

Attacking the Heart and Guts: Urban Operations Through the Ages

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Cities predate the modern nation-state by several millennia and have long been the focus of culture, politics, economics, religion, and all other aspects of endeavor that represent civilization. Because of their importance, cities have been the dominant focus of military operations for most of human history, and a fundamental purpose of armies has been defending or attacking cities. Attacking defended cities has been one of the most difficult and potentially costly military operations. This was reflected in the ancient Chinese text, *The Art of War*, which recognized the challenges of seizing cities and admonished its readers that the lowest realization of warfare was to attack a fortified city.¹ This maxim has been passed to many modern armies that continue to want to avoid large-scale urban operations. Unfortunately, although strategists have advised against it and armies and generals have preferred not to, the nature of war has required armies to attack and defend cities, and victory has required that they do it well.

The importance of capturing cities has always been evident. In China, it became the dominant requirement of warfare around the second century A.D. (approximately six hundred years after Sun Tzu).² In Europe, cities became a primary focus of warfare in the Middle Ages. Almost from their conception, cities raised walls for their own defense, and the walled city remained a significant challenge to armies into the twentieth century. Walls also provided a police and customs barrier, regulating who entered the city and permitting the taxation of goods passing through the gates.³ The inhabitants of cities realized that through fortifications and a modest number of soldiers they could protect themselves from hostile armies at an economic cost. For most of history, the walled city had the advantage over attacking armies. Gunpowder changed this situation drastically. In the fifteenth century, artillery was developed that was capable of moving with armies and breaching the walls of fortified cities.⁴ City dwellers responded with more sophisticated fortifications that included lower, thicker walls and defensive cannon. This initiated a period of increasingly sophisticated siege and fortress warfare that extended into the opening years of the twentieth century. The objective of fortress warfare was control not only of the city and surrounding territory but also of its citizens and its

political, cultural, and economic assets. In this respect, siege warfare is the direct predecessor of modern urban warfare, distinguishable primarily in its tactical and technological methods. The objectives of siege warfare, many of its principles, and even many of its tactical considerations remain valid today.

The thought, resources, and effort exerted to defend and capture cities throughout history reflect their importance. That importance is also demonstrated in the manner in which the changing military challenges posed by cities has caused adjustments in the operational art and tactics of urban warfare. A study of warfighting and cities reveals several themes that have characterized urban warfare throughout the ages. This chapter will address some of these themes that warrant consideration in the context of modern urban operations.

Cities have been pivotal within larger operations in two ways. First, they have been important as the object of battle. A study of battles reveals that in many of the most important battles in history, urban areas were central to why the battle was fought, although not always central to how it was fought. Often a battle was fought for control of the city but not fought at the city itself due to terrain, tactics, technology, or other considerations. The Napoleonic battle of Borodino is a case in point. The goal of Napoleon's 1812 campaign was the defeat of Russia. The French army's objective was Moscow. To defend Moscow and defeat the French, the Russians under General Prince Mikhail Kutuzov met the French army near the village of Borodino on 7 September 1812, 75 miles west of Moscow. The Russians picked the most advantageous ground for the defense of Moscow, and given their estimate of the situation, the relative size of both armies, and contemporary tactics and technology, they chose a location that was not the city itself. The French victory at Borodino came at great cost but forced a Russian retreat and the evacuation of Moscow. As a result of this victory, Napoleon entered the city unopposed a week after the battle, on 14 September 1812.⁵ This example demonstrates that although the tactical battle may not be fought within the confines of the urban area, the urban area may remain central to the purpose, scope, and execution of the battle and the larger operation.

Another way that cities have influenced major operations is as the geographic location of battle. This is the classic urban battle in and around a city, with forces directly engaged on the urban terrain for domination of the urban area. In this battle, the defender has the advantage of using the complex terrain of the city and its fortifications to provide cover and concealment for his forces. As for the attacker, one

option is to assault the city directly from the march. In medieval and early modern times, however, attacking armies did not typically have sufficient mobility to achieve the surprise necessary to make such a tactic reasonable. Most often, the attacker chose to conduct a siege, an option that allowed him to take his time, make extensive preparations, and culminate his operations with a decisive assault on the city. This deliberate operation is the focus of most discussions of premodern urban combat, and within this battle lay most of the major challenges of urban operations.

An examination of urban operations occurring before World War II reveals a number of consistent themes. Subsequent chapters will demonstrate that many of these themes and principles continued to be validated during World War II and after. One of the most important of these themes concerns the reasons armies are compelled to engage in urban combat. Another recurring theme is the significant resources required to conduct urban operations successfully. Additionally, history demonstrates that specialized equipment, personnel, training, and tactics are needed to succeed in urban operations. The unique effects of the complex urban terrain and the presence of the civil population are also issues that continually reoccur in urban battle. These themes of purpose, resources, specialization, and terrain and population factors, although certainly important in all types of operations, are unusually significant in urban operations and have been throughout the history of warfare.

A classic operational question that challenged and teased army commanders was which circumstances properly compelled or warranted the conduct of urban operations. Commanders understood the difficulties and challenges posed by an attack on a city. On the other hand, they also understood the compelling reasons for taking cities. Writing over two millennia ago, Sun Tzu addressed this pivotal decision directly by explaining why a city was not an inviting target:

As for fortified cities that are not assaulted: We estimate that our strength is sufficient to seize it. If we seize it, it will not be of any advantage to the fore; if we gain it we will not be able to protect it at the rear. If our strength equals theirs, the city certainly will not be taken. If, when we gain the advantages of a forward (position) the city will then surrender by itself, while if we do not gain such advantages (the city) will not cause harm to the rear—in such cases, even though the city can be assaulted, do not assault it.⁶

Unfortunately, cities often had to be captured. Sixteenth-century French commander Marshal de Tavannes commented that “great empires and powers must be attacked in their hearts and guts.”⁷ The heart and guts of most nations was their capital and other important cities. Cities were often the center of leadership, economics, and culture, and thus could represent a strategic center of gravity. Additionally, they often were the location of an essential operational consideration such as geographic position, the enemy force, or an important logistics base. Finally, from a defensive point of view, cities offered important asymmetric advantages in terms of cover and concealment that could offset the advantages of attacking forces.

One of the most important reasons for attacking a city was to capture the enemy’s political, economic, or cultural center, thereby destroying his morale, his ability to sustain a war, and his capability to govern. In other words, the city was attacked because it was the enemy’s center of gravity. This resulted in numerous battles for capital cities such as Rome and Paris. In ancient times, the Persian Empire’s efforts to subdue the independent Greek city-states centered on the most important city-state and its capital, Athens. The Persians mounted three separate unsuccessful campaigns between the years 492 and 479 B.C. aimed at capturing the Greek cultural and economic center.⁸ The Greeks succeeded in defending Athens in a series of brilliant battles fought not in the city but on its land and sea approaches. The victory gained in these battles was central to the Greeks’ successful resistance to a Persian invasion. In 1453, the successful siege and capture of the Byzantine capital of Constantinople by Islamic forces not only spelled the end of the Byzantine Empire but also ended forever Christian efforts to dominate the Middle East. Thus, the successful attack or defense of a key city could decide the outcome of the campaign, the war, or the fate of an empire.

Attacking the urban political center of an opponent was often decisive but not always. The capture of Mexico City by U.S. forces in 1847 did not compel the surrender of Mexico. Napoleon’s successful capture of Moscow in 1812 did not compel the capitulation of Russia, as described by historian David Chandler:

Every day that passed was allowing the advantage of the strategic situation to move more decidedly in the Tsar’s favor. Kutusov appreciated this and did all in his power to protract Napoleon’s stay in Moscow, deliberately playing on his opponent’s desire for peace....Not only was time playing into the hands of the Russians by

bringing “General Winter” ever closer, but it was also permitting the size of their forces to be rapidly augmented.⁹

Napoleon’s focus on capturing the enemy capital and not on destroying the enemy’s field army contributed directly to the failure of his Russian campaign and his disastrous retreat. Attacking an urban area as a means to defeat a nation required careful evaluation of the military situation, geopolitical factors, culture, and economics before executing operations. An incomplete understanding of the role and importance of the urban area to the opponent could lead to an extensive expenditure of time and resources with little operational or strategic gain.

An equally compelling reason to attack urban areas was military operational necessity. Commanders sometimes attacked an urban area to destroy an enemy force located there or because of the strategic location of the urban area. Often the urban area contained a capability that was necessary for future operations. When defending, a commander often located his forces in an urban area because of his inferior capability and the increase in combat power provided by the inherent defensive qualities of the urban terrain. These reasons compelled commanders to engage in urban operations to affect the military situation directly.

Strategic geographic position was an important reason for deciding to attack or defend a city. Wellington’s bloody siege of Badajoz in 1812 was necessary to secure the primary invasion route into Spain.¹⁰ Grant’s decision in the American Civil War to capture Vicksburg was primarily motivated by that city’s strategic location on the Mississippi River. When Vicksburg surrendered on 4 July 1863, the Union gained unchallenged control of the river and divided the Confederacy geographically. This success greatly inhibited support and communications between the eastern and western Confederate states and was a devastating blow to the South’s morale and prestige.¹¹

Often urban operations were required to acquire a capability for future operations. This capability may have been the need for an advance base, logistics facilities, or a harbor. In June and July of 1758 during the Seven Years’ War, a 14,000-man English army under General Jeffery Amherst captured the French fortress city of Louisbourg on Cape Breton Island.¹² This city was important as a North Atlantic base for the fleet and facilitated the blockade of French Canada. The loss of the city enabled British land and sea operations and greatly inhibited the operations of the French fleet in North America.

When defending, an army that was outnumbered often took advantage of the inherent defensive qualities of urban areas to

compensate for its lack of numbers and to offset other advantages of an enemy. In 1683, an outnumbered Christian force of approximately 20,000 under the command of the Holy Roman Empire took shelter in and defended Vienna rather than meet the Ottoman army of 75,000 in open battle. The fortifications of the city permitted the outnumbered and less mobile European army to avoid defeat for two months until a relief force of 20,000 arrived to lift the siege and drive off the Turks.¹³

As the examples of Mexico City and Moscow indicate, urban operations did not always result in the desired outcome, even when tactical success was achieved and the city occupied. And, as the Turks found out at Vienna, offensive operations against cities often were not successful despite a significant commitment of resources. Thus, it behooved a commander to consider carefully whether urban operations were absolutely essential to the major operation or campaign he was conducting.

Occasionally, the commander could discover viable alternatives to the conduct of a deliberate urban operation. Oftentimes, the mere threat to a capital or key city was enough to compel its surrender. In the Franco-Prussian War, the French surrendered after the Prussians had laid siege to Paris but before an actual assault was mounted. Other times, the attacker could attempt a demonstration or ruse, or conduct a turning movement to entice the garrison of a city to fight in the open. A final technique that armies attempted whenever possible was to use surprise to capture a city before a defense could be organized. Attacking from an unexpected direction or by an unexpected means could achieve this.

British General James Wolfe used several techniques to achieve success and capture the French Canadian city of Quebec without attacking it by the most obvious means. First, he achieved surprise and attacked from an unexpected direction by moving his army stealthily up-river from the city, conducting a night amphibious landing, and scaling the supposedly inaccessible Heights of Abraham. By the morning of 13 September 1759, he had positioned his army in a double rank on the Plains of Abraham west of the city astride Quebec's supply lines. The brilliant and unexpected maneuver unnerved the French commander, Marquis de Montcalm, who decided to attack the British in the open without waiting for reinforcements. In the ensuing battle, British firepower routed the attacking French, destroyed French military capability and morale, and resulted in the city's capitulation on 18 September.¹⁴ In 1702, the Austrians also used surprise and an unexpected approach to capture the northern Italian city of Cremona by

infiltrating elite troops into the defense by way of an aqueduct.¹⁵ In 1597, the Spanish captured the city of Amiens in northern France using a ruse. A small group of Spaniards disguised as peasants approached the city gateway, at which point they pretended that their cart had broken a wheel. In the confusion that followed, they rushed and captured the gate.¹⁶ These techniques entailed risk taking and required boldness, imagination, and unique circumstances to be successful.

Bypassing the urban area was a viable technique; however, it had disadvantages. It required that the attacker tolerate the urban garrison in his rear and that he maintain sufficient forces to contain the threat of forays by the city garrison. Another effect of bypassing large important cities was that it often extended the political viability of the opposition and the duration of the campaign, thus jeopardizing the achievement of quick and decisive victory. The mounted Mongol armies that invaded the Chin Empire in northern China in 1211 were not very adept at the nuances of siege warfare and were forced to bypass important large, fortified population centers. The inability of the mounted Mongols to conduct effective sieges was a major factor in the Chin's ability to resist and sustain their Empire for over two decades after the initial Mongol onslaught. Though rarely defeated in open battle, the vaunted Mongol cavalry did not fully conquer the Chin until 1234, after being aided in their efforts by Chinese generals and armies who provided experience in siege warfare.¹⁷

Another aspect of urban operations that has remained relatively consistent through the ages is the immense resources required for success. Urban operations, particularly from the attacker's perspective, required investments significantly greater than combat operations in open terrain. These investments included time, manpower, special equipment, supplies, and the will and morale of the attacking troops.

Urban operations could take a significant amount of time to execute. Often, the defender relied on the urban fortifications not to defeat but merely to delay the enemy until changed circumstances created conditions for success. The attacker frequently relied on time to starve the garrison into submission. Both sides made calculations that time would work in their favor. Sun Tzu recognized that patience in urban warfare was a virtue and impatience could lead to disaster: "If the general cannot overcome his impatience but instead launches an assault wherein his men swarm over the walls like ants, he will kill one-third of his officers and troops, and the city will still not be taken."¹⁸

During the siege of the Mediterranean port of Acre by Crusaders in the twelfth century, the goal of the Muslim defenders was to prevent the

Crusaders from taking the city before the arrival of the reinforcing army of Saladin. The Muslims did not realize that what they hoped would be a quick relief would end up as a two-year defense. The Crusaders were hampered by a lack of siege equipment and the fact that the town walls had been reinforced and the town provisioned just before their arrival in August 1189. Saladin arrived to relieve the garrison in mid-September but was unable to break through the ring of Crusaders. Saladin then organized his forces into defensive positions, and the Crusaders were themselves besieged and faced with enemies on two fronts. This circumstance marked the beginning of a series of battles and skirmishes that lasted for twenty-three months. Finally, in July 1191, the Crusaders were reinforced with sufficient naval components to blockade successfully the seaward approach to the city. With the defense totally isolated, famine and disease finally took their toll and the garrison surrendered.¹⁹

Other external factors that may have intervened in support of a defense over time include the loss of will of the attacking force, logistic constraints on the attacking force, and, in many cases, the impact of disease and illness on the attacking force. Weather was another factor upon which defenders relied to change conditions in their favor. Typically, the defender in a city was much more protected from the elements than the attacker. Thus, some defenders sought to frustrate the attack until adverse weather sapped the strength and morale of the attacker. Before the nineteenth century, most armies considered winter siege operations virtually impossible.

Another resource that the attacker required in urban operations was numerical superiority. Napoleon estimated that the attacker of a fortified city must outnumber the defender by four to one.²⁰ At Vienna, the Ottomans outnumbered Imperial forces at a ratio of almost four to one. At Vicksburg, Union forces numbered approximately 80,000 while the Confederates numbered approximately 47,000.²¹ Here the ratio between forces typically varied between two and three to one. Nevertheless, sufficient Union forces were present to dissuade the Confederates from seeking battle in the open and to prevent the Southern forces from breaking the siege.

Numerical superiority was necessary not only for the combat power to conduct the assault on the city, but also to ensure that the attacker could sustain other tasks associated with the operation. At Badajoz, the British were forced to raise their first siege attempt in 1811 because they had insufficient troop strength to conduct the siege and meet the threat posed by a French field army commanded by Soult.²² In this case

and others, attackers required sufficient force to conduct the siege while discouraging relieving forces. Other factors, such as personnel losses to illness and engineering manpower requirements, also had to be calculated into the attacker's resource requirements. Because of these additional considerations, armies attacking cities needed greater numerical superiority than those opposing the same enemy in open battle.

Urban operations have traditionally required more logistic support than conventional operations. As the length of time of the operation stretched out, the attacker had to ensure that he had sufficient food to last the siege. Initially consolidated into a prepared position, the defender usually had the better supply situation to start. The medieval military strategist de Balsac advised defenders to move all food supplies from the surrounding country into fortified positions, thus denying the wealth of the land to the enemy.²³ An efficient logistics system capable of feeding and supplying tens of thousands of troops far from the home country as they attempted a siege lasting weeks or months was a daunting task for medieval and early modern armies. The magnitude of this task did not get appreciably smaller in more modern times, but more professional and robust logistics systems, combined with better planning and other capabilities such as improved transportation, made sustained siege operations possible even in winter.

Munitions were used in prodigious amounts in the conduct of urban siege operations, and the supply of artillery munitions in particular was a major concern. In the modest English siege of Louisbourg in 1758, the final twelve-hour cannonade by the English expended over 1,000 projectiles.²⁴ The requirements in terms of artillery support were always very significant. In 1799, the Austrians used 138 field pieces of various types against the city of Turin in northern Italy. In two days, they fired 200 rounds from each cannon and 150 rounds from each mortar. This bombardment compelled the city to surrender without an assault.²⁵ Beginning in late medieval times, massive artillery support backed by abundant munitions was always vital to success, but it did not always guarantee success. A total of 43,000 rounds of artillery ammunition was expended by a powerful French and Spanish army in an unsuccessful bid to capture the northern Italian fortress of Cuneo in 1744.²⁶

A final resource that proved essential for successful urban operations was the morale and will of soldiers and leaders. Urban operations, whether attacking or defending, were physically exhausting and mentally

stressful—even more so than regular operations. This was largely a function of the extended duration of the operation, often primitive living conditions, the challenges of overcoming man-made obstacles and fortifications, and the intensity of combat once joined. Urban operations thus required soldiers who were mentally and physically tough, skilled, and motivated to succeed. Frequently, highly motivated soldiers could achieve success even under adverse conditions that would have caused less motivated armies to quit the siege. It was equally important that leaders also be mentally tough. Casualties were likely to be high, and an operation required significant time and patience. The successful storming of the Russian city of Port Arthur in May of 1904 after a four-month siege can largely be attributed to the morale and courage of the Japanese infantryman. Ellis Ashmead-Bartlet, an English reporter who witnessed the siege, stated:

...the most striking fact about the siege was the sustained heroism displayed by the Japanese soldiers—a heroism never excelled, and seldom equaled in the history of warfare. Every nation has at some time possessed troops capable of performing gallant actions, but I question if any nation has ever produced men who could repeat such feats of bravery as were witnessed before Port Arthur for a continuous period of six months.²⁷

Leaders of successful urban operations had to have a clear vision of the operation and the patience to apply tactics, techniques, and procedures systematically to achieve success. At the height of formal siege warfare in the eighteenth century, sieges were expected to last at least thirty days, but often, in fact, lasted much longer. The lengthy siege of Acre discussed previously was successfully sustained and concluded by the Crusaders largely due to the inspiring leadership of the English King Richard, who arrived in time to bolster Christian morale, which was eroding due to the length of the operation. Absent his personal leadership, the battle may have ended differently.

Another important characteristic of urban warfare was the necessity of military forces to deal with the complexities of the urban environment. Those complexities fell into two broad categories: physical and human. The physical complexities of the urban terrain primarily related to the density of man-made structures. Throughout the history of urban operations, the most challenging of the physical structures were man-made fortresses and defensive works that, until the twentieth century, were integral to most important urban areas. The human aspect of urban warfare was represented by the city population. Civilians have always been present on the urban battlefield, and both

defending and attacking commanders had to plan for dealing with the urban population.

City fortresses dominated urban warfare in medieval and early modern history. This physical challenge to the employment of military power was primarily found in the defensive walls that surrounded the city. Commanders needed a certain competence and expertise in specific tactics and techniques used to defend or attack a fortified city. The nuances of this type of warfare were such that commanders employed a variety of experts—including artillerists, miners, and engineers—to give advice, supervise, and conduct operations.²⁸

The civil structures in the urban area were also important and were often part of the reason the city was being attacked. Historically, commanders have had to be concerned about the vulnerability of civil structures to fire. At Louisbourg, the inability of the garrison to cope with continuous outbreaks of fire was an important consideration in the capitulation of the French command.²⁹ In that battle, the British were interested in the city's location and its harbor and thus were less than discriminate in attacking civil structures by bombardment.

The human dimension of urban combat was also a factor that commanders had to address in urban operations. On the defense, the question of taking care of the friendly or allied urban population was extremely important. In the defended city, the urban population had to be fed. The morale and disposition of the population could decisively affect the defense. In Londonderry in 1689, the Protestant loyalist civil population of 30,000 was determined to resist a Catholic Irish Jacobite army commanded by King James, even though the city's garrison only numbered 7,000 to the Irish 12,000. Despite the desire of the governor to surrender and the decimation of the population by disease and starvation, the people refused to allow the garrison to surrender the city. The intervention of the population permitted the city to resist for 105 days until the Royal Navy broke the siege. Over half the small garrison perished in the defense, and it is estimated that as many as 15,000 noncombatants perished.³⁰

Armies attacking into urban areas also had to deal with the population once they penetrated the city after a successful attack. Ancient and relatively unsophisticated armies often dealt with the civil population by massacre or slavery. The Mongols were often not interested in administering a captured city and frequently put a population to the sword. Ancient historical accounts put the death toll in the Mongol sack of the eastern Persian city Harat at between 1.7 and 2.4 million people.³¹ As armies and civilizations became more sophisticated, the advantages

of taxes, resources, and commerce inherent in the urban population became apparent. Additionally, as religious influences grew, moral considerations also influenced behavior. Mitigating damage to the urban population was not an easy task because of the density of the population and its proximity to the military operation. It was often made more difficult because the population was frequently openly hostile to the attacking force. The attitude of the attackers also posed problems for the commander. The transition of the attacking army from intense offensive operations to occupation and military administration was psychologically difficult for even well-disciplined troops. The transition could be impossible for troops who were not well trained, were motivated by a hatred of the enemy, had sustained significant casualties, and had been through the stress of a long and difficult siege.

The case of Magdeburg during the 30 Years War is an example of how the stress and ferocity of urban combat could cause commanders to lose control of their troops and perpetuate atrocities. In March 1631, a Catholic Imperial Army under Johan Tzerclaes Count Tilly laid siege to the Protestant city and its more than 30,000 civilian inhabitants. After two months, Tilly's troops were starving and a relieving Swedish army was on the march. The Imperials made one last desperate attempt to capture the city on 20 May. After a furious two-hour assault, Tilly's men took the city. Three days of pillage and slaughter followed the battle. The city itself was burned to the ground and most of the garrison and civil population slaughtered. Estimates of civilian casualties range between 20,000 and 40,000.³²

Even the legendary discipline of elite British Guard and Rifle brigade regiments could break down under the strain of siege operations culminating in a vicious assault on a fortified city. At Badajoz, the conclusion of the successful assault on the French garrison precipitated 72 hours of uncontrolled rape, drinking, looting, and murder. What was very unusual about Badajoz was that most of the atrocities were perpetuated on the Spanish civilian population who were allied with the British. British officers who attempted to intervene and establish control were ignored, assaulted, and even shot at by their own troops. Ironically, the French soldiers of the garrison that surrendered were largely protected as prisoners of the British during the chaos.³³

A hostile civilian population could continue to present a challenge even after successful military operations to capture a city were complete. The case of French Louisbourg is an example of one drastic means of controlling a hostile civilian population. After the city's

surrender, the French population was put on ships and deported back across the Atlantic to France. In total, more than 8,000 men, women, and children were removed from North America to ensure that the British garrison was not troubled by a hostile civilian population.³⁴

Armies often had to deal with urban populations in noncombat situations. Armies were deployed into urban areas under conditions other than combat to maintain order, deal with insurgencies, or support civil authorities coping with natural disasters. Under authoritarian regimes, the use of force or threat of force to control the civil population was so common it was almost unworthy of historical comment. This circumstance began to change with the Age of Enlightenment during the eighteenth century. In more democratic countries, and as international interest increased, the use of force against a domestic or foreign civil population became a much more sensitive issue. Thus by the late nineteenth and early twentieth century, the successful use of military force by modern armies in noncombat situations in cities, though still common, required a fuller understanding of the issues, restraint, and deft execution on the part of the military.

Even in the United States, the Army was employed regularly to deal with disturbances and emergencies in large cities. During the American Civil War, the Union Army—including cadets from West Point—was used to help quell draft riots in New York City. From the end of the Civil War to the end of the nineteenth century, the U.S. Army was called out to deal with civil unrest over three hundred times. The largest deployments were in 1877 when troops were dispatched to augment police forces in Baltimore, Chicago, and St. Louis, and in 1894 when troops from Fort Sheridan were used to restore order in Chicago.³⁵

Armies were also used to assist in other kinds of urban emergencies. The American Army's role in providing emergency assistance during the great San Francisco earthquake and fire of 1906 is particularly notable. The earthquake and fire took over 3,000 lives and caused extensive property damage. At one point, four square miles of the city were on fire. Despite this chaos, disorder was not a major problem. General Frederick Funston commanded Army troops who were deployed within hours from the nearby Presidio. He described the effect the troops had:

San Francisco had its class of people, no doubt, who would have taken advantage of any opportunity to plunder the banks and rich jewelry and other stores of the city, but the presence of the square-jawed silent men with magazine rifles, fixed bayonets, and with belts full of cartridges restrained them. There was no necessity for the regular

troops to shoot anybody and there is no well-authenticated case of a single person having been killed by regular troops.³⁶

A typical example of the use of military force in an urban area is the U.S. Army's last deployment of a large number of troops into an urban area before World War II. On 28 July 1932, President Hoover ordered federal troops to remove the "Bonus Marchers," who were protesting for the payment of World War I veterans' bonuses, from the District of Columbia, using force if necessary. Federal troops, consisting of about 200 mounted cavalry led by Major George S. Patton, 600 infantry and six tanks, drove the veterans from the district and burned their shanty village. Tear gas, bayonets, and sabers were used to move the protesters out.³⁷ By the next day, the mission was complete and troops returned to their garrisons. No shots were fired and the Army's role in the incident largely reflected General Funston's experience in San Francisco: disciplined Army troops well deployed in an urban area can restore order with a minimum or no use of force.

Fighting for cities caused armies to develop unique weapons, tactics, and equipment to ensure success. Most of this equipment was required by the attacking army, although some could be used in both the defense and offense. In addition, armies also created specialist soldiers who had unique capabilities, training, and expertise necessary for successful urban warfare.

The invention of artillery was one of the most important weapon advances in military history and was a direct response to urban fortification. Artillery was initially designed specifically to deal with the walls of medieval castles and walled cities. It was so effective that it quickly caused the demise of the castle and resulted in drastic changes in the design of fortified cities. Large numbers of artillery were used to attack cities. However, artillery was not normally used against the city itself. The primary purpose of artillery was to create a breach in the surrounding wall. Secondly, artillery was used to suppress enemy fire, including enemy artillery, during the approach and the assault. Artillery was not commonly used against the population or structures of a city unless a commander specifically decided to compel the city's surrender by the tactic of bombardment.

Before the existence of artillery, defenders behind walls were attacked using mechanical weapons. The three most famous are the catapult, ballista, and the trebuchet. The earliest recorded use of the catapult was in Greece in 398-97 B.C.³⁸ This weapon did not typically

have the kinetic power to defeat well-constructed walls but was somewhat effective at suppressing the enemy manning the walls.³⁹

In addition to artillery, other specialized capabilities were developed for the assault on cities. One of the most important munitions was the hand grenade, which was used by both the offense and the defense. Special “grenadier” troops were initially organized to handle this dangerous weapon. Hand grenades became an essential element in siege warfare, as demonstrated by the Spanish who used over 36,000 grenades against the French during the siege of the French city of Valenciennes in 1656. Baron von Wetzels, Austrian governor of the northern Italian city of Brescello, called them “the best means of defense in the event of a siege.”⁴⁰ They were used by both attackers and defenders during the close quarters fighting just before and during the initial stages of the assault.

Another unique munition was the petard. The petard consisted of an explosive case used to aim and blast a penetrating timber through small fortification doors and gates.⁴¹ It was usually carried forward with the infantry in the assault. The petard permitted infantry to breach obstacles in closed spaces within the city and its fortifications where artillery was not practical.

Armies also developed specialized tactics to seize cities. Before cannon were available to breach walls, armies had to scale them. This was known as attack by escalade, and it could be accomplished only with great difficulty using scaling ladders or siege towers. Once wall-breaching cannon became generally available, an escalading attack was a tactic only used in rare situations where surprise was possible.

Consistent and long-term suppression of enemy defensive fire was a key factor in successful attacks on cities. Suppressing fires covered the approach of assaulting forces, the employment of siege towers, and the process of building trenches. Suppression was accomplished by firing over the heads of the friendly forces approaching the city. Before gunpowder, archers and catapults were key suppression systems. Once cannon were invented, artillery became the key suppression system.

Another tactic important to city fighting was mining and countermining. Attackers mined at a point beginning out of enemy artillery range and ending under the city wall. At the appropriate time, explosives were placed in the mine, detonated, and the wall collapsed. The assault would then follow over the breached wall. Defenders responded to mining with countermines designed to locate the enemy

shaft. Countermine caused one or more of the following: the enemy gave up the mine, the mine collapsed, or the force of the mine explosion was dissipated.

Bombardment was another tactical option available to the attacker. This relatively simple tactic required the attacker to surround the city and isolate it from support. When this was accomplished, the attacker used siege lines to bring his artillery into position, and then he proceeded to bombard the city indiscriminately. This tactic attacked the morale and will of the defender. It was sometimes effective when the attacker had the time to wait for the bombardment to slowly erode the morale of the garrison and the population. Bombardment had the advantage of avoiding the casualties of an infantry assault, but it was not an effective technique against a resolute enemy or when time was short. It also was likely to destroy valuable facilities, material, and property inside the city and cause civilian casualties.

The most important, common, complex and successful tactic was the formal siege. The post-medieval, or modern, version of this age-old operation began to be developed late in sixteenth-century Europe and was codified in formal and informal customs and laws of war by the early seventeenth century. It began with a formal demand for and rejection of surrender. This was followed by an official opening of the attack signified by breaking ground on the first trench or by firing the first cannon shot. Its execution was scientific and systematic and thoroughly documented in the writings of the professional military engineers of the period. This tactic made extensive use of very careful reconnaissance and planning, required a lot of time, synchronized a variety of component phases, and made use of unique techniques and specialists. Parallel and zigzag trenches were dug as approaches to the city. These engineering efforts were done in full observation and under the constant fire of the defenders. The trench systems included protected battery positions for friendly artillery. Once friendly artillery was in place, it attempted to blast a breach in the city wall, whereupon infantry stormed from the advance trenches and assaulted the breach. The infantry gained access into the city by climbing the rubble of the collapsed wall. Typically, if the siege was not interrupted by a relieving force, the formal siege ended with a negotiation and agreement on terms once the defender was convinced of its success and before the culmination of the assault on the city.⁴²

Walls were the primary means of city protection, but cities also used other obstacles to prevent the attacker from gaining access to the walls. Defensive forces equipped themselves with caltrops, wire, and

sharpened stakes pounded into the ground as means to impede the advance of the attacker. These were primarily effective against cavalry and wheeled transportation. Attackers often used bundles of branches, or fascines, to fill ditches and cover wet ground to facilitate the forward movement of men and equipment. Another important piece of equipment was the gabion, a large wicker basket filled with dirt. They were used by the thousands by both attackers and defenders to provide cover and rapidly prepare defensive positions. Sandbags were also invented as a tool of urban sieges and they were used in a similar manner as gabions.⁴³ To gain access to the walls of the city, attackers often had to cross large ditches, which they accomplished by carrying large bags of hay to throw into the ditches to provide soft landings for troops jumping into them en route to the walls.

Walls are almost as old as cities themselves, and almost as old as walls are the implements used to overcome them. Specialized breaching equipment, such as rams, siege towers, and oversize ladders, offered the primary means of gaining access to cities before gunpowder. Even a small fortress wall required at least a thirty-foot scaling ladder. Most of the basic tools of escalade were invented several millennia before gunpowder. Early rams have been identified in ancient Egypt around 1900 B.C., and the earliest scaling ladder also was found in Egypt around 2400 B.C. Evidence indicates the use of siege towers at least as early as 727 B.C.⁴⁴

Siege towers were an important element of a successful siege before the advent of artillery. These towers were elaborate affairs, and their construction and use required careful engineering support, aid from supporting troops, and very careful synchronization and coordination by the attacking forces. An example of the effective use of siege towers in the assault was the Crusaders' capture of Jerusalem in July 1099 during the first crusade. The Crusaders arrived at the city in June and took six weeks to gather wood and build several siege towers. These towers were over forty feet tall, wheeled, enclosed on three sides by hides (which were sufficient to deflect arrows), and included a built-in bridge and catapult. The Crusaders took three days and nights to fill the defensive ditches on the wall approaches. Finally, the tower was moved forward and approached the wall:

Resistance was spirited, and the towers were racked by the stones, tar, pitch, and other burning stuffs flung against them. Sacks of cotton and hay, carpets and timber beams had been hung over the walls to absorb the Frankish bombardment. At about midday, while Godfrey's men strove to drive off the Moslem on the walls, the crusaders cut down

two of the beams and pushed them out from the siege tower across to the wall top where they formed a foundation for the bridge when it was lowered. Then they set fire to the sacking. Smoke billowed up and forced the defenders to virtually abandon a section of the wall. The bridge came down and Godfrey and his men rushed across; ladders were hastily erected to give extra support.⁴⁵

This example of the execution of a tower assault demonstrates how engineering efforts to move the tower were coordinated with supporting catapult fires and how smoke was used both to conceal the assault and to drive defenders from the assault point. The complexity and sophistication of this operation demonstrates not only the importance of special equipment, but also the special skills and leadership necessary to employ the equipment properly.

As the defenses of cities became more complicated, it became absolutely essential that armies be manned with specialists in the methods of their defense and attack. The development of grenadiers to handle dangerous explosives has already been mentioned, but first and foremost among the specialists were the engineers. Engineers were not present in medieval armies but made their appearance as sieges became more formal and artillery and fortress design vied for superiority. Engineers began as guilds of civilian specialists, then became quasi-military members, but were only accepted into full status as soldiers in the nineteenth century. Nevertheless, armies, particularly in the attack, relied on their expertise. They advised the commander on which aspect of the fortress to attack and determined the exact breach point. Engineers shared a very hazardous duty as they were constantly in the fore supervising and observing the enemy. An observer of the Seven Years' War commented: "In a single siege an engineer officer must risk his life more frequently, and expose himself to more danger than do many other officers in the entire course of a long war."⁴⁶ During the ten-week successful allied siege of French-occupied Lille during the War of Spanish Succession in 1708, all seventy allied engineering officers were killed.⁴⁷

Engineers supervised two types of specialty troops necessary for urban operations: sappers and miners. The engineers generally had exclusive control of the use of miners but had to share with the artillery the direction of sappers. Often this unclear chain of command caused delays in the execution of siege operations. Sapping, the digging of trenches under almost constant fire, was extremely dangerous work. The French engineer Vauban instituted a system of cash rewards based

on progress and danger. With these incentives, Vauban's sappers could complete 480 feet of trench every twenty-four hours.⁴⁸

Mining remained an essential element as long as cities were defended by prepared positions and fortresses. Mining could take one of two forms. A deep mine was started well outside the fortification and mined to its foundation. At that point, barrels of explosives were positioned against the foundation and exploded. The result, if done properly, was the exploding of the wall and a huge crater, which became the center of the following infantry assault. The other type of mining was called "attaching the miner." This technique was a direct mine into the base of the fortress wall. The miners quickly burrowed directly into the base of the wall as the enemy above was suppressed by fire. The miners then branched left or right within the wall. At that point, explosives were placed and ignited, bringing down a section of wall.⁴⁹ The infantry assault then mounted the wall over the rubble resulting from the explosion. Mining was often used when artillery proved ineffective.

Engineers, sappers, and miners were absolutely critical to successful siege operations. There were never enough of them, and their absence or lack of numbers often caused delays. The failure of Wellington's first siege of Badajoz in 1811 is attributed in part to a chronic shortage of engineers.⁵⁰ Mistakes by, or the absence of, engineers could cause significant friendly casualties. Thus, the importance of cities to warfare was recognized in the effort and cost undertaken by armies to develop and train specialized troops to meet the particular needs of successful operations against cities.

Beginning at the end of the seventeenth century, many cities began to change their design, and the fortress city became less common. This process did not occur all at once; by the beginning of the twentieth century, the fortress city was recognized as obsolete and had essentially disappeared. This was a function of several factors. For several hundred years after the Middle Ages, city populations were relatively stable, but urban populations began to increase rapidly in the late eighteenth century.⁵¹ The walled cities began to experience significant crowding and suburbs of the city began to expand beyond the city walls, making the effectiveness of the walls questionable.⁵² Additionally, during the eighteenth century, cities in the interior of stable nation-states were not deemed sufficiently threatened to maintain their fortification. Countries such as France intentionally allowed specific city fortifications to erode.⁵³ Finally, by the time of the Franco-Prussian

war in 1870, modern rifled artillery was able to reduce most city fortifications from a range of nearly two miles.⁵⁴

At the same time artillery technology was improving, advances in small arms technology also occurred. Rifled repeating arms made small groups of infantry much more lethal. Small arms technology radically changed infantry tactics. In an urban area, these developments had the effect of turning individual buildings manned by small groups of soldiers into miniature fortresses. Groups of buildings became mutually supporting defensive networks. These man-made defensive networks were much less homogenous than the city wall and hence a much more difficult artillery target. Additionally, the lethality of infantry meant that the integrity of the urban defense was not broken by a break of the walls. Defenders now had the capability of defending effectively throughout the depth of the urban environment—a technique impossible when infantry tactics relied on massed close-knit formations to achieve effective firepower.

One of the early indicators of this phenomenon was the unexpectedly stout defense of the small Chateau de Hougomont during the climactic Battle of Waterloo in 1815. The allied defense of this position demonstrated the emerging defensive potential of small groups of stone buildings resolutely defended with small arms.⁵⁵ By the end of the nineteenth century, the press of urban population growth, the effectiveness of rifled artillery, and the firepower of breech-loading rifles and machine guns led to the obsolescence of the protective city wall and to the capability to defend within individual city buildings and blocks of buildings.

The tactical challenge of the fortified building moved the urban battle from the city wall to the city streets. Thus, the tactics of modern urban warfare, as practiced since the beginning of World War II, differ in many respects from ancient, medieval, and early modern urban tactics. Yet, much about attacking and defending cities remains consistent in principle. Two of the most important consistencies are why armies attack cities, and the fact that the capture and defense of cities remain decisive. Indeed, due to recent urbanization and population trends, it may be argued that the ability to capture and control large urban areas is more important in modern times than in any other time in history.

Other consistencies include the large investment in resources required to properly conduct urban operations. Modern urban operations, like their predecessors, require excessive troops, time, and supplies to be successful. Soldiers and leaders committed to urban combat continue to require inordinately high morale, steadfast will, and patience to

endure the stress and grueling physical conditions of the urban environment.

Modern urban operations also require a unique understanding of the physical and human aspects of the urban center. Commanders and their staffs must understand the intricate infrastructure of the modern city, just as the general commanding a besieging army had to understand the design of a fortress city. In addition, even more so than historical commanders whose societies were less sensitive and media aware than modern Western culture, modern commanders must have a thorough understanding of, and a plan to deal with, the urban population. Modern soldiers are subject to many of the same stresses of urban combat, and commanders must be aware of the need for firm discipline regarding interactions with the civil population.

The tactical techniques of urban combat may have changed significantly, but many of the principles remain constant. Modern tactical urban combat still devolves into suppression, breaching, and assaulting fortified positions. Ironically, many cities retain elements of classic fortifications, and these can still affect modern military operations. Twentieth-century urban operations in Metz, Manila, and Hue City all faced the challenges posed by ancient fortress designs that proved to be significant obstacles to modern weapons and tactics. In this regard, twenty-first century armies will be well advised to appreciate the value of direct-fire artillery against stone, concrete, and steel structures.

Although the siege tower is long obsolete, modern forces executing urban operations require special weapons and equipment designed to be optimized in the urban environment. Specialized tactics and troops also continue to have a role against enemies in the urban environment. Modern commanders can benefit from employing specialized troops to act as advisers and to execute specific unique missions in the urban environment. The modern equivalent of grenadiers, sappers, and miners may be civil affairs specialists, snipers, and special operating forces.

Twenty-first century cities are much larger than cities were just a hundred years ago. Cities are not as homogeneous as they once were. Modern-day buildings within cities are generally much more resilient than those of previous ages. In effect, rather than being a single fortified entity, modern cities have the potential of being developed by a defender into dozens or hundreds of individual mutually supporting miniature fortresses. Many of the traditional techniques of fortress assault may be adaptable to this circumstance. The escalade of the

twenty-first century may use helicopters instead of scaling ladders, but the principles remain the same.

Cities of the twenty-first century are as challenging to military operations as they have ever been, if not more so. And, as history has demonstrated, armies will continue to have no choice but to execute operations against and within cities. These operations will include the full spectrum of mission types from intense offensive and defensive combat to less lethal but equally vital stability or support operations. Success in these operations will be, as always, a function of understanding the principles illustrated in the past and applying that knowledge to the conditions, technology, organization, and tactics of the present.

Notes

1. Sun Tzu, *The Art of War*, Ralph D. Sawyer, trans. (Boulder, CO: Westview Press, 1994), 177.
2. *Ibid.*, 55.
3. Mark Girouard, *Cities and People: A Social and Architectural History* (New Haven, CT: Yale University Press, 1985), 61.
4. John Keegan, *A History of Warfare* (New York: Random House, 1993), 321.
5. David G. Chandler, *The Campaigns of Napoleon: The Mind and Method of History's Greatest Soldier* (New York: MacMillan Publishing Co., 1966), 808.
6. Sun Tzu, 245.
7. Christopher Duffy, *Siege Warfare: The Fortress in the Early Modern World, 1494-1660* (London: Routledge and Kegan Paul, 1979), 45.
8. Elmer C. May and Gerald Stadler, *Ancient and Medieval Warfare* (West Point, NY: Department of History, U.S. Military Academy, 1973), 11-17.
9. Chandler, 815.
10. Ian Fletcher, *Badajoz, 1812, Wellington's Bloodiest Siege* (Oxford, UK: Osprey Publishing Limited, 2001), 10.
11. James R. Arnold, *Grant Wins the War: Decision at Vicksburg* (NY: John Wiley & Sons Inc., 1997), 298-309.
12. Fred Anderson, *Crucible of War* (NY: Random House, 2000), 250-54.
13. William Seymour, *Great Sieges of History* (London: Brassey's, 1991), 87-100.
14. Anderson, 355-65.
15. For simplicity and clarity, the description of locations of cities in this chapter, except when obvious, will be in modern national and geographic terms rather than in terms of the referenced battle. For example, Cremona is located in the modern northern Italian province of Lombardy, which at the time of the city's conquest by Austria in 1702 was under Spanish rule.
16. Christopher Duffy, Fire and Stone, *The Science of Fortress Warfare, 1660-1860* (London: Greenhill Books, 1996), 116-17.
17. David Morgan, *The Mongols* (Oxford, UK: Basil Blackwell, 1986), 65-73.
18. Sun Tzu, 177.
19. Seymour, 12-27.
20. *Ibid.*, xvii.
21. Arnold, 301-308.
22. Fletcher, 11.

23. *Feeding Mars: Logistics in Western Warfare From the Middle Ages to the Present*, John A. Lynn, ed. (Boulder, CO: Westview Press, 1993), 35.
24. Anderson, 254.
25. Duffy, *Fire and Stone*, 125.
26. *Ibid.*, 130-31.
27. Ellis Ashmead-Bartlett, *Port Arthur: The Siege and Capitulation* (London, UK: William Blackwood and Sons, 1906), 478.
28. Duffy, *Fire and Stone*, 134-35.
29. Anderson, 253.
30. Seymour, 101-20.
31. Morgan, 74.
32. David Palmer, Albert Britt, Gerald Stadler, and Jerome O'Connell, *The Dawn of Modern Warfare* (West Point, NY: Department of History, U.S. Military Academy, 1973), 79.
33. Fletcher, 80-81.
34. Anderson, 255.
35. Russell F. Weigley, *History of the United States Army* (NY: Macmillan Publishing Co. Inc., 1967), 281.
36. Frederick Funston, "How the Army Worked to Save San Francisco," *Cosmopolitan Magazine* (July 1906) at <<http://www.sfmuseum.org/1906/cosmo.html>>, 5 March 1996.
37. Robert N. Webb, *The Bonus March on Washington, D.C., May-June 1932* (NY: Franklin Watts Inc., 1969), 55-60.
38. Keegan, 150.
39. E. Viollet-Le-Duc, *Annals of a Fortress: Twenty-Two Centuries of Siege Warfare* (Barton-under-Needwood, UK: Wren's Park Publishing, 2000), 130.
40. Duffy, *Fire and Stone*, 168.
41. *Ibid.*, 118.
42. Duffy, *Siege Warfare*, 249-50.
43. Duffy, *Fire and Stone*, 134.
44. Keegan, 150.
45. Christopher Gravett, *Medieval Siege Warfare* (Oxford, UK: Osprey Publishing, 1990), 56.
46. Jakob Mauvillion quoted in Christopher Duffy, *The Military Experience in the Age of Reason* (Atheneum, NY: The MacMillan Publishing Company, 1988), 290.
47. David Chandler, *The Art of Warfare in the Age of Marlborough* (NY: Hippocrene Books Inc., 1976), 221.
48. *Ibid.*, 255.
49. Duffy, *Fire and Stone*, 170-75.
50. Fletcher, 19-20.

51. Robert E. Dickinson, *The West European City: A Geographical Interpretation* (London: Routledge & Kegan Paul Ltd., 1951), 461-63.
52. Girouard, 212-13.
53. Dickinson, 418.
54. *Ibid.*, 354.
55. Chandler, *The Campaigns of Napoleon*, 1072.

Bibliography

- Anderson, Fred. *Crucible of War*. NY: Random House, 2000. An authoritative history of the Seven Years' War. This work contains excellent discussions of the strategic importance and the battles to secure Louisbourg and Quebec.
- Arnold, James R. *Grant Wins the War: Decision at Vicksburg*. NY: John Wiley & Sons Inc., 1997. Arnold's effort is an outstanding discussion of this decisive battle with an emphasis on the tactics and technology of siege warfare.
- Ashmead-Bartlett, Ellis. *Port Arthur: The Siege and Capitulation*. London: William Blackwood and Sons, 1906. Ashmead's work is a firsthand perspective of this important battle from the perspective of an English journalist with the Japanese.
- Chandler, David. *The Campaigns of Napoleon: The Mind and Method of History's Greatest Soldier*. NY: MacMillan Publishing Co., 1966. This work is the definitive one-volume account of Napoleon's campaigns; an excellent reference to the context of major urban operations during this period.
- _____. *The Art of Warfare in the Age of Marlborough*. NY: Hippocrene Books, Inc., 1976. This effort is an excellent overview of the nature of warfare during the early eighteenth century.
- Dickinson, Robert E. *The West European City: A Geographical Interpretation*. London: Routledge & Kegan Paul Ltd., 1951. This volume is a superb analysis of virtually all aspects of urban design and development in Europe. This work places particular emphasis on the development of urban city plans.
- Duffy, Christopher. *Siege Warfare: The Fortress in the Early Modern World, 1494-1660*. London: Routledge and Kegan Paul, 1979. This work is the most complete account of fortress warfare in the early modern period.
- _____. *The Military Experience in the Age of Reason*. Atheneum, NY: The MacMillan Publishing Company, 1988. This book is an excellent discussion of the nature of warfare in the mid- to late-eighteenth century and the role of fortifications and engineers.
- _____. *Fire and Stone, The Science of Fortress Warfare, 1660-1860*. London: Greenhill Books, 1996. This work is the authoritative follow-on to Duffy's earlier work and completes the history of fortress warfare.

- Fletcher, Ian. *Badajoz, 1812, Wellington's Bloodiest Siege*. Oxford, UK: Osprey Publishing Ltd., 2001. This work is an excellent short, but detailed, account of Wellington's successful effort to seize the key Spanish city of Badajoz.
- Girouard, Mark. *Cities and People: A Social and Architectural History*. New Haven, CT: Yale University Press, 1985. This volume is a profusely illustrated history of urban development and culture that helps put urban fortifications and warfare into the context of urban history.
- Gravett, Christopher. *Medieval Siege Warfare*. Oxford, UK: Osprey Publishing, 1990. This work is a concise description of medieval siege warfare with an emphasis on siege weapons.
- Keegan, John. *A History of Warfare*. NY: Random House, 1993. This work is an excellent one-volume overview of the history of warfare. It is valuable for placing urban warfare within the context of military history and tracing its ancient origins.
- Lynn, John A. Editor. *Feeding Mars: Logistics in Western Warfare From the Middle Ages to the Present*. Boulder, CO: Westview Press, 1993. This work is an excellent discussion of the importance of urban areas to logistics and of the impact of logistics on siege warfare.
- May, Elmer C. and Gerald Stadler. *Ancient and Medieval Warfare*. West Point, NY: Department of History, U.S. Military Academy, 1973. This work is an excellent concise reference to ancient and medieval warfare.
- Morgan, David. *The Mongols*. Oxford, UK: Basil Blackwell, 1986. This work is an excellent history of the Mongols and includes a well-researched description of the Mongol invasion of China and the challenge of Chinese cities.
- Palmer, David and Albert Britt, Gerald Stadler, and Jerome O'Connell. *The Dawn of Modern Warfare*. West Point, NY: Department of History, U.S. Military Academy, 1973. This work is an excellent concise reference to early modern warfare.
- Seymour, William. *Great Sieges of History*. London: Brassey's, 1991. This book is an excellent reference to some of the most important sieges in history.
- Sun Tzu. *Art of War*. Translated by Ralph D. Sawyer. Boulder, CO: Westview Press, 1994. This volume is a complete accounting of the writings of the important ancient Chinese military thinker and is valuable in accessing the thoughts of ancient strategists regarding urban operations.

- Viollet-Le-Duc, E. *Annals of a Fortress: Twenty-two Centuries of Siege Warfare*. Barton-under-Needwood, UK: Wren's Park Publishing, 2000. This book is a fascinating reprint of the work of a well-regarded nineteenth-century French military engineer. He uses the history of a fictitious French fortress to describe and analyze the development of fortress design and siege tactics.
- Webb, Robert N. *The Bonus March on Washington, D.C., May-June 1932*. NY: Franklin Watts Inc., 1969. This book is the most complete account of the confrontation between the U.S. government and the Bonus Marchers.
- Weigley, Russell F. *History of the United States Army*. NY: Macmillan Publishing Co. Inc., 1967. This book is the most authoritative one-volume history of the U.S. Army.