 3. Plans and views of cities – available in single sheets or bound together in large "theatres of cities" – become part of its iconography, avidly collected by inhabitants and by foreign collectors. The serial depiction of individual cities in print developed out of German chronicles, but soon took on the status of an independent genre. Successive editions of Sebastian Münster's *Cosmographia*, for example, display more large-format illustrations of recognizable cities, though some woodcuts are still used generically for more than one location. By the mid-sixteenth century it was possible to compile chorographies of European cities. The *Epitome de la corographie d'Europe illustré des portraitz des villes plus renommées d'icelle* by Guillaume Guéroult offered such an early collection of city-views (Lyons, 1553). Although he does not explain his choice of cities, the author offers a remarkably lovely and sharp series of woodcuts, accompanied by verbal descriptions of each city. Another precocious sixteenth-century city book is Giulio Ballino, *De' disegni delle piu illustri città e fortezze del mondo* (Venice, 1569), which includes up-to-date fortifications such as the citadel of "Piaseza" (Piacenza). The publishers of civilian printed illustrations were no doubt aware of the innovations of military architects in design and representation of urban sites. For example, Salamanca and Lafrery, the principal publishers of illustrated material in Rome in the mid-sixteenth century, were shown Francesco de' Marchi's influential treatise in 1545, when the author visited Rome for a military conference, and looked for ways of publishing his heavily illustrated book.[15] The availability of exceptionally large audiences interested in cities is implicit in an even greater publication success, the *Civitates Orbis Terrarum* (Cities of [All] Countries of the Globe) published from 1572 by the Dutch cartographers Braun and Hogenberg. With its increasingly comprehensive coverage (363 plates contained more than 500 views and plans of towns and cities), this atlas celebrating the urban riches of Europe was repeatedly reissued (in expanded French, Latin, and German editions in 1575, 1581, 1588, 1598, and 1617), each volume with its own title often playing on the word "theatrum."[16] Braun-Hogenberg provided the prototypes for the representation of individual European cities for the next two centuries, including Mathaeus Merian's *Theatrum Europaeum*.

Nor should this enquiry be limited to engravings in books. The ornamental role of military urbanism is quickly developed through the adoption of siege, battle, and fortification design as decorative features of public buildings. Thus painting cycles and tapestries depicting war and its instruments come to adorn city halls, galleries of sovereign rulers, and even the houses of military commanders. The commemoration of the events of war reinforces the visual impact of military urbanism. Buildings and monuments raised after the conclusion of military conflicts, the founding of new towns to reinforce conquered territory, the re-fortification or de-militarization of conquered cities may all be celebrated in paintings, engravings, medals, stage designs, and three-dimensional models or *plans-relief*.

By the middle of the sixteenth century a substantial number of cities have had their distinctive images established in print, starting with Venice, where the view drawn by Jacopo de' Barbari in 1500 endured unsurpassed.[17] For other cities such as Rome, however, the search for a persuasive and definitive form continued through the eighteenth century. In the late sixteenth century the interest in urban representation is reinforced by greater competitiveness in the domination of cities, which represent the wealth of sovereign states. This interest appears in the decorative programs of numerous princely residences, which increasingly featured painted, carved, or woven city views – the most spectacular being the siege tapestries of Emperor Charles V, the cartographic gallery in the Vatican palace, and the "Conquests of Louis XIV." Views and plans corroborated the authority of the prince, and provided a constant reminder of subject cities.[18]

The graphic representation of the city is a fundamental tool in understanding urban form. For

example, the plan of Vienna – surveyed and drawn by Augustin Hirschvogel (1547, and engraved in the early 1550s, as described in Chapter 3) shows the new fortifications built soon after Vienna withstood the first Turkish siege in 1529. Similarly, the plan of Milan made by the architect Francesco Maria Ricchini (1603), discussed in Chapter 4, offers a complete record of the fortifications of the expanded city. Manuscript plans and fragmentary drawings of design proposals for the defense of cities were collected by their authors, and especially by the sovereign rulers who employed the military architects and who controlled the cities that were fortified.[19] Among the most outstanding campaigns to document the cities of a realm is the program to glorify Louis XIV, which took place around his sieges, as I show in the last section of Chapter 3. The engraved plans distributed as collections of cities, or printed from multiple plates as monumental wall-hangings, were an effective counterpart to these carefully collected manuscript plans, an act of mediation between the designers of the new architecture and the wider public. Publicly available maps and views trumpeted the achievements of military planners and architects to a wide readership, recording the exceptional variety of ideas and realizations in urban design. I frequently draw on these images, which combine the ichnography of the surveyed plan with the scenography of the illusionistic bird's-eye view; among the most successful, analyzed in Chapter 4, are the views of Naples from the sea by Alessandro Baratta, and the axonometric plan of Rome by Giovanni Battista Falda.

The effect of war on the city continued during periods of peacetime – and in a sense guaranteed that peace, providing both a monument of civilization and a deterrent to future attack. The geometrical abstraction, large scale, and unadorned practicality of military architecture influenced civic urban design, housing, and movement. The glories of military endeavor were celebrated through torrents of visual art, from public sculptures and paintings to popular news books. Graphic news of war, as well as literary descriptions, educated a broad range of persons in the great numbers, the layout, and the architectural riches of contested European cities. Capturing the military successes of victorious generals and sovereigns, triumphalist art permanently entered the public domain. Some of its most visible elements, such as the equestrian statue and the triumphal arch, became staples of European cities far into the nineteenth century. The commemoration of the events of war – the sieges studied in Chapter 3, the new fortress-cities analyzed in Chapter 4, the triumphs and victory celebrations explored in Chapter 5 – reinforces the visual impact of military urbanism. Fireworks brilliantly reproduced the light and sounds of cannon bombardment, and often simulated fortresses and castles being blown up, further educating the population into the effects of military conflicts on buildings and cities – while offering the urbane pleasure of terror without danger.

Following the history of these events through contemporary graphic documents yields an exceptionally vivid and visually rich portrayal of the early modern city. Indeed, our visual knowledge of these celebrations derives almost entirely from graphic art, and in many cases the paintings that purport to capture the event were in fact copied from engravings. Urban views of spaces *within* the city – complementing the panoramic external views and plans of Braun-Hogenberg and Merian – became widespread in the seventeenth century; they are among the most extraordinary documents of the Baroque conception of the city, and of Baroque understanding of urban space. We will see throughout this book that print-makers represent the city in multiple forms and formats, in single sheets and in uniform series combined in large folios, in abstract plans, distant profiles, bird's-eye views, and more realistic street-level *vedute*. Frequently, they show an idealized version of urban space, presenting as built what had been only planned. The city may appear as foreground or background, for example in illustrations of antiquities, in the plates of military treatises, and in portraits of victorious rulers. Views of the city often served as the framing backdrop for ceremonies, parties, and processions, bringing together knowledge of its principal political events and its cultural patrimony, its monuments of military and civil architecture. Connoisseurs and strategists collected these depictions avidly. Though plans were considered functional and views decorative or popular, these representative modes frequently overlapped. Graphic illustration did not simply evolve from an earlier encomiastic

and emblematic mode to a more scientific and topographical approach.[20] These depictions of urban festivities respond to the need for documentation *and* celebration, description *and* prescription, in a typically Baroque synthesis.

The materials and protagonists of this book are closely interconnected. The authors, patrons, and designers encountered most frequently in the following chapters moved in, and helped to create, a multidisciplinary as well as international world of discourse, architecture, and power. De' Marchi, for example, served as fortification consultant to a pope and a regent of the Netherlands, and drew up designs for citadels including Turin and Antwerp, where he also supervised up to eight engravers for the 170 plates that would illustrate his treatise (a number he planned to expand to 460). In his correspondence he boasts that his ideas and works gained privileged access to the nobles in the Flemish government: the counts of Egmont and Horn and the prince of Orange read and compared the solutions for fortifications offered in treatises by Cataneo, Lanteri, Castriotto, Maggi, and others, but prefer de' Marchi's unpublished work (which eventually appeared in 1599, posthumously).[21] Carlo Tetti, another sixteenth-century engineer who traversed Europe in Imperial service, gained practical experience consulting on the reconstruction site of Vienna's fortifications, where he met Daniel Speckle of Strasbourg; both Tetti and Speckle attended the military conference in Regensburg in 1576, which was convened to consider the fortification of Hungary, the Christian bastion against the advance of the Ottoman empire. Tetti's manuscript and published treatises on fortification evidently led to his employment by the emperor and by the Venetian state, and in his 1575 edition he claims that his treatise was so ardently desired that an earlier version was published against his will but with the encouragement of Pompeo and Prospero Colonna in Rome.[22]

Galeazzo Gualdo Priorato – historian and biographer of Mazarin and Wallenstein, compiler of a survey of Dutch fortified cities, experienced in military campaigns throughout Europe – defines the prince as a "prudent and politic soldier."[23] Such a patron must encourage the invention of new urban forms and new modes of representing their success. Like so much in military culture, this exploitation of multiple visual media goes back to Emperor Charles V. Charles took care to include artists as well as trainee generals on his endless military campaigns. His assault on Tunis was recorded in commissioned drawings that in turn inspired wall paintings, tapestries, and sets of engravings that narrated his exploits (see Chapter 3). In the Netherlands, Charles commissioned the fortification of a "chain" of cities in a program that accompanied his conflicts with the Protestant German princes of the empire. An entire early series of sixteenth-century woodcut prints document the emperor's sieges and his new fortresses; subject to conscious manipulation, these imperial images were media events calculated to convey the emperor's political program and to promote his "collective enterprise of fabrication."[24]

Charles V's patronage formed the next generation of leaders, among them Emanuele Filiberto, future Duke of Savoy, whose contributions to military culture I studied in an earlier book, and whose commission of the pentagonal citadel in Turin begins the present history. Emanuele Filiberto's education in fortification grew when he accompanied the emperor (his employer as well as his uncle) on a tour evaluating the strength of Flemish and Dutch fortresses. Savoy court patronage, sustained by the citadel, the painted gallery of victories and the extensive collection of military graphic documents, led to the development of a group of military architects and engineers, similar to the *corps du génie* founded by Henri IV in France, but more emphatically concerned with urban design and public architecture. Although Emannuele Filiberto did not *publish* a treatise on military strategy, imbedded among his copious manuscripts (composed in a personal version of Spanish admixed with French, Italian, and Flemish) are notes showing that he had meant to compose something similar to Alessandro Farnese's manuscript treatise. The Venetian ambassador Antonio Boldu claimed that the duke recorded daily the events of his life, modeling his writings on those of Julius Caesar.[25]

Patrons could thus be writers and military architects in their own right. The formidable strategist

Alessandro Farnese composed a book-length manuscript himself as well as commissioning artists to record his *fasti* in monumental form, modeling himself on his imperial grandfather by ensuring his visual afterlife.[26] Although not published (the manuscript is in the library of the Academia dei Lincei in Rome), the treatise is an elaborate study based on extensive reading and personal experience, and could be interpreted as a compilation of study notes made during the reading of the existent literature on the subject, which Farnese quotes extensively.[27] On the opposing front, Prince Maurits of Orange-Nassau led the military resistance to Spanish rule, designed many of the fortifications that formed a "chain" to protect the Dutch provinces, and encouraged a brilliant circle of artists, theorists, and engineers. Maurits's patronage is directly war-related, and his most important contribution is in the writings of Simon Stevin, and of other military scientists such as Samuel Marolois, Hendrick Hondius, and Jan Vredeman de Vries, all of whom dedicated their treatises on military architecture to him. Marolois, a military engineer and mathematician, was a colleague of Stevin, while Hondius was a publisher in The Hague whose privileges included the exclusive right, from 1597 to 1607, to publish Maurits's portrait.[28]

Military architects, in response to the complex demands of their educated rulers, were often polymaths. The ability to combine invention, design, map-making, calculation, research, writing, draftsmanship, building, and collecting was not confined to Renaissance figures like Leonardo. The multidisciplinary Adam Freitag, with doctorates in philosophy and medicine, taught mathematics and enjoyed an active career as a doctor and as a "Captain Engineer" in the service of Poland, the Netherlands, and Sweden. Daniel Speckle kept his day job as a silk embroiderer, while he was constructing the city model of Strasbourg and designing its new fortifications. Erik Dahlbergh – who worked his way by sheer talent to become provincial governor, national security advisor, and a Swedish Count – designed significant fortifications and new cities, and drew for his team of engravers the topographical views that defined Swedish identity, together with some of the most powerful images of sieges and urban ceremonials. Antoine de Ville, a gifted draughtsman, drew the most accurate map of Mantua and its environs as well as imaginative illustrations for his treatises that combine real topography with ideal geometrical traces of great visual power. His beautifully illustrated *Les fortifications, ou l'ingénieur parfait* (Lyons, 1629) established him as an authority on urban defense, completing the work of his predecessor Jean Errard. De Ville published a long list of books regarding contemporary war practices, drawn almost entirely from his own experience – as mining and fortifications expert in the armies of France, the Venetian Republic and the Duke of Savoy. Among his prizes was the award of the knighthood of the order of Saints Maurizio and Lazaro given to him by Carlo Emanuele I, the Duke of Savoy, in 1629. De Ville describes in close detail the sieges of Corbie, Landrecy, and Hesdin, but his interests also extend to archaeology and art history. He devotes an entire book to the distinguished antiquities of the Venetian colony of Pola that he also adorned with a regular bastioned fortress.[29]

Conversely, many seventeenth-century thinkers and artists eminent for other talents made their contributions to military education and urbanism. The engraver Israel Silvestre, tutor to the royal pages, was also commissioned to record the complete fortifications of France. François Blondel's career, as he delights to inform us, involved major civil commissions, the writing of several treatises, a prestigious lectureship in architecture, drawing lessons to the royal family, and military assignments in every corner of the globe; Blondel's multifarious talents set off a bidding war when Sweden tried to hire him as a royal tutor.[30] The greatest scientist of the century, Galileo, published several military treatises: one was dedicated to Cosimo de' Medici, the Grand Duke of Tuscany, but also offered to other princes who had studied with Galileo at Padua – Ferdinand Archduke of Austria, Philip Landgrave of Hesse, and Vincenzo Gonzaga, the heir of the duchy of Mantua. Descartes himself relates his conceptual breakthrough to his military service, and compares his new philosophy to a city designed by a military engineer.

I

THE GEOMETRY OF POWER

PENTAGONAL CITADELS AND THE EMERGENCE OF MILITARY URBANISM

The Phenomenal Spread of Bastioned fortifications in the early modern period remains one of the least studied aspects of urban architecture. The early modern city, like the medieval city, was defined by its walls, which contained within the most valuable products of material culture: the sites of political power and the circles of knowledge production. In the seventeenth century the race to defend and fortify these valuable and vulnerable cities – the storage sites of cultural production – followed the trend started in the late fifteenth century in response to artillery warfare. Polygonal fortifications, constructed to protect cities, had direct and indirect effect upon Baroque urbanism. To the historical characterization of the Baroque city, as composed of the "dynamism of the diagonal" and "the willful slash" of early modern urbanists as the principal stylistic gestures of composition,[1] must be added the geometrizing and non-anthropomorphic scale of seventeenth-century military architecture.

The Baroque city was transformed thoroughly, inside and out, by the actual fortifications and the alterations brought about by military research and culture. My intention throughout this book is to consider the quality of the transformation in urban form and the character brought about by the renewed and enlarged fortification patterns, the foundation of new fortified towns as claims for colonial or expansionary policies, and the construction of citadels and fortresses in the dangerous and fluctuating border zones between conflicting territorial nationalist claims. The new fortifications promoted the shedding of the medieval character of the city, jolting it, in turn brutally and subtly, toward modernity.[2] Even more than the medieval enclosures, early modern bastioned fortifications and the concomitant outworks separated the city from the country, establishing such pronounced differences that, even after most city walls were demolished in the nineteenth century, cities could maintain their distinct formal identity, forged through their role as military objects. It is this multifarious effect of fortification, of the logistics of war preparation and its reflection in the physical form of the city, that I call military urbanism.

"The most beautiful aspect of architecture is surely that which deals with cities," wrote Pietro Cataneo in his pioneering treatise of 1554, "but since cities are now threatened by artillery which the ancients did not possess, I will demonstrate how to build cities differently so as to defend them from a menace that was previously unknown."[3] This "difference" manifested itself most dramatically in the massive polygonal forms of the bastion and the citadel, sloping walls of earth and masonry constructed on a scale unprecedented since Imperial Rome. Military urbanism involves a monumentality of composition no longer proportioned to the size of the individual. The abandonment of anthropomorphic scale, a principle of artistic and architectural composition advocated and theorized by Renaissance architects, is the single most evident outcome of Baroque military architectural design. Modern aerial views show the thorough disparity in scale between civilian and

military structures of the early modern period. This non-anthropomorphic scale system then abandons the human body as a standard of measurement. Consequently military installations, such as walls and citadels, cannot be experienced by an individual in the same way as church or palace facades and public squares. Direct experience and understanding are replaced by defenseless subjection or abstract comprehension – limited to those with an understanding of surveying, mathematics, and architectural composition – transmitted through a two-dimensional drawing.

Thanks to these graphic techniques, and the mobility of the Italian experts who disseminated them, the new military architecture rapidly became an international phenomenon, comparable to the cathedral building of medieval Europe. Some of the earliest and best-preserved examples are found in far-flung places, such as Berwick-upon-Tweed on the English-Scottish border, Spandau near Berlin, Copenhagen, Malta, and Cyprus. On Cyprus one can still see complete examples of the old and the new systems of urban fortification. In Famagusta the Venetians modernized the port but kept the powerful late medieval walls, round turrets, and moat; in Nicosia, only a few years later, they enclosed the entire city in a regular polygon defined by eleven arrowhead bastions. Neither fortification succeeded against the Turkish invasion of 1570, and ironically their failure guaranteed their preservation. Baroque fortifications often became valued elements of architectural patrimony, representing a no-longer-threatening military condition, part of the self-definition of individual cities, and referred to as "ours." In contrast the U.S. Pentagon, which incorporates design ideas from the citadels discussed in this chapter, still stands for national military power.

The fortification shared with civilian architecture the twin goals of "force and beauty," according to the seventeenth-century theorist Nicolas Goldman.[4] There were two major requirements to ensure the strength of the fortification: the fortress had to withstand siege from cannon and assault, and all parts of the fortification had to be visible from another part; that is, all parts of the fortress have to be flanked because the defense consisted of gunfire that raked the fortification walls, preventing the approach of the enemy. Because beauty and strength reside in regularity, architects struggled to impose symmetry and modular repetitiveness in their compositions.

Cannon fortification signified great achievement and great destruction. In his important treatise on military architecture Francesco de' Marchi recognizes the fear and anger of the inhabitants when the construction of deeper fortifications requires the tearing down of suburbs. De' Marchi recounts the demolition of the suburbs of Milan, which dislocated thousands of inhabitants, as an example of a practice enacted throughout Italy. These demolitions, known as *tagliate* and *spianate*, mercilessly cut down vineyards and orchards, leveled hills and valleys, and altered the course of rivers in order to clear the land adjacent to the walls of the city and provide a clear line of defensive fire. De' Marchi knew personally the loss inflicted by military conflicts: his letter of 1541 to the Florentine authorities claims reparation for the damages that were made to his property, a farmhouse and an orchard, during the siege of Florence in 1529–1530, a siege in which he participated.[5] Despite the widespread destruction, de' Marchi applauds the fortifications of Milan built under Charles V and Philip II, and refers to them again and again.

The trenchant alteration brought about by fortification defined the city as an object of virtue and military pride. The *spianata* of Milan, de' Marchi's example of destruction, is praised by the seventeenth-century historian Galeazzo Gualdo Priorato as a delightful place to walk on a summer evening.[6] Other visitors, such as John Evelyn, exclaim that "Milan is one of the princliest cities in Europe, it has no suburbs, but is circled with a stately wall for 10 miles, in the center of a country that seems to flow with milk and hony . . . the paradise of all Lombardy." This combination of "princely" city and "orderly" landscape is made possible by the military clearance of suburbs, the clarity imposed by the wall ("of a circular figure fortified with bastions"), and the "commanding" presence of the citadel.[7]

The angled bastion and the polygonal citadel were the two most visually gripping components of this innovative system. The role of the bastion in military architecture is analogous to that of the column in civic architecture: it is the core of the discipline and its irreducible internal discourse.[8] In fact, the