VAUBAN IN THE WILDERNESS:

THE MILITARY REVOLUTION AND

THE SEVEN YEARS' WAR IN NORTH AMERICA

by

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DEDICATION

To my family – morituri te salutant

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ABSTRACT

For the past thirty years there has been an ongoing debate regarding the nature of the Early Modern European Military Revolution. Much of this debate centers around whether the military and technological changes which are at the heart of the military revolution created the conditions for the bureaucratic systems of the modern nation state, or if those bureaucratic systems made possible the creation of larger, state sponsored armies and navies, as well as when these changes took place. Instead of focusing on what came first, the chicken or the egg, this thesis explores one aspect of the Military Revolution, focusing on the works of Sebastian le Prestre de Vauban who invented the socket bayonet, refined and systematized the practice of siege warfare, and emphasized the importance of the lives of his men. These changes are fundamental to understanding not only how wars were fought, but also how war affected those that fought them during this pivotal period of European history.

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INTRODUCTION

With Popes Innocent VIII and Alexander VI urging him to lay claim to the vacant throne of the Kingdom of Naples, Charles VIII, King of France, mustered an army of 25,000, and marched them into Italy. Among this force were 8,000 Swiss mercenaries, and as many as forty new artillery pieces. Crossing the border in September of 1494, Charles' army reached Pisa by November 8th, Florence by November 17th, and Rome by December 31st. By February 8th, 1494, the army encamped near the town of Monte San Giovanni, the northern-most outpost of the Kingdom of Naples. While it was a fortified town, it was best remembered as being the place where Thomas Aquinas was imprisoned by his family, to attempt to dissuade him from joining the Dominicans.

The 11th-century castle which protected Monte San Giovanni had been besieged many times before. With a garrison of a thousand men, it had once been besieged for seven years without falling. It was with this history in mind that the defenders refused the demands for surrender. To make sure their refusal could not be misconstrued, the defenders killed the French envoys, mutilated their bodies, and sent their corpses back to the French lines.

The next day, Charles arrayed his forty new artillery pieces before the walls of Monte San Giovanni, with the rest of the army drawn up to assault the place once breaches in the walls were made. While neighboring Monte Fortino surrendered as soon as the French artillery were in place, Monte San Giovanni would not be given that same honor. After the smoke cleared from the first volley, noticeable cracks in the city's stout

walls were visible from the French lines. The gunners used those cracks as targets, spewing cast-iron cannonballs from eight-foot-long bronze cannons at an astonishing rate. Soon the walls of the castle were rubble, and the French army advanced while the gunners continued to bombard the town. Eight hours after the first gun fired, Monte San Giovanni, a city that had once withstood a siege for seven years, was in ruins, the inhabitants and garrison who survived the bombardment all put to the sword. In the face of such swift violence the rest of the Kingdom of Naples fell to Charles VIII without even having to arrange his artillery.

While sieges were common, and massacres even more so, the swiftness with which Charles VIII conquered the Italian peninsula, the rapidity with which previously unassailable fortresses fell, represents a revolutionary shift in how European wars were fought. Using cast-iron cannonballs, and long, thin cast-bronze cannons, the supremacy of defense, which stood since builders began building fortifications from stone, disappeared. In the course of those eight hours nearly every fortification in Europe was obsolete. The fall of Monte San Giovanni signaled the beginnings of an Early Modern European Military Revolution.

For more than thirty years, the academic community has been embroiled in an acrimonious debate concerning the Early Modern European Military Revolution. The reason for this enmity arises from how central these ideas have been to the careers of some of these scholars. For centuries prior to this Revolution, European armies were assembled using a feudal model, with kings calling upon lesser nobles who owed them allegiance, to fill out the ranks of the army. In turn these lesser nobles called on others who owed them allegiance, to fill their quotas of spearmen, archers, and cavalry. The

advent of the Revolution changed this, with feudal men at arms and their obligations replaced by peasant conscripts trained by the state to fight for pay.

The prevailing arguments around how and why these changes were made fall into two competing schools of thought. The first of these is the “Roberts-Parker” camp, that argues for technological determinism, with gunpowder artillery, linear infantry tactics, and new fortifications changing how armies fought during the Early Modern period, and the importance of individuals to this revolution, namely Maurice of Orange, and Gustav Adolf of Sweden. The “other” camp argues against revolution, instead describing it as gradual evolution involving changes to infantry, artillery, fortification, small-arms, and finally naval power, utilizing a wider dating of events to describe these changes. Both camps agree that there are significant differences between how wars were fought before these events occurred and after.

Instead of positioning myself in one camp or another, I propose a different definition. My solution takes the technological aspects of Roberts-Parker (angled bastion fortifications and the artillery needed to take them, as well as the introduction of the socket bayonet) and places them within a different chronological framework (1660-1760). My model will, like the Roberts’ original, focus on individuals, but places them within a later time frame presenting Sebastian le Prestre de Vauban as the embodiment of this military revolution.

Vauban’s life and work are key to understanding my interpretation of the Early Modern European Military Revolution. His invention of the socket bayonet allowed infantry armed with gunpowder weapons to defend themselves against cavalry, which previously was the battlefield roll of pikemen. His development of parallel siege trenches,

the perfection of “ricochet batteries”, and a systematic approach to siege warfare were essential to preserving the lives of the men under his command. This focus on preserving the lives of French soldiers is the most revolutionary aspect of Vauban’s legacy.

But in focusing on Vauban and his legacy, there requires an examination of his motivations. Part of a family of clerks and notaries, Vauban did not have formal military training, instead receiving an education at the Carmelite college at Semur-en-Auxois. He gave his life wholly to the preservation of the French state, tirelessly devoting himself to fortifying its borders, and protecting the soldiers in its employ. And while he is mostly remembered today as a fortifier of places, in his day and to military tacticians and engineers during subsequent centuries, he was best known for his achievements on the battlefield. By focusing on his written words, and these tactics which shifted the balance of the battlefield from the defensive to the offensive, it will be possible to bring harmony to this otherwise acrimonious debate. This, in turn, will increase “our understanding of the role war played in the development of the early modern state.”[1]

To prove the validity of my model for military revolution, Vauban’s contribution to military theory and the practice of siege engineering will be examined. The Early Modern European Military Revolution elevated the siege as the dominant form of warfare amongst European Powers. His contemporaries, as well as later scholars, considered Vauban to be the ultimate practitioner of this new siege warfare. The only way to gain an understanding of his ideas is to examine his most famous written work: *A Manual of Siegecraft and Fortification*, written after his retirement from active military service in

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[1] Jamel Ostwald, *Vauban Under Siege: Engineering Efficiency and Martial Vigor in the War of Spanish Succession* (Boston: University of Leiden Press, 2007), 19.

1705. This is a continuation of his previous works, *Traité des sièges et d'attaque des places* and *Traité de la défense des places,* all of which describe the various means by which a fortified place might be taken or defended.

I contend that Vauban's siege tactics, as contained in *A Manual of Siegecraft and Fortification,* serve as the benchmark against which all subsequent military actions will be judged. They mark the beginning of this military revolution. One individual, Vauban, served as the "tipping point" for revolution, as Roberts, Parker, and their supporters maintain, but his contributions came later than the periodization common to the Roberts-Parker camp, as their critics in the "other" camp argue. The real "tipping point" is the idea that the lives of men were a valuable resource and needed to be shepherded, and could be protected by use of the socket bayonet, and these improved siege techniques.

With Vauban's words in hand I will compare his words to accounts of his actions. This is similar to the approach taken by Jamel Ostwald in his 2007 book *Vauban Under Siege: Engineering Efficiency and Martial Vigor in the War of Spanish Succession.* To differentiate my work from his, I will examine siegecraft during the Seven Years War in North America. I do this not only to distance myself from Ostwald's work on the War of Spanish Succession, but to also shine further light on a conflict that is often overshadowed by the American Revolution, a conflict that can rightly be described as the last major European conflict of the Early Modern Period. Like Ostwald, however, I will use Vauban's successful 1697 siege of Ath as the touchstone for my observations of later sieges.

The sieges in North America that I examine are the 1757 siege of Fort William Henry, the 1758 unsuccessful siege of Fort Carillon (Ticonderoga) and its seizure in

1759, as well as the 1759 siege of Fort Niagara. These represent a good sampling of both French and English actions, while representing examples of both victories and defeats. And I would be remiss not to include Fort Niagara, since my visit there in 2016 inspired my research into this topic. Once I outline the events of these sieges, I will compare the actions of the various commanders: the Marquis de Montcalm, Major General James Abercromby, General Jeffery Amherst, and Colonel John Prideaux to Vauban's description of how a siege should be undertaken.

To demonstrate the superiority of Vauban's methods, I use documentary evidence. In addition to *A Manual of Siegecraft and Fortification,* Louis Goulon, a French engineer, provided an eyewitness account of the siege of Ath, which I use as proof of Vauban's concept. The noted French naturalist and explorer, Louis de Bougainville left his journal recording his involvement with Montcalm during the attack on Fort William Henry and the defense of Fort Carillon. Pierre Pouchot, commanding the French garrison at Fort Niagara, left an account of how the French defended the fortress, and how he saw the English conducting their siege.

In chapter 1, I discuss the historiography of the military revolution. Chapter 2 gives my new, differing view of the military revolution and introduces Vauban while discussing the revolutionary nature of his contributions. Chapter 3 covers the 1697 siege of Ath and a broad overview of Vauban's writings. Chapter 4 looks at the 1757 French action at Fort William Henry, the 1758 British assault on Fort Carillion, its seizure in 1759, and the 1759 British victory at Fort Niagara. Chapter 5 will tie these ideas together as well as give ideas for further research.

CHAPTER ONE: SO YOU SAY YOU WANT A REVOLUTION

The "Early Modern European Military Revolution" is best described as a series of changes to how European militaries conducted warfare during the Early Modern period (1453-1798).[2] This includes changes to infantry tactics, the integration of gunpowder artillery and hand-held firearms, fortress design and construction, and naval warfare. Some have described these changes as revolutionary, while others have not. In citing Stephen Jay Gould and Niles Eldridge's evolutionary theory of "punctuated equilibrium" to describe his own place in this conversation, Clifford Rogers argues that, "this newer concept of punctuated equilibrium evolution, combining both incremental and 'revolutionary' change, seems to describe the process of military innovation extraordinarily well."[3] But by "attempting to subsume the innovations of five centuries into a single phenomenon, we may be imposing an artificial technological unity onto a series of inherently distinct, separate developments."[4] This means that although hindsight supports the idea of an Early Modern European Military Revolution, it should be viewed

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[2] To clarify, the Early-modern Military Revolution is not the same as the "Revolution in Military Affairs" or RMA. The fundamental difference between the Military revolution and the RMA is intent. The discussion surrounding the Military Revolution is academic in nature, discussing the past for its own sake. The RMA uses academic discourse as a base, that is then put through a theoretical framework, developed in the Soviet Union, to discover the next sudden change in how wars will be fought, to predict the course of events, and thereby gain an advantage. Thus, the discussion of the Military Revolution deals exclusively with the past, the RMA uses the past to predict the future.

[3] Clifford J. Rogers, "The Military Revolutions of the Hundred Years War" in *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe*, ed. Clifford J. Rogers, (New York: Westview Press, 1995), 77. Introduced in 1972, the theory of "punctuated equilibrium evolution" argues that biological evolutionary changes come as a result of sudden bursts of rapid change, followed by long periods of "near stasis" rather than by constant, slow change over time.

[4] Ibid.

as a strictly academic exercise. This is because people involved in past events would have been unaware how their actions would be construed by future generations.

This chapter will discuss historiographic trends and arguments regarding the Early Modern European Military Revolution. Originally the Military Revolution was described as changes in infantry tactics that allowed for larger armies which precipitated absolutism. This was later revised to include advances in the design of fortifications which created larger armies, and that these changes are what caused absolutism. Further arguments stated that medieval changes in army composition allowed for larger armies which provided the conditions that allowed absolutism to flourish. This idea, that armies increased in size has come under question, as well as when these changes occurred. With each phase of this debate, new aspects have been examined, and as new information comes to light, and new sources are examined, each wave of historians build from, and refute, the ideas that have come before.

The concept originates with Michael Roberts. In a lecture given at Queen's University in Belfast in 1955, he argues that military developments of a technical nature exerted a lasting influence on society at large. In the simplest terms, these technical advances, which include the development of personal firearms, led to tactical innovations. These technical and tactical developments were both agents and auxiliaries of social change. According to Roberts, the originators of this military revolution sought to implement linear tactical solutions, which promised to provide victory over the combined forces of the Hapsburgs, by standardizing and economizing the training of large numbers of individual foot soldiers. Roberts states, "the soldier of the Middle Ages had been … highly trained over a prolonged period. The coming, first of firearms … put

an end to this state of affairs. The mercenary in the middle of a pike square needed little training and less skill."[5] So instead of small armies composed of men who spent their entire lives training for war on horseback, fighting out of obligation to their feudal lords, they were replaced by large numbers of men trained for a couple of months armed with pikes and guns, fighting exclusively on foot and for pay. Warfare was no longer the exclusive purview of the nobility,

By Roberts' admission, the originators of the military revolution, were Maurice of Orange, and Gustav Adolf, king of Sweden, "under the inspiration of Vegetius, Aelian, and Leo the Isaurian."[6] Roberts argues, "in place of the massive, deep, unwieldy squares of the Spanish *tercio,* or the still larger but more irregular blocks of the Swiss column, they relied on a multiplicity of small units ranged in two or three lines, and so disposed and armed to permit the full exploitation of all types of weapon."[7] While Maurice used these tactical changes on the defensive, Gustav Adolf applied them "with brilliant success in offensive actions too."[8]

But in order to accomplish this, officers were needed, in order to drill the men, conforming their will to that of their commanders. While the armies of the medieval period had commanders and chains of command, those chains were forged from the iron of feudal obligation, with each fighter bedecked in their own livery, trying to make a name for themselves on the battlefield. "The army was no longer to be a brute mass, in

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[5] Michael Roberts, "The Military Revolution, 1560-1660" in *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe,* ed. Clifford Rogers, (New York: Westview Press, 1995), 14.
[6] Ibid, 13-14.
[7] Ibid, 14. The most important of these weapons would be firearms, but Roberts would leave it to other historians to emphasize this point.
[8] Ibid.

the Swiss style, nor a collection of bellicose individuals, in the feudal style; it was to be an articulated organism of which each part responded to impulses from above."[9] This could be done by issuing uniforms, which would create cohesion within the army, and by creating a local army, composed entirely of soldiers fighting for pay. However this change created more problems than it solved.

Roberts writes that while Machiavelli argues for local militias, these small, local units made up of part-time soldiers were unable to master the modern arts of war. Additionally, most European monarchs were unwilling to grant the lower orders of society training in arms, for fear of what might be. This led to the rise of an international mercenary culture, best exemplified by the flamboyant German *landsknecht,* that would be overshadowed by the Roman inspired forces of Maurice of Orange during the Eighty Years' War, and the Swedish peasant conscripts wielded by Gustav Adolf during the Thirty Years' War. With these tactical revolutions, Roberts specifies two types of strategic revolution as well. One of these is based solely on the offensive, the idea being that battles between armies were the only way for conflicts to be resolved. The second was based on the gradual conquest of territory. Both would necessitate larger, longer standing, national armies.

According to Roberts, these tactical and strategic revolutions helped usher in large permanent armies, which helped create absolute monarchies. He states, "where absolutism triumphed in this century, it did so because it provided the response to a genuine need; and though an army might be useful for curbing aristocratic license, it was but an accessory factor in the general political situation which produced the eclipse of the

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[9] Ibid, 15.

Estates."[10] These monarchies created new administrations. These sought to solve military problems by standardizing equipment, which promised to reduce costs. This, in turn, helped to solve the problem of paying for larger, better equipped armies. This led to the armies becoming the property of the monarch, which would have unforeseen social consequences.

These consequences would include the leveling of the social playing field. War was no longer the exclusive purview of the nobility. The poor could go to war and use it as a vehicle for social mobility. He states that "the new armies, in fact, served as the social escalators of the age; the eternal wars favoured interstratic mobility; and for a young man with some capital behind him a regiment could be a brilliant investment: Wallhausen lamented that war was ceasing to be an honourable profession, and was becoming a mere traffic."[11]

The arts of war went from being something a soldier had to dedicate their whole lives to, to something they could learn, by rote instruction, from a book, in a much shorter amount of time. For this purpose, nations established military academies, to train and instruct a new piece of the battlefield puzzle: the officer. This instruction in the arts of war cemented a clear divide between the military and civilian worlds. As such, the old rites of loot and plunder, rapine and slaughter, needed to be restricted, with the State maintaining a monopoly on violence. This would result in well-fortified frontiers, as well as codes of conduct established in the wake of the violence of the Thirty Years' War that would try to limit the destruction of legitimate war.

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[10] Ibid, 18.
[11] Ibid, 23.

For nearly twenty years, Roberts' theory remained unquestioned. But in 1976, Geoffrey Parker, writing his dissertation about the Spanish Army in Flanders, expressed his doubts about some of the tenets of Roberts' ideas. He recounts that "with that grim humor for which academics are famous, the History Faculty Board of Cambridge University appointed Michael Roberts as my external examiner … Much to my surprise, however, that generous and gracious man told me that he found my critique convincing and advised me to publish it separately as an article."[12] The article, entitled "The 'Military Revolution, 1560-1660' – A Myth?" while agreeing with the idea that a military revolution took place, disagreed with more than just the start date. According to Parker, "Many of the developments described by Roberts also characterized warfare in Renaissance Italy … the French, German, Swiss, and Spanish invaders had to adopt the methods of the *condottieri*, both in attack and defense, before they could make real headway against them."[13]

While Roberts emphasizes the tactical reforms of Maurice and Gustav, Parker downplays their importance. He writes that these men were both forced to rethink their tactics and reshape their armies due to defeats suffered at the hands of better trained and equipped Hapsburg forces. Parker notes, "the Spanish army … was a force of impressive military efficiency."[14] Ten years prior to Roberts' start date, the Spanish army in Flanders had already gained notoriety for relying on the relatively new arquebus. Fernando

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[12] Geoffrey Parker, "In Defense of the Military Revolution" in *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe*, ed. Clifford Rogers, (New York: Westview Press, 1995), 337.
[13] Geoffrey Parker, "The 'Military Revolution' – A Myth?" in *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe*, ed. Clifford Rogers, (New York: Westview Press, 1995), 38-39.
[14] Ibid. 39.

Álvarez de Toledo, the notorious Duke of Alva added musketeers to his infantry companies during the 1550s, and by the 1570s "there were at least two companies which consisted solely of shot in every *tercio* on active service."[15]

Roberts viewed the Eighty Years' and Thirty Years' Wars as exhibiting the first "national" armies, Parker observes that permanent or semi-permanent armies existed prior to that, during the dynastic conflicts between England and France, known as the Hundred Years War. This near constant state of war, over such a long period of time, produced "standing armies, greater professionalism among the troops, improvements in military organization, and certain tactical innovations."[16] Of more importance than any perceived tactical innovation was technological innovation.

According to Parker, the most important technical innovation, and the real keystone of the military revolution was "the appearance of an entirely new type of defensive fortification: the *trace italienne,* a circuit of low, thick walls, punctuated by quadrilateral bastions. In the course of the fifteenth century it became obvious that improvements in gun founding and artillery had rendered the high, thin walls of the Middle Ages quite indefensible."[17] He cites Ferdinand and Isabella's conquest of Granada and Charles VII's seizure of English possessions in France as examples.

Parker notes that military architects in Italy were the first to develop this new style of fortification, Italy having more cities than any other region in Europe. This new fortification style, which will be discussed in more detail below, meant that cities could not be quickly battered into submission. Without adequate artillery support, the only way

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[15] Ibid.
[16] Ibid, 40.
[17] Ibid, 41.

to reduce a city was to surround it and starve the inhabitants. The only way to raise such a siege would be for an outside force to relieve them, and it was in these rescuing actions that battles took place, like the 1525 Battle of Pavia, where Charles V defeated Francois I, and the 1683 Battle of Vienna, where the Polish hussars under Jan III Sobieski routed the Ottomans. Parker sees sieges as being more important than battles, because "whenever wars happened to occur in areas where the trace italienne was absent … then battles were both frequent and important."[18]

While Parker disagrees with Roberts regarding certain aspects of the military revolution, the strategic and tactical aspects, as well as the dates, there is one point where they agree. "There is absolutely no doubt about its third constituent: the growth of army size. Between 1530 and 1710 there was a ten-fold increase both in the total numbers of armed forces paid by the major European states and in the total numbers involved in the major European battles."[19] To explain this dramatic increase, Parker contrasts medieval armies with those of the early modern period. He states that heavy cavalry, armored men on horseback delivering a crouched lance blow at the gallop, were the backbone of European medieval armies. The heavy cavalry dominated, until "it was discovered that a heavy cavalry charge could regularly be stopped either by volleys of arrows or by a forest of pikes."[20]

He argues that while, economically, there was a limit to how many heavily armored men and horses were available to a given commander, "there was none to the number of ordinary men who could be enlisted and issued a pike, sword, and helmet. A

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[18] Ibid, 42.
[19] Ibid, 43.
[20] Ibid, 44.

pike-man's basic equipment cost little more than his wages for a week, and in some cases even this paltry sum could be deducted from the soldier's pay."[21] And, thus, armies could receive more "bang for their buck" by employing large numbers of foot soldiers, who would be trained in a manner consistent with Roberts' thesis.

But accomplishing the dream of mass mobilization required administrative and financial innovations. Describing the necessities to feed an army of 50,000, Parker claims that, "only in the later sixteenth century did it become possible to meet these basic human needs on a grand scale."[22] This was only possible due to increases in governmental revenues, raised with new modes of taxation. This further forced states to develop more complex bureaucracies, because only the financial resources of a larger entity could continue to pay for and equip such a large force. Echoing Roberts' prior esteem for the works of Maurice of Orange, Parker describes the manner in which the Dutch approached international trade and finance, describing it as being the only way to keep an army in the field for so long with so few disruptions. This system was so successful, he states, that it was soon emulated throughout Europe, allowing any nation of sufficient economic strength to field a sizeable army.

Parker notes, though, that this military revolution had its limits. He notes that while there was an increase in military manpower, there were operational and logistical limits that needed to be addressed before European armies could reach the numbers seen during the revolutionary wars of the late eighteenth/early nineteenth centuries. But he punctuates this by stating that this surge in the number of men engaged in warfare,

> had all the significant consequences which Roberts attributed to it: it made

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[21] Ibid.
[22] Ibid, 46.

> war impinge more on society; it increased the authority of the state (partly at the expense of the citizen); it accentuated social mobility; and it undoubtedly retarded the economic development of most participants (although it stimulated that of many neutrals) … The 'prodigious increase in the scale of warfare' alone merits the title of 'military revolution' which Roberts bestowed upon it.[23]

While Parker and Roberts were trying to "connect the dots" between military revolution and the rise of absolutism, others focused on describing the change in the way European armies fought each other for its own sake. Michael Howard, deviates from Roberts' description of an Early Modern European military revolution. In his best-selling *War in European History*, he describes the infantry-heavy armies and better gunpowder artillery[24] that allowed France, under Charles VIII to swiftly batter down almost every fortification he encountered during the Italian War of 1494-98, forcing citadels to fall in days where they had previously taken months or even years to capitulate. The infantry, in this case, were based on the successful Swiss pike blocks, which would soon be copied throughout Western Europe.

By the end of the fifteenth century, Howard argues, pikemen, accompanied by men armed with the arquebus, represented the core of every infantry force. These men, and those that plied the artillery, represent a revolutionary advancement of the art of war. Instead of engaging in warfare out of feudal obligation, and hoping to be "taken into Royal service on a permeant basis," the men fighting under Charles VIII were doing so in order to receive payment from the state.[25] Thus, the army the French king took to Italy, a mixture of Swiss pikemen, French cavalry, and bronze cannons, all of whom were either

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[23] Ibid.
[24] As compared to torsion siege engines, catapults, trebuchets, and other non-gunpowder artillery.
[25] Michael Howard, *War in European History*, (New York: Oxford University Press, 1976), 18.

paid wages by, or in the case of the cannons, paid for by the state, constitutes the first, modern, European army.

Howard argues, though, that the wars fought by these modern armies were of a decidedly medieval character, with kings and nobles trying to exert their will onto other kings and nobles. These were not wars of national liberation, nor were they wars dictated by the passions of religion. But warfare in Europe would also be carried out by "an international class of contractors on a purely commercial basis."[26] Unlike their medieval counterparts, these contractors saw their armies as resources to be shepherded, and so large scale, formal battles became much less frequent.

As a result of improved fortifications, increased firepower, and a "cautious professional competence" sieges replaced field battles as the main work of European armies.[27] Howard delves into the tactical organization that so fascinated Roberts and Parker, placing himself squarely in their camp. He describes the shift from having one arquebus to every ten pikes employed by the Spanish *tercio*, described by Parker, to a one-to-six ratio among the armies of Gustav Adolf, highlighted by Roberts. To this discussion of tactical reorganization, he includes in wholesale adoption of the bastioned trace (angled bastions or *trace italianne*).

This new style of fortification included the lowering and thickening of fortification walls, and the inclusion of artillery, in a counter-battery role. Howard extolls the virtue of the later engineering systems of Vauban and van Coehorn, seen to be the pinnacle of the style, explaining that this new style of fortification was more resistant to

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[26] Ibid, 24.
[27] Ibid, 27.

assault. More time was needed to reduce an angled bastion than the tall, stone walls of medieval fortifications, and this led to the spade being introduced to the infantryman's kit, as trenches and gunpowder mines needed to be excavated for these fortified positions to be taken.

Cross Section of Angled Bastion Fortification

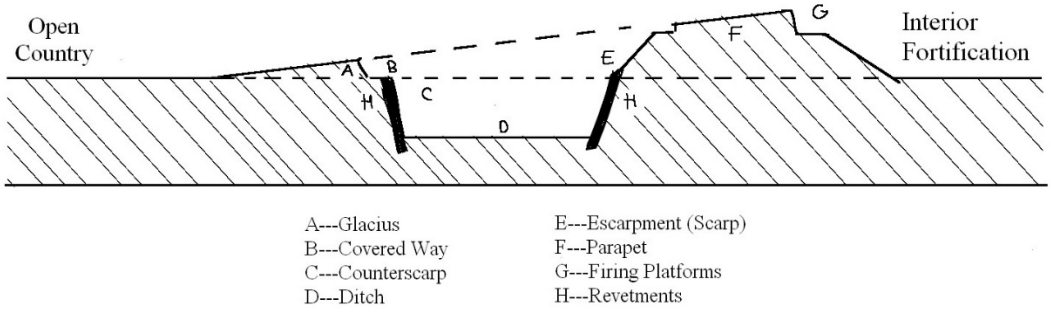

Figure 1 Illustration by Lillian Green

But of far greater significance than the spade were improvements to gunpowder artillery. And it is this, Howard argues, that allows Europeans to be able to force their will on peoples throughout the rest of the world.[28] This is the first time this observation would be made, but certainly not the last. These artillery pieces would be placed on bastioned fortresses, not only in Europe, but all over the globe. They would be found on merchant ships and, later, dedicated warships. These broadside firing sailing vessels, using "line ahead" tactics, came to dominate the seas. However, both fortifications and fleets of warships cost vast sums of money. This is money that most European powers did

[28] And while it is true that much of European colonization took place during the 18th century, the genesis of that conquest comes from the Early Modern period.

not necessarily have on hand, which caused them to fight among themselves for "over-seas" resources.

To reduce the costs of warfare, many of the nations of Europe experimented with standardization in arms and equipment, with arms, at first, being procured, and later produced, by armories owned by the state. They sought out technical innovations to make their new, standardized armies even more deadly. These innovations included replacing the "matchlock" with the flintlock ignition system, and replacing the pikes in their armies, first with the plug bayonet (a dagger jammed into the barrel of the musket, which precluded its use as a firearm), and later with the socket bayonet (which allowed the infantryman to discharge his weapon and reload with the bayonet attached).[29]

Roberts and Parker described the Military Revolution as the means by which the European nation state came into being. Howard examines how it changed the military aspects of European society. Another work examines the impact war had on European society. In 1985, J. R. Hale published *War and Society in Renaissance Europe.* He starts his examination in 1453, the last year of the Hundred Years' War between England and France, and the fall of Constantinople to the Ottomans. His narrative ends with the Bohemian riot in 1618 that sparks the Thirty Years' War. Like Parker and Roberts, Hale focuses on the increase in the size of armies. He states that the central mystery, relating to the wars of the period, was not, "why, but how enough men were found to fight them."[30]

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[29] The "matchlock" operated by having a lit piece of "slowmatch" (rope impregnated with gunpowder) be pressed into the gunpowder filled priming pan. The "flintlock" operated by having a piece of flint strike against a piece of steel, showering the priming pan with sparks. While the flintlock was not as reliable an ignition system as the matchlock, it was far less dangerous for the infantryman to operate.

[30] J. R. Hale, *War and Society in Renaissance Europe, 1450-1620,* (Baltimore, The Johns Hopkins University Press, 1986), 45.

To answer this, Hale examines a military “reformation” in which portable artillery and firearms radically effected the conduct and conditions of war. This is best summarized by saying that better artillery led to better forts, which led to longer sieges, which extended the campaigning season, which increased the overall cost of warfare for those involved. As reliance on gunpowder weapons increased, firearms and gunpowder would need to be procured and stockpiled, which further increased the cost of warfare, even in peace time. These costs magnified exponentially when artillery was added to fortifications. All of this led to a greater financial burden, which was passed on to the populace of the state by way of taxes.

Picture 1 Examples of matchlock and flintlock muskets -- Photo by the author

Hale echoes Roberts' original military revolution thesis, but aligns himself with Parker, seeing the origins of the military revolution beginning not with Maurice of Orange, but instead with the *tercios* of the Army of Flanders. Like Howard, he emphasizes the importance of Swiss contributions, but sees the Spanish combined-arms model, paid for with looted New World silver, as being the first successful implementation of the Military Revolution on a large scale. Like both Parker and

Roberts, he argues that professional, paid military service was necessary to lessen the direct impact of war upon civilians, which he termed, an "unremitting molestation of normal life", which would only increase during the blood and horror of the French Wars of Religion, and the Thirty Years' War.[31]

With these evolutions of Robert's original idea of the Military Revolution in place, Parker returned to the subject with his book, *The Military Revolution: Military Innovation and the Rise of the West, 1500-1800.*[32] In this work, he reiterates his initial thesis concerning a military revolution, stating that in response to improvements in artillery, the angled bastion fortification was developed. The angled bastion allowed for this improved artillery to be used in a defensive role, further increasing military reliance on firepower. This, in turn, created the need for larger armies, in order to crew more guns, which would further increase the ancillary aspects of armies, as more materiel (gunpowder, muskets, cannons, etc.) was needed to keep these men in the field. The increase in the number of field armies up to the nineteenth century, he argues, is proof of the correctness of his thesis.

But while Parker asserts that the validity of his thesis remained intact, others were not so sure. Simon Adams takes issue with Parker on the topic of the growth of army size. While both Roberts and Parker claim that army sizes ballooned as a result of the Early Modern European Military Revolution, Adams argues that there was no real difference between field army strengths from the sixteenth to the seventeenth centuries. Unlike the previous authors who claim an increase in army size, he argues that the

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[31] Ibid, 179.
[32] Geoffrey Parker, *The Military Revolution: Military Innovation and the Rise of the West, 1500-1800,* (New York: Cambridge University Press, 1988).

number of men under arms remained nearly static, stating that finding the total strength of any particular state is problematic because the systems for record keeping were in their infancy, and sometimes those records can be suspect. He further argues that if armies grew during the period, the growth stems from political reasons, rather than technological ones. He draws attention to the Hapsburgs, and their engagement in a series of defensive wars, wars fought by isolating and reducing strongholds, which was a time consuming and expensive process. He concludes by stating that "any final conclusions about the military revolution must take its political context into account."[33]

And he makes a fair point. If Hapsburg armies increased it would be due to a series of simultaneous wars. With this increase evident on the battlefields, their antagonists would feel the need to have to increase the numbers of their forces as well. This argument turns the focus from the tactical and technological reasons that Roberts and Parker claim armies increased in size and shifts it towards the political situation at the time, namely the struggle against Hapsburg hegemony. In this, Adams stands apart from both Parker and Roberts. If one of the major aspects of their Early Modern European Military Revolution is increased army size, which led to increased bureaucracy, then Adams' claims that army sizes stayed relatively static changes that.

Clifford Rogers, writing in 1993, while agreeing that there had been a military revolution, differed with Parker on both scope and time frame. Instead of a single revolution. Rogers argues for a series of evolutions over a longer period. Shifting away from the Early Modern period, Rogers believes that, "the focus on the centuries after

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[33] Simon Adams, "Tactics or Politics? 'Military Revolution' and the Hapsburg Hegemony, 1525-1648" in *Tools of War*, ed. John A. Lynn, (Urbana, Illinois: University of Illinois Press, 1990), 46.

1500 obscures the importance of the period in which the most dramatic, most truly revolutionary changes in European military affairs took place: the period, roughly, of the Hundred Years War (1337-1453)."[34] This view is only fitting, as Rogers' work focuses on the Medieval period. While Parker does call attention to changes in medieval army composition, he does it almost in passing. But to Rodgers this change is formative to the military revolution.

Prior to this, in Europe, armies were comprised of feudal aristocrats fighting from horseback, who sought to capture one another for ransom, not to kill. But he states that "the armies which conquered Europe's first global empires, on the other hand, differed from this description on *every single count.*"[35] Not only were these new armies comprised of common people, but they fought on foot, for pay, "in close-order linear formations which relied on missile fire than shock action; and they fought to kill."[36] What Rogers argues for is an "infantry revolution" taking place during the Hundred Year's War, which was followed by an "artillery revolution" as proposed by Parker, and a revolution in the way war was administered, proposing an "alternative paradigm based on the biological concept of 'punctuated equilibrium evolution.'"[37]

Rogers uses the infantry victories of Courtrai (1302), Bannockburn (1314), and Morgarten (1315) to preface similar triumphs by the English over the French "using the 'pike-and-shot' combination of dismounted men-at-arms and archers which they developed in the 1330s in Scotland."[38] These tactics made the battlefields of Europe a

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[34] Rogers, "The Military Revolutions of the Hundred Years War", 56.
[35] Ibid.
[36] Ibid.
[37] Ibid, 57.
[38] Ibid, 59.

decidedly deadlier place. He states that "war under the feudal regimes of Western Europe in the twelfth and thirteenth centuries often seemed more like sport than serious business. In the Flanders War of 1127, which involved about a thousand knights fighting for over a year, only one died by the hand of an enemy; an equal proportion of the losses of the war resulted from excessive horn-blowing."[39] These tiny casualty figures have more to do with aristocratic desires to capture and ransom their foes, than any other desire.

But if one of the stated purposes of medieval warfare was to gain funds through ransom, non-aristocratic infantry "did not command large enough ransoms to make their capture worthwhile. Nor did they share in the 'fellowship in arms' which bonded chevaliers even of different nationalities. Quite the opposite: the class differences between knight and bourgeois or peasant often encouraged extreme bloodthirstiness."[40] In addition, pikes, halberds, billhooks, longbows, and crossbows were designed to kill at distance, thus giving their relatively untrained wielders an advantage against their usually mounted foes.[41] Rogers states that, "it is easy to see why the battlefields of the Infantry Revolution became such bloody places … Ever since, Europeans have had an unusually lethal approach to warfare."[42] Rogers fails to report whether Europeans practiced the same amount of restraint when fighting non-Europeans, or Europeans who failed to follow orthodox religious practices.

According to Rogers, European lethality would increase with the technological

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[39] Ibid, 62.
[40] Ibid.
[41] Longbows are an exception here. It took a lifetime to become proficient with the longbow, with exhumed longbowmen showing physical deformations incurred over a lifetime of practice. This investiture in time would be one of the driving forces in the adoption of the firearm, even though the longbow was more efficient weapon system.
[42] Ibid.

advancements that heralded the advent of the Artillery Revolution. Prior to the 1415 siege of Harfleur, gunpowder artillery had been used in concert with more traditional medieval artillery (catapults, springalds, and trebuchets), but instead of being used against the walls, "gunstones were fired *into* the town, where they knocked down houses and churches."[43] At Harfleur, the artillery made sizable breaches in the walls, forcing the defenders to capitulate after relieving forces were nowhere to be found. By the 1430s, this was becoming the norm, as "the powerful Burgundian artillery … could demolish the walls of most fortifications."[44]

Cities that traditionally required long sieges to capture, fell quickly to the concentrated firepower of French gunpowder artillery. Rogers states, "it seems fair to say that a revolution occurred in the art of war around 1420-30s, as gunpowder artillery overturned the centuries-old dominance of the defensive in siege warfare. What was the nature of this revolution?"[45] To answer this, he describes technological advances in cannon founding, cannon design, and improved loading techniques, as well as new methods of gunpowder production. Further improvements included two-wheeled carriages and cast-iron cannonballs.

> The development of the hooped-staves method made it possible for even the largest iron canon to have longer barrels, the adoption of which increased accuracy, power, and rate of fire. The new iron refining process, and the increased skills of the gunsmiths, made guns cheaper to buy; and corned powder made them both more powerful and cheaper to use. The number and size of guns in use increased rapidly.[46]

Having presented his evidence for the Infantry and Artillery Revolutions, Rogers

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[43] Ibid, 64.
[44] Ibid, 67.
[45] Ibid.
[46] Ibid, 73.

echoes Parker as to the importance of *trace italianne* fortifications, describing this as the "Artillery Fortress Revolution."[47] But, again, he attempts to distance himself from his predecessors, stating that "we are, thus, dealing not with one revolutionary change, but with a whole *series* of revolutions which synergistically combined to create Western military superiority of the eighteenth century."[48] This assertion that the Military Revolution was the root of European military hegemony was a step further than either Roberts or Parker were willing to go. And while this is a compelling argument, it fails to account for the agency of those people who were on the receiving end of European colonialism.

Both Roberts and Parker argue that "administrative, fiscal, and governmental reforms" were necessary for the growth in the size of armies during the period.[49] Shifting the chronological focus ever so slightly, John Lynn focuses on the social stability, brought about by the long reign of Louis XIV as being the catalyst for increased army size. This interpretation synchronizes with Simon Adams studies of the Hapsburgs. Since the Hapsburgs increased their armies to meet a series of threats, France felt the need to increase their armies, as they were surrounded by the Hapsburgs and their allies. By focusing on Louis XIV, whose reign covered the latter half of the seventeenth century, he aligns himself with Jeremy Black, who:

> ascribes all French military growth to Louis XIV's personal reign. The fact that he shifts the time period away from Robert's original dates is of little consequence in itself, since others, including Parker, had done that before. However, much more essential, Black insists that the military

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[47] Ibid, 76.
[48] Ibid, 77.
[49] John A. Lynn, "Recalculating French Army Growth During the *Grand Siècle*, 1610-1715" in *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe*, ed. Clifford J. Rogers, (New York: Westview Press, 1995), 117.

> expansion occurring after 1660 came only as the consequence of increased government capacity made possible by social and political compromises hammered out under Louis XIV. Therefore, Black reads out the army and war as *causes* of political change, and instead reduces them to mere *effects.*[50]

Thus, the idea of an Early Modern European Military Revolution, as put forth by Roberts, and championed by Parker has been successfully challenged. Instead of a single military revolution embodied by linear infantry tactics, there were multiple revolutions (one could even call them evolutions) in how armies fought: an infantry revolution which began with the mobilizing of peasants during the Hundred Years War, a gunpowder artillery revolution which caused medieval fortresses to become obsolete almost overnight, a fortress revolution which shifted the balance on the battlefield from attack back to defense, and returned the siege to the dominant form of activity on the battlefields of Europe, and a naval revolution (which lies outside the scope of this paper) that projected military power around the globe. With each of these revolutions came a change to the way rulers, and their armies, prosecuted warfare. These evolutionary changes, in turn, necessitated new ways in which the nations of Europe were forced to govern. Bureaucracy and taxation increased, which eventually paved the way for the revolutionary period that marked the beginnings of Modern Europe.

But what if there was another military revolution? What if these incremental changes paved the way for another and thoroughly more modern revolution, one that could have (had it been fully realized) changed how wars were fought? My evidence will show that this is the case. It consists of some of the technological factors focused on by Parker, and places them within a later timeframe. This new revolution springs from the

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[50] Ibid.

mind, actions, and written words of one man. This one individual is said to have "the stage for a Military Enlightenment later in the century."[51] His name was Sébastien le Prestre de Vauban.

[51] Jamel Ostwald, *Vauban Under Siege: Engineering Efficiency and Martial Vigor in the War of Spanish Succession* (Boston: University of Leiden Press, 2007), 1.

CHAPTER TWO: THE MAN, THE MYTH, THE LEGEND

To discuss these ideas it necessitates a discussion of the man himself. How does a seventeenth-century military engineer become the embodiment of the Early Modern European Military Revolution? Among his many achievements, Vauban contributed three things which are key to this discussion. The first invention was the socket bayonet, which Vauban invented and introduced to the French army in 1668. His second was a systematic approach to siege warfare, important because pitched battles were rare, while sieges predominated the era. His final invention was an attempt to limit the cost of warfare in both men and materiel.[52] By examining these three inventions, it will be possible to gain a better understanding of how Vauban shaped, and contributed to an Early Modern European Military Revolution.

Born in 1633, to a minor noble, Vauban was orphaned by the age of ten, and by seventeen he was fighting alongside the rebels led by the Duc d'Orléans during the Fronde of the Princes. Captured and rehabilitated (not executed for fighting against the crown), Vauban fought for the rest of his life under the banner of the Sun King. By 1655, he received a commission as a royal engineer, and by the time peace was declared in 1659, he had overseen, or participated in, ten sieges, being wounded several times. When war broke out again in 1667, he successfully besieged Spanish garrisons in Douai, Tournai, and Lille, which helped bring the War of Devolution to an end.

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[52] That is to say reducing the cost in men and materials to his own side. Vauban, as far as can be surmised, cared far less about the people occupying any fortress he was attacking.

As new territories came into the possession of France, Vauban was tasked with rebuilding and revitalizing any existing fortifications. When war with the Netherlands recommenced, Vauban reduced Rheinberg, Nijmegen, Maastricht, Trier, Bouchain, Valenciennes, Cambrai, Ghent, and Ypres. In 1692, he besieged, and took the fortress of Namur, which was defended by his Dutch counterpart Menno van Coehoorn. In 1697 Vauban took Ath, a town he had previously fortified. He died in 1707, and after his remains were scattered during the Revolution, his heart was interred in the Hôtel des Invalides on the orders of Napoleon I.

With his life given a cursory examination, it is time to look at the first of his revolutionary inventions: the socket bayonet. Sharpened sticks are thought to have been among the first human weapons. As metallurgical technology improved, the spear became "the most important and most widely used offensive armament."[53] This would continue to be the case until well after the development of gunpowder weaponry.[54] As it took a relatively long time to reload these early firearms, the infantry using them would be quite vulnerable. To combat this, infantry armed with pikes, which are spears up to sixteen feet long, were used to defend these musketeers from attacks by cavalry, as well as other men with pikes.[55] Firearm technology advanced. First came the matchlock, which used a piece of smoldering rope that plunged into an ignition pan of loose gunpowder. Then came the wheellock, which consisted of a wheel, under tension, that

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[53] Kely DeVries, *Medieval Military Technology*, (Lewiston, New York: Broadview Press, 1992), 9.
[54] The bow, as a weapon of war, has a spotty history of effectiveness. While the English longbow may have helped the English win several battles during the fourteenth century, the amount of time and training that it took to create train a competent bowman, would cause it to be surpassed by gunpowder weaponry.
[55] As has been stated before, among the Spanish *Tercios* the ratio of pikes to guns was 10:1, under Gustav Adolf that ratio lowered to 6:1. By the time of Vauban, only non-commissioned officers retained their half-pikes, and this as a badge of rank, more than a functional weapon.

when released created sparks that ignited gunpowder like a cigarette lighter. Finally came the flintlock, an ignition system that consisted of an arm, called a dog, holding a flint that falls forward and strikes a steel plate, causing sparks which ignites the gunpowder. With these innovations in, place reload times decreased, thus lessening the need, but not eliminating, the need of pikemen for defense. So long as cavalry remained an effective tool on the battlefield, men with firearms would be vulnerable.

The first attempt to solve this vulnerability came in the form of the plug bayonet. The plug bayonet was a dagger, the handle of which was designed to be jammed into the barrel of the firearm, giving the soldier something sharp which with to defend himself. The obvious shortcoming of this design is that it renders the firearm useless except as a spear, the barrel being plugged by the bayonet. While this worked in extreme circumstances, it did not outweigh the benefits that a firearm brings to the battlefield.

Picture 2 Socket bayonet -- Picture by the author

Vauban designed and introduced a bayonet that, instead of being inserted into the barrel of the firearm, slipped over the barrel, locking in place by means of a lug on the barrel. This adaptation, introduced to the French Army in 1688, allowed the soldier to discharge and reload his weapon with the bayonet attached. This subtle shift allowed each infantryman the chance to use their firearms while maintaining the ability to defend themselves. In addition, it allowed these infantrymen to advance, fire a volley, and charge, which became the formula for battle for the next several centuries. It also signaled the final demise of cavalry as the dominant power on the battlefield, although it would take several centuries for the horse to be completely removed from the battlefield.[56]

Next in Vauban's revolutionary toolbox came a systemization of siege warfare. According to Christopher Duffy, prior to the career of Vauban, "the skill of military architects placed the offensive at a relative disadvantage."[57] This disadvantage only became more apparent after the development of Vauban's system. Prior to Vauban, sieges were long, laborious, and expensive undertakings, sometimes with years passing before either side capitulated.[58] During the medieval period, sieges could last years, as stout castle walls could last as long as the food held out. This changed with the advent of gunpowder artillery.

In 1494, "the French took a mere eight hours for the business of breaching the

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[56] Horses were still being used, in limited roles, during the First and Second World Wars, and a United States special forces unit conducted a cavalry charge as part of the attack on Mazar-i-Sharif in 2001.
[57] Christopher Duffy, *Fire and Stone: The Science of Fortress Warfare, 1660-1860,* (London: Castle Books, 2006), 10.
[58] Beginning in 1648, the city of Candia, in Greece, withstood Ottoman siegecraft for 21 years, only falling after a defector gave the Ottomans detailed information on the cities' weaknesses. The Spanish defenders of Ceuta, on the Moroccan coast, were besieged in 1694, the besiegers farming the land around the city to sustain themselves. They were finally relieved in 1720.

important frontier stronghold of Monte San Giovanni and massacring its garrison. The place had once withstood a siege of seven years."[59] Richard Holmes states "siege warfare hinged upon the duel between engineer, who sought to make his fortifications impregnable, and the gunner, who strove to batter them down."[60] The engineers, having seen their tall, stone fortifications quickly knocked down by gunpowder and cast-iron shot, embarked on a new, angular building style.

First adopted in Italy, the *trace italienne* style of fortification, consisted of "low defenses of earth, revetted with brick or stone, with deep ditches – which might sometimes be flooded – shielding them from direct assault."[61] The key feature of this new style of defense was the angled bastion "an arrow-head shaped work that jutted out from the line of the main curtain wall to enable guns mounted on it to cover the wall with flanking fire … From the attacker's side little could be seen but a gentle slope, the glacis, which fell away into a shallow walk-way protected by sharpened stakes."[62] Further impediments could be added, and all approaches would be subject to heavy fire from defenders, possibly from multiple angles, making any attempt at forced entry a deadly proposition. Thus, these early sieges were conducted via "a formless maze of saps and redoubts, by which dangerously exposed parties of workmen dug their way towards the fortress. The siege guns offered the men no very effective support, for the technology of artillery design had made no progress since the 1490s, and nobody was sure where the

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[59] Christopher Duffy, *Siege Warfare: The Fortress in the Early Modern World, 1494-1660,* (London: Routledge, 1979), 9.
[60] Richard Holmes, *Redcoat: The British Soldier in the Age of Horse and Musket,* (London: W. W. Norton and Company, 2002), 378.
[61] Ibid, 379.
[62] Ibid.

batteries should best be sited."[63]

To this chaos, Vauban introduced order. An expanded description of his siege techniques will be presented later, but the importance of order cannot be overstated, as much has been made of the "intellectual context of the period, particularly Scientific Revolutionary and Enlightenment predilections for geometry, Newtonian mechanics and rationalism"[64] The difference between Vauban and his predecessors is best represented by his two most vaunted achievements: the introduction of siege parallels and ricochet shot. But both of these developments "were crucial in the first place for accelerating the progress of sieges and making some parts of the fortifications much more vulnerable than they had been previously. They are also indispensable for understanding the nature of Vauban's contributions."[65]

Before Vauban, besiegers "dug under fire a siege trench that snaked toward a vulnerable part of a besieged fortification. Throwing up gabions and fascines before them and building up earthworks as soon as they had dug a trench, sappers made a zig-zag pattern on their way to the defensive perimeter."[66] Under Vauban, "the original zig-zag trenches now became merely communications trenches between a series (usually three) of long trenches parallel to each other and concentric with the besieged fortress."[67] Regarding the artillery, it could be placed in a number of different places, providing "a wide arc of fire to batter the defenses, thus multiplying the potential points of attack."[68]

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[63] Duffy, *Fire and Stone*, 10-11.
[64] Ostwald, *Vauban Under Siege*, 10.
[65] Langins, *Conserving the Enlightenment*, 108.
[66] Ibid.
[67] Ibid.
[68] Ibid.

Langins describes these parallel trenches as being "a kind of counter-fortress advancing on a fortress."[69]

Duffy states that, "when we look back at on the state of fortress warfare in the 1640s and 1650s it is clear enough that without the determination of a single individual, namely Vauban, who set out to remedy all the deficiencies he had observed, the French would never have gone on to make their name as the greatest takers and builders of fortresses in modern history."[70] Describing this contribution to French siege practices, Martha Pollack states:

> Vauban was considered a theoretical, systematic, and machinating genius … His tables of calculations gave the impression of strategic unassailability; since he calculated not only the dimensions of every element of the fortification, but also the length of time it would take … to gain individual layers of the fortification, every stage of the siege could be predicted in advance. Vauban reduced the defense and attack of fortresses to double-entry bookkeeping, where the two columns balance each other precisely.[71]

The means by which fortified places were taken remained the same, but the difference lay in the manner in which they were used; the most important of these were the blood and sweat of the men laboring to take them.

In his treatment and concern for his fellow soldiers, laborers, and engineers Vauban was at his most revolutionary. But to appreciate this, contemporary practices must be examined. In 1695, an "ill-assorted army of Dutch, Spanish, English, Brandenburgers, Hessians, and Hanoverians", better known as the Grand Alliance,

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[69] Ibid.
[70] Duffy, *Siege Warfare*, 139.
[71] Martha Pollak, *Military Architecture, Cartography and the Representation of the Early Modern European City: A Checklist of Treatises on Fortification in the Newberry Library,* (Chicago: Newberry Library, 1992), xxxiv.

besieged the city of Namur, which had fallen to Vauban in 1692.[72] According to Duffy, when the French attacked, "Vauban made sure on every occasion that the way was well-reconnoitered, that the battalions were thoroughly conversant with their tasks, and that the troops had to cover only the shortest possible stretch of open ground before they reached their objectives."[73] Contrast that with how, on the 30th of August, 1695, a signal was given for "the best battalions of the Allied army to climb out of the trenches and advance against the citadel complex … they moved steadily across six hundred yards of fire-swept ground with drums beating and colors flying."[74] For their gallantry the Allies suffered over two thousand casualties for no appreciable gain. To contrast, three years earlier Vauban took the same city suffering less than three hundred casualties. But it was not only military men and tactical thinkers who commented on Vauban's concern for the lives of his men.

Louis de Rouvroy, Duc de Saint-Simon, was a courtier at Versailles, who began writing his memoirs in 1699. His collection of anecdotes and stories presents a view into the colorful court life of Louis XIV. Among his remembrances, he includes a description of Vauban. Unlike the more malicious entries Saint-Simon reserves for those he hates, he paints Vauban in the best possible light, calling him "perhaps the most honorable and upright man of his day … the simplest, truest, and most modest of men … never was a man better natured, gentler, or more obliging."[75] But most interesting is Saint-Simon's description of Vauban's interaction with his men. He writes, "he was courteous without

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[72] Duffy, *Fire and Stone,* 167.
[73] Ibid.
[74] Ibid, 171.
[75] Louis de Rouvroy de Saint-Simon, *Memoirs of Duc de Saint-Simon: A Shortened Version, 1691-1709,* ed. and trans. by Lucy Norton, (New York: 1500 Books, 2007), 327.

servility, almost miserly with the lives of his soldiers, and possessed the kind of valour that bears every burden and lets others enjoy the credit."[76]

Being "miserly" with the lives of soldiers seems like a very late-twentieth century notion. And for this Vauban's ideas should rightly be seen as revolutionary. His invention of the socket bayonet, which allowed infantry with firearms to defend themselves, his system of siegecraft, including ricochet batteries, and parallel trenches, that reduced the time and cost of sieges which were the dominant aspect of warfare at the time, are both revolutionary in their approaches. And while both are evolutions of earlier technologies and systems, they are revolutionary in the manner in which they were implemented. Both of these can be seen as attempts to reduce casualties among French troops, while increasing casualties among France's enemies. All of these things, being taken together, represent a revolution in the manner in which war was prosecuted during the Early Modern period. But to prove this theory of revolution, an event in which the socket bayonet, systematic siege craft, and attempts to limit the danger to the besiegers needs to be found, and there can be no better example found than by examining Vauban at the height of his craft.

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[76] Ibid.

CHAPTER THREE: A SAMPLE OF HIS GREATNESS: ATH, 1697

Writing in 1887, E. M. Lloyd, a Major in the Royal Engineers, and late Professor of Fortification at the Royal Military Academy at Woolwich mused that while improvements in weaponry and tactics changed the nature of siege warfare, "the principles which Vauban was the first to grasp, and which his rules embodied, remain as applicable as ever."[77] Ostwald states that, "with over forty sieges to his credit, Vauban's followers could have chosen other sieges to emphasize. But several reasons converged to focus attention on the 1697 siege of Ath. First, given the importance of Vauban's legacy to the engineering community, a capstone of his career was only appropriate to show him at the zenith of his art."[78] The account of the siege of Ath offered Vauban's disciples "the opportunity to illustrate a fundamental tenet of military engineering, the desire to constantly improve the efficiency of siegecraft."[79] And one of the best ways to study Vauban's methods was to study his words.

Written after his formal retirement from military service, for the rising generation of French military engineers, *A Manual of Siegecraft and Fortification* represents the culmination of Vauban's military accomplishments. Written almost a decade after the siege of Ath, he states, that by employing his method, "you will spare three fourths of the people you are accustomed to lose in such an enterprise; you will avoid much useless

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[77] E. M. Lloyd, *Vauban, Montalembert, Carnot: Engineer Studies*, (London: Chapman and Hall, 1887), 61.
[78] Jamel Ostwald, *Vauban Under Siege: Engineering Efficiency and Martial Vigor in the War of Spanish Succession*, (Boston: Brill, 2007), 46.
[79] Ibid.

expense; you will make all your efforts with greater assurance of success; you will advance just as rapidly as if you went at it precipitately; and, finally, you cannot help but succeed, whereas at present we usually fail."[80] While much ink has been spilled by historians and biographers concerning Vauban's life and the fortifications he designed and built along the frontiers of France, *A Manual of Siegecraft and Fortification* contains nothing in regards to his fortifications, and precious little in the way of describing how to conduct a defense. The majority of the text, instead, attempts to codify the most efficient way to force a fortified position to surrender. So, while Vauban is primarily known as being a military architect (twelve of his fortifications have been designated UNESCO World Heritage sites), he should be remembered, not only for being a superbly talented engineer, but as a masterful practitioner of the art of war. [81] This assertion reinforces the claims of Vauban's biographers, who identify his most important contribution to the art of siegecraft as being "his systematization of the siege attack", and they declare him "responsible for another radical shift from defensive dominance to offensive supremacy"[82]

Vauban begins by instructing his reader that "the first fault in the conduct of sieges is the violation of secrecy."[83] Foreshadowing the "loose lips sink ships" motto from the Second World War, he says, "nothing is more important than secrecy; but also nothing is more difficult to achieve because of the nature of the men to whom a general is forced to communicate his plans in order to have their advice and the necessary

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[80] Sebastien Le Prestre de Vauban, *A Manual of Siegecraft and Fortification,* (Ann Arbor: The University of Michigan Press, 1968), 93.
[81] http://whc.unesco.org/en/list/1283.
[82] Ostwald, *Vauban Under Siege*, 9.
[83] Vauban, *Manual of Siegecraft and Fortification*, 22.

material."[84] He exhorts his reader to "plant false rumors to the effect that a siege of some other place is intended, in order to occupy the gossips who infest every army and whose guesses are sometimes more accurate than you might wish."[85]

Once the decision to attack a particular place has been made, Vauban implores his reader to "personally make a full circuit of the invested position, reconnoitering the surrounding countryside and especially the directions from which a relieving force is most to be feared, posting strong guards in those quarters."[86] According to Louis Goulon, who provides the best known description of the siege of Ath, on the 18th of May, 1697, "the Marshals Villeroy and Catinat, with Monsieur de Vauban and other general Officers went and reconnoitered the Ground on the side of the Abbey of Cambron."[87]

Befitting a work intended to be read by military engineers, Vauban continues by saying that a chief engineer should, "acquaint himself with positions which might give him some advantage, for he must try to profit as much as possible from the terrain … to do this well they should have an accurate map of the position, on which they should mark any changes that seem to have been made since it was drawn."[88] He concludes by stating, "if you want your map to be the best possible, it is a good idea to take along someone from the area who can give you the names of the chief landmarks that you will see."[89] Vauban designed the fortifications around Ath, overseeing their construction from 1668 to 1674, giving him an intimate knowledge of the defenses.

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[84] Ibid, 23.
[85] Ibid.
[86] Ibid, 24.
[87] John Heath, *Memoirs of Monsieur Goulon. Being a Treatise on the Attack and Defense of a Place. To Which is Added a Journal of the Siege of Ath, in the Year 1697, Under the Conduct of Monsieur de Vauban,* (London: C. Bathurst and A. Millan), 95.
[88] Vauban, *Manual of Siegecraft and Fortification,* 25.
[89] Ibid, 27.

Once the terrain has been scouted and the besiegers have taken up their positions, Vauban describes the next three things the besiegers need do. First, they must "wrest every possible advantage from the terrain, leaving the enemy only those positions from which he cannot be dislodged."[90] Next, they "must not allow the inner side of the camp to lie within cannon range of the fortress" which could lead to undue casualties among the besiegers.[91] But at the same time Vauban states, the besiegers "must take care not to move the camp too far away lest he occupy more ground than is necessary and find himself inconvenienced by over-extended lines."[92] This is done to "shut the enemy up as closely as possible in the fortress so that they cannot pass beyond their outer fortifications, if he has not already been so bottled up during the investment."[93]

"Bottling up" the enemy is advantageous for several reasons. First, it denies them "forage or the wood found around the fortress."[94] It will be much more difficult for them to receive aid. Plus, it will make it much more difficult for "spies or individuals who slip past the camp to get into the fortress, and by the same token more difficult for those on the inside to get out."[95] This will allow the besieging engineers the opportunity to perform their own reconnaissance in relative safety.

Vauban states that any besieged position "should be reconnoitered from time to time and studied as closely as possible."[96] And while he encourages the commanding general and his staff to participate, he is emphatic that it is "the engineers who should

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[90] Ibid.
[91] Ibid, 28.
[92] Ibid.
[93] Ibid.
[94] Ibid, 29.
[95] Ibid.
[96] Ibid, 39.

especially study how to demolish both the strong and weak points of the fortress, since this kind of knowledge is their province."[97] The engineers are exhorted to "draw an exact map … They cannot be too meticulous in marking in details and in clearly showing the houses, bridges, screening terrain, hollows, marshes, rivers, streams, and rocks that they observe."[98] This map gives those in charge the information they need in order to put together their plan of attack. Goulon reports that on the 21st of May, "Monsieur de Vauban, who had his Plan of Attack ready formed, and had very frequently before reconnoitered the Ground, went thither again with Monsieur de Catinat, and a few Ingineers, who advanced pretty near the Place, under favor of the dark of the evening."[99]

Vauban writes that while the general gives orders, the engineers need to "show him alternative plans of the works, explaining the strengths and weaknesses of each and offering estimates of the construction time needed in each case."[100] Later in his book, Vauban claims four days to invest (surround) the fortress, nine days from the opening of the first trench to the beginning of the attack on the covered way (the small step behind the glacis that proves a firing position for the defenders in front of the ditch which protects the fortress), four days to capture the covered way, and on and on until the besieged are forced to capitulate.[101] Only after a plan of attack has been agreed upon, can the engineers begin construction of the siege lines.

These lines comprise several parts. Between the line and the besiegers is a ditch.

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[97] Ibid.
[98] Ibid, 39-40.
[99] Goulon, *Memoirs of Monsieur Goulon,* 96.
[100] Vauban, *Manual of Siegecraft and Fortification,* 30.
[101] Vauban estimates that, following his method, a typical siege should last no longer than forty-three days. But if the enemy had done all their homework, and the defenders were zealous in their actions, then it could take an additional twenty-eight days. The siege of Ath lasted twenty-one days from investment to surrender.

Behind the ditch is a parapet, or low wall, from which musketeers can receive some cover. This is backed by a palisade, or fence, constructed of sharpened sticks. To this are added strong points, or *redans* which are "V-shaped protrusions of the line with the point of the V extending in the direction from which attack is expected",[102] which include the all-important artillery batteries. Vauban states that "the artillery of the army is normally placed in the redans. The guns should be able to lay a flanking fire along the length of the line and should be placed on raised platforms so that they may fire across the parapet without the need of embrasures."[103] These are not the heavy siege guns that are used to knock holes in the enemies' walls, (those will be organized into batteries at various places along the lines) but smaller field artillery used in the event of a sortie by the besieged. Once these first lines are completed, the engineers begin opening the first of three parallel trenches. As the name suggests, these trenches run parallel to the besieged fortification, allowing the attackers to move in relative safety, unobserved by the besieged.

Vauban warns that after everything has been prepared for beginning these trenches "you must exert every effort to be certain that the enemy does not suspect your intention."[104] To accomplish this, he recommends opening the trenches at night because "daylight is extremely favorable to those defending the lines, while darkness aids the attackers."[105] At Ath, the trenches "were opened accordingly at Seven in the evening in two Places on the side of the Gate of Brussels, a shower of Rain falling very opportunely,

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[102] Ibid, 152. Vauban includes in *A Manual of Siegecraft and Fortification* a handy glossary of terms used in siegecraft, and attack for the uninitiated in the vocabulary of fortifications and siege warfare.
[103] Ibid, 34.
[104] Ibid, 43.
[105] Ibid, 34.

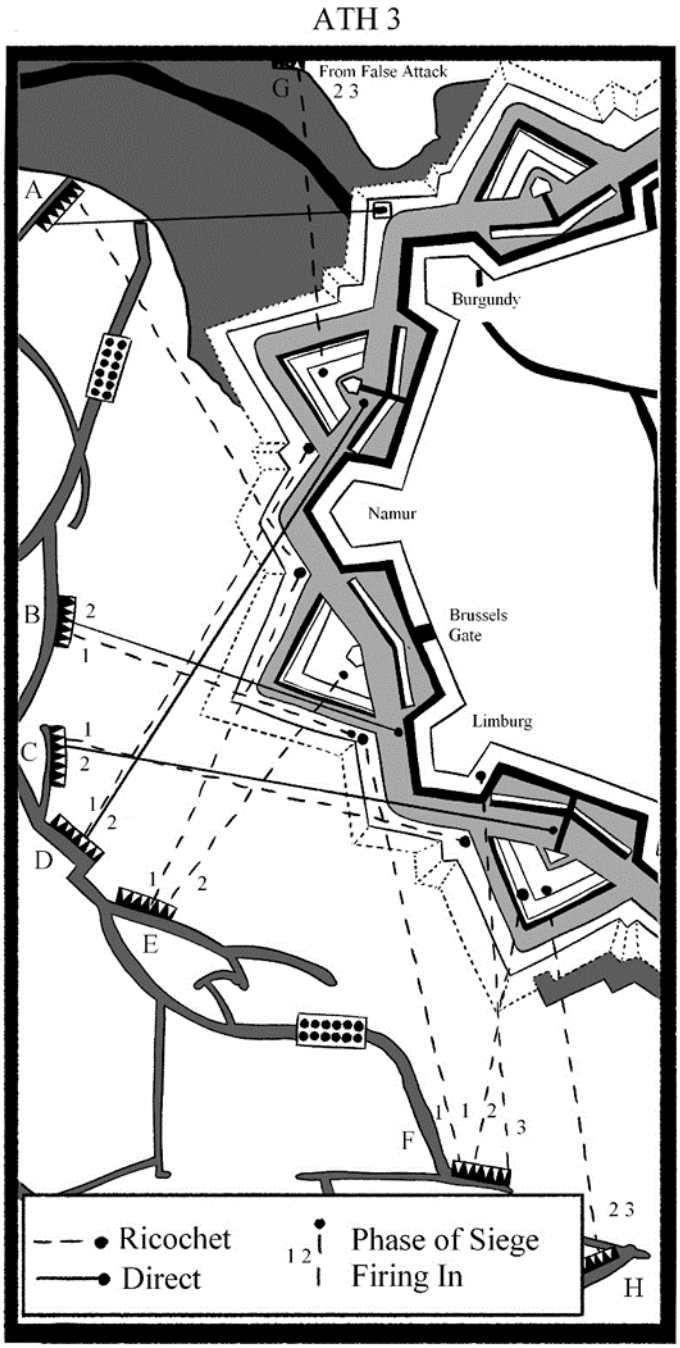

Figure 2 The final stage of the 1697 siege of Ath – Illustration by Lillian Green

which made the night very dark."[106] In order to make it more difficult for this work to be discovered, the engineers were to warn the workmen "to be silent, to lie down on their fascines, not to start working until they are so ordered."[107] Additionally, "the chief engineer should be present … and must revisit it after an hour to make certain that everyone is doing his duty and that the plans are well executed. Each night he must do more or less the same thing, for it is his responsibility to place the workmen in position – or at least the first ones."[108] Goulon reports that Vauban "visited the Trenches constantly twice every morning to inspect and examine the Work of the night before, in order to see what was further to be done."[109]

With the first parallel trench opened, the engineers begin to snake their way towards the fortifications, using saps. Vauban describes saps as "a sort of sunken path or trench by means of which one advances towards the enemy works."[110] This forward movement allow the besiegers to bring forward men and material in relative safety. Christopher Duffy states that at Ath, Vauban opened the first trench "at a distance of 650-700 paces from the covered way on the eastern side of Ath. This was followed on the night of the 24-25th by the digging of the second parallel, three hundred paces from the fortress."[111] Before Vauban, heavy artillery batteries were routinely placed in the first parallel. But Vauban, "being of the opinion that Batteries at so great a distance only serve to imbolden the Enemy, and burn Powder to no purpose", set up his first artillery battery

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[106] Goulon, *Memoirs of Monsieur Goulon,* 96.
[107] Vauban, *Manual of Siegecraft and Fortification,* 47. A fascine is a tightly bound bundle of sticks,
[108] Ibid, 48.
[109] Goulon, *Memoirs of Monsieur Goulon,* 100-101.
[110] Vauban, *Manual of Siegecraft and Fortification,* 155.
[111] Christopher Duffy, *The Fortress in the Age of Vauban and Frederick the Great, 1660-1789,* (London: Routledge and Kegan Paul, 1985), 30.

in the closer second parallel.[112]

It is important to note, that these batteries were not used primarily for the purpose of knocking the walls down. Instead, they were expected to disable the defenders' artillery. To facilitate this, Vauban proposed a new way of handling the artillery. Goulon reports that "it was not without difficulty, that Monsieur de Vauban prevailed upon the Officers of the Train to lower the Charges of their Great Guns to batter a *ricochet* with small Charges, the effects of which did not presently appear to them."[113] According to Duffy, "in order to deliver this kind of fire the gun barrels were elevated by anything from three to fifteen degrees, and the powder charges were varied by an ounce at a time until the gunners arrived at the weight which caused the shots to graze over the top of the fortress parapets and bound along the length of the terrepleins behind."[114] Goulon states that "it is necessary to observe, that these Ricochett Batteries must always be placed on the right or left of the Attacks, in order to infilade and fire upon the reverse of the Cover'd Ways, and other Works."[115] Jamel Ostwald, describing the siege of Ath claims that, "the results of Vauban's ricochet fire was evident when they captured the town's covered way on the night of the 29th. … Less than two days of ricochet fire from thirty-six cannon had forced the defending soldiers to abandon it entirely."[116] Goulon notes, "We found, after the place was taken, that the greatest part of the wounded had their Legs and Arms carried away upon the Rampart by the effects of these Batteries, the bullets

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[112] Goulon, *Memoirs of Monsieur Goulon,* 102.
[113] Ibid, 104.
[114] Christopher Duffy, *Fire and Stone: The Science of Fortress Warfare, 1660-1860,* (London: Castle Books, 1975), 117. Terrepleins are the leveled platform on which a fortress' artillery is mounted.
[115] Goulon, *Memoirs of Monsieur Goulon,* 107.
[116] Ostwald, *Vauban Under Siege*, 32.

giving the Enemy incessant disquiet on all sides, following 'em even into their safe Retreats, dismounting their Guns, by breaking the Wheels and Cheeks of the Carriages."[117] While these new ricochet batteries, by themselves, have the potential to cause terrible casualties among the defenders, they did not guarantee an easy conclusion to the siege. More would be needed to force the besieged to surrender.

Once the enemy guns are either knocked out of action, or greatly reduced in number, the besiegers are free to push forward another set of saps, and begin work on the third and final parallel, which Vauban calls the "forward assembly area."[118] He laments, "of all the obstacles that the necessity of defense has invented to resist the besieger's attack, I know of nothing more difficult to surmount than the outer edge of the ditch – the counterscarp. Whether you take it at the first attempt or not, the effort is certain to entail heavy losses – especially if you fail, which happens all too often."[119] He continues, by stating that, "this loss is always a result of excessive haste; we do not take half the precautions demanded by such an enterprise, and consequently instead of gaining a day we lose two – at the cost of our best troops who perish miserably on such occasions."[120] This is in part because the counterscarp is completely exposed to fire from the main rampart of the fortification, cannons located in embrasures in the escarpment, as well as any of the other outer works which have not yet been cleared. In order to undertake a successful assault, he recommends "two lieutenants, each with four sergeants, six grenadiers, and thirty riflemen, to go after the two faces of the angle. I do not send squads

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[117] Goulon, *Memoirs of Monsieur Goulon*, 107.
[118] Vauban, *Manual of Siegecraft and Fortification*, 65.
[119] Ibid. The counterscarp is the outer wall of the ditch between the outerworks of a fortification and the main redoubt, with the escarpment, or scarp, being the inner wall of the ditch.
[120] Ibid.

under sergeants ahead of them, for being small parties they can be cut up terribly by the least accident; and this only terrifies their comrades who are often frightened enough already by the imminence of danger."[121] The first detachments should number at least fifty men, with each subsequent detachment containing two hundred men and "as many grenadiers as possible."[122] Before going in, Vauban recommends that all the batteries "begin the bombardment of the counterscarp five or six hours before the assault to occupy the defense and break down the palisades here and there, leaving gaps. If you have been careful to position the batteries well, they will not fail to cause great disorder, and if you have any explosive shell use it upon the areas of the glacis where you intend to make your assault."[123] But, more important than everything else is "a brave example is most necessary to keep courage high, for ordinarily the enemy resists vigorously and willingly takes advantage of any hesitation or confusion to return to the counterscarp."[124]

Goulon reports that on the night of the 1-2nd of June, "the Cannon Batteries being now establish'd before the Faces of the Bastions, they began to batter in Breach. There were Six twenty-four Pounders before each Bastion, and four more at each Return of the Parapet of the Cover'd Way, which were opposite to the Flanks of those Faces, and began to batter them."[125] These cannon, placed in batteries very close to the fortification were used very differently than the ricochet batteries. He states, "as the business was now to fire with full Charges, and strait before 'em, the Gunners were in the Center, only they were ordered to cut the Wall in a direct Line about six Feet above the surface of the

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[121] Ibid, 73.
[122] Ibid.
[123] Ibid, 74.
[124] Ibid.
[125] Goulon, *Memoirs of Monsieur Goulon*, 131.

Water, all the Points of which Line, being struck together at the same time, soon produced the desired effect."[126] This repeated firing will eventually cause a breach. And causing a breach is the penultimate aim of the siege. Goulon continues, saying "Our Guns continuing to fire the evening and night following, and all the day afterwards, the Breaches were made to satisfaction."[127]

Vauban writes that, "after a breach has been enlarged and made accessible, you can attempt to establish a foothold upon the bastion … From there you can slip along the edges of the right and left faces until you are in a position where you can force the abandonment of any retrenchments – which does not take long."[128] With any retrenchments cleared, he states, "you should mount your cannon and attempt to secure all possible advantages of fire power against the defenses … This is the time to make the strongest efforts, to pound the defenses, to break down the palisades, and attack the enemy vigorously, unless he forestalls his loss by surrendering the fortress, which is still in position to make an honorable capitulation."[129]

Goulon reports that at two in the afternoon, on the 5th of June, twenty companies of grenadiers prepared to attack the breech "confidently assured he should carry the Place by Assault. When they got to the Foot of the Breach, a Cry was heard amongst our Men, That the Enemy were coming out upon the Breach … Whilst this was doing, a poor frightened Drummer was beating the Chamade very softly in the Center of the Bastion,

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[126] Ibid.
[127] Ibid, 135.
[128] Vauban, *Manual of Siegecraft and Fortification*, 90. A retrenchment is an improvised position, usually behind a breach, to which the besieged retire when they are forced to abandon other positions.
[129] Ibid, 91.

not daring to venture upon the Rampart."[130] And with that the siege of Ath was over, "one of the strongest places in Europe, was taken without farther Loss than about fifty private Men … and about one hundred and fifty more wounded."[131] Goulon continues, stating that "No Siege was ever carry'd on with so little Loss or Expense."[132] As if to push home Goulon's point, Ostwald describes the siege of Ath as "the epitome of Louisquatorzian siegecraft."[133] And while this is a beautiful turn of phrase (and quite a mouthful), it does not convey the beauty (if one can attest beauty to death and destruction) of Vauban's siege method. Vauban, as if describing his seizure of Ath, states, that "There is no fortress to which this method is not applicable."[134] His record would be would prove him correct, as he conducted more than forty successful sieges during his career, only being rebuffed twice, and both of those times only because he was ordered to withdraw before the siege could be successfully concluded.

Were Vauban's methods always followed? No. But as E. M. Lloyd said, "the principles which Vauban was the first to grasp, and which his rules embodied, remain as applicable as ever."[135] These methods included: maintaining secrecy as to the intended target, personally reconnoitering the target to insure the more correct information, attempting to gain all advantages provided by the terrain, closing the enemy off from any reinforcements, prosecuting the siege in an orderly manner, and most importantly knowing that haste wakes waste. And when these methods were followed success was

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[130] Goulon, *Memoirs of Monsieur Goulon*, 140. The *chamade* is a signal made on the drums, signifying the desire to parley, usually to offer terms of surrender.
[131] Ibid, 143. Goulon mentions two of the dead, by name, the Sieur Courtin and Sieur de Fresne.
[132] Ibid, 144.
[133] Ostwald, *Vauban Under Siege*, 21.
[134] Vauban, *Manual of Siegecraft and Fortification*, 93.
[135] Lloyd, *Vauban, Montalembert, Carnot,* 61.

almost always assured. Among those who were France's principle antagonists in Europe at the time, the Dutch and English, the example of Menno van Coehoorn, who advocated for a furious bombardment followed by an equally furious assault, trying to take positions by storm regardless of the cost in human lives, was the vogue.

But European warfare was never ending. Once the Dutch had been humbled by the combined might of France and England, the English, ruled by a Dutch prince, William of Orange, would later, under the German Georgian kings, serve as a foil to France during the rest of the eighteenth century. In 1754, this struggle would expand beyond Europe, to the forests and islands of North America, where the fate of that continent would hang in the balance.[136]

[136] Why examine the Seven Years War in North America? Because it is the last major conflict of the Early Modern Period, because it is the only conflict between European powers in North America, and because it is a relatively under-represented in the literature, with most military historians wanting to either discuss the American Revolution or focus solely on warfare in Europe.

CHAPTER FOUR: ULTIMA RATIO REGNUM

In 1754, Virginia militia, under the command of a young George Washington, accompanied by a contingent of Mingo Indians, ambushed, killed, and captured a group of French-Canadian militia along the banks of the Monongahela River. This action, and Washington's subsequent capture, helped to spark a worldwide conflict that would change the balance of power in Europe, strengthen Britain's influence in India and North America, and subsequently lead to political revolution, in the Americas and France. And by all accounts, the fighting in North America was not revolutionary. While certain aspects of the art of war as practiced by Native Americans were present, the majority of fighting took place between Europeans, fighting in the European style. This is important to illustrate whether, fifty years after his death, Vauban's military revolution had been implemented, and if this implementation was ultimately effective. To do this, the sieges of Fort William Henry (1757), Fort Carillion (1758, 1759), and Fort Niagara (1759) will be examined in much the same way as the Siege of Ath.

The art of the siege as practiced by Vauban can be distilled into six simple steps:

Maintain some Secrecy
Do Some Reconnaissance
Gain All the Advantage of Terrain
Bottle the Enemy: Not too Close, Not too Far
Prosecute the Siege in an Orderly Fashion
Slow and Steady Wins the Race (Haste Makes Waste)

Following the victory over Baron Dieskau and his French forces at the Battle of Lake George (1755), Sir William Johnson, Superintendent of Indian Affairs,

commissioned a fortress be built at the southern end of Lake George, to serve as an advanced base of operations, as well as to guard the southern route to Albany. This fort, named William Henry, was designed and built under the direction of William Eyre, a captain in the Royal Engineers. It was a timber structure, constructed with four bastions, with a glacis and ditch, that could accommodate up to three hundred men, while additional forces maintained a fortified campsite on higher ground five hundred yards to the east.

In March of 1757, a combined French, Canadian, and Native force of over 1,500 men, armed with scaling ladders, attempted to seize the position, unsuccessfully. Louis Antoine de Bougainville, writing in his journal states, "such was the end of this expedition; they burned the enemy's three hundred bateaux, four vessels, two storehouses, and left one other to which they believed too exposed to burn … One must hope that this loss will delay the operations of the enemy."[137] In August of that same year, Louis-Joseph de Montcalm-Gozon, marquis de Montcalm de Saint-Véran, gathered more than 8,000 men at nearby Fort Carillion, in order succeed where the previous expedition had failed.

A word about Montcalm. Before being tasked by king Louis XV with defending New France, he fought with distinction in the Wars of Polish and Austrian Successions. During the War of Polish Succession, he served at the sieges of Kehl and Phillipsburg under Claude-François Bidal, marquis d'Asfeld. D'Asfeld was a disciple of Vauban's who would later be marshal of France and head of the Department of Fortifications, chief over the entirety of the French engineering corps. It can be assumed that any knowledge

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[137] Ibid, 97.

gained during these sieges would have been infused with the example of Vauban. It is therefore very likely Montcalm would have had access to Vauban's texts, and he would have had ample time to study these during these sieges.[138]

As per Vauban's recommendations, Montcalm reconnoitered the area around Fort William Henry. While Vauban recommended that a commander "should detach a large body of cavalry with all the mounted infantry in his army" to blockade a fortress.[139] However, cavalry was of limited use in the densely forested, and mountainous terrain of the North American frontier of the mid-eighteenth century. But Montcalm had a contingent of 1799 Native Americans from various nations, of whom Bougainville states, "it is necessary to inform them of all the plans, to consult with them, and often to follow what they propose. In the midst of the woods of America one can no more do without them than without cavalry in open country." In addition, as both Fort Carillion, and Fort William Henry lay near to large, navigable lakes, experience directed using those lakes as means of transporting men and materiel more quickly and more easily than trying to cover the same distance on foot through dense, forested, mountainous terrain. And while this would tend to lessen the element of surprise, the strategic targets offered to each side were rather obvious.

On the third day of August, Montcalm surrounded Fort William Henry, and the adjacent fortified camp. Bougainville writes, "the Chevalier de Lévis arrived and took a position on the road from Lydius … the body of the army formed the rest of the

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[138] Information about Montcalm during this time is limited as he was a relatively minor player. His remaining letters and journals are from his time in Canada. Most of that correspondence is either addressed to his wife and family or to François-Gaston de Lévis, Duc de Lévis, Montcalm's second-in-command in Canada.

[139] Vauban, *Manual of Siegecraft and Fortification,* 23.

investment … the position the advance guard held, although the best possible for cutting

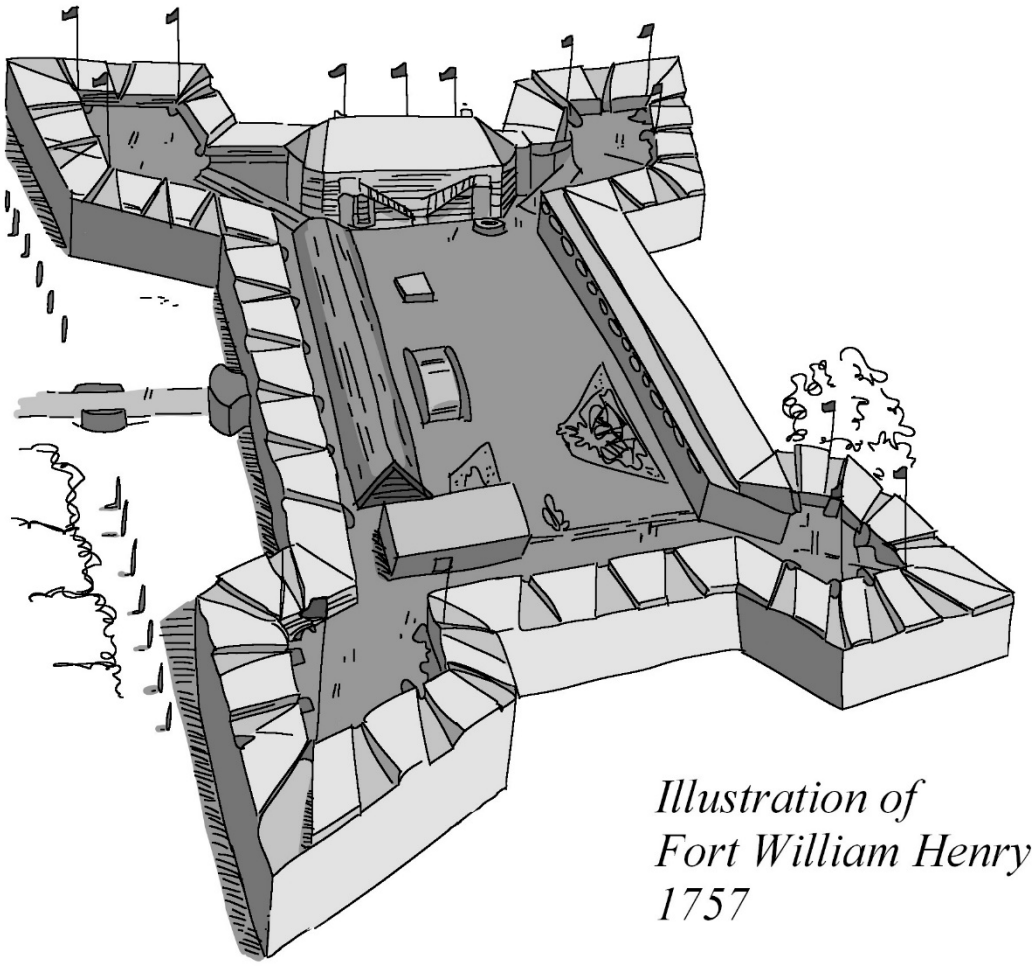

Figure 3 Illustration by Lillian Green

off communications, was not a battle position and was too far away from the siege, the provisions, and other supplies."[140]

At three in the afternoon that first day, Montcalm exhibited one of Vauban's

[140] Ibid, 158-159. Fort George is what the French called Fort William Henry.

revolutionary ideas: he "notified the commander of the fort that humanity obliged him to warn him that once our batteries were in place and the cannon fired, perhaps there would not be time, nor would it be in our power to restrain the cruelties of a mob of Indians of so many different nations."[141] The desire to spare the lives of his own men being a hallmark of Vauban's revolutionary thinking, thus Montcalm can be credited with trying to spare the lives of his men, by employing "the Art of Fighting without Fighting."[142]

The next day Montcalm, "having decided to open the trenches this same night, went with the engineers and the artillery officers to reconnoiter the area where the attack was to be made and to look for battery positions."[143] This action fulfills Vauban's second step, which is to make reconnaissance. At the same time, Montcalm attempted to "bottle the enemy" ordering a large part of the army, including all of his Native American warriors, to "cover the right side of the army, to send scouts on the road to Lydius, to watch the enemy on this side, and to make them believe, by continuous movements in this area, that we occupied all this line of communication, for it was quite impossible to invest the whole place."[144]

Once this was accomplished, it was time for Montcalm and his subordinates to make their plan of attack. Bougainville states, "it was decided to make the attack from the north and to emplace two batteries, one to work directly against the north bastion, and the other to cross its fire onto the same front, both at the same time to deliver ricochet fire on

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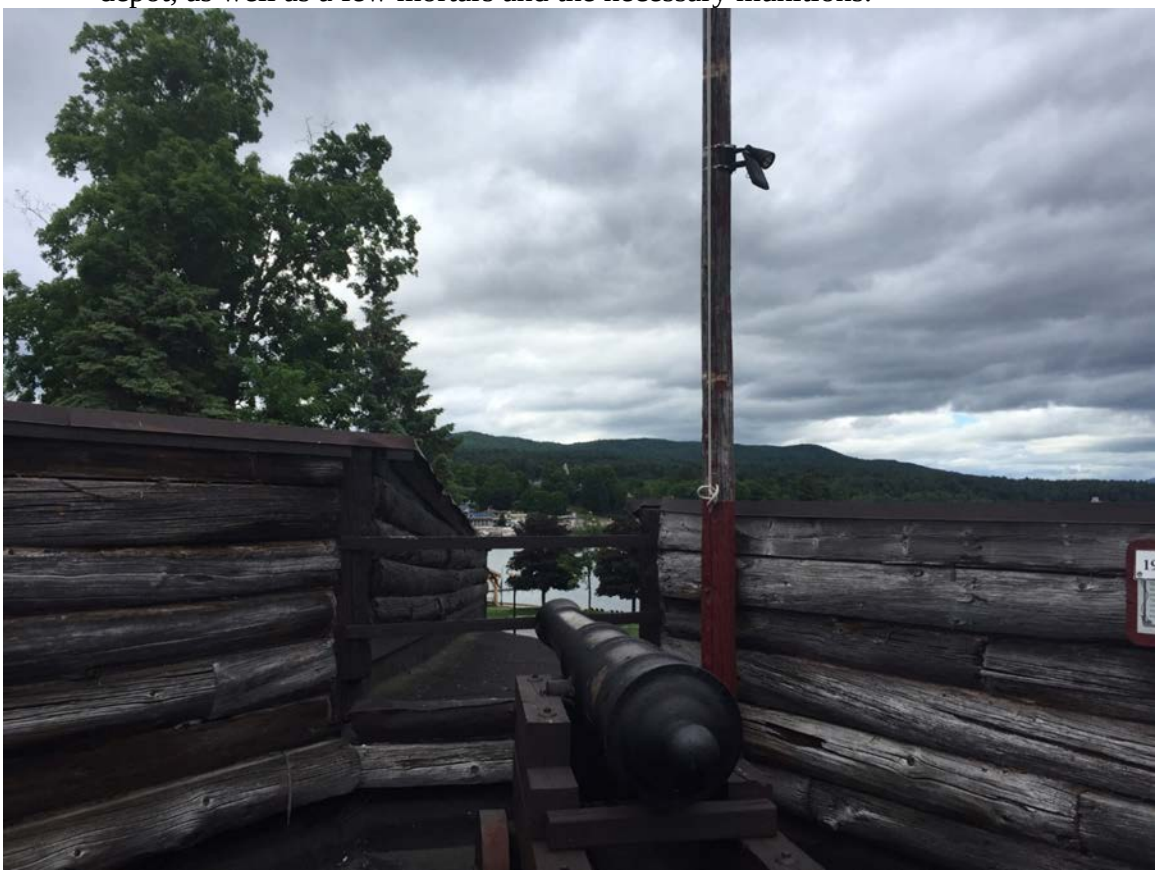
[141] Ibid, 159.
[142] While this idea was first put forth by the Chinese philosopher Sun Tzu in his treatise "The Art of War" it was more recently employed by Michael Allin in his film *Enter the Dragon.*
[143] Ibid, 160-161.
[144] Ibid, 160.

the defenses."[145] This decision to use "ricochet fire" shows another of Vauban's legacies was still in use fifty years after his death.

Bougainville writes, concerning the next step in Vauban's siege method:

> This afternoon a large number of workers have been employed in … opening the trench at 350 toises from the fort, and at starting a parallel, the two protected batteries, and the communication of this parallel with the batteries. *They took full advantage of the terrain* and overcame the difficulties that the fallen trees and stumps which covered it presented. The work advanced well, and by day break was under cover everywhere except at the right battery ... They also got twelve cannons ashore at the depot, as well as a few mortars and the necessary munitions.[146]



Picture 3 North Bastion of the recreation of Fort William Henry – Photo by the author

[145] Ibid, 161.
[146] Ibid, 162. Emphasis added. The building in the center of the picture is the approximate location of Montcalm's camp. The picture was taken from the top of the "north bastion" which suffered the heaviest damage from Montcalm's artillery.

With the trenches opened, Bougainville notes that the besieged garrison was "two thousand men and consequently strong enough to make sorties."[147] To make it more difficult for those sorties, and since the woods around the fort were thick, Bougainville states that, "we camped close enough to the trenches to be able to support them. However, since the troops in this position were much bothered by the enemy's fire, and some were killed in their tents by cannon balls and bombs, the Marquis de Montcalm had the camp … pulled back."[148] And while Vauban claims that "using many workmen" to dig trenches "could make a considerable advance the first night with few losses", he never states how many "many" is.[149] Bougainville writes in his journal that, "a thousand workers employed this night in the trenches finished the left battery, hauled the guns there, finished the communication trench to the right battery and very much advanced the work on this battery."[150]

With open trenches, and the initial batteries in place, Montcalm had the elements in place to "prosecute the siege in an orderly fashion." Bougainville begins his journal entries for the 6th and 7th of August by describing how the two batteries, which consisted of twenty cannon, howitzers, and mortars fired "either along or at an angle, on the defenses fronting on the lake … and by ricochet on the entrenched camp."[151] While the

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[147] Ibid.
[148] Ibid.
[149] Vauban, *Manual of Siegecraft,* 43.
[150] Bougainville, *Adventure in the Wilderness,* 165.
[151] Ibid, 166. Bougainville notes the size of most of the artillery involved, with five of the cannons firing 18lb balls, five firing 12lb balls, one 8lb, two 7in howitzers, along with a 9in and 6in mortar. These pieces would have been cast bronze, and therefore very heavy. The weight of artillery will present itself to be an impediment when the British attempt to take Fort Carillion. And this speaks to the importance of waterways in European-style warfare in North America, as well as to the reasons fortresses were located as they were.

artillery fired, “the workers continued the trench started the previous night, which they carried to within about one hundred toises of the fort. They also started at the end of this trench another parallel for a battery and for musket men who will fire at the parapets on the front being attacked.”[152] And for the next two days the French artillery battered the defenders constantly. But before the breaching batteries could be established, or any assault on the fortress could be conducted, a letter was intercepted by the French from General Daniel Webb to Colonel George Munro, informing the commander of Fort William Henry, that he would be unable to relieve him and to “obtain the best terms he could.”[153] On the morning of August 9th, “the fort raised the white flag and asked to capitulate.”[154]

The ease with which Montcalm captured Fort William Henry, a position which was “certainly not impregnable, but neither was it to be easily brushed aside” demonstrates the power of Vauban’s siege technique.[155] And while it can be argued that the defenders of William Henry were hampered by old artillery, almost all of which ruptured from over use during the siege, and they were at a numerical disadvantage, the French outnumbering them three to one, the only thing that could have saved Fort William Henry was intervention. But here too, this argument is ineffectual, as the forces available to Webb were numerically inferior to Montcalm, and had his relief of the fort failed, then the road to Albany, and victory in New York, would have been assured. Thus, this action at Fort William Henry exemplifies the Early Modern Military Revolution. It

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[152] Ibid, 167.
[153] Ibid, 163.
[154] Ibid, 169.
[155] Walter R. Borneman, *The French and Indian War: Deciding the Fate of North America*, (New York: HarperCollins Publishers, 2006), 91.

shows the dominance of gunpowder artillery, the durability of *trace italianne* fortifications (even when they are built of lumber and earth), and the effectiveness of siegecraft as practiced by Vauban and his scions.

Having shown that maintaining secrecy as to the intended target, personally reconnoitering the target, using the terrain to the best advantage, closing the enemy off from any reinforcements, prosecuting the siege in an orderly manner, and most importantly taking ones time to gain a more harmonious outcome successfully caused North America fortifications to be taken, it is necessary to demonstrate what could happen when they were not. As the campaign season of 1758 began, the English set out to take the key to Lake Champlain and the water route north: Fort Carillon, a place the Mohawk people called Ticonderoga.

When Montcalm approached Fort William Henry along Lake George, he used his Native American auxiliaries to feign an attack on Fort Edward and Albany. The British commander in 1758, Major General James Abercromby, had no force capable of misleading the French as to his ultimate goal. Montcalm conducted his reconnaissance of Fort William Henry in person, but Abercromby entrusted the scouting of his objective to Major Roberts Rogers, the leader of Rogers' Rangers, a famous band of woodsmen who had spent the previous winter fighting the French in the mountains between Fort Carillion and Fort Saint Frédéric. And while Rogers might have had well-deserved reputation as a frontiersman and warrior, he was not an engineer.

On the morning of July 5th, Abercromby and approximately fifteen thousand British regulars and colonial militia boarded boats and began the arduous pull up Lake George. In the vanguard were Rogers, Abercromby's deputy commander, brigadier

general George Augustus, viscount Howe, and the 80th Regiment of Light-Armed Foot, commanded by lieutenant colonel Thomas Gage, who would later serve as the military governor of Massachusetts, his actions there starting the American Revolution. The French were able to observe the movements of the British unopposed along the lakeshore.

Up to this point, Abercromby had failed to follow any of Vauban's admonitions, and this would ultimately lead to a crushing defeat. Firstly, he failed to keep his target a secret. As early as March 24th, Bougainville, who spent the winter in Montreal, noted in his journal that the British were concentrating forces in Albany, and that these forces could only be directed towards Fort Carillion. Second, he failed to conduct a personal reconnaissance, Abercromby had his subordinates do it. Third, and in this instance most importantly, he failed to make the best use of the terrain. Walter Borneman suggests that Abercromby's deputy, Lord Howe "should have ordered the entire army to follow Rogers along the route he had previously reconnoitered and close with Fort Carillion as quickly as possible."[156] But instead of bringing the entire army, Howe advanced with the 80th and some of Rogers' Rangers, blundering into a French advanced force. In the ensuing firefight, the French were driven off, but at the cost of Lord Howe and any element of surprise. Bougainville noted, "His death stopped the advance. The disheartened English gave us twenty-four hours' delay, and this precious time was the saving of us and of the colony."[157]

The next day saw the French construct a fortified position, "made of tree trunks, lying one on top of the other, and having in front overturned trees whose cut and

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[156] Ibid, 131.
[157] Bougainville, *Adventure in the Wilderness,* 229.

sharpened branches gave the effect of *chevaux-de-frise.*"[158] Nursing a wound back at Lake George, William Eyre, the first commandant of Fort William Henry, described the scene to his friend Robert Napier:

> But I fancy'd you might Ask how it came about that I was not employ'd or conselted before the Attack of the intrenchmt was made, as you know I have been Generally in time of Service employ'd in that Branch of the Service, however the Attack was made, I am Sorry to Say not in the most Regular Manner … Unhappy for us we presently found it a most Formidable Intrenchmt & not to be forc'd by the Method we were Upon. for upwards of one hundred Yards in front of it, Trees were fell down in Such Manner it Broke our Battalions before we got to the Breastwork … I was of opinion we should attack it in Column, each Regt picking one, or two to Support each Other, As we could more easily force Our Way thro' the fell Trees than by making so large A Front, but it was said this would cause confusion: in short, it was said, we must Attack Any Way, and not be losing time in talking or consulting how. Attack we did, but it's hard to describe which way … Great faults are found with the Method of the attack and little knowledge we had of the Strength of the Enemys Works, & the Sudden Retreat to this Ground … I believe we may have lost near Two thousand Men kill'd And Wounded, I fancy about fifteen or Sixteen hundred of them Regulars … I forgot to inform You that we had part of Our Artillery not far from the Rear of the Attack, but no use was made of them either before or after.[159]

Again, Abercromby had failed to heed Vauban. And even if he was ignorant of Vauban's teachings, William Eyre was not. And he makes it clear he was not consulted as to how the attack should be conducted. Bougainville recorded his own impressions of the battle:

> The different attacks, almost all afternoon and almost everywhere, were made with the greatest vigor. … This column, composed of English grenadiers and Scottish Highlanders, returned unceasingly to the attack, without becoming discouraged or broken, and several got themselves killed within fifteen paces of our abatis. … At seven o'clock the enemy

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[158] Ibid, 230. The *chevaux-de-frise* is an anti-infantry obstacle usually made of wood, consisting of a central piece, bisected by sharpened points, giving it the appearance of Xs lined up in a row.
[159] William Eyre to Robert Napier, July 10, 1758, Lake George, in *Military Affairs in North America, 1748-1765: Selected Documents from the Cumberland Papers in Windsor Castle*, ed. Stanley Pargellis, (London: D. Appleton Century Co, 1936), 420-422.

thought only of retreat, covered by the fire of the light troops, which kept up until dark.[160]

Picture 4 Remnants of Montcalm's redoubt – Photo by the author

Each example of Abercromby's failure validates Vauban: "you will spare three fourths of the people you are accustomed to lose in such an enterprise; you will avoid much useless expense; you will make all your efforts with greater assurance of success; you will advance just as rapidly as if you went at it precipitately; and, finally, you cannot help but succeed, whereas at present we usually fail."[161] Abercromby failed to keep his target a secret, relied on the reconnaissance of others, fought the French on the ground of

[160] Ibid, 233-234.
[161] Vauban, *Manual of Siegecraft and Fortification*, 93.

their choosing while failing to make use of all the resources at his disposal, and did so in such apparent haste that he failed to even consult with the one trained officer of engineers on his staff.

However, since Vauban was French, and Abercromby was English, is it possible that he had never heard of these techniques and as such cannot be faulted for failing to follow them? The answer is no. Were he trying to follow van Coehoorn's example, he would have used his artillery, yet Eyre reports that the artillery was not involved. Further proof of the superiority of Vauban's techniques comes from the actions of General Jeffery Amherst a year later when he took Fort Carillion with far less trouble.

Unlike Abercromby, Amherst had conducted a successful siege in Vauban's style, conquering Louisbourg, the Gibraltar of North America, just weeks after the disastrous attack on Fort Carillion. Amherst's victory at Louisbourg typifies how France lost the Seven Years War in North America. Louisbourg was the strongest, most modern fortification in North America. But its location, isolated on Île-Royale (present day Cape Breton Island), made relief and resupply difficult. When a British force, under Lord Loudoun, attacked in 1757, they were unable to land troops, and were driven off by a combination of a strong French naval presence and a hurricane. Later, in response to British maneuvers directed against their sugar-producing colonies in the Caribbean, France removed most of their fleet from Louisbourg, leaving only a token naval force of four "ships of the line" to guard the most strategic harbor in French possession, and subsequently the mouth to the Saint Lawrence river. This allowed the Royal Navy the room to land troops and subsequently cut out and burn the remaining ships, leaving Louisbourg on its own.

Even more disastrous for the French defenders than the loss of their naval support was their lack of provisions. Bougainville, throughout his journal, bemoans the state of the food supply available in New France. Even in cities like Montreal and Quebec there were shortages, and on Île-Royale they were entirely reliant on imports from France to survive. With the Royal Navy blockading the harbor, the defenders of the greatest fortress in North America were doomed, even if Amherst had not employed Vauban's siege techniques. But a silver lining could be found for the French in their defeat. The time the British expended reducing Louisbourg prevented them from launching an attack on Quebec that year, and instead they spent the rest of the campaigning season taking the French settlements in what is today Newfoundland, New Brunswick, and Prince Edward Island.[162]

With the 1759 campaigning season in the planning stage, Amherst put forth a bold plan to Prime Minister William Pitt: simultaneous attacks against Fort Carillion, Fort Niagara, and Quebec. This three-prong approach would help to keep the French off balance, not allowing them to focus on any one target, fulfilling Vauban's first requirement of maintaining secrecy. In March, he sent Rogers with some of his rangers, a detachment of light infantry, and Native auxiliaries to map, not only the defenses of Carillion, but also the surrounding countryside, so when it came time to make his move against the fort, he could use that map to find a suitable place to carry out his own reconnaissance. On the morning of July 23rd, from the top of Rattlesnake Hill (now named Mount Defiance), Amherst enjoyed an unobstructed view into the fortress and set

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[162] The same could be said about the 1757 Loudoun expedition. With the British having set their sights on Louisbourg, it allowed Montcalm to pull forces from Quebec and Montreal, which gave him the forces necessary to take Fort William Henry and defend Fort Carillion.

about dispatching part of his artillery to fire upon the defenses. This fire allowed him the opportunity to simultaneously start his own trenches, thus using the terrain to his advantage, prosecuting the siege in an orderly fashion, while attempting to bottle up the enemy.

Picture 5 Fort Ticonderoga as viewed from Mount Defiance – Photo by the author

Once Amherst's artillery was in place, and the English and colonial forces pushing their trenches up on to the old Carillion battlefield, Brigadier General François-Charles de Bourlamaque found his position untenable. Under the cover of a furious artillery barrage, he retreated north to Fort Saint Frédéric and before leaving, he set charges in Carillion's powder magazine. After the dust settled, Amherst was in possession of the fort. The English had lost five dead, with thirty one wounded, a casualty

count that would have made Vauban proud.

Now that Carillion was in British hands, the French saw their position in Fort Saint Frédéric as untenble. Seperated by thirty miles, Saint Frédéric defended a narrow passage on Lake Champlain, serving a similar function to Carillion. With walls twelve feet thick and up to four stories tall, with cannon embrasures on each floor, it was an imposing position, placed right on the lake shore. This proximity to the lake, while

Picture 6 The remnants of Fort Saint Frédéric – Photo by the author

advantageous to controlling maritime traffic, would prove a hinderance to its defense. The height of its walls, while advantageous for defending against attacks made without the benefit of artillery, became a serious liability and an obvious target for British artillerymen. Even without having to sap and advance, the British would be able to turn

the fortress to rubble in short order. Having seen how efficently Amherst had reduced Carillion, the French decided to abandon Fort Saint Frédéric. And like at Fort Carillion, they set charges in its powder magazine.

Thus, by following Vauban's methods, Amherst captured two fortifications, with minimal casualties on his side. He would build Fort Crown Point on a site adjacent to the ruin of Fort Saint Frédéric before beginning his trek towards Montreal, a move that would end the fighting in North America the next year. But these maneuvers were only one piece of the three-pronged attack designed to crush the forces of France in North America. The next position that needed to fall would be the recently improved Fort Niagara.

Amherst's choice to lead the attack on Fort Niagara was John Prideaux, "colonel of the Fifty-fifth Regiment on the death of Lord Howe and who with this new command assumed the rank of brigadier general in North America."[163] According to Borneman, "he was also discreet. As Prideaux assembled some 3,000 regulars, including the Forty-fourth and Forty-sixth regiments, a battalion of Royal Americans, and a company of Royal Artillery, and led them west up the Mohawk, secrecy was Amherst's sternest charge."[164] Again, Vauban's injunction to maintain uncertintanty amongst the enemy concerning the intended target of an attack would pay dividends for the British, if they could keep their target a secret. In order to achieve this secrecy, Prideaux needed a strong screening force, to keep prying eyes away from his camp, as well as to bolster his force. Enter Sir William Johnson and a thousand warriors from the various nations that made up the Iroquois

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[163] Borneman, *The French and Indian War*, 193.
[164] Ibid.

Confederacy. On July 6th, Prideaux landed forces three miles from the fort, while others made their way overland, effectively circumvallating Fort Niagara, and bottling up the enemy.

As the fortress commands the headland where the Niagara River empties into Lake Ontario, Prideaux sent several barges filled with men to reconnoiter the fort. Captain Pierre Pouchot, the commander of the French garrison at Fort Niagara states in his memoir, "We allowed them to group together and come in close. As soon as we saw they did not wish to come any closer, we fired cannon at them, which made them put back into the lake again."[165] While this occurred, the Engineers were "to attend and regulate the place of breaking ground before the fort."[166] Prideaux can be seen following Vauban's methods to the letter, being methodical in his preparation, and thorough in his execution.

On the 10th, an anonymous French officer, whose journal was among the items siezed after Fort Niagara's fall states that "at 2 o'Clock all our Men were on the Ramparts, and at Day-break we percieved they had opened their Trenches, at the entrance of the Wilderness, at about 300 Toises from the Fort; we made a very hot fire upon them all day."[167] Despite the continuous fire from the French artillery, the British continued to advance their trenches. By noon, on the 11th, "a party of about 15 Men, Soldiers and Militia, went very nigh to the Trenches of the Enemy, and percieved them sally out

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[165] Pierre Pouchot, *Memoirs on the Late War between France and England*, trans. Michael Cardy, ed. Brian Leigh Dunnigan, (Youngstown, New York: Old Fort Niagara Association, 1994), 193.
[166] *The Papers of Sir William Johnson*, Vol. III, ed. James Sullivan, (Albany: University of the State of New York, 1921), 64.
[167] Anonymous, "Journal of the Siege of Niagara, translated from the French" in *Memoirs on the Late War between France and England*, 507.

between 4 and 500, who came towards them at a quick Pace, but they were stop'ed by our Cannon … at 5 0'Clock they began to play two Granadoe Royal Mortars."[168] William Johnson later related to John Stanwix, that "we Carried on our Approaches with little or no loss and opened two Batterys the 11th: one of which did no great Execution by reason of its great distance."[169] This is the only black mark against Prideaux, thus far, this situating of the first battery too distant to be effective. A careful reading of Vauban states that he was "of the opinion that Batteries at so great a distance only serve to imbolden the Enemy, and burn Powder to no purpose".[170]

Had Prideaux not been following Vauban's method, if his planning, and organization had been found wanting, then the disasterous events of the 20th would have put the entire operation in jeopardy. Vauban councelled that, "whatever care you may take to construct your trenches carefully, there is never any place in them where you are completely safe from all hazards. You are incessantly exposed to the ricochet of the balls which most often – only raking the top of the parapet without being stopped – fall into the trench killing and maiming many poor devils."[171] Early in the evening of the 20th, General Prideaux and his aide-de-camp, Colonel John Johnstone, were inspecting the forward trenches when what Vauban warned about occurred. Johnstone was pierced by a French musketball, killing him instantly. Prideaux helped carry the body back to the rear and continued his inspection. Pausing to watch his men fire off one of the mortars, it misfired, the shell exploding prematurely, destroying the piece, taking Prideaux with it.

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[168] Ibid, 507-508.
[169] *The Papers of Sir William Johnson,* Vol. X, ed. Milton W. Hamilton, (Albany: University of the State of New York, 1951), 112.
[170] Goulon, *Memoirs of Monsieur Goulon,* 102.
[171] Vauban, *Manual of Siegecraft and Fortification,* 96.

When word of Prideaux's death reached the fort, the anonymous journaler recorded, "We have Room to hope, that with such Succours we may oblige the Enemy to raise the Siege, with the Loss of Men; and as they take up much Ground, they must be beat, not being able to rally quickly enough."[172] And had Prideaux been more like Abercromby, that might have been the case.

The next morning, Sir William Johnson stated he was "determined to persevere in the same just and vigorous maners, which was carried on by the Deceased General" hoping that the troops would "exert themselves to the utmost and act with the same laudable spirit which they have hitherto shown."[173] With this determination to stay the course, the only way for the French to relieve Niagara would be to drive off the British. To this end, François-Marie Le Marchand de Lignery, the hero of the Monongahela, marched at the head of a relief force and arrived in the environs of Niagara on the 23rd. On the 24th, they met men under the command of Colonel Eyre Massey, who stood behind an abatis reminiscent of that employed by Montcalm at Carillion.

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[172] Anonymous, *Memoirs on the Late War*, 511.
[173] *The Papers of Sir William Johnson,* Vol. III, 77-78.

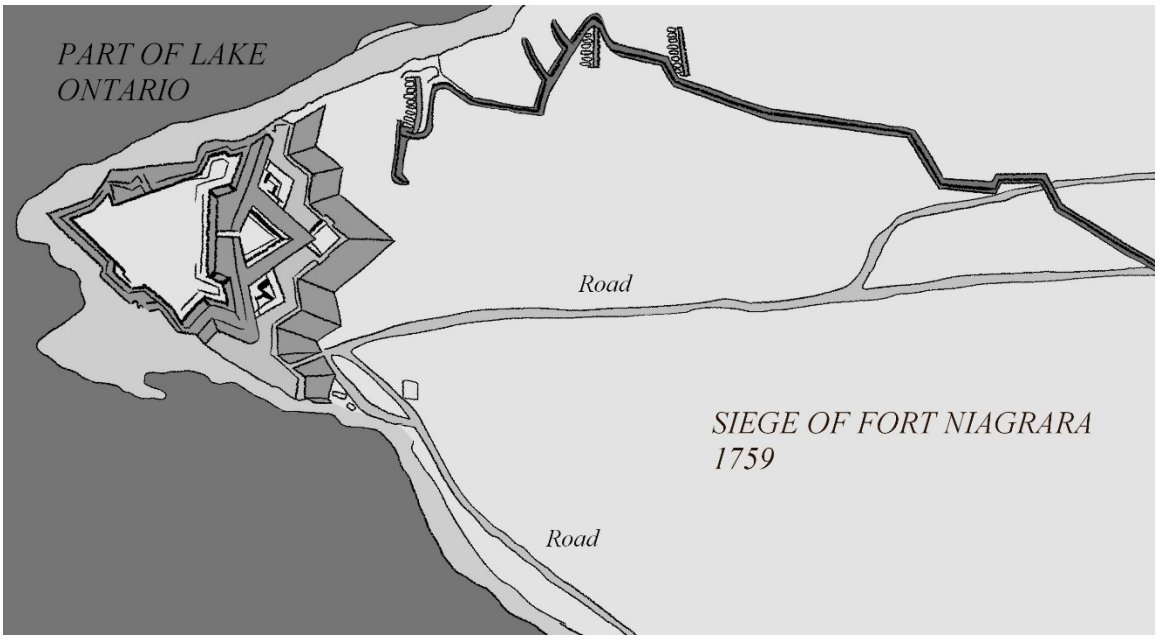

Figure 4 Illustration by Lillian Green

When the smoke cleared, the defeat was total, with only around one hundred of the French surviving to be taken prisioner. Lignery succumbed to his wounds a few days later. Pouchot continued to resist for a bit longer, but after another inspection of the fortress, the precariousness of the defense was evident.

> All these considerations made the officers of the garrison ask M. Pouchot to consent to a capitulation. Up to that point he had said nothing. He begged these gentlemen to consider whether there might be any other course of action. They pointed out to him the exhaustion of the garrison, which had not slept for 19 days & had been continuously under arms or reparing the works. They also claimed that a delay of two or even eight days, even were that possible, could not save the place & could only lead to the pointless loss of even more brave men, more especially as no reinforcements could be hoped for from any quarter.[174]

Pouchot formally surrendered Fort Niagara to Sir William Johnson on the 25th of July, 1759, opening "a vast void in New France from the forks of the Ohio almost to the

[174] Pouchot, *Memoirs on the Late War*, 225.

gates of Montreal."[175] Only Quebec remained defiant, and that defiance would cease after a sixty-eight day bombardement, preceded by a battle on the Plains of Abraham which saw both the Marquis de Montcalm and General Wolfe killed.

While there may be many reasons France lost the war in North America, the fall of New France hinged firmly on the successful implementation of the siege techniques espoused by Vauban. By maintaining operational secrecy, conducting reconnaissance to gain first-hand knowledge of the nature of their targets, utilizing all of the advantages provided by the terrain, denying the besieged enemy reinforcements, maintaining their sieges in an orderly manner, and prudently taking their time, commanders on both sides of the Seven Years War in North America were able to reduce and seize fortified positions. British victories at Louisbourg, Fort Carillion, Fort Saint Frédéric, and Fort Niagara coupled with the French victory at Fort William Henry prove the effectiveness of Vauban's methods. And the inverse is true. Had Abercromby emulated Vauban and used the terrain to his full advantage, like Amherst did, had he placed cannons on Mount Defiance, there would have been no need to conduct the many costly, and ultimatly disasterous frontal attacks against the heavily entrenched French lines. These attacks wasted the lives of his men, bolstered French morale, and ultimately prolonged the war in North America by at least another year, taking even more lives on both sides.

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[175] Borneman, *The French and Indian War*, 203.

CONCLUSION

For all that has been written about Vauban's ingenuity on the offensive, much less has been said about his views on defense. This is, in part, because of how rarely Vauban conducted defensive actions. But it is also, in the words of George A. Rothrock, because "it was in the attack that he showed the scope of his genius and inventiveness."[176] When Vauban was given the opportunity to conduct a siege according to his principles, he was successful. Where does that leave the defenders then? Are they simply doomed to fail, or are there ways and means by which they can successfully defend against Vauban's methods?

The short answer is no, for if Vauban's methods are followed, any fortress will fall, given the strategies, technologies, and army organization of the era. Only twice during his military career did Vauban fail to take the fortification he was tasked with. He states, "you would be wrong to believe that with all the secrets of the art, and all the advantages of nature you could make a place impregnable; they can all be taken by an enemy who combines strength and resolution."[177] But, in knowing that defeat in inevitable, he recognizes that the purpose of a fortified place is to stall the enemy, to keep them there, as compared to them being someplace else. This would require the defenders to continue to fight, retreating behind new defenses each time the attackers advance.

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[176] George A. Rothrock, preface to *A Manual of Siegecraft and Fortification,* by Sebastien Le Prestre de Vauban, (Ann Arbor: The University of Michigan Press, 1968), viii.
[177] Vauban, *Manual of Siegecraft and Fortification,* 131.

Vauban writes that "of all retrenchments the best, in my opinion, is the small bastion built within the bastion under attack. It is that much more advantageous if it forms a second wall, which having more or less the same defenses can be held in the same way."[178] But, according to Vauban, the governor of a fortress, having been, "reduced to abandoning his bastions and retrenchments, he can retire within new positions he has prepared within the fortress itself."[179]

These new positions would require the attackers to, essentially, begin the siege again, but now within the confines of the fortress, forcing them to "advance foot by foot from retrenchment to retrenchment until there is no longer room enough to throw up others against him."[180] This would allow the governor to claim that he had fought as long and as hard as was possible, without being forced to fight to the proverbial "last man." Vauban concludes his discussion of defense by saying that, "after such extremities it is certain that the governor will not be allowed the surrender that could not have been refused him had he been willing to treat earlier; but however he leaves the fortress he will bear all the laurels that may be won."[181] Montcalm's sally at Quebec, that cumulated in the Battle of the Plains of Abraham, was predicated on this idea. With the British in a position to besiege Quebec, and no relief available, Montcalm must have felt that was his only option to stall defeat.[182]

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[178] Ibid, 136.
[179] Ibid, 137.
[180] Ibid.
[181] Ibid.
[182] Much had been written about Montcalm's decision to engage Wolfe outside Quebec. Had he waited for Bougainville to bring his men he would have outnumbered Wolfe two to one, with Bougainville's men being seasoned veterans, while Montcalm's men were mostly untrained militia. Had he not died, it is possible that blame for the loss of Canada would have rested upon his shoulders, instead of on Pierre de Rigaud de Cavagnial, Marquis de Vaudreuil, governor of New France.

This commitment to be frugal with the lives of his men is the most revolutionary aspect of Vauban's military revolution. This is in part due to military tradition. With regards to a military aristocracy, Langins states, "The adjective 'military' would have been a pleonasm during the Middle Ages, when nearly all nobles were soldiers. In an influential book that appeared a few years later, the chevalier d'Arcq argued that the true nobility, and the mainstay of the monarchial state, was the military nobility."[183] But with the advent of the absolutist state came a new interpretation of what it meant to be a noble. Unlike Menno van Coehoorn's family who enjoyed a long and storied military tradition, Vauban's family were elevated to the nobility through a combination of financial contributions to the crown, and governmental service as notaries and clerks.

This "nobility of the robe" would not have had expectations of glory on the battlefield. Instead, their loyalty and expectations would have been to the apparatus of the state, with the protection of the state and its resources being their highest priority. This explains why Vauban was so "miserly with the lives of his soldiers" as everyone, from the common laborer to the most experienced marshal of France, was an irreplaceable resource that should only be expended when no other option was available. This is in stark contrast to military tradition which holds martial glory as more important than casualties. Again, a comparison between Vauban and van Coehoorn is apt. Casualties were of secondary concern to van Coehoorn, as long as the objective was met, whereas Vauban, as has been mentioned, did everything he could to reduce casualties among his men, a paragon of "efficiency".

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[183] Langins, *Conserving the Enightenment,* 176.

But as bayonets replaced pikes, and as sieges have been part of the Western Tradition since Joshua went to Jericho and Agamemnon camped outside of Troy, what, then, is the lasting impact of Vauban's military revolution? Ostwald points out that even before his death in 1707, Vauban's methods, while effective, were not terribly popular among certain circles, especially field commanders such as John Churchill, 1st Duke of Marlborough. While the effectiveness of Vauban's methods are evident, field commanders argued that there was little glory to be won in the plodding, regularity of the siege.

Using the past as their guide, these men praised the battles of Alexander and Hannibal, seeing war of maneuver as being the pinnacle of their art. The military career of Napoleon best exemplifies this. A skilled artillerist before gaining command, Napoleon sought decisive battle. He rarely conducted sieges, except during his campaign against the Ottomans, who refused to meet his armies in the field. During the same period, British commanders in Spain, hampered by the nature of the French occupation, conducted several successful sieges, including taking the city of Badajoz but only after sustaining very heavy casualties in a series of costly frontal assaults.

By examining battles fought during the eighteenth, nineteenth, and even into the very early twentieth centuries, a pattern emerges around the use of the bayonet. During a typical battle, the artillery opened fire at long range as the infantry closes. When optimum distance was reached, the infantry on both sides would engage each other. It was at this point, after the infantry had given and received volleys of musket fire, that one side would see that their opponent was wavering and order their infantry to charge. This motion, the sudden rushing forward of men with gleaming steel intent on murder, would

often be enough to break the enemy line, and the victorious commander would order the cavalry to pursue the defeated. One can assume that the men who died under Abercromby's command, died with bayonets attached to the barrels of their muskets.

This pattern would continue even after technological advances had made the bayonet charge a suicidal proposition. This is in part due to tradition. The bayonet had replaced the pike, and the pike was the favored weapon of Hannibal and Alexander. There is also a psychological aspect to using the bayonet. During the American Civil War, many battles involved at least one bayonet charge, and most of these resulted in terrible casualties on the attacking side with no appreciable gain.

But in the instances where they were successful, they were often the difference between victory and defeat. In 1916, as part of the preparations for an all-out offensive against the German lines along the River Somme, British High Command began a preliminary bombardment on June 24th. At the appointed hour, on July 1st, the British threw themselves at the German lines, bayonets fixed, with all the ferocity their antecedents displayed at Badajoz. And much to the same conclusion. Why? Because there was the possibility, like on the Plains of Abraham, where one volley and a bayonet charge could win the day. And if the battle was a bloody one, all the brighter the laurels for the victor.

According to Jean-Denis G.G. Lepage "Vauban was a man-at-arms who did not like violence."[184] His development of the socket bayonet changed the way armies were fielded on the battlefield. By giving every man with a musket the ability to defend

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[184] Jean-Denis G.G. Lepage, *Vauban and the French Military Under Louis XIV: An Illustrated History of Fortifications and Strategies*, (London: McFarland & Co, 2010), 6.

himself against cavalry, it allowed the entirety of the infantry greater flexibility to perform, while giving commanders a powerful offensive weapon, which became central to offensive tactical thinking well into the twentieth century. And while the invention of high explosives increased the killing power of the artillery, it did not fundamentally change the way in which it was employed. Advances in gun design might have made the "ricochet battery" obsolete, but the principles upon which it operated, are now universally recognized as "counter-battery fire." The French gunners who pounded Fort William Henry would have recognized how the British artillerymen firing on the Somme were trying to crack open the German positions, even though they would not have been familiar with how the artillery operated.

Vauban's siege techniques were designed to limit casualties among the besiegers, which is the most revolutionary aspect of his Military Revolution. This was rare among his contemporaries. Vauban was willing to extend a siege in order not to needlessly expend lives. His chief antagonist, the Dutch maestro Menno van Coehoorn, is noted for having been willing to risk the success of a siege on one massive artillery barrage, followed up by an equally massive infantry attack. These failed as often as they succeeded, often incurring huge numbers of casualties. But when successful, the glory heaped on the victors more than made up for the casualties, at least in the eyes of the commanders involved. And where the Dutch found allies, namely Britian, Prussia, and whoever else was fighting France at the moment, van Coehoorn's bloody, decisive methods found traction.

This "cult of vigor" as described by Ostwald, led commanders to reject sieges in favor of battle in the field, a much bloodier proposition for all involved.[185] He writes, "excessive safety and *industrie* were to be eschewed while speed and action were to take their place: the engineering cult of efficiency was opposed by the generals' cult of vigor."[186] And it will ultimately be the generals who will rule the day. It has been proven that Vauban's system saved lives, and could be counted on to produce victory, but Ostwald states that, "many generals were willing to pay this additional price if they believed it would expedite the siege. Vauban could rail against the inefficiencies and argue that his method saved lives *and* time, but such counterfactuals were impossible to prove to impatient commanders."[187]

While the socket bayonet would continue to be a feature of the battlefield until well into the present day, and variations of Vauban's siege techniques were practiced until the advent of airpower made static fortifications obsolete, his drive to be thrifty with the lives of the men under his command would not last. If bayonets were designed to keep the infantry safe from cavalry, and parallel trenches, ricochet batteries, and a systematic approach to the siege were intended to keep men safe then this means, ultimately, Vauban's revolution failed.[188] If he had hoped that his methods would save lives, he was mistaken. That most famous of French generals, Napoleon, who certainly studied Vauban at the *École Militaire*, squandered his armies time and again, finally

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[185] Ostwald, *Vauban Under Siege*, 215.
[186] Ibid.
[187] Ibid, 308.
[188] During the 19th century, military engineers would revisit Vauban's siege techniques. The most common of Vauban's techniques they employed was mining. While this technique had been previously used by the Ottomans (among others) it is Vauban's descriptions of tunnel mining that would be most commonly used. Examples of this include the 1799 siege of Acre, 1854-55 siege of Sevastopol, and the 1864 battle of the Crater, as well as the numerous tunnel mines exploded on the Western Front, during the Great War.

throwing away his "Old Guard" at Waterloo.[189] Ostwald notes, that "many generals supplemented efficient tactics with brute force, tactics which suited their wide-ranging belief in the importance of vigorous action. The resulting amalgam of techniques were enough to force towns to submit, yet the results were unsatisfactory for both sides. "[190] A perfect example of this is Abercromby's attack on Carillion. And while the fighting between England and France during the Seven Years War in North America revolved around the reduction of fortified places, the fighting was ultimately decided by a pitched battle, decided by one musket volley and a bayonet charge. Bougainville laments in his journal that "the campaign did not end as happily as it began; it cost us Quebec, Carillion, St. Frédéric, Niagara, Frontenac, and the Marquis de Montcalm. The general was killed at the battle lost on September 13 before Quebec, and the colony was brought to bay."[191]

Twenty-three years later the French would have their revenge. Thirteen of the British colonies in North America rebelled and declared their independence. They had captured Fort Crown Point and Fort Ticonderoga, stripping them of their cannon which were used to drive the British from Boston. After many years of fighting, it became clear that the British forces in Virginia needed to be evacuated, as they had maneuvered themselves into an unfavorable position. They soon found themselves under siege at a place called Yorktown. With the Americans and their French allies employing Vauban's methods the besieged Cornwallis knew that their salvation rested in relief by the Royal

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[189] Napoleon famously abandoned an army in Palestine, had an army waste away from disease, exhaustion, and exposure during the retreat from Russia, lost almost a quarter of a million men fighting on the Iberian Peninsula, and squandered his army fighting during the Hundred Days. But Vauban's influence can still be seen in Napoleon's career. He followed Vauban's "six simple steps" in most of his campaigns, failing to heed "haste makes waste" step due to his desire for decisive victory.
[190] Ostwald, *Vauban Under Siege*, 309.
[191] Bougainville, *Adventure in the Wilderness*, 324.

Navy. On the 5th of September 1781, the Royal Navy clashed with *La Marine Royale* in the Chesapeake Bay. The action was indecisive, but the British were forced to withdraw, leaving the French free to land supplies, reinforcements, and most importantly heavy siege artillery. Cornwallis surrendered on October 19th to George Washington, the Virginian who led the incursion into the Ohio River valley that had been the spark that lost them New France.

But what does all this mean for the debate surrounding the Early Modern European Military Revolution? Roberts' original idea, that this revolution began with Dutch efforts to integrate Roman military techniques which ultimately helped to create the modern nation state has been cast into doubt. Parker's interpretation borders on technological determinism and is therefore suspect. Jeremy Black almost argues against the idea of an Early Modern European Military Revolution, stating, "Technological, economic and social constraints gravely qualify any notion of an early modern European military revolution."[192] But what it really means is that there are many more things to research.

The name of Early Modern European Military Revolution focuses on a specific place and time. The name would suggest that there might have been a non-European Military Revolution during the Early Modern period. One such avenue of study could focus on the influence of the Ottomans on European military thought and actions, as Vauban is rumored to have been inspired by Ottoman siege works. In addition, Mughal

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[192] Jeremy Black, *A Military Revolution? Military Change and European Society 1550-1800*, (London: Macmillan Press, 1991), 35.

India, as well as China, and areas of South Asia are under-represented areas in the field of military history, especially with regards to how those cultures influenced Europeans.

And while John Lynn has written about how women dealt with, participated in, and were integral to warfare during the Early Modern period, his work represents a fraction of the stories to tell. In addition, while much has been written concerning military architecture, very little is written about those who were compelled to dig the ditches, open the trenches, fill the gabions, and haul the fascines to make these sieges happen. Vauban's siege techniques were designed to keep those people safe, and hopefully their stories will one day be told.

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