

A HISTORY OF THE ORGANIZATIONAL DEVELOPMENT OF THE CONTINENTAL  
ARTILLERY DURING THE AMERICAN REVOLUTION

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by  
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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

## ABSTRACT

A HISTORY OF THE ORGANIZATIONAL DEVELOPMENT OF THE CONTINENTAL ARTILLERY DURING THE AMERICAN REVOLUTION, by William C. Pruett, 166 pages.

The thesis of this study is that the Continental artillery in the American Revolution, despite its ad hoc beginning and wartime challenges, gradually developed into a professional organization by the end of the war. Rather than operational history of the organization, its focus is on the growth of the organization over time, in terms of its cultural beginnings, its doctrinal development, and the leadership and career paths of some of its middle ranking leaders. The first chapter lays out the structural framework and statutory authorizations for the organization. The second chapter describes its early cultural shift from its pre-war legacy of provincialism to a trajectory toward professionalism. This chapter uses a cultural analysis to argue that Washington's decision to replace the aged Richard Gridley with Henry Knox as the commander of the Continental artillery ushered in a cultural shift away from an older provincial organizational culture to one that sought professionalism. The third chapter portrays the development of a battlefield tactical doctrine described in books that gradually took hold in informal ways. It takes a comparative theory and practice approach to argue that the kernel of an emerging doctrine existed in available European books and from those kernels, a consistent and effective doctrine developed over time. The fourth chapter uses a collective biographical approach to show organizational development in the careers of its middle ranking leaders. The concluding chapter summarizes findings and ties the professionalization of the corps of artillery to the military establishments of the new republic.

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## TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE .....	iii
ABSTRACT.....	iv
ACKNOWLEDGMENTS .....	v
TABLE OF CONTENTS.....	vi
CHAPTER 1 INTRODUCTION .....	1
An Artillery of Companies .....	4
Massachusetts Beginnings .....	5
A Continental Artillery .....	7
The Pattern of Structural Change.....	8
The 88 Battalion Resolutions.....	8
The 110 Battalion Resolutions.....	12
Numerical Designation .....	13
Conclusion .....	16
CHAPTER 2 PROVINCIAL TO POTENTIAL: THE EARLY CULTURAL TRANSFORMATION IN THE AMERICAN ARTILLERY OF THE REVOLUTIONARY WAR.....	18
Cultural Influences.....	21
Colonial Political-Military Thought .....	21
Colonial Antecedent Artillery Traditions .....	26
The Immediate Situation.....	30
A Developing American Strategy.....	31
The Impact of Leadership–Biographies and Schema .....	36
Richard Gridley.....	36
Henry Knox.....	39
Cultural Description.....	43
One Artifact of Artillery Culture–The Gun and its Metal .....	43
Values-in-use of the Continental Artillery.....	48
Basic Cultural Assumptions of the Continental Artillery .....	55
Conclusion .....	60
CHAPTER 3 ESSAYS AND TREATISES: BOOKS AND THE DEVELOPMENT OF DOCTRINE IN THE CONTINENTAL ARTILLERY, THEORY AND PRACTICE .....	62
The Normative–Eighteenth Century Books on Artillery .....	65

Muller.....	67
Le Blond.....	70
Saxe.....	72
Bland.....	74
De Cresse.....	75
Steuben.....	77
The Positive–Eighteenth Century Artillery Tactics-in-Use on the Battlefield.....	79
The Continental Artillery in Action.....	82
Book Types–The Essay, The Treatise and The Handbook.....	85
The Impact of French Officers.....	87
A Continental Pedagogy–Attempt at Formal Indoctrination.....	88
Conclusion.....	89
CHAPTER 4 THE LEADERS AND THE LED: A SELECTED COLLECTIVE BIOGRAPHY OF MIDDLE RANKING LEADERS OF THE CONTINENTAL ARTILLERY.....	91
The Sergeants and Lieutenants–Commanders of the Piece.....	92
Kollock.....	92
Thompson.....	94
White.....	98
Callendar.....	99
Shaw.....	102
The Captains–Company Commanders and Administrative Leaders.....	104
Singleton.....	104
Bauman.....	107
Sargent.....	109
Proctor.....	111
Forrest.....	113
The Field Grade Officers–Making it all Happen.....	116
Carrington.....	116
Oswald.....	119
Career Patterns and Conclusions.....	122
CHAPTER 5 Conclusion.....	126
APPENDIX A Methodological Explanation of the Examination of Culture.....	131
APPENDIX B Biographical Database of Middle Ranking Artillery Leaders.....	142
APPENDIX C List of Regimental Officers 1775-1776.....	143
APPENDIX D Richard Gridley’s Louisbourg Map.....	144
BIBLIOGRAPHY.....	145
INITIAL DISTRIBUTION LIST.....	159

## CHAPTER 1

### INTRODUCTION

The thesis of this study is that the Continental artillery, despite its ad hoc beginning and wartime challenges, developed into a professional organization by the end of the war. Although this development mirrored the Continental Army, it is significant because of the post war importance of the organization as professional continuity and a formative experience for individuals that would go on to lead a nationalist political agenda for the new nation. An examination of its culture, doctrine and leadership can chart the course of its development. It grew from a motley collection to the professional organization that provided the only standing continuity from the American Revolution to the military establishments of the early United States. The American artillery of the American Revolution started as a collection of units from Massachusetts and Connecticut. They gathered outside Boston, along with many other colonial units, in response to the American militia engagements with the British at Lexington and Concord.

This study follows the organizational development of the artillery from this inauspicious beginning through the battle of Yorktown. It describes its early cultural shift from its pre-war legacy of provincialism along a trajectory toward professionalism. This study also portrays the impact of a doctrine largely developed through practice rather than books. Finally, it examines the career paths of middle ranking leaders throughout the war.

The historiography of the American Revolution has largely neglected the Continental artillery. This study seeks to redress that neglect and to answer several basic questions. How did the Continental artillery develop as an organization in the midst of

the American Revolution? What were the factors in its organizational development? How did the organization develop in the midst of significant operational requirements? How did the organization understand how to fight in terms of doctrine? How did that doctrine shape its practice? How did the organization grow and support its personnel, particularly junior officers? Did the organization grow to true professionalism in the span of the war? This topic is significant because it traces the development of a military organization during an active war. This situation is analogous to the military organizations we are attempting to help develop in Afghanistan and Iraq. It also speaks to the organizational development of our own army. For almost ten years now, we have attempted to change or transform our Army while fighting two unconventional wars. It also points us to the dynamics of organizational development and change in the midst of conflict and can illuminate obstacles, opportunities and expectations as we deal with our own developmental challenges at home and abroad.

It is necessary to state a few assumptions that underpin this study. The first is that organizations have a developmental trajectory. Like people, they grow over time. The second is that organizational cultures are relatively stable. By nature, they rarely change. Normally, cultural change is an evolutionary process that is slow and takes time.

It is also necessary to define some key terms used throughout this paper. First, “organizational culture” is a way an organization deals with internal integration and external adaptation. Often, scholars describe it through the unwritten, largely unspoken underlying assumptions of people in the organization.<sup>1</sup> Second, “doctrine” is a system of

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<sup>1</sup>Edgar H. Schein, *Organizational Culture and Leadership*, 3rd ed. (San Francisco, CA: Jossey-Bass, 2004), 17.

learned principles upon which practitioners act. In this context, doctrine is the set of rules understood to provide the best tactical battlefield advantage. Currently defined, doctrine represents “a body of thought on how . . . forces intend to operate . . . a guide to action . . . a common frame of reference.”<sup>2</sup> Military leaders did not use the term doctrine in the 18th century, but this idea can be illuminating as a direction for study. Third, “professionalism” is competence in an occupation in which someone is paid for their services, of considerable duration, which requires specialized training, education and/or qualification. Formal organizations with a distinct culture and doctrine usually accompany professionalism. Professionalism carries a sense of corporateness and is normally self-policing.

Methodologically, this study is complex and uses a topical approach. Primary source material in the form of manuscript orderly books, 18th Century books, published papers, published memoirs and statistical data form the basis for the research. Secondary sources in the form of books, articles and published theses flesh out historical arguments, address information gaps, and establish theoretical frameworks to understand the problem. In an attempt to approach a comprehensive understanding, this study incorporates three different methodological approaches by chapter. Chapter 2 will describe the organization through cultural analysis, specifically highlighting cultural change. Chapter 3 will focus on doctrine through a history of available books and examine the theory compared to the practice. Chapter 4 uses a biographical analysis of twelve individual leaders whose careers chart the course of professional development.

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<sup>2</sup>Headquarters Department of the Army, Field Manual 3-0, *Operations* (Washington, DC: Department of the Army, 2008), D-1.

While the sample is small, it is fairly representative. The contours of change are evident in their career paths. To understand the context of these topics, it is necessary to outline a background narrative of the Continental artillery during the American Revolution.

### An Artillery of Companies

Just prior to the American Revolution, towns across the seaboard, particularly in New England, mustered existing militia artillery companies or created new companies to serve as defense against possible encroachment from the British Navy. The size and shape of these companies could vary according to function and local recruiting possibilities. However, for the most part, companies consisted of approximately thirty to fifty soldiers manning three to four guns. After the engagements at Lexington and Concord, councils charged with the defense of their colonies began to commission officers, and recruit and equip artillery companies as well. As a result, the artillery organizations that existed in the earliest phases of the conflict were local in character. Prior to the war, most of the major seaport towns in the colonies, such as Boston, Philadelphia, Newport, and Charleston, maintained some modicum of artillery defenses to protect against threats such as pirates and the enemies of Britain. The artillery forces that surrounded Boston upon the British retrograde from Concord were primarily from Massachusetts, more particularly from Boston itself. Later, a company from Rhode Island commanded by John Crane joined them.<sup>3</sup> As the crisis developed, the provincial Congress of New York would commission independent companies under John Lamb,

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<sup>3</sup>Richard Frothingham, *History of the Siege of Boston* (1873; repr., Cranbury, NJ: Scholar's Bookshelf, 2005), 100.

Bernard Romans, Sebastian Bauman, and Alexander Hamilton.<sup>4</sup> Virginia adopted the Williamsburg Artillery Company and commissioned a French volunteer, O'hickey d'Arundel to be its commander.<sup>5</sup> Pennsylvania adopted Captain Thomas Procter's Philadelphia artillery company.<sup>6</sup> Connecticut raised an artillery company in Hartford under John Bigelow.<sup>7</sup> John Grimke of South Carolina enlisted soldiers for their "Regiment of Artillery" to augment their longstanding artillery militia, the Charlestown Artillery.<sup>8</sup> In the beginning, there was no unifying organization to cement these disparate companies together, only the cause of the beleaguered in Massachusetts provided a common purpose.

#### Massachusetts Beginnings

As militia from throughout New England streamed in to bottle up the British in Boston, the colonies of Rhode Island and Connecticut bound their forces to the overall

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<sup>4</sup>Wright, 62.

<sup>5</sup>Congressional Order, 18/19 March 1776; see note 7 in *Papers of George Washington*, 4:107; E. M Sanchez-Saavedra, *A Guide to Virginia Military Organizations in the American Revolution, 1774-1787* (Westminster, MD: Willow Bend Books, 1978), 98.

<sup>6</sup>Samuel J. Newland, *The Pennsylvania Militia: The Early Years, 1669-1792* (Annville, PA: Commonwealth of Pennsylvania Department of Military and Veterans Affairs, 1997), 131.

<sup>7</sup>Henry P. Johnston, ed., *The Record of Connecticut Men of the Military and Naval Service during the War of the Revolution, 1775-1783* (1889; repr., Baltimore, MD: Clearfield, 2003), 124.

<sup>8</sup>Broadside Pamphlet, Charleston, 1775, Statutes of South Carolina, 20 November 1775; Richard Walsh, *Charleston's Sons of Liberty: A Study of the Artisans, 1763-1789* (Columbia, SC: University of South Carolina Press, 1959), 35; Fitzhugh McMaster, "Colonial Cannon: South Carolina Artillery 1670-1813," *Field Artillery Journal* 45 (September-October 1977): 47-49.

command of Massachusetts and General Artemas Ward.<sup>9</sup> The council in Massachusetts recognized the need for a regiment of artillery and commissioned Richard Gridley as Colonel and commander. This Massachusetts regiment consisted of a colonel, a lieutenant colonel and two Majors with a staff and a company of artificers to serve ten companies.<sup>10</sup> Artificers were specialized artisans who were responsible for repairing damaged ordnance equipment. Overall, the artillery forces arrayed around Boston consisted of Gridley's Regiment, the companies under Rhode Island's John Crane and Connecticut's company under John Bigelow. The various elements of the Massachusetts Artillery Regiment under Richard Gridley occupied the works surrounding the British in Boston with its headquarters located at Cambridge, Massachusetts.<sup>11</sup> This artillery organization fought the battle of Bunker Hill in which it performed rather poorly. During the battle, Gridley also served as chief engineer. He planned the hasty fortification on Breed's Hill and failed to direct the cutting of embrasures for the cannon. As a result, his company commander positioned the field pieces uncovered by fortifications. These guns settled for ineffectual fire on British warships and withdrew early upon the British advance. They lost all their field pieces except one.<sup>12</sup> George Washington assumed command of this artillery along with the rest of the ad hoc Army when the Continental

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<sup>9</sup>Charles Martyn, *The Life of Artemas Ward* (1921; repr., Cranbury, NJ: Scholar's Bookshelf, 2005), 145.

<sup>10</sup>See Appendix C, adopted from Chart 1 in Wright, 14; Boyd L. Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery* (Fort Monroe, VA: Office of the Command Historian, 1992), 13.

<sup>11</sup>Niles Papers, 26 November 1775, Massachusetts Historical Society.

<sup>12</sup>John R. Elting, *The Battle of Bunker's Hill* (Monmouth Beach, NJ: Philip Freneau Press, 1975), 24; Frothingham, 136-152.

Congress commissioned him as Commander in Chief of the new Continental Army on 15 June 1775.<sup>13</sup>

### A Continental Artillery

Washington's General Orders dated 21 October 1775 in Cambridge sought to enlist the entirety of Colonel Gridley's Massachusetts Artillery Regiment into the Continental artillery for one year. It also included the Rhode Island artillery company under Major John Crane.<sup>14</sup> Colonel Gridley's organization had some inherent difficulty, particularly with discipline, and with it Washington adopted some significant problems. He soon realized the magnitude of these challenges and sought remedy for them. It became apparent that the regiment would need a significant change in leadership and Washington found a suitable replacement in Henry Knox.<sup>15</sup> The Continental Congress appointed Henry Knox to command the regiment on 17 November 1775, although other duties would preclude his taking effective command until 1 January 1776.<sup>16</sup> In December of 1775, the Continental Congress passed a resolution concerning the artillery regiment that expanded the total number of companies from ten to twelve and provided for two

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<sup>13</sup>Wright, 25.

<sup>14</sup>General Orders, *Papers of George Washington*, 2:215; Janice E. McKenney, *The Organizational History of Field Artillery, 1775-2003* (Washington, DC: Center of Military History, United States Army, 2007), 6.

<sup>15</sup>See chapter 2 of this study for a detailed look at the challenges associated with the command under Richard Gridley.

<sup>16</sup>McKenney, 4.

lieutenant colonels and two majors.<sup>17</sup> Augmented by separate artillery companies from New York and Pennsylvania, this arrangement was the organization that threatened the British enough to evacuate Boston and would fight the long retreat from New York through New Jersey. Operations in the field drove home to the Congress a need for a more general reorganization of the Continental Army.

### The Pattern of Structural Change

Throughout the war, structural change in the Continental artillery tended to occur in a pattern. The assumption of organizational authority by the Continental Congress imparted this pattern. As such, recognition of a pressing need, a requisite recommendation for redress, and a motivating crisis would drive Congressional resolutions. The resolutions adopted often reflected extant realities rather than ideal solutions. Three particular episodes show the pattern of this change. They highlight a cycle that brought about the most apparent organizational changes, that of its formal structure, personnel and equipment.

### The 88 Battalion Resolutions

In September of 1776, recognizing the challenges that faced the Army after the defeats in New York and New Jersey and reflecting a significant attitude change on the need for a standing army, Congress voted to reorganize and expand the Continental Army. This first structural change, called the 88 Battalion Resolution, mandated a set of quotas by state that resulted in three-year enlistments for the soldiers and a total

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<sup>17</sup>Resolution of the Continental Congress, 2 December 1775, *Journals of the Continental Congress*, 3:399; Wright (Chart 4), 53.

Continental Army organization consisting of eighty-eight battalions. In regards to the artillery branch, this reorganization largely reflected conditions that already existed.<sup>18</sup>

Congress then took into consideration the report of the Board of War . . . and, thereupon, came to the following resolutions: That eighty eight batallions be inlisted as soon as possible, to serve during the present war, and that each state furnish their respective quotas. . . . That twenty dollars be given as a bounty to each noncommissioned officer and private soldier, who shall inlist to serve during the present war, unless sooner discharged by Congress. . . . That the appointment of all officers, and filling up vacancies, (except general officers) be left to the governments of the several states, and that every state provide arms, cloathing, and every necessary for its quota of troops. . . . That each soldier receive pay and subsistence from the time of their inlistment.<sup>19</sup>

The real significance of this resolution was that it enlisted soldiers to serve for the duration of the war. This was a marked change from the single year enlistments that the artillery, and other, formations had operated under before the resolutions. The Congress attempted to enforce the requirements of this resolution through entreaty to the states. On 24 September 1776, they sent a circular letter to the states pleading for assistance while reflecting the realities of the expense and provision of an army. In this letter, the Congress explained the reasoning behind raising a standing “American Army” and pleaded with the state legislatures to raise their respective quotas of troops.<sup>20</sup>

A Committee of Congress called upon to investigate the defeat at Long Island also requested that Henry Knox submit his proposals on the improvement of the artillery. These proposals included a series of specific recommendations. First, he suggested the

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<sup>18</sup>Wright, 93.

<sup>19</sup>Resolution of the Continental Congress, 16 September 1776, *Journals of the Continental Congress*, 5:762-763.

<sup>20</sup>Letter of the Continental Congress to the States, 24 September 1776, in *Major Problems in the Era of the American Revolution, 1760-1791*, ed. Richard D. Brown (Lexington, MA: DC Heath, 1992), 197-198.

establishment of permanent laboratories or industries to produce and maintain all the variety of ordnance stores required to maintain the artillery and that these have sufficient trained artificers to work the implements. Second, he recommended that Congress acquire a large-scale cannon foundry capable of the manufacture of brass (bronze) artillery as soon as possible. Third, he advised the establishment of an academy to educate artillery officers. Fourth, he indicated the need to adopt a Board of Ordnance, on the British model, to oversee the development and management of the entire department. Fifth, he recommended a personnel expansion of the artillery through increased enlistments to fill a ratio of six artillerymen to every one hundred infantrymen. Sixth, reflecting a mature understanding of the artillery as a weapons system, he suggested the procurement of wagons, horses and contracted drivers to provide transportation of ordnance and ammunition. A system, as opposed to only a weapon, included all the pertinent accoutrement necessary for its effective function. In modern parlance, this includes the prime movers, ammunition carriers and gun. In the eighteenth century, the system included horses and carriage, ammunition wagon and gun.<sup>21</sup> Seventh, he recommended the provision of a group of field artificers to service and maintain the system while on campaign and a sufficient staff assigned to the commander of artillery to assist in the management of the significant logistical burden. Finally, he urged Congress to procure thirty-six light brass cannon as soon as possible to field the Army.<sup>22</sup> A few

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<sup>21</sup>For a complete description of period artillery implements see Harold R. Peterson, *Round Shot and Rammers* (New York: Bonanza Books, 1969), 29-45.

<sup>22</sup>Knox's recommendations to Congress, September 1776, in William E. Birkhimer, *Historical Sketch of the Organization, Administration, Materiel and Tactics of the Artillery, United States Army* (Washington, DC: James J. Chapman, 1884; repr., New York: Greenwood, 1968), 4-5.

months later, most likely spurred on by Washington, Knox expanded his assessment that in addition to those recommendations earlier provided to Congress included several others. His expanded assessment included recommendations for artillery pay that exceeded the other branches by twenty-five percent in order to recruit ~~the~~ “the best men,” a regiment consisting of five subordinate battalions, appointment of a commissary of military stores and other staff, and the rapid procurement of 150 brass cannon.<sup>23</sup>

Washington, in his full letter to John Hancock dated 20 December 1776, seconded and supported Knox’s proposals with the exception that he did not wait for Congressional approval to direct Knox to begin recruiting three artillery regiments [battalions] to serve with the main army. His letter provided explicit support for those three regiments noting that the southern states already established their own artillery units. He also noted discontent within the artillery corps on the matter of pay and strongly recommended that Congress redress the issue. In the dire straits the Army found itself in before Trenton in 1776, all of this he communicated with the urgency that operations required. He wrote, ~~In~~ “In short, the present exigency of our Affairs will not admit of delay either in Council or the Feild . . . the design of Genl Howe, is to possess himself of Philadelphia this Winter, if possible, and in truth, I do not see what is to prevent him, as ten days more will put an end to the existence of our Army.”<sup>24</sup> With the hodge podge Army at his disposal,

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<sup>23</sup>The Plan is presumably from 18 December 1776. Quoted in full in note 3 in Washington’s letter to Hancock, 20 December 1776, *Papers of George Washington*, 7:387.

<sup>24</sup>Washington to Hancock, 20 December 1776, *Papers of George Washington*, 7:381-382.

Washington and Knox attacked the Hessians at Trenton. The artillery performed with distinction.

### The 110 Battalion Resolutions

In the second major structural change, immediately upon the word of the victory at Trenton, Congress now fully confident in Washington, resolved on 27 December 1776, in a Cromwellian Moment, to give the General the power to manage the entirety of the Continental Army, in six month's time.

Resolve, That General Washington shall be, and he is hereby, vested with full, ample, and complete powers to raise and collect together, in the most speedy and effectual manner, from any or all of these United States, 16 battallions of infantry, in addition to those already voted by Congress; to appoint officers for the said battallions; to raise, officer, and equip three thousand light horse; three regiments of artillery, and a corps of engineers, and to establish their pay; to apply to any of the states for such aid of the militia as he shall judge necessary; to form such magazines of provisions, and in such places, as he shall think proper; to displace and appoint all officers under the rank of brigadier general, and to fill up all vacancies in every other department in the American armies; to take, wherever he may be, whatever he may want for the use of the army, if the inhabitants will not sell it, allowing a reasonable price for the same; to arrest and confine persons who refuse to take the continental currency, or are otherwise disaffected to the American cause; and return to the states of which they are citizens, their names, and the nature of their offences, together with the witnesses to prove them: That the foregoing powers be vested in General Washington, for and during the term of six months from the date hereof, unless sooner determined by Congress.<sup>25</sup>

In a spirited mode, Congress also adopted a standing recommendation from Washington and –Resolved, That a brigadier general of artillery be appointed; and, the ballots being taken, Colonel Henry Knox was elected.”<sup>26</sup> This would be necessary for the command of

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<sup>25</sup>Resolution of Congress, 27 December 1776, in *Journals* 5:1045-1046.

<sup>26</sup>*Ibid.*, 1043.

three artillery regiments authorized by the resolution. In his reply, Washington showed his deference to civil authority.<sup>27</sup>

This resolution, called the 110 battalion resolution, which included three battalions for artillery and three for cavalry, expanded the total number of authorized artillery regiments to four. It reduced the number of field grade officers per regiment from five to three to reflect the actual number of experienced officers available. It also reduced the total number of matrosses per company from thirty-two to twenty-eight, which better reflected the personnel requirements for serving six guns per artillery company. Finally, the resolution provided for artillery maintenance and sustainment by establishing a foundry (brass capable) in Philadelphia and two artificer facilities, one at Springfield in Massachusetts and the other at Carlisle, Pennsylvania.<sup>28</sup>

#### Numerical Designation

The third major structural change in the Continental artillery during the War was the “numerical designation” of the regiments. The numerical designation of the Regiments set off an internal controversy over precedent and rank. This was important because the number indicated the relative seniority of the regiments. Tied to this process was the relative rank of their commanders. This issue was a source of honor and a prickly issue to eighteenth century gentlemen. To a gentleman, rank denoted social standing. They protected by honor their social standing and public reputation at all costs. This specific controversy put Washington and Knox in a difficult situation; they had to

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<sup>27</sup>Washington, *Papers*, 7:500.

<sup>28</sup>Wright, 102-104.

determine who outranked whom without ruffling feathers of the units involved. It was an impossible task.

The battle of Monmouth in 1778 was a watershed moment for the artillery where it saw its greatest success to date. When the smoke cleared, questions of rank among the officers of artillery heightened to a fevered pitch. These controversies induced the resignation of some of the best officers in the corps and initiated a potential crisis.<sup>29</sup> Seeking resolution to these consternations, Washington initiated a series of General Officer Boards to resolve disputes. It took almost a year for the boards to come to a tentative conclusion on the artillery. In his General Orders of 10 August 1779, Washington published the results:

The board of General Officers appointed in the orders of the 5th. instant to settle the relative rank of the Colonels of Artillery so far as it still remains unsettled, and the rank of the regiments, have made the following report: The board are of opinion the arrangement of the Colonels of Artillery ought to stand as follows:

Colonels Crane  
Lamb  
Harrison  
Proctor

and the regiments in the following order (viz) Colonel Harrison's 1st. The rank of Colonel Crane's and Colonel Lamb's regiments to be decided by lot, and Colonel Proctor's to be the 4th. As the precedence of Colonel Crane's and Colonel Lamb's regiment remains to be decided, Lieutenant Colonel Popkins on the part of the former and Colonel Lamb in behalf of the latter will cast lots for it without delay in presence of General Knox who with these two Gentlemen will report the issue to the Commander in Chief that it may be announced in orders.<sup>30</sup>

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<sup>29</sup>David T. Zabecki, "Oswald, Eleazer (1755-1795)" in *The American Revolution 1775-1783: An Encyclopedia*, vol. 1, ed. Richard L. Blanco (New York: Garland Publishing, 1993), 1268.

<sup>30</sup>General Orders, 10 August 1779, in Washington, *The Writings of George Washington from the Original Manuscript Sources*, vol. 16, ed. John C. Fitzpatrick (Washington, DC: Government Printing Office, 1937), 75.

Colonel John Lamb was dissatisfied with the outcome. Thus, the regimental commander with the most combat experience of all the others tendered his resignation. He wrote Washington on 12 August 1779 suggesting that the board had dishonored his service and reputation. No doubt in an effort to remind his superior of his sacrifices, he went on to express his gratefulness to Washington for his efforts while Lamb was a prisoner in Canada.<sup>31</sup>

Washington, recognizing the urgency of the situation, attempted to persuade Lamb to remain in service. Lamb's resignation caught Washington at the wrong time. He knew the importance of retaining his senior officers and he did not sanction Lamb's resignation but instructed him to forward it to the higher authority of Congress. He wrote Lamb on 13 August 1779:

I sincerely wish your Letter had been upon no other than the subject above. It pains me much to find an Officer of your rank and merit soliciting a resignation, and I would willingly hope upon farther consideration, that you will decline your application. Your good sense and judgment will not permit me to expostulate with you, or to use any persuasive upon the occasion; but you will remember Sir, that the resignation of every good Officer, especially if he is of high rank, is attended with great injury to the public. They not only experience an injury in the loss of his Individual services, but the example has an unhappy and pernicious influence. And your case too, has been decided by a very respectable Board of Officers, fully possessed of all the circumstances of your and Colo. Crane's services, and who could have nothing in view but substantial justice to either party. I repeat my wishes that you will decline your application; but if you should finally determine to persevere in it, You will be pleased to make it to Congress, as I have not of late accepted the resignation of any Colonel.<sup>32</sup>

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<sup>31</sup>Letter of John Lamb to George Washington, 12 August 1779, in Issac Q. Leake, *Memoir of the Life and Times of General John Lamb* (1857; repr., Glendale, NY: Benchmark, 1970), 224.

<sup>32</sup>Letter of Washington to Lamb, 13 August 1779, in Washington, *Writings*, 16:91.

Colonel Lamb continued dissatisfied and replied to Washington on 19 September 1779. In his reply, Lamb pointed out the issue of honor and further suggested some impropriety by the Board. He suspected that the Board had not followed their own procedural terms. Interestingly, the Board in a previous meeting had decided in favor of Lamb, the findings Washington rejected as beyond their requested scope of duty at the time.<sup>33</sup> Washington contested and rejected Lamb's resignation and directed that Lamb submit to Congress for appeal. Lamb did submit to Congress but appears to have been mollified by his selection and appointment as Surveyor of the Ordnance of the United States, an additional duty of prestige.<sup>34</sup> With this crisis averted, the Continental artillery could move on to preparations for the campaign that would end the war, Yorktown.

### Conclusion

These three episodes are important because they reflect a growing reliance on Congressional sanction to provide the legitimacy necessary for structural change in a "Continental" organization. They also reflect a trend of the growing acceptance of military leadership toward centralized civilian control of serious efforts at change. The true value of a narrative of these events is to provide an artifactual backdrop for changes in the Continental artillery. They show that the artillery was changing structurally partly due to the realities of the war. Those changes while reflective of eminent needs and based on recommendations, were usually Congressional mandates of de facto conditions driven

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<sup>33</sup>Letter of George Washington to the Board of General Officers, 6 August 1779, in Washington, *Writings*, 16:57.

<sup>34</sup>For Lamb's appeal to Congress see Letter of Lamb to John Jay, President of the Continental Congress, 3 September 1779, in Leake, 227. For his appointment as "Surveyor" see Letter of Henry Knox to Lamb, 22 November 1779, in Leake, 230.

by other factors. However, while important and indicative of an interesting set of military-political values, the last episode of numerical designation with its resulting crisis with Colonel Lamb, highlights that even over time these mechanisms were merely structural and largely superficial and were not reflective of the true engines driving change. There were deeper assumptions at work. In short, these structural changes and the military realities they reflect were not the primary factors contributing to professionalization.

The 88 Battalion resolution, the 110 Battalion resolution and the numerical designation, mark seminal moments in the structural organizational changes of the Continental artillery. Other authors have covered this history well but it only scratches the surface of its developmental history. In chapter 2, an examination of the major cultural shift early in its growth will give a deeper look into the true beginnings of its developmental journey.

## CHAPTER 2

### PROVINCIAL TO POTENTIAL: THE EARLY CULTURAL TRANSFORMATION IN THE AMERICAN ARTILLERY OF THE REVOLUTIONARY WAR

This chapter looks at the early organizational culture of the Continental artillery.<sup>35</sup>

While many studies of organizational culture tend to highlight continuities, cultural concepts can also help explain change. This chapter emphasizes an early organizational culture shift in the American artillery. It underscores the role of leadership and environmental influences in inducing that change. An early decision by the Commander-in-Chief to replace the leadership of his artillery arm prompted this cultural shift. This chapter makes a relatively straightforward argument. When Washington arrived to the army in 1775, he did not like what he saw and set out to change it. The performance of the artillery arm at the battle of Bunker Hill earlier that year indicated that it needed a significant change. Washington replaced Richard Gridley in the command of the artillery with the young and inexperienced Henry Knox and thereby instituted a change in its organizational culture that set the course of the artillery on a path toward professionalism. Specifically, the artillery changed from an organization steeped in the military culture of provincials to one that began a cultural transformation toward the professionalism found in other 18th century regular standing armies. As will be shown, provincial military culture cherished localism and valued the accountability of its officers to the soldiery. It thrived on a contractual volunteer spirit that tacitly contained egalitarian expectations of

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<sup>35</sup>A synthesis of the organizational development theory underpinning this analysis is explained in detail in Appendix A. This theory is heavily influenced by the work of W. Warner Burke, Edgar Schein and Joanne Martin.

both officers and soldiers. In contrast, professional military culture of the time had different sets of expectations. Regular discipline enforced through a regimented experience buttressed those expectations that relied on social distinctions between officers and soldiers.

Interestingly, the literature of the war has barely covered this important decision. Of five general military histories of the American Revolution, only three of them mention the transition at all, and then it merits only two or three sentences. Of three general histories of the American artillery, it warrants only three to six sentences each. Of five relevant biographies, only four treat the subject in any detail.<sup>36</sup> Therefore, this chapter fills a historiographical gap in explaining the consequences of the decision. The guiding question of this chapter is what happened to the artillery organization when General Washington prescribed a leadership change? General Washington, only after a few months, determined that he needed a leader for his artillery whose talents could adapt to the environment, whose sense of vision mirrored his own, and whose leadership could

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<sup>36</sup>For general histories of the war see John Ferling, *Almost a Miracle* (New York: Oxford, 2007), 101; Samuel B. Griffith, *The War for American Independence* (Chicago: University of Illinois, 2002); Robert Middlekauff, *The Glorious Cause* (New York: Oxford, 2005); George F. Scheer and Hugh Rankin, *Rebels and Redcoats* (New York: World, 1972), 103; and Christopher Ward, *The War of Revolution* vol. 1 (New York: MacMillan, 1952), 123. For artillery histories see William E. Birkhimer, *Historical Sketch of the Artillery, United States Army* (repr., 1884, New York: Greenwood, 1968), 2-3; Boyd L. Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery* (Ft. Monroe, VA: TRADOC, 1992), 14; Fairfax Downey, *Sound of the Guns: The Story of the American Artillery* (New York: David Mackay, 1956), 28. For Henry Knox biographies see Noah Brooks, *Henry Knox: A Soldier of the Revolution* (repr., 1900, Cranbury, NJ: Scholar's Bookshelf, 2005), 34-35; North Callahan, *Henry Knox: George Washington's General* (New York: A.S. Barnes, 1958), 34-36; Francis S. Drake, *Life and Correspondence of Henry Knox* (Boston: Drake, 1873), 20-21; Thomas M. Griffiths, *Major General Henry Knox and The Last Heirs to Montpelier* (Lewiston, ME: Monmouth Press, 1965); Mark Puls, *Henry Knox: Visionary General of the American Revolution* (New York: Palgrave MacMillan, 2008), 32-33.

change the organization from the inside out. General Washington intuitively instigated a cultural change in the artillery with the decision to replace Colonel Richard Gridley with Mr. Henry Knox.

Both external influences and internal processes shaped the organizational culture of the Continental artillery. These external influences consisted of colonial military-political thought, antecedent artillery traditions, the immediate military situation, a developing strategy and the individual experiences of its earliest leaders. The widely held beliefs about standing armies confronted by military realities constrained the cultural environment to two realistic alternatives, a provincial force or a standing army. Each of these had a particular relationship to civil authority and society. The tension between desired outcomes and military reality forced authorities to make choices with trade-offs. The Continental Congress made the choice for a standing army largely based on military realities. They hoped to mitigate the perceived difficulties of standing forces through the leadership of George Washington, who was one of their own, a member of the Continental Congress.

Consequently, the leadership, and the choice of leaders, further refined those alternatives, imposing the individual histories, will and penchants of individuals on the early formation of the organizational culture. This was necessary to confront growing external realities. Leadership from the top down is particularly important to culture formation in the beginning stages of an organization. In hierarchical organizations, such as the Continental artillery, the leadership sets and shapes the vision and serves as a guide for future action by providing purpose, direction and motivation. Over time, these become normalized and ingrained within the fabric of the organization. Members of the

organization pass them on through a process of enculturation. Leadership supervises these processes and points them toward the organizational mission.

This cultural analysis of the early Continental artillery paints a picture of a change. Continuing with the metaphor, the external environmental influences, and the leadership, its purpose and mission, all provide the frame for that picture. Early in the American Revolution, these factors constrained the cultural boundaries of the Continental artillery. They identified the scope of possibilities and the range of potential options. On the canvas are the artifacts, values and assumptions that point us to a reasonable depiction of its organizational culture. In the background are the earlier ways and antecedents; in the foreground are the beginnings of a force that looked toward professionalism. Our analysis begins with a look at the political thought in the colonial environment of the times.

### Cultural Influences

#### Colonial Political-Military Thought

Revolutionary colonial political-military thought centered on the idea of the dangers of a standing army. Intellectual patterns among colonial political elites followed the English anti-standing army writers of the seventeenth century. The English Bill of Rights that followed the revolution of 1688 specifically castigated the British monarch for ~~r~~aising and keeping a standing army within this kingdom in time of peace, without consent of parliament, and quartering soldiers contrary to law.<sup>37</sup> Power and the corruptibility of man seemed incorrigibly combined in the menace of a professional

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<sup>37</sup>Constitution Society. ~~English~~ Bill of Rights, 16 December 1689,” [http://www.constitution.org/bor/eng\\_bor.htm](http://www.constitution.org/bor/eng_bor.htm).

standing army.<sup>38</sup> Further, the acceptance of standing armies indicated an attitude among elites of shirking responsibilities and public duties. Standing professional forces required substantial fiscal expenditures and required taxation to maintain.<sup>39</sup> Additionally, colonists felt that the further they were from London, the more likely a standing army was to perpetrate despotism.<sup>40</sup>

The counterpoint to professional standing armies was the militia. In debates surrounding the establishment of a national militia in Britain, one prevailing attitude prior to the American Revolution was that militias were the preferred option for the defense of the British Empire. Militias were the guarantors of civil liberties. The natural fighting spirit of the people to protect hearth and home was superior to professionals who fought only for money.<sup>41</sup> This militia tradition was alive and well in the colonies. In fact, it represented immediacy in the face of native threats that Britain proper had not experienced at all in the same century.

Politically, the American colonies inherited a Whiggish tradition of aversion to standing armies. In fact, the increased presence of the British Army in America created a

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<sup>38</sup>Bernard Bailyn, *The Ideological Origins of the American Revolution* (1967; repr., Cambridge, MA: Belknap Press, 1992), 61-62.

<sup>39</sup>James Kirby Martin and Mark Edward Lender, *A Respectable Army: The Military Origins of the Republic, 1763-1789*, 2nd ed. (Wheeling, IL: Harlan Davidson, 2006), 8-9.

<sup>40</sup>Don Higginbotham, *The War of American Independence: Military Attitudes, Policies, and Practice, 1763-1789* (Boston: Northeastern University Press, 1983), 16.

<sup>41</sup>Eliga H. Gould, *The Persistence of Empire: British Political Culture in the Age of the American Revolution* (Chapel Hill, NC: University of North Carolina Press, 2000), 73-77.

significant amount of pre-revolutionary animosity. Joseph Warren's memorial speech, informed by the Boston Massacre, reveals the attitudes in Boston in March of 1772:

The ruinous consequences of standing armies to free communities may be seen in the histories of Syracuse, Rome, and many other once flourishing states. . . . Their baneful influence is most suddenly felt, when they are placed in populous cities; for, by a corruption of morals the public happiness is immediately affected. . . . Soldiers are also taught to consider arms as the only arbiters by which every dispute is to be decided between contending states;-- they are instructed implicitly to obey their commanders, without enquiring into the justice of the cause they are engaged to support: Hence it is, that they are ever to be dreaded as the ready engines of tyranny and oppression.<sup>42</sup>

Prevailing republican theories, of which many colonists whole-heartedly embraced, found standing armies to be instruments of tyrannical oppression and corruption. They were the tool of those who paid them. Systems of patronage and the "dependence" created by salaries, in Whig republican ideologies, created the conditions for the army to act as a coercive force for the central government.<sup>43</sup> If the government's policies were at odds with traditional British liberties, then a standing army in America was a threat to the traditional British rights of colonials.

More important though, was the perceived role of the regular standing forces in the colonies. During the French and Indian War, colonists tolerated and even embraced the British Army as the protector of the Empire and consequently as guardians of their rights as British citizens. The military necessities of that war created the need for hybrid forces. Short-term provincial military forces acted in concert with regular British forces

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<sup>42</sup>Joseph Warren, *The Dangers of Standing Armies* (1772), quoted in *The Military in America*, ed. Peter Karsten (New York: Free Press, 1980), 21.

<sup>43</sup>J. G. A. Pocock, *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton, NJ: Princeton University Press, 1975), 408-409.

against the French and Indian threat.<sup>44</sup> However, after the war, when the Parliament decided to leverage the British Army to enforce new measures designed to elicit funds to pay the debts of the war, the colonists changed their attitude. The real rub with provincial legislators, were the provisions of the Quartering Act, which General Thomas Gage suggested extend to the colonies. This Parliamentary legislation levied an indirect tax on provincial legislatures to raise money to support British regulars. Colonial leaders strongly invoked the anti-standing army tradition when Parliament decided to require the colonies to pay for the Army ostensibly sent to police them.<sup>45</sup>

However, many colonial leaders recognized the value of regular forces in times of war. During the French and Indian War, by 1763, over 8,000 colonial Americans enlisted in the British regular army. In 1762, in Massachusetts, there was a surplus of colonial American volunteers for regular service enlistments.<sup>46</sup> In 1757, ten percent of the Royal American Regiment, the 60th Foot, was composed of colonial American enlistees.<sup>47</sup> As for officers, four of the five top American commanders had service within British regular

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<sup>44</sup>See Chapter 2, “Military Institutions of Colonial America,” in Don Higginbotham, *War and Society in Revolutionary America: The Wider Dimensions of Conflict* (Columbia, SC: University of South Carolina Press, 1988), 19-38.

<sup>45</sup>John Shy, *Toward Lexington: The Role of the British Army in the Coming of the American Revolution* (Princeton, NJ: Princeton University Press, 1965), 143; Higginbotham, *War of American Independence*, 36-38.

<sup>46</sup>Shy, *Toward Lexington*, 143, 145.

<sup>47</sup>Alexander V. Campbell, *The Royal American Regiment: An Atlantic Microcosm, 1755-1772* (Norman, OK: University of Oklahoma Press, 2009), 73.

army units during the French and Indian war.<sup>48</sup> From the 1750s, the Royal Artillery stationed elements throughout the colonies to protect the seacoasts and frontier forts. After the French and Indian War, detachments of the 3rd Battalion of the Royal Artillery were in New York, Boston and Crown Point.<sup>49</sup> Further, the British Army stationed the 4th Battalion, Royal Artillery throughout the colonies with its headquarters in New York.<sup>50</sup>

Most future Continental generals viewed the standing army question from the perspective of military efficiency. In that, they generally favored a regular force in times of war.<sup>51</sup> Particularly, George Washington's history predisposed him toward regular forces. His time as an aide to Braddock and as a commander of the Virginia Regiment brought him into close proximity to the regular British Army. He admired their discipline. He unsuccessfully sought a regular commission and the adoption of the regiment into the regular British establishment. He trained the Virginians in a regimented and regular fashion. As one author has put it, this preference for professionalism was a

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<sup>48</sup>George Athan Billias, ed., *George Washington's Generals and Opponents: Their Exploits and Leadership* (New York: Da Capo, 1994), viii-ix. George Washington served as an aide-de-camp to Braddock.

<sup>49</sup>Francis Duncan, *History of the Royal Regiment of Artillery*, vol. 1 (London: John Murray, 1872), 244.

<sup>50</sup>*Ibid.*, 252-253.

<sup>51</sup>Paul David Nelson, "Citizen Soldiers or Regulars: The Views of American General Officers on the Military Establishment," *Military Affairs* 43, no. 3 (October 1979): 127.

particular “obsession” of Washington.<sup>52</sup> A professional army organized and equipped in a regular European style offered a certain amount of international legitimacy as well.

Colonial governments were averse to regular standing armies in times of peace and organized short term provincial forces in times of war. At the same time, influential military communities had significant formative histories with the regular British Army. Many future general officers of the American army were experienced enough to understand the effectiveness of a regular regimented force on the battlefield. The idealism of a militia army would collide with reality on the outskirts of Boston in 1775. When faced with indiscipline, desertion, debauchery and ineffectiveness, the Congress made choices about military organization. Previous colonial military traditions bounded these choices.

#### Colonial Antecedent Artillery Traditions

Wayne Lee has delineated three prevailing colonial military cultural traditions prior to the American Revolution. He suggests that their “European roots,” interaction with Native Americans, and the “institution of the militia” primarily influenced “Colonial Ways of War.”<sup>53</sup> However, there existed four distinct artillery traditions in the Colonies. The first was the militia tradition. In this tradition, like other militia units, men gathered to train periodically. The purpose of the militia was local defense. In the colonial

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<sup>52</sup>Higginbotham, *War and Society*, 31.

<sup>53</sup>Wayne E. Lee, *Crowds and Soldiers in Revolutionary North Carolina: The Culture of Violence and Riot in War* (Gainesville, FL: University of Florida Press, 2001), 105.

landscape, these militia artillery units served as harbor or port defense when needed. Artillery militia in the colonial tradition focused in port cities and not in the interior.

The second tradition was the artillery “company” tradition. Exemplars of this tradition were the “Ancient and Honorable Artillery Company” in Boston and the “Charlestown Artillery” in South Carolina. These “companies” were largely social institutions whose stated purpose might be facility in the use of the “great guns” but whose real purpose was to denote social rank or status in the community. Although important in providing the rudiments of knowledge and training to officers, these companies were more important regarding social contacts than to real expertise or skill.

The third and perhaps most important tradition was the expeditionary volunteer or provincial tradition. This tradition was voluntary contractual provincialism. It drew its core assumptions from the older militia ideal that dealt with local threats. The “local” is what really mattered. As the colonies grew in population and appetite for land and resources, the “local” concept grew to incorporate the collective localities of the colony or province. This expanded view of the “local” extended to the contractual military relationships forged in provincial armies raised for specific campaigns. The Louisbourg and Crown Point expeditions provide the best examples of these relationships.

A provincial army in the American military culture had several characteristic features. First, it was temporary, mustered for a single campaign, for a specific purpose or military goal. Second, customs of volunteerism, which highlighted the value of patriotism as a virtue, defined the culture. Third, enlistments and commissions were largely contractual, bounded by legal responsibility and subordinate to civil legal authority.

Fourth, they had an antipathy toward standing armies and often preferred to operate independently from regular forces.

The work of Fred Anderson further conceptualizes additional cultural aspects of Provincial armies. First, both soldiers and political authorities understood military service as a contractual agreement.<sup>54</sup> Soldiers and officers engaged in disputes with regular British Army officials over larger concepts of commitment and loyalty used these principles. Second, provincial armies saw the hand of Providence in the conduct of war. God justified warfare and showed His hand and will in the course of natural and military events.<sup>55</sup>

Another key to understanding Provincial armies is that they were temporary. Colonial legislatures raised them for the course of a single campaign under contractual terms. Consequently, if campaign leaders violated the terms of enlistment or the contracted enlistment duration expired, provincial soldiers felt justified, no matter the military consequence, to return home from the expedition.<sup>56</sup> Although they mirrored regular forces in organizational structure, neither officers nor the ranks saw the same type and rate of promotion or sustained lengths of service found in regular armies.<sup>57</sup> Douglas

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<sup>54</sup>Fred Anderson, *A People's Army: Massachusetts Soldiers & Society in the Seven Years' War* (Chapel Hill, NC: University of North Carolina Press, 1984), 51, 167; Fred Anderson, *Crucible of War: The Seven Years' War and the Fate of Empire in British North America, 1754-1766* (New York: Alfred A. Knopf, 2000), 221.

<sup>55</sup>Anderson, *A People's Army*, 196.

<sup>56</sup>Douglas Edward Leach, *Roots of Conflict: British Armed Forces and Colonial Americans, 1677-1763* (Chapel Hill, NC: University of North Carolina Press, 1986), 109.

<sup>57</sup>Anderson, *A People's Army*, 50-51.

Leach points out that provincial forces had natural loyalties to regional and local areas.<sup>58</sup> This grew not only from the natural affinity toward home and hearth but also from a reluctance to serve outside specific geographic boundaries due to residual local defense ideals and a general aversion to executive political power.<sup>59</sup> Over the course of the French and Indian War, because of cultural differences between British regulars and provincial levies, stereotypes exacerbated tensions and a reflective disdain grew in provincial forces toward regular standing armies.<sup>60</sup>

The regular standing artillery formations stationed throughout the colonies provided a fourth tradition to emulate. British authorities stationed, and transited them through, most of the port cities throughout the colonies. They sometimes transmitted institutional knowledge to local militias through informal training sessions. Like the regular British army to which they belonged, the leaders of the 3rd and 4th Battalions of the Royal Artillery Regiment subjected their units to regular discipline and training. The regiment recruited soldiers for a term of three years or longer.<sup>61</sup> The regiment employed their sub-units in widely dispersed locations. Their tactical duties included defense of fortifications on the frontier and coastal cities and field duty in support of British regular forces on campaign. These antecedent artillery traditions were a part of the cultural milieu in the minds of leaders as they assessed the situation outside of Boston in 1775.

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<sup>58</sup>Leach, *Roots of Conflict*, 108.

<sup>59</sup>Douglas Edward Leach, *Arms for Empire: A Military History of the British Colonies in North America, 1607-1763* (New York: MacMillan, 1973), 275.

<sup>60</sup>Leach, *Roots of Conflict*, 165.

<sup>61</sup>Edward E. Curtis, *The British Army in the American Revolution* (1926; repr., Ganesvoort, NY: Corner House, 1998), 55.

## The Immediate Situation

The specific political and strategic environment in which the American artillery existed also shaped its culture. The colony of Massachusetts, after the rolling engagement through Lexington and Concord, found themselves in open armed conflict with the “ministerial troops” of Great Britain. The militia and “minutemen” that coalesced around Boston to keep the British army bottled up was hardly an army. It did not take long however, before the political authorities, namely the Council of Massachusetts and its Committee of Safety, recognized the need for a more robust military establishment.

Given the underlying political aversion to standing armies and a provincial military tradition that had been somewhat independently successful, it was natural that the Council would create an army under a model that looked like their previous colonial military endeavors. Specifically, they enlisted the soldier for a very specific and limited term through the end of the year, only approximately eight months. They went as far as to appoint field officers and designate a commander, namely Artemas Ward. After the engagements around Lexington and Concord, and the responding militia had bottled the British regulars up in Boston, the Council decided to build its army from the militia forces already gathered. It passed regulations for this army in April. On 16 May 1775, the Council appointed Richard Gridley to command the Artillery Regiment.<sup>62</sup>

The environment facing the colonial forces around Boston and its artillery regiment was at face value a crisis. The key political and economic relationship that had existed for several generations, that of the colony operating within the British Empire had come under severe strain. The political environment shifted in early 1776 and had a

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<sup>62</sup>Wright, 12-14.

significant impact on the army and its artillery regiment. The Continental Congress convened with an agenda to act in concert with the other colonies, tie the loose bonds that already existed and either move toward a permanent schism with Britain and establish political independence or effect reconciliation. By June 1775, in terms of military organization, reforms had already begun with the establishment of a “Continental Army” and the appointment of a Virginian to its command. Increasingly, as the British crown determined to crush the rebellion through military force, the current organization seemed unable or ineffective to meet the growing British threat. The Artillery Regiment needed to change to adapt to its environment. The strategy developed to deal with this environment had a hand in molding that adaptation.

#### A Developing American Strategy

In order to meet the situation the colonists faced, political and military leaders had to devise a strategy. That strategy would shape the organizational culture of the artillery. The political decision for or against independence determined the colonial military strategy of the Continental Congress. Initial congressional proclamations indicated willingness for reconciliation with the British. The documents “To the People of Great-Britain” (September 1774), “Declaration for Taking Up Arms” (July 1775), and the “Olive Branch Petition” (July 1775) all provide evidence for this early political objective.<sup>63</sup>

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<sup>63</sup>Pauline Maier, *American Scripture* (New York: Vintage Books, 1997), 20, 24. These documents are available in full in James H. Hutson, ed., *A Decent Respect to the Opinions of Mankind: Congressional State Papers, 1774-1776* (Washington, DC: Library of Congress, 1975), 23-31, 91-97, 127-130.

Joint Publication 3-0 defines strategy as ~~a~~ prudent idea or set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve theater, national and/or multinational objectives.”<sup>64</sup> Another scholar defines strategy as ~~the~~ bridge that connects the worlds of policy and military power. It . . . interprets the meaning of policy for military power, and which must devise schemes for the threat or use of that power to serve the purposes of policy.”<sup>65</sup> One historian uses Clausewitz’s definition, ~~as~~ the use of combat, or the threat of combat, for the purpose of war in which it takes place.”<sup>66</sup> More recently, military writers define strategy in this way, ~~Strategy~~ addresses the ends, ways, and means of war and embraces how a nation prepares for and conducts it. . . . Strategy determines how the state will fight the war . . . and under what conditions and how the state will end it.”<sup>67</sup> In short, political purpose compels military strategy and influences the organization of military forces.

Given these definitions of strategy, it becomes clear that the political purposes or objectives of the Second Continental Congress drove the strategy. Those purposes gradually changed as the need for political independence became clear. Early on, the political purpose was reconciliation based on rights as British subjects. This policy precipitated a relatively non-aggressive defensive strategy in which hastily formed forces

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<sup>64</sup>U.S. Department of Defense, Joint Publication 3-0, *Joint Operations* (Washington, DC: Government Printing Office, 2006), Glossary-26.

<sup>65</sup>Colin Gray, *Fighting Talk* (Washington, DC: Potomac Books, 2009), 48.

<sup>66</sup>Carl von Clausewitz quoted in Peter Paret, ed., *Makers of Modern Strategy* (Princeton, NJ: Princeton University Press, 1986), 3.

<sup>67</sup>Jacob W. Kipp and Lester W. Grau, ~~Military Theory, Strategy and Praxis,~~” *Military Review* 91, no. 2 (2011): 16.

would suffice. Later, the policy of political independence drove a strategy that required offensive operations that could meet the British army on their own terms—a strategy that required a regular standing army.

An offensive or defensive strategy in turn influenced the particulars of operational employment. Before the decision for independence, General Artemas Ward commanded the forces surrounding the British in Boston. He sought to contain the British forces within Boston and repel any of their advances into the interior. He intended to threaten them indirectly by seizing and holding the key surrounding hills of Dorchester and Charlestown. Ward did not consider offensive action beyond the denial of terrain. In fact, he did not have the manpower to realistically accomplish an attack. He had to call in additional militia for the planned seizure of the Dorchester and Charlestown heights.<sup>68</sup> Ward's operational approach supported a defensive military strategy that nested with the political purpose of reconciliation. A military strategy that was defensive in posture gave the best opportunity for a quick negotiated peace. Unfortunately, the Continental Congress did not know that the King and Parliament were already determined to crush the "rebellion" through military force. In September 1774, King George III had already written, "blows must decide whether they are to be subject to this country or independent."<sup>69</sup>

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<sup>68</sup>Charles Martyn, *The Life of Artemas Ward: The First Commander-in-Chief of the American Revolution* Repr. of the 1921 edition (Cranbury, NJ: Scholar's Bookshelf, 2005), 102.

<sup>69</sup>King George III to Frederick North, Prime Minister quoted in Jeremy Black, *George III: America's Last King* (New Haven, CT: Yale University Press, 2006), 215.

In contrast, once General Washington assumed command, reflecting his personal penchant, he changed the operational approach to a preference for offensive action designed to expel the British forces from Boston. In September of 1775, General Washington wrote, “The State of Inactivity, in which this Army has lain for some Time, by no Means corresponds with my Wishes, by some decisive Stroke to relieve my Country . . . a Surprize did not appear to me wholly impracticable, though hazardous.”<sup>70</sup> Mirroring a growing political momentum in the Congress for independence, this approach significantly influenced the requirements of the artillery regiment.

To prepare for a defensive strategy, it was sufficient for the artillery regiment to cover the approaches of the enemy to their works and be prepared to repel any sortie or attack. They could continuously improve their existing platforms, embrasures and defensive works. To prepare for an offensive strategy, the regiment must arrange for moving ordnance into positions to facilitate a reduction of the enemy works, to support friendly assaulting forces, and providing harassing fires into the city. This required prodigious efforts such as finding suitable transportation animals, ammunition preparation and stockpiling, field carriage construction and detailed assault coordination planning with other arms.

Within this developing strategy, the artillery served a particular purpose within the larger ground force establishment; it had a specific role. The artillery provided crew-served direct firepower to the military engagement. The artillery piece provided the largest amount of firepower projected from a single weapon on the eighteenth-century

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<sup>70</sup>George Washington to John Hancock, 21 September 1775, *Papers of George Washington*, 2:28.

battlefield. Consequently, its role was both psychological and physical. Psychologically, the artillery provided a source of strength through its sound and explosive force. Often, the army protected the artillery at great peril. It also served as a rallying point for wavering forces. Physically, the artillery was the weapon of choice for defending or attacking during the siege. It had the physical force to batter down walls and could inflict significant damage on fortifications. Additionally, for a land force that wished to oppose ships at sea, artillery was the only weapon that could be effective at inflicting significant damage beyond musket range. In addition, in the direct fire engagement, the artillery firing canister at short range could decimate approaching enemy forces.<sup>71</sup> Consequently, soldiers of the 18th Century considered the artillery as a technical field. As such, armies paid artillerists different wages as the rest of the army. Their pay was often significantly higher than the infantry, which reflected a need for a higher degree of technical skill from its soldiers.

On the surface the mission for the artillery seems relatively simple, to provide firepower in the siege and in the battle. For the artillery commander, the dilemma often came in determining the priorities for the development of the organization in either of these directions. Leaders often rely on their backgrounds, training, learning and experience to set these priorities. Psychologists refer to these mental paradigms as “~~s~~chema.” Social psychologists have defined schema as a process of memory and “~~e~~conceptual structure” based on “~~s~~implified pattern recognition” which can ~~h~~ave the

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<sup>71</sup>B. P. Hughes, *Firepower: Weapons Effectiveness on the Battlefield, 1630-1850* (New York: Sarpedon, 1997), 40.

potential of instigating action.”<sup>72</sup> In short, schemas provide the mental framework in which leaders make decisions. In terms of the development of the Continental artillery, the personal histories or biographies of its potential leaders influenced its cultural development.

### The Impact of Leadership–Biographies and Schema

In regards to leadership, and its impact on the organizational culture of the artillery, the biographies of both Gridley and Knox are helpful in determining their personal schema and consequent organizational impact. Their previous military and life experiences certainly shaped their assumptions about war. It appears that Gridley’s military schema was largely experiential, in that it assumed action produced knowledge. This schema lent itself to making organizational decisions based on demonstrated technical proficiency and individual skill. With Knox however, it appears his schema was highly educational, in that it assumed study and reflection could produce and refine knowledge. This fell in line with increasing professionalization of the technical arms that existed in the British artillery and other European standing armies of the time.<sup>73</sup>

#### Richard Gridley

Richard Gridley’s military experience in America prior to the Revolution was broad. The nature of the four campaigns in which he participated shaped his personal

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<sup>72</sup>Roy G. D’Andrade, “Schemas and Motivation” in *Human Motives and Cultural Models*, ed. Roy D’Andrade and Claudia Strauss (New York: Cambridge University Press, 1992), 28-29.

<sup>73</sup>Christopher Duffy, *The Military Experience in the Age of Reason* (New York: Atheneum, 1988), 232-233; Armstrong Starkey, *War in the Age of Enlightenment, 1700-1789* (Westport, CT: Praeger, 2003), 54-55.

schema to favor provincial notions of military organization. Early in his life young Richard Gridley apprenticed to a wholesale merchant, his mathematical abilities soon distinguished him for a life as a surveyor and civil engineer. He studied the military arts of engineering through an association with John Henry Bastide, who in the first part of the eighteenth century, the British government employed to design the defensive fortifications around Boston. Military engineering in the 18th Century was the preserve of a highly educated sort. Its required knowledge consisted of arithmetic, applied geometry, building material strength, soil density, the science of fortification based on Vauban's geometric models, mechanics, hydraulics, drawing and surveying lines and the methods of employing artillery in the defense and attack of fortified places.<sup>74</sup>

In King George's War, Gridley served as second-in-command of Massachusetts provincial artillery in the expedition that captured Louisbourg in 1745. Gridley demonstrated his skill as a cartographic engineer by drawing a detailed map of Louisbourg. He published his map in Boston in 1746.<sup>75</sup> His map shows a thorough understanding of the distances between siege batteries, depth soundings of the harbor and detailed descriptions of fortification features highlighting vulnerabilities. His map evidences a mature set of engineering skills not only in the drawing itself but also in the wisdom underneath the ink.<sup>76</sup>

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<sup>74</sup>John Muller, *A Treatise containing the Elementary Part of Fortification* (1746; repr., Ottawa, Canada: Museum Restoration Service, 1968), 66; George Smith, "Engineer," in *A Universal Military Dictionary*, 1779; repr., 1969.

<sup>75</sup>"Gridley" in Edward Ross Frank, ed., *Dictionary of American Biography*, vol. 7 (New York: Scribner, 1937), 611.

<sup>76</sup>See Appendix D to view Gridley's map.

After Louisbourg, Gridley prepared Castle William in Boston Harbor for an expected French attack that never came. In the French and Indian War, he participated in William Shirley's Kennebec expedition, William Johnson's Crown Point expedition and Wolfe's Quebec campaign. In these campaigns, he supervised the construction of Fort Western and Fort Halifax in Maine, and Fort William Henry off Lake George in New York.<sup>77</sup> In all of these campaigns, he commanded provincial artillery forces, enlisted for the duration of the campaign with specific limitations on geographic employment and enjoyed a measure of tactical autonomy given to artillery in siege.

In 1756, Gridley became involved in an interesting dispute indicative of provincial military culture. The scenario that developed in the Crown Point expedition, in July and August of 1756, clearly demonstrated Gridley's preference for the autonomous operation of provincial forces and a general disinclination for cooperation with regular troops. He attached his name to, and was a voting member of a council of war that essentially refused to act against Crown Point if required to operate in conjunction with British Army regular units. Justification for this breach of orders was that in part, a contract governed the raising of the provincial troops, which was specific enough to outline the duration and basic plan of operations for the campaign. The result of a breach of this contract would be a dissolution of the greater part of the Army, and have a direct

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<sup>77</sup>Boatner, Mark Mayo, III. *Encyclopedia of the American Revolution* (New York: David McKay, 1976), 458; David T. Zabecki, "Gridley, Richard (1711-1796)," in *The American Revolution 1775-1783: An Encyclopedia*, vol 1, ed. Richard L. Blanco (New York: Garland Publishing, 1993), 702-4; Frank, 612; Aubrey Parkman, *Army Engineers in New England: The Military and Civil Work of the Corps of Engineers in New England, 1775-1975* (Waltham, MA: US Army Corps of Engineers, 1978), 1-3.

tendency to prevent the raising of any Provincial Troops for his Majesty's Service for the future."<sup>78</sup>

In short, prior to the American Revolution, Colonel Richard Gridley was an experienced and veteran artilleryman of four major campaigns against the French in America. In comparison with other leaders at the time of the American Revolution, he was the most experienced provincial artillery officer in the colonies. His skill as a military cartographer established his bona fides. His experiences were completely within the provincial context. He commanded only provincial forces. None of his experience included employing artillery on the battlefield and consisted of its command in the siege. Further, his military experience showed distaste for regular forces. His early success at Louisbourg cemented within his schema a confidence in the military efficacy of purely provincial forces. He carried that schema with him into the Revolutionary War.

### Henry Knox

Knox had very little military experience and at the beginning of the revolution was only 25 years old. However, circumstance threw the mantle of responsibility on Henry Knox early in his life. At the age of 50, his father William Knox died. Young Henry was 12 years old and gained a clerkship in a booksellers shop in Boston to earn a living for the family. During his clerkship at Wharton and Bowes, he used his free time to study history and military leadership. He was also popular among the Boston street gangs and participated in their ritual melees. He enjoyed fighting and soon developed a

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<sup>78</sup>Minutes of a Council of War, (Fort Edward) 22 July 1756, Transcribed from the Public Records Office, London, England America and West Indies Vol. 82 in the Francis Parkman Papers, Massachusetts Historical Society, Boston, 41:244.

reputation as ~~the~~ best fighter in the area.”<sup>79</sup> In contrast to his youthful aggressiveness, while at work inside the bookstore he developed acquaintances with influential Boston political leaders who noted him for his ~~in~~quisitive turn of mind.”<sup>80</sup>

This desire for learning, particular in the military arts, motivated him to join Adino Paddock’s Boston Artillery Company, the ~~Frain~~,” in 1768. The unit’s impressive display of artillery maneuver with two small brass guns during parades attracted him to the opportunity.<sup>81</sup> Elements of the 3rd Regiment Royal Artillery drilled the ~~Frain~~” while they wintered in Boston enroute to Quebec.<sup>82</sup> In the course of his instruction with the ~~Frain~~,” he discovered that he needed more knowledge in the sciences and mathematics to reach the mastery he sought. He began studying French, the language in which most artillery treatises were published. He regularly visited the Harvard College library to study those works. The bookstore also provided opportunities to consult military works.<sup>83</sup> When Knox opened his own bookstore in 1771, it rapidly became a social gathering place for Tory elites, especially British officers. Knox took advantage of the access to quiz them while they patronized his store.<sup>84</sup> In 1772, his ambition and his penchant for martial display induced him to co-found the ~~Boston Grenadier Corps~~” from elements of the

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<sup>79</sup>Mark Puls, *Henry Knox: Visionary General of the American Revolution* (New York: Palgrave MacMillan, 2008), 5.

<sup>80</sup>Ibid.

<sup>81</sup>Ibid., 5-6.

<sup>82</sup>Ibid., 6; North Callahan, *Henry Knox: General Washington’s General* (New York: A. S. Barnes, 1958), 19.

<sup>83</sup>Puls, 6.

<sup>84</sup>Ibid., 13.

–Frain.” Despite the name, the grenadiers trained on artillery drill and infantry maneuvers.<sup>85</sup>

Therefore, his early military experience was in the city militias of Boston and the British regular army artillery units that shaped them. These experiences piqued in Knox a keen interest in artillery, which he would diligently study and use to great effect later.<sup>86</sup> Judging from later sources it seems that Knox gathered his military knowledge largely from books. He was familiar with the best sources for military engineering and artillery of the time. He was conversant with authors such as Marchel de Saxe, John Muller, Guillame Le Blond, Bernard Forest de Belidor, J.C. Pleydell, Blaise Francois Pagan, Francis Holiday, Francois Blondel and the older works of Menno von Coehorn and Sebastien Le Prestre Vauban, both in English translation and in French.<sup>87</sup> His mastery of these subjects proved useful to him as a gentleman volunteer to the forces outside of Boston. Although not a formally educated engineer, the provincial forces employed him in the design and supervision of field fortifications. In July of 1775, Knox was enamored with the new direction General Washington pursued with the Army.<sup>88</sup> By September of

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<sup>85</sup>Ibid., 14.

<sup>86</sup>Callahan, 19.

<sup>87</sup>Letter of John Adams to Henry Knox, (Philadelphia), 11 November 1775, Robert J. Taylor, ed. *The Adams Papers: Papers of John Adams, Volume 3: May 1775-January 1776* (Cambridge: Harvard University Press, 1979), 286-287; Letter of Josiah Waters to Knox, (Windham), 16 February 1776, Henry Knox Papers, microfilm, Massachusetts Historical Society, reel 2; Knox to John Adams, 16 May 1776, *The Adams Papers*, 4:189-191; Joseph R. Riling, *The Art of Science of War in America, 1690-1800* (Alexandria Bay, NY: Museum Restoration Service, 1990), 11. The specific content of some of these works is discussed in detail in chapter 3.

<sup>88</sup>Henry Knox to Lucy Knox, 11 July 1775, in Drake, 19.

1775, Knox had made enough of an impression on the Commander-in-Chief to receive an invitation for him and his wife Lucy to dine with the General.<sup>89</sup>

The general congruence of their respective schemata is important to understand the reasoning behind General Washington's decision to replace Gridley with Knox. Washington's formative military experiences had been as an aide in Braddock's Monongahela campaign and perhaps more importantly as commander of the Virginia militia. Washington, ambitious of a British commission like his older brother, sought to transform the Virginia militia into an organization that closely resembled the British Army. During this time, he wrote to the Governor of Virginia about organizing and building a force "more after the British manner."<sup>90</sup> He sought out for his forces longer service, regular discipline, and sustained training. Washington despised comparisons with other "Provincials" and wrote, "We have been regularly Regimented and trained; and have done as regular Duty for upwards of 3 Years as any regiment in His Majesty's Service."<sup>91</sup> In short, Washington preferences toward regular establishments nicely aligned with the youthful Knox's predilections for open-minded learning and a general schema developed by encounters with the regular British artillery.

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<sup>89</sup>Knox Letter, 25 September 1775, Henry Knox Papers, Reel 1, Microfilm Collection United States Military Academy Library.

<sup>90</sup>Washington to Governor Dinwiddie, 16 April 1756, in Don Higginbotham, *George Washington and the American Military Tradition* (Athens, GA: University of Georgia Press, 1985), 20.

<sup>91</sup>Washington to Dinwiddie, 10 March 1757, in Higginbotham, *George Washington*, 22.

## Cultural Description

Having looked at the external influences on the early development of the organizational culture of the Continental artillery, we move to its cultural description. As taxonomy, a description of organizational values and assumptions is appropriate. This approach will describe the organizational culture of the Continental artillery from its least important layer, its artifacts, to its most important layer, its underlying assumptions.

### One Artifact of Artillery Culture—The Gun and its Metal

The most significant material cultural artifacts of the artillery regiment were the guns themselves. Long considered the prizes of battle, in the eighteenth century, the artillery piece among others was one symbol of victory. In after action narratives, commanders often listed the number of guns captured alongside battle standards or colors. Because of their relative immobility, in easy battlefield victories, defeated fleeing armies quickly abandoned the guns that became first prey to advancing armies. Marking tough eighteenth century battles were the ravenous melees over the guns, often trading sides more than once, each side determined to hold on to the artillery. Although it was not the only indicator, the capture of artillery was often a measure of the scale of battle success. Captured artillery served as a physical manifestation of a victory and in some cases contributed to the firepower of a victorious army. In short, the artillery and its ordnance symbolized victory or defeat.

In the 18th century, the metals used to manufacture artillery were iron and brass. As surface artifacts, they are ~~the~~ readily visible . . . and/or tangible products of the

organizational culture, from which the culture may be inferred.”<sup>92</sup> Iron ore and the charcoal necessary for iron manufacture were available in the colonies prior to the war. In 1775, a line of furnaces and forges extended from New Hampshire to South Carolina.<sup>93</sup> Merchants, soldiers and seafarers traded iron products on the open markets. Colonial iron production output accounted for approximately one seventh of the world’s pig and bar iron.<sup>94</sup> Despite the Iron Act which had precluded colonists from making finished iron products, local tradesmen had a working knowledge of how to cast and mould it.<sup>95</sup> As a military metal, colonial forces used it to construct the implements for wagons and carriages and almost exclusively as the substance for round shot cannon balls. The point is that it was a local commodity. Local artisans easily obtained and readily manipulated iron.

The artillery under Colonel Richard Gridley used primarily iron ordnance. This was largely attributable to the practicality of ordnance manufacture in America. As stated earlier, the colonies had a respectable though not continuous system of iron ordnance manufacture from the French and Indian War until the time of the American Revolution.<sup>96</sup> Richard Gridley’s military experience was in the use of iron cannons. In the

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<sup>92</sup>J. Steven Ott, *The Organizational Culture Perspective* (Pacific Grove, CA: Brooks-Cole, 1989), 25-26.

<sup>93</sup>Erna Risch, *Supplying Washington’s Army* (Washington, DC: Center of Military History, 1981), 359.

<sup>94</sup>Irene Neu, review of *A History of Metals in Colonial America*, by James A. Mulholland, *Journal of Economic History* 42, no. 2 (1982): 463.

<sup>95</sup>*Encyclopædia Britannica Online*, s.v. “Iron Act,” <http://www.britannica.com/EBchecked/topic/294367/Iron-Act> (accessed 23 May 2011).

<sup>96</sup>Bishop, 482-495.

Louisbourg campaign, his earliest and most influential direct combat experience, Gridley and the rest of the provincial forces primarily made use of iron guns. Many of the artillery pieces of the expedition were older naval pieces used for harbor and ship defense. At the time, naval and harbor defense batteries usually consisted of iron ordnance.<sup>97</sup> In fact, in 1772, Richard Gridley in partnership with Edmund Quincy started manufacturing implements from iron ore at Sharon, Massachusetts.<sup>98</sup> Contemporary correspondence suggests that Gridley's iron manufactory actually produced iron ordnance for the army.<sup>99</sup> Later in the war, in February and March of 1777, the Congress contracted Gridley to supply iron ordnance to the Continental Army.<sup>100</sup>

The ordnance itself as material artifact is the first place where we find significant differences in the regiment under Colonel Gridley and the preferences of Colonel Knox. Knox clearly preferred brass to iron. Before the war began, part of the reason why the Boston "Frain" enamored Knox was their use of small brass guns. Early on in the war, in

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<sup>97</sup>G.A. Rawlyk, *Yankees at Louisbourg* (Orono, ME: University of Maine Press, 1967), 90; see also the outline of the British 1765 Naval Ordnance Stores Regulation in Adrian B. Caruana, *The History of English Sea Ordnance. 1523-1875. Volume 2: 1715-1815, The Age of the System* (Rotherfield, England: Jean Boudinot, 1997), 228-232. In the narrative of the siege of Louisbourg authored by Pepperell and endorsed by Gridley, ordnance was referred to simply by the size of its shot and only by exception if it was brass. The rest were iron. William Pepperell, *An Accurate Journal and Account of the Proceedings of the New England Land Forces during Late the Expedition Against the French Settlements on Cape Breton, To the Time of the Surrender of Louisbourg* (London: A and S Brice, 1746), 21.

<sup>98</sup>Edmund Ross, *Dictionary of American Biography*, vol. 7 (New York: Scribner, 1937), 612.

<sup>99</sup>Edward W. Hanson, ed. *The Papers of Robert Treat Paine, Volume 3: 1774-1777* (Boston: Massachusetts Historical Society, 2005), 238.

<sup>100</sup>*Ibid.*, 353-4; 358-9.

November of 1775, Knox was already searching for proper foundries to cast brass ordnance for field pieces.<sup>101</sup> In February of 1776, Knox had already started to receive brass field pieces from the surrounding cities.<sup>102</sup> In June of 1776, Knox communicated his preference for brass ordnance to the Cannon Committee of the Continental congress, “Iron Howitzers are so unwieldy from their weight that they are entirely exploded in the British Army. A ten Inch will weigh 2.8.0.0, 8 Inch 1500, & 5[1/2] 1000, whereas a Brass 8 Inch will not weigh more than 450 or 500, 5[1/2] Inch 280 or 300. . . . If possible our field Artillery small mortars & Howitzers should be brass, our heavy mortars and Cannon, Iron.”<sup>103</sup>

Brass, sometimes called bronze, was an alloy requiring the combination of tin and copper at an approximate ration of one part tin to ten parts copper.<sup>104</sup> Tin deposits were unknown in the colonies before the war. A single attempt at copper mining proved unsuccessful.<sup>105</sup> Further, there were few smiths familiar with working the metals for

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<sup>101</sup>Philander D. Chase, ed. *The Papers of George Washington; Revolutionary War Series, Volume 2: September-December 1775* (Charlottesville, VA: University Press of Virginia, 1987), 434.

<sup>102</sup>Letter of the Town of Hartford to Henry Knox, signed by Benj. Payne, Saml Wadsworth and George Smith, 10 February 1776, Henry Knox Papers, microfilm, Massachusetts Historical Society, reel 2.

<sup>103</sup>Henry Knox to Robert Treat Paine, 24 June 1776, in *Papers of Robert Treat Paine*, 3:235-237.

<sup>104</sup>David Emanuel Musly, “A Treatise of Artillery,” manuscript 1760-1766, in *The Art of Gunfounding: The Casting of Bronze Cannon in the late 18th Century*, ed. Carel de Beer (Rotherfield, England: Jean Boudriot, 1991), 121.

<sup>105</sup>J. Leander Bishop, *A History of American Manufactures: From 1608 to 1860*. vol. 1, 3rd ed. (repr. 1966, New York: Augustus M. Kelly, 1869), 483.

domestic uses much less for military applications.<sup>106</sup> Despite the fact that there was a single brass metalworker business in Philadelphia from 1723-1759, contemporary correspondence indicates that there was only one manufacturer of brass cannon in the colonies at the time. It was in the city of New York.<sup>107</sup> Therefore, brass, as a metal, was associated with international trade.

Culturally, iron production was firmly rooted to the American soil from which it came. Iron cannon, often used in the manufacture of battering pieces of 24-pounder or larger, were reflective of older notions of the power of stationary fortified places. Further, iron was symbolic of existing colonial military manufactures. It represented the limited possibilities of provinces on the periphery of empire. On the other hand, brass was indicative of emerging notions of the power of mobility. Brass cannons represented maneuverability on campaign and the battlefield. Further, it was symbolic of new manufacturing possibilities with its corresponding faith in scientific achievement. It represented the aspirations of a growing independence from empire with links to the wider world. These artifacts reflected the cultural vantage point from which their organizations originated, iron with old and brass with the new. A glance at one cultural artifact enlightens us to the differences in the provincial spirit and professional ideals; a comparative look at the values of each organization can further illuminate the cultural landscape.

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<sup>106</sup>Thayer Tolles, "American Bronze Casting," in *Heilbrunn Timeline of Art History*, Metropolitan Museum of Art, 2000, [http://www.metmuseum.org/tomh/hd/abrc/hd\\_abrc.htm](http://www.metmuseum.org/tomh/hd/abrc/hd_abrc.htm).

<sup>107</sup>Henry Knox to George Washington, 27 November, *Washington Papers*, vol. 2, 434; Risch, 357. A brass cannon factory stood up during the war in Philadelphia. See Risch, 361; Bishop, 574.

## Values-in-use of the Continental Artillery

Like the army of 1775 and earlier colonial provincial forces, the “love of Freedom” motivated Gridley’s Regiment. They lashed out against the harsh discipline sought by regular forces and fought hard to maintain their individual freedoms.<sup>108</sup> Royster summarized well when he wrote, “The systematic thinking of the revolution . . . showed one how to restrain the army and justified one’s reluctance to strengthen it. The validity of the call to fight did not necessarily validate the call to build a powerful military institution.”<sup>109</sup> Short enlistments were a reaction against the fears of a long-term standing army and realistic fears of a weakened agricultural labor pool. One bombardier enlisted in the artillery Regiment for only eight months.<sup>110</sup> Short terms of service alleviated the fear of voluntary servitude that they thought accompanied longer enlistments.<sup>111</sup> Royster wrote, “The failure of the one-year enlistment caused revolutionaries special distress, because a central element in their definition of their army was voluntarism.”<sup>112</sup> Short-term soldiers made it difficult to impose effective discipline.

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<sup>108</sup>Charles Royster, *A Revolutionary People at War: The Continental Army & American Character, 1775-1783* (Chapel Hill, NC: University of North Carolina Press, 1986), 28.

<sup>109</sup>Ibid., 38.

<sup>110</sup>Joseph White, “An Narrative of Events, As They Occurred from Time to Time in the Revolutionary War,” *American Heritage* (June 1956):75. Sergeant Joseph White enlisted in Gridley’s Regiment for eight months as a Bombardier. He eventually became an assistant adjutant and orderly sergeant in the regiment. His narrative originally held at the National Archives is reprinted in *American Heritage*.

<sup>111</sup>Royster, 48.

<sup>112</sup>Ibid., 50.

Military discipline was lax in Gridley's Regiment. In fact, 21 of 24 entries for the artillery regimental orders from August through December of 1775 involve the convening or sentences of courts martial.<sup>113</sup> The regiment had particular problems with its corps of non-commissioned officers. Three of twenty-one entries involve courts martial for sergeants within the regiment. One of those was the Regimental Sergeant Major.<sup>114</sup> From 17 August 1775 through 3 January 1776, the orderly book records two instances of disobedience of orders, one of forging signature for rum, four for abusive (insolent) behavior to officers, one for firing guns contrary to orders, seven for absent from duty, two for drunk on duty, one for sleeping on duty, and one for desertion.<sup>115</sup> Gridley's discipline problems were not only with the enlisted soldiers of the regiment, several of his officers, including his two sons were recipients of courts martial as well. Four of five of the courts martial involving regimental officers were the result of the battle of Bunker Hill. The court martial of Lieutenant Randall resulted from him stabbing a soldier because of an insult. Although courts martial were common when officers tried to clear their reputations, these courts found guilty three officers, including one of Gridley's sons, and cashiered two more officers from service.<sup>116</sup> It is important to note that most of these courts martial occurred in the period shortly after Washington assumed command. They

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<sup>113</sup>Regimental Orders, Orderly Book of Adjutant Jeremiah Niles, volumes 1 and 2, *Papers of Jeremiah Niles*, Library of Congress, Washington, DC.

<sup>114</sup>Ibid.

<sup>115</sup>Ibid.

<sup>116</sup>General Orders, 7 July 1775 (John Callendar), in *Papers of George Washington*, 1:71; General Orders, 24 September 1775 (Scarborough Gridley), 11 October 1775 (Samuel Gridley), 13 October 1775 (Richard Woodward), and 17 October 1775 (Thomas Randall), in *Papers of George Washington*, 2:37, 140, 154, 181.

reflect his efforts to enforce regular discipline on a provincial force and are evidence of a significant culture clash. There were other challenges as well.

Upon the establishment of the Artillery Regiment, the Massachusetts Provincial Congress gave Colonel Gridley wide latitude in choosing his subordinate officers.<sup>117</sup> His method was to select an experienced second-in-command and rely upon family and patronage connections to fill out commissions.<sup>118</sup> In short, nepotism was a guiding factor in the determination of officer appointments in Gridley's Artillery Regiment. In his regiment as in earlier provincial forces, family members were trusted officers tied to the command through personal affections. With the weak command structures that existed in provincial forces, a commander needed reliable officers. Family members were often a good choice for subordinates because they already owed personal allegiances. Members of the same two families, Gridley and Burbeck, filled many of the top officer positions in the Regiment. Gridley appointed his sons to several positions in the Regiment. Gridley's son Major Scarborough Gridley was third in rank in the regiment and his other son Samuel commanded a company.

Massachusetts appointed William Burbeck, also a provincial veteran, second-in-command of the Regiment as lieutenant colonel. His sons occupied more positions within the Regiment. Edward was a captain and company commander, Henry was a lieutenant, Joseph and Thomas were both matrosses in the Regiment as well.<sup>119</sup> After the battle of

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<sup>117</sup>Orders and Resolutions of the Massachusetts Committee of Safety, 10 March 1775, in Peter Force, *American Archives*, 4th Series, vol. 2 (Washington, DC, 1853), 797.

<sup>118</sup>*Ibid.*, 1354.

<sup>119</sup>Note 16 in Jayne E. Triber, *A True Republican: The Life of Paul Revere* (Boston: University of Massachusetts Press, 1998), 236.

Bunker Hill, when the failures of the Regiment significantly jolted the Massachusetts Provincial Congress, they decided to curb Colonel Gridley's influence on officer appointments in an effort to appoint officers of merit. Colonel Gridley's reaction was obvious and direct; he threatened to resign if he did not have more control of the appointment of officers. He wrote,

But I find, gentlemen, my judgment in these matters is of little weight with you; it seems not necessary to consult me in it. Though I must have the trouble of teaching every one under me the knowledge necessary for the service, you have been pleased to revise the plan I gave you; that, no doubt, you have a right to do. But be assured, gentlemen, if I must have no judgment, and am not to be consulted in these matters, but must have persons transposed and imposed upon me without consulting me, I am determined I will withdraw myself from the Army, and will have nothing farther to do with it.<sup>120</sup>

Nepotism was a value-in-use in provincial artillery organizations.

The values of Knox's organization are in stark contrast. In regards to patronage, the record of Knox's Regiment presents some immediate contrasts. Patronage was a different idea than nepotism. Military patronage involved the involvement of political leaders in the preferment and promotion of military officers. While anathema today, in the 18th century it was a hallmark of standing forces. In fact, this patronage inspired fears of standing armies because it put soldiers at the disposal of their political masters, usually monarchs. Political patronage was certainly a part of the British political culture in the eighteenth century.<sup>121</sup> King George III exercised significant patronage in the appointment

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<sup>120</sup>Letter from Colonel Richard Gridley to the Massachusetts Provincial Congress, 3 July 1775, published in the Minutes of the Massachusetts Provincial Congress, 4 July 1775, in Force, *American Archives*, 4th Series, vol. 2, 1477-1478.

<sup>121</sup>A. N. Newman, "Communication: The Political Patronage of Frederick Lewis, Prince of Wales," *The Historical Journal* 1 (1958): 68-75.

and promotion of officers in the British Army.<sup>122</sup> In Europe and Britain, nobles claimed or wealthy individuals purchased officer commissions, both of which entitled an officer to a certain measure of patronage from senior officers.<sup>123</sup> The American provincial congresses and the Second Continental Congress played with patronage albeit by different rules. While neither commission by purchase or entitlement from nobility existed, political patronage was alive and well in America. Each provincial delegation sought the promotion of its own native sons to general officer rank. The Congress used General officer appointments to cement unified political action and mollify segments within the political establishments.<sup>124</sup> Of course, an eye toward military experience and expertise tempered this patronage. The “Baltimore resolution” declared the principles of general officer selection, “a due regard shall be had to the line of succession, the merit of the persons proposed, and the quota of troops raised, and to be raised, by each state.”<sup>125</sup> Early in the war at lower levels, state legislatures determined officer commissions and rank often through the personal connections and recommendations of regimental commanders.

The appointment of Knox to command of the Regiment had a significant impact on its officer leadership. Between June 1775 and June 1776, in one year, 8 out of 14, or 57 percent of the top officers in the Regiment changed, including three of the four of

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<sup>122</sup>Black, *George III*, 118.

<sup>123</sup>See Chapter 2, “The Officer Class” in Duffy, 35-88.

<sup>124</sup>Jonathan Rossie, *The Politics of Command in the American Revolution* (Syracuse, NY: Syracuse University Press, 1975), 12-16.

<sup>125</sup>Baltimore Resolution quoted in Higginbotham, *War of American Independence*, 90-91.

highest rank.<sup>126</sup> William Burbeck, remained second-in-command of the regiment for only six more months.<sup>127</sup> Henry Knox wrote to General Washington in April of 1776, “Lieutenant-Colonel Burbeck declined complying with your Excellency’s orders, alleging that the province had settled on him four shillings per day during life, after the war was over, which, if he went out of the province, he might perhaps lose.”<sup>128</sup> Burbeck subsequently remained in Massachusetts and never left the province. This failure to comply with Washington’s order indicates a strong leaning toward older provincial notions of service and the propensity for contractual military relationships within provincial structures. However, Knox owed his command largely to the patronage and influence of John Adams, delegate to the Continental Congress from Massachusetts. Adams recommended him for a position in the army as early as July of 1775.<sup>129</sup>

By late 1776, after Henry Knox was in command of the regiment, soldiers and political leaders began to realize the value of a longer-term standing army of their own.<sup>130</sup> Knox, and those like him, reacted to an internal need to integrate their forces when they realized the earlier values of rampant patriotism and fervent call to arms would not be

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<sup>126</sup>See Appendix C, Regimental Officers. Source information is found in Regimental Orders, Niles Orderly Book; Henry Knox Papers, Reel 2, microfilm USMA Library; Francis B. Heitman, *Historical Register of the Officers of the Continental Army* (Baltimore: Genealogical Publishing Company, 1967); Appendices A1, A3, and A4 in Birkhimer, 331-333; Wright, 53-54.

<sup>127</sup>Heitman, 133.

<sup>128</sup>Knox to Washington, 21 April 1776, in Drake, 26-27.

<sup>129</sup>Letter of John Adams to James Warren, 23 July 1775, in *The Adams Papers: Papers of John Adams, Volume 3: May 1775-January 1776*, ed. Robert J. Taylor, (Cambridge: Harvard University Press, 1979), 87.

<sup>130</sup>Royster, 37.

enough to ensure victory in the face of determined and disciplined British forces.<sup>131</sup> Lieutenant Shaw, in September of 1776, had realized the need to “meet the enemy on equal terms.” This young leader wished for a transformation of the artillery from one based on provincial levies to units solidified in longer terms of service and effective discipline.<sup>132</sup> By the middle of 1776, along with the rest of the army, Knox’s Artillery Regiment began to enlist soldiers for longer duration.<sup>133</sup> Lieutenant Shaw of Captain Foster’s artillery company, perceived a change in the atmosphere of the artillery with a change in its personnel whose enlistments were rapidly expiring. He wrote of the exodus of the soldiers of the “old army” and hope that “as soon as the *new army* is completed” that they would attempt an offensive operation against the British in Boston.<sup>134</sup> Of course, these changes would take time, but the attitudes had already changed.

Knox’s attitudes toward military discipline also contrasted with older provincial notions. In February of 1776, even the junior officers in the artillery were feeling the effects of a larger emphasis on duty and discipline. Lieutenant Shaw wrote: Our life in camp is confined. The officers are not allowed even to visit Cambridge, without leave from the commanding officer, and we are kept pretty closely to our duty. The drum beats at daybreak, when all hands turn out to man the lines. Here we stay till sunrise, and then all are marched off to prayers. We exercise twice a day, and every fourth day take our turn on guard.<sup>135</sup>

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<sup>131</sup>Ibid., 42.

<sup>132</sup>Samuel Shaw, 27 September 1776, in Josiah Quincy, ed., *The Journal of Major Samuel Shaw* (Boston: Crosby and Nichols, 1847), 21.

<sup>133</sup>Royster, 48.

<sup>134</sup>Samuel Shaw, 1 January 1776, in *The Journal of Major Samuel Shaw*, ed. Josiah Quincy (Boston: Crosby and Nichols, 1847), 7.

<sup>135</sup>Samuel Shaw, 14 February 1776, in *The Journal of Major Samuel Shaw*, ed. Josiah Quincy (Boston: Crosby and Nichols, 1847), 8.

By the time Knox took effective command in late January of 1776, discipline had improved considerably.<sup>136</sup>

### Basic Cultural Assumptions of the Continental Artillery

The provincial cultural tradition to which the artillery under Gridley belonged was distinct from earlier concepts of the militia and grew out of service in the shadow of British regulars. There were four basic assumptions that guided this organization. First, the spirit of volunteerism motivated soldiers to enlist. An individualism born of self-reliance and a protective nature emphasized the importance of protecting local communities. Second, in contrast to the shoulder-to-shoulder well-drilled tactical discipline exercised by regulars, Gridley's regiment relied upon natural ability and native courage in battle. Third, they believed in the particular suitability of provincial organization to the American theater. Short enlistments and local campaigns worked best in the colonies. This approach minimized disruption to family well-being and the

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<sup>136</sup>The Knox Papers, particularly reel 2 at the United States Military Academy Library, indicate no real discipline issues in Knox's Regiment after he assumed command. However, the differences in the nature of the sources should be considered and qualify this statement. The Orderly Book in the Niles Papers was an organizational document designed to represent the general concerns of the commander and to record the "orders" of the regiment and higher authorities. More specifically it was kept and maintained by the regimental Adjutant, whose primary concern was the administration of the unit, in which its legal aspects were a significant part. Therefore, it follows that an orderly book would record nearly every court martial that occurred. Contrastingly, the Knox Papers are really a collection of private and professional letters kept by Knox himself and transmitted through the years from his family. The nature of these papers is such that they would certainly not keep a detailed account of courts martial or any other discipline matter, unless it was of serious proportion. However, the lack of contradictory evidence in the Washington, R.T. Paine, or Adams Papers would seem to confirm the legitimacy of the statement.

agricultural economy. Fourth, consensus and a spirit of attenuated social distinction should inform the exercise of leadership.

However, while the battles of Lexington and Concord seemingly confirmed many of these notions, the battle of Bunker Hill severely challenged them. When it became evident that the conflict would last longer than expected, the spirit of volunteerism lessened requiring longer-term enlistments. Royster suggests that early on, during the “Rage Militaire,” in which Gridley’s Massachusetts Artillery Regiment was raised, Americans forces relied on their God-given or native courage to sustain them in battle.<sup>137</sup> Gridley, and provincial officers like him, harbored the assumption that provincial forces, like those at Louisbourg and Crown Point were essential to victory and particularly well suited to the type of warfare exercised in America.<sup>138</sup> This assumption mirrored the same wider cultural notion confirmed throughout the French and Indian war, particularly in the Braddock campaign. A common discourse suggested that homegrown military forces were best suited for American warfare.<sup>139</sup> However, recent experience disproved this assumption. The poor performance of the artillery at Bunker Hill shook this notion and created room for new concepts to emerge.

In this context, the assumption of lessened social distinctions also presented problems. One officer described an enlightening episode in which Colonel Gridley was seen carrying his own meal to his tent rather than having it delivered. When questioned

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<sup>137</sup>Royster, 27.

<sup>138</sup>Higginbotham, *The War of American Independence*, 64.

<sup>139</sup>Higginbotham, *George Washington and the American Military*, 9-10.

about it, Colonel Gridley replied that he was setting the right example for his officers.<sup>140</sup> Colonel Gridley's actions here were indicative of the provincial spirit whereby officers were more effective the closer they were socially to their men.

This example was in stark contrast to the expectation of senior officers to keep a genteel table.<sup>141</sup> In fact, commissaries distributed rations according to rank with officers allowed additional money for subsistence.<sup>142</sup> Even at Valley Forge where Washington sincerely felt for the hardships of the soldiers, he had a log cabin constructed outside of the house he rented for his headquarters to provide additional space for himself and his staff to take meals.<sup>143</sup> At Valley Forge, all officers lived separately from their soldiers and some higher-ranking officers lived in well-stocked homes away from camp.<sup>144</sup> The simple fact of the time is that officers often lived and ate separate from their soldiers. This was the cultural expectation of a professional army where the officer class was composed of gentlemen.<sup>145</sup> Indeed, this was the expected norm by both officers and soldiers in a professional force. When the British captured Ethan Allen with his men on Long Island, they offered him additional rations despite the shortage in order to keep up

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<sup>140</sup>Alexander Graydon cited in Christopher Ward, *The War of the Revolution*, vol. 1 (New York: MacMillan, 1952), 104

<sup>141</sup>Washington quoted in Cox, 224.

<sup>142</sup>Holly A. Mayer, *Belonging to the Army: Camp Followers and Community during the American Revolution* (Columbia, SC: University of South Carolina Press, 1996), 67-68.

<sup>143</sup>Ron Chernow, *Washington: A Life* (New York: Penguin, 2010), 324.

<sup>144</sup>Ferling, 276.

<sup>145</sup>Statement of Joseph Plumb Martin quoted in Cox, 52. See also Cox, 41, 72 for her discussion on the expectations of officers.

appearances.<sup>146</sup> In short, Gridley's approach was conciliatory and at the time must have appeared debasing and beneath the dignity of an officer to those who sought to emulate regular forces.

The regiment under Knox came to embody a different set of cultural assumptions. The artillery gradually transformed its guiding assumptions into those that relished the battlefield preeminence of a regular standing army, where soldiers enlisted for the duration of the war, and where officers were of merit and maintained social barriers while sharing hardships. Henry Knox would realize that the regiment needed to look more like the British and jettison the "leveling" flavor of a provincial force. He embraced Washington's professionalizing agenda where officers would distance themselves from their soldiers and enact exacting discipline, like a European regular army.

The underlying assumptions of the Continental artillery were fourfold. First, they required rigid subordination to authority. The regiment expected this discipline from soldier to officer and from officer to superiors. Second, there was an expectation of knowledge and competency. This equally applied to soldiers and officers. Regular training and education was required. Third, officers expected the opportunity to rise in rank and responsibility based on their merits. Ironically, and the source of turbulence especially in the officer corps, the fourth was an obsession with personal reputation as gentlemen of honor.<sup>147</sup>

Knox's most revealing statement comes from a letter to his brother William from Harlem Heights in September of 1776. He wrote:

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<sup>146</sup>Cox, 223.

<sup>147</sup>Chapter 4 of this study will go into some detail about this obsession.

We ought to have men of merit in the most extensive and unlimited sense of the word. Instead of which, the bulk of the officers of the army are a parcel of ignorant, stupid men, who might make tolerable soldiers, but [are] bad officers; and until Congress forms an establishment to induce men proper for the service, it is ten to one they will be beat till they are heartily tired of it. We ought to have academies, in which the whole theory of the art of war shall be taught, and every other encouragement possible given to draw persons into the army that may give a lustre to our arms. As the army now stands, it is only a receptacle for ragmuffins. You will observe I am chagrined, not more so than at any other times since I've been in the army; but many late affairs, of which I've been an eye-witness, have so totally sickened me, that unless some very different mode of conduct is observed in the formation of a new army, I shall not think myself obliged by either the laws of God or nature to risk my reputation on so cobweb a foundation.<sup>148</sup>

Knox's conception of a "new army" referred to a regular standing force on the British model with regimented discipline and an officer corps composed of gentlemen. This assumption would also be reflected into action when in 1778 through 1779, Knox established an artillery academy for the officers and soldiers of his regiment in cantonment at Pluckemin, New Jersey. Although the precise curriculum is unknown, Knox appointed a preceptor to lecture on the "Knowledge of their Profession" and mathematics and regarded the instruction as an "essential & necessary Branch of Science."<sup>149</sup> The architecture of the Academy reserved the place of honor for the Lecture Hall, which dominated both courtyards while the line of academy buildings occupied the center of the encampment.<sup>150</sup> He also wrote in September of 1776 with several clear ideas

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<sup>148</sup>Knox Letter, 23 September 1776, in Drake, 31-32.

<sup>149</sup>Regimental Orderly Book 3: 23 February 1779, quoted in John Lewis Seidel, "The Archaeology of the American Revolution, A Reappraisal & Case Study at the Continental Artillery Cantonment of 1778-1779, Pluckemin, New Jersey" (PhD Dissertation, University of Pennsylvania, 1987), 213.

<sup>150</sup>See the Lillie drawing of the Cantonment (Figure 8) and the structural references to that drawing (figure 9) in Seidel, 178, 182-183.

on the direction of the artillery, specifically he mentioned, ~~as~~ Officers can never act with Confidence until they are Masters of their profession, an Academy establish'd on a liberal plan would be of the utmost service to america. Where the whole Theory and practice of Fortification and Gunnery should be taught; to be nearly on the same plan as that at Woolwich."<sup>151</sup> Woolwich was the academy for training British artillery and engineer officers.

In summary, the cultures of the artillery Regiment under Gridley and the same regiment under Knox began to change under the influence of leadership schemata, strategies, and the wider environment. A comparison of its artifacts, values and assumptions shows this cultural shift. The most evident differences were in a movement from provincial officer attitudes and notions toward a more professional tone, a change in overall preparatory outlook, a realization of the necessity to meet the British on their own terms, and differing emphasis on military discipline and theoretical knowledge.

### Conclusion

General Washington's decision to replace Colonel Richard Gridley with Colonel Henry Knox initiated a cultural transformation in America's first Artillery Regiment. The organizational culture began to move away from previous provincial assumptions and moved toward the potentials of a regular standing army. In the mind of military leaders, this shift was important to bring about a decisive effect by facing the British on their own terms. Over time, this shift allowed the artillery arm to increase its battlefield effectiveness and ability to support the aims of the larger army. Of course, the American

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<sup>151</sup>Knox's entire ~~h~~ints on the improvement of the Artillery" are transcribed in full in Appendix II of Seidel, 738-741.

artillery would not reach its zenith until the battle of Monmouth Courthouse and the eventual victory at Yorktown. Hopefully, this chapter has helped to elucidate the story of the cultural change in the artillery and serve as a needed corrective to the study of the organization throughout the war.

## CHAPTER 3

### ESSAYS AND TREATISES: BOOKS AND THE DEVELOPMENT OF DOCTRINE IN THE CONTINENTAL ARTILLERY, THEORY AND PRACTICE

Understanding military organizations requires an understanding of their doctrine. Professional forces normally codify doctrine through the publication of works that outline the standards of military behavior and specify the norms or rules that govern that behavior. Although it was a term not in use during the 18th century, doctrine was published in books. In the budding Continental artillery, officials had neither the time nor experience to write their own military treatises. However, there were existing texts that provided information on artillery practice in Europe. Although not the exclusive sources of doctrine, these texts influenced the development of the Continental artillery over time.

In describing the education of French artillery officers, Holliday, author of the English work *Practical Gunnery* wrote, that they were “taught and furnished with Books and Instruments, explained with a Variety of Experiments, and thereby Practice and Theory go hand in hand, and receive mutual assistance from each other.”<sup>152</sup> Holliday’s book was one of several that Henry Knox, commander of the Continental artillery in the American Revolution, recommended to John Adams for instruction on the art of gunnery.

Current U.S. Army manuals describe the role of doctrine as “a body of thought on how . . . forces intend to operate.” It acts as “a guide to action, not a set of fixed rules.” It seeks to create “a common frame of reference including tools that . . . leaders use to solve

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<sup>152</sup>F. Holliday, *An Easy Introduction to Practical Gunnery, or The Art of Engineering* (London: W. Innys and J. Richardson, 1756), viii.

military problems.”<sup>153</sup> Further, it consists of “fundamental principles” and “is authoritative but requires judgment in application.”<sup>154</sup> Modern doctrine writers codify it into military publications that serve as the basis for understanding training and operations of military forces. U.S. military schools and units teach and train doctrine as part of professional education.

In the 18th century, “doctrine” in the modern sense did not exist. However, there were available publications that served similar functions. The origin of the Latin word “doctrine” is religious. It refers to a system or set of beliefs that people learn.<sup>155</sup> In this military context, doctrine is the system of beliefs about how armies should fight. It is normative; its principles prescribe how an army should behave. Some scholars date the development of military doctrine with the rise of Moltke in the mid-nineteenth century.<sup>156</sup> Others place it firmly in the mid-eighteenth century with Frederick the Great’s *Instructions* and the publishing of books on drill and maneuvers.<sup>157</sup> The term “doctrine” was not in military use in the 18th century. Smith’s *Universal Military Dictionary* does

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<sup>153</sup>U.S. Department of the Army, Training and Doctrine Command, FM 3-0, *Operations* (Washington, DC: Government Printing Office, 2008), D-1.

<sup>154</sup>U.S. Department of the Army, Training and Doctrine Command, FM 1-02, *Operational Terms and Graphics* (Washington, DC: Government Printing Office, 2004), 1-65.

<sup>155</sup>*Compact Oxford English Dictionary*, 2nd ed., s.v. “doctrine”; *Webster’s Collegiate Dictionary*, 4th ed., s.v. “doctrine.”

<sup>156</sup>Eliot A. Cohen, “Doctrine,” in *The Reader’s Companion to Military History*, ed. Robert Cowley and Geoffrey Parker (Boston: Houghton Mifflin, 1996), 138.

<sup>157</sup>Daniel Moran, “Doctrine, Military,” in *The Oxford Companion to Military History*, ed. Richard Holmes (Oxford: Oxford University Press, 2001), 262; Roger Spiller, “Doctrine, Military,” in *The Oxford Companion to American Military History*, ed. John Whiteclay Chambers, II (Oxford: Oxford University Press, 1999), 232.

not have it as an entry.<sup>158</sup> Nevertheless, military authorities published doctrine in the regulations of the British Army and taught it in the curriculums of Woolwich and the regimental artillery schools in France at Metz, La Fere, Strasbourg and Grenoble.

This chapter, somewhat mirroring the work of Ira Gruber and heavily borrowing from the work of Sandra Powers, looks specifically at the impact of doctrine, as represented in books, on the actual battlefield behavior of one specific military branch in the American Revolution, the artillery.<sup>159</sup> In order to limit its scope, this inquiry favors the battlefield doctrine, artillery field tactics, rather than the siege or manufacture. This method analyzes extant theory and compares it to tactics-in-use, forming a theory and practice approach. An examination of the contents of several of 18th century books forms the basis for understanding their impact on doctrinal development. How did these books impact individual and collective behavior? This chapter analyzes doctrine “normatively,” as suggested by books, and “positively,” as described by its practice.

The kernel of an emerging doctrine existed in books. However, these kernels gradually took hold as doctrine in less formal ways. Caroline Cox wrote that there is little proof that many American officers read books; “it is unlikely that military texts were reaching more than a small minority of officers.” Further, and perhaps as important, she

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<sup>158</sup>George Smith, *An Universal Military Dictionary* (London: J. Millan, 1779; repr., Ottawa, Ontario: Museum Restoration Service, 1969).

<sup>159</sup>Ira D. Gruber, *Books and the British Army in the Age of the American Revolution* (Chapel Hill, NC: University of North Carolina Press, 2010), 3-53; Ira D. Gruber, “British Strategy: The Theory and Practice of Eighteenth-Century Warfare,” in *Reconsiderations on the Revolutionary War*, ed. Don Higginbotham. Westport, CT: Greenwood Press, 1978; Sandra L. Powers, “Studying the Art of War: Military Books Known to American Officers and Their French Counterparts During the Second Half of the Eighteenth Century,” *The Journal of Military History* 70, no. 3 (2006): 789-800.

speculates that reading books would not have made much of a difference. “Reading about army life wasn’t going to train the army. Rather, living the army life would have to do it.”<sup>160</sup> A. R. Hall related for the seventeenth century, although the science of gunnery had advanced, the practical use of artillery had changed very little from the sixteenth century.<sup>161</sup> Gunners, as those who physically handled the artillery piece, and were responsible for its battlefield employment, largely relied on their experience and hands on training to guide them. The nature of the books themselves shaped their influence. Many were theoretical, scientific or mathematical while others were more practical or “how-to” type manuals. What did the books of the period proscribe for the artillery in battle?

#### The Normative–Eighteenth Century Books on Artillery

The best place to find artillery doctrine for the Continental Army is in Knox’s corpus. His detailed suggestions to John Adams on military literature give us an important insight into the mind of the commander of the Continental artillery from 1775 through the end of the war. Writing to John Adams upon inquiry, Knox details,

The officers of the army are very difficient in Books upon the military art which does not arise from their disinclination to read but the impossibility of procuring the Books in America; something has been done to remedy this at Philadelphia and I hope they will not stop short. There are a variety of Books translated into English which would be of great Service but none more so than the great Marechal Saxe “who stalks a God in war.” Tis he who has done more towards reducing war to fix’d principles than perhaps any other man of the age. Indeed his Reflections on the propagation of the human Species are odd and whimsical, as they without hesitation put to death all the fine feelings of the human heart.

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<sup>160</sup>Caroline Cox, *A Proper Sense of Honor: Service and Sacrifice in George Washington’s Army* (Chapel Hill, NC: University of North Carolina Press, 2004), 44.

<sup>161</sup>A. R. Hall, *Ballistics in the Seventeenth Century* (Cambridge: Cambridge University Press, 1952), 2; Henry J. Webb, *Elizabethan Military Science: The Books and the Practice* (Madison, WI: University of Wisconsin Press, 1965), 147.

Mullers Artillery and Hollidays principles on Gunnery Monsr. Clariac Mullers and Pleydells field fortification are Books so necessary for a people struggling for Liberty and Empire, that they well merit the attention of even your respectable assembly of patriots. They are too expensive for a private undertaking. There are other Books some translated and others in French which tho' they are more Scientific will be in some future period essentially necessary. Vauban Coehorn, Blondell, Count Pagan, and Belidor treating on fortification and military mathematics in all their Branches. Mr. Muller an Englishman has compil'd principally from the above, two Books, which if printed would be of vast service, his Elements of Fortification and his Practical Fortification.<sup>162</sup>

Informed by the recent experiences of Bunker's Hill and Boston, this correspondence emphasizes the importance of knowledge in fortification and siege craft. In fact, Holliday's *Practical Gunnery* is concerned almost exclusively with the mathematics of ballistics and gunnery. Belidor's *Le Bombardier Francais* consists of details on the use of mortars and "bombes" or exploding shells. Clairac's *Field Engineer* goes deep into a discussion on field fortification. Specifically, he mentions the types of forts best defended by musketry, and when cannon are necessary their defense.<sup>163</sup> Pleydell's *Field Fortification*, a work of dubious authorship, speaks specifically to infantry officers to acquaint them with hasty fortifications and their general use.<sup>164</sup> None of these works deals with authority on the use of artillery on the battlefield.

Of the books in Knox's corpus regarding artillery battlefield tactics, Saxe and Muller are the most important. Saxe's works seem to shape Knox's overall understanding of war and Muller treats directly with the artillery arm. To this collection, we might add

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<sup>162</sup>From Henry Knox to John Adams, (New York) 16 May 1776, in *The Adams Papers: Papers of John Adams, Volume 4: February-August 1776*, ed. Robert J. Taylor (Cambridge: Harvard University Press, 1979), 189-191.

<sup>163</sup>Chevalier de Clariac, *Field Engineer*, trans. Lewis Nicola (Philadelphia: Aitken, 1776), 28-30.

<sup>164</sup>J. C. Pleydell, *An Essay on Field Fortification* (London: J. Nourse, 1768), v-xii.

several other works known to be specifically influential. Another work known to be available to both French and Continental officers was Le Blond's *Treatise on Artillery*.<sup>165</sup> George Washington's recommendations included such works as Bland's *Treatise* and De Crisse's *Essay*.<sup>166</sup> One particularly American work must also be included, Steuben's *Regulations*.

In order to determine the normative theory of artillery in battle, an examination of the content of each of these works is necessary. Saxe, Bland, De Crisse, and Steuben, although not works specific to the artillery, provide explanations of the greater art of war and can speak to the understanding of army commanders on the employment of artillery in battle. Muller's work was the most influential.

#### Muller

The initial portions of Muller's work describe at length the mathematics of gunnery, borrowing from the work of Benjamin Robins and others. Interestingly, Muller took only two and a half pages to describe the tactics for use of artillery in battle.<sup>167</sup> He lists this advice under the heading "The service of ARTILLERY in a land engagement."<sup>168</sup> In these pages, he described several basic methods and modes.

First, Muller described the most common understanding of artillery in battle, that of positioning. In fact, commanders used guns of position on most battlefields as early as

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<sup>165</sup>Powers, 785-788, 790, 806.

<sup>166</sup>Ibid., 792.

<sup>167</sup>John Muller, *A Treatise of Artillery*, 2nd ed. (London: J. Millan, 1768), 160-163.

<sup>168</sup>Ibid., 160.

the 16th Century. Muller proposed that guns of position occupy ~~some~~ rising ground before, and at the sides of the first line, where the enemy is supposed to make the greatest effort.”<sup>169</sup> This approach required the artillery commander to use his eye for the ground to select the best terrain for his artillery and divine the intentions of the enemy commander to determine his point of attack in order to position his guns at the most advantageous point. This tactic scored two basic assumptions of Muller on artillery in battle, that it will be primarily defensive and that once positioned the artillery will not move.

Second, Muller related the actual service of the individual piece in battle. Each time the piece fired it rolled back on its wheels several feet from its original position. This necessitated the crew to manhandle the piece back to where it was before firing. In addition, in older pieces, those used in Britain prior to Muller’s writing, there was a wedge, called a quoin, which gunners placed under the breech end of the barrel that imparted an elevation on the cannon. After each firing, the quoin would often fall off the carriage due to the recoil. These two occurrences made it quite difficult for the gunner to make sighted corrections, as he had to reset the piece as accurately as he could after each firing. Muller mentioned the use of screws in place of the quoin or wedge. This gave the advantage of eliminating one of these nuisances.

Third, Muller described the switching of ammunition based on range and target. Ball shot was the primary ammunition, but he did not describe the specific range for the use of ~~grape shot,~~” he wrote that gunners should employ it ~~when the enemy comes near.~~” Also, he recommended the use of howitzers with shells against enemy cavalry and infantry formations firing ~~obliquely upon the enemy’s line~~” which when combined with

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<sup>169</sup>Ibid.

the psychological effect of explosive shells rolling on the ground would create ~~a~~ great disorder . . . among them.”<sup>170</sup>

Fourth, Muller expressed measures for ensuring the safety of the cannon and crew. Specifically, he recommended a removal of the residue of spent cartridges in the chamber of the cannon by means of a sponge spring that would simultaneously wet and remove the spent cartridges after firing. The cartridges had a tendency to remain burning at the bottom of the chamber and when loading another could inadvertently cause the cannon to fire, often a deadly effect to the crew, especially the loader.<sup>171</sup>

Fifth, he related the positioning of the powder carts. He recommended that on the field, they be close to the guns themselves to make it easier to find for the crewmembers. Lastly, almost in passing, he mentioned the use of ~~two~~ field pieces” in ~~every~~ battalion.” In this last comment, he described the common British practice of placing two light cannon with each infantry battalion.

Thus, Muller laid the foundation for Continental artillery tactics. However, he mentioned two of the most important tactical employment concepts almost as afterthought. These concepts were the use of light cannon as ~~battalion~~ guns” and the common tactic of employing artillery to fire ~~obliquely~~” or enfilade. He mentions these as sub-ideas to statements that are relatively secondary, the first in the midst of a discussion about the placement of powder wagons and the second in an exposition on the use of ammunition. The British army used Muller’s work and many of its artillery

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<sup>170</sup>Ibid., 161-2.

<sup>171</sup>Ibid., 162.

officers studied him at Woolwich. Muller was not the only artillery work that significantly influenced officers.

### Le Blond

Le Blond's *A Treatise of Artillery* was also accessible and influential. This English translation is in fact the first part of Le Blond's larger three-volume work entitled *The Elements of War*. It appears that Le Blond structured this work to be accessible to French officers. Written with language that specifically avoided technical abstractions, the English translation introduction makes clear the intended audience, "young gentlemen in the French armies."<sup>172</sup> His work appears to have significantly influenced British officers as well.<sup>173</sup>

In regards to tactics, unlike most other period works on the artillery, Le Blond forgoes the discussion on the mathematics of gunnery and focuses instead on the interaction between the cannon and its powder, the service of the mortar and descriptions of other types of artillery to include the "obus" or howitzer. Interestingly, he does include sections on "pointing," "different ranges" and " ricochet." Also unlike Muller, Le Blond spends a very small portion of his work on the construction of carriages and their types. For the employment of artillery in battle, Le Blond concentrates on the service of the piece. Perhaps the intended audience was the commander of the gun, the advice on ranging and aiming seem particularly pertinent to that level. To address the most

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<sup>172</sup>Guillaume Le Blond, *A Treatise of Artillery*, trans. Unknown (London: E. Cave, 1746; repr., Ottawa, Ontario: Museum Restoration Service, 1970), first page of the introduction.

<sup>173</sup>Gruber's study counts 24 percent of British officer's libraries contained works by Le Blond. See Gruber, *Books and the British Army*, 282.

interesting discussion in the work on tactical employment—ricochet,” Le Blond couches this discussion within the context of the siege. He gives correct attribution for the tactic to Vauban, the French master of the siege, and mentions its use in the Siege of Aeth. Le Blond wrote:

To fire a piece by way of the ricochet, is only to charge the cannon with no more powder than is sufficient to carry the bullet along the face of the works attacked. The bullet discharged in this manner goes rolling and bounding, killing and maiming all it meets in its course, and creates much more disorder by going thus slowly along, than it could if thrown from the piece with great violence and speed.<sup>174</sup>

Also interesting is Le Blond’s mention of the “obus” or howitzer. It is only a brief description. He referred to it as a “kind of mortar” which is “used to throw bombs into the platform of a bastion, or the middle of a party of men.”<sup>175</sup> Le Blond advocated the specific targeting of personnel with the howitzer, but again in the context of the siege.

Adding to Muller’s concepts of battalion guns and enfilade firing, Le Blond introduced the important tactical concept of ricochet and added further clarity to effective targeting or “pointing” the piece in battle. By the time of the American Revolution, gunners were familiar with the ricochet tactic in the field. Frederick’s gunners used mortars on the field at Rossbach to effect with improvised ricochet fire. His artillerymen mounted the mortars on specially constructed carriages that allowed for a lower angle fire from the mortars. In this instance, Frederick’s gunners used them in a similar role to

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<sup>174</sup>Ibid., 23.

<sup>175</sup>Ibid., 61.

howitzers.<sup>176</sup> Muller and Le Blond established some fundamentals of artillery tactics, however, some other books on the “art of war” added to this foundation.

### Saxe

Saxe’s *Reveries* is an exposition on the “art of war” and seeks to find its “principles.” In this way, it was an attempt to understand war in its fullness. Saxe addresses it to general officers at the level of the “sublime.”<sup>177</sup> In regards to artillery, Saxe makes implicit a specific dichotomy in the artillery for siege and the artillery for battle. In the latter, he recommends lightweight cannon of his own design, called an *amusette*. The important point to deduce from his discussion of these cannon is their lightness, the fact that they need only two or three men to serve them.<sup>178</sup> The use of lightweight cannon was not novel. Gustavus Adolphus used light guns to effect at Breitenfeld.

He details one *amusette* to each “century” of the legion, essentially one per approximately 150 men, a much higher ratio or proportion than other works advocate. He

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<sup>176</sup>Smith, *Universal Military Dictionary*, 226.

<sup>177</sup>Maurice de Saxe, Field Marshal, Count. *Reveries or Memoirs on the Art of War*, translated from French, Anonymous (London: J. Nourse, 1757), dedication and preface.

<sup>178</sup>By *amusette*, Saxe is referring to a lightweight piece fired a roughly one pound iron ball, or a 1-pounder. These guns were akin to “swivel guns” that were mounted on vertical axles that allowed for easy traverse on fortifications. As such, they could weigh not much more than one hundred pounds. If mounted on field carriages they could be easily maneuvered with a crew of two or three. Manucy wrote, “Gustavus saw the need for mobility, so he divorced anything heavier than a 12-pounder from his field artillery. His famous ‘leatheren’ gun was so light that it could be drawn and served by two men.” Albert Manucy, *Artillery through the Ages* (Washington, DC: Government Printing Office, 1949), 9.

envisioned these pieces performing a role in close support of the infantry, advancing with them on the attack and advancing in front of the infantry line to harass an approaching enemy force. He places them under the care, supervision and command of a “captain-at-arms” whose sole responsibility is the employment of the *amulette*. Soldiers drawn from the infantry would serve these small cannons, and therefore be a part of the infantry’s formal organization.<sup>179</sup> He wrote, “the sixteen [amulettes] belonging to a legion planted together in an engagement, will be sufficient to silence any battery of the enemy in an instant.”<sup>180</sup> Saxe was advocating, for the purposes of counter-battery fire, the massing of field pieces in a firing unit of sixteen pieces.

Most artillery officers did not take Saxe’s specific suggestions on army organization seriously. These concepts did not take the form of outright procedures but were part of a theoretical argument for a general reorganization of military forces. Nevertheless, he did introduce the importance of artillery maneuverability on the battlefield, particularly in the offense. He also made explicit the common understanding that the weight of artillery pieces determined their function, either in the siege or in the field. The most important tactical concept he highlighted was the massing of guns, under the army commander, to achieve multiplied effects. Saxe was a bit ahead of his time for advocating massed artillery on the battlefield. It took thirty more years for the concept to come to full fruition under Du Teil.<sup>181</sup>

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<sup>179</sup>Ibid., 39, 77.

<sup>180</sup>Ibid., 39.

<sup>181</sup>Jean Du Teil, *De l’usage de l’artillerie nouvelle dans le guerre campagne* (Metz: Marchal Librairie, 1778).

## Bland

Bland's *Military Discipline* had a specific intent; "From the great Reputation of the British Arms, Men would be apt to imagine, that Several Treatises of the Art of War, were to be met with in our Language; but when they come to enquire, they will be strangely surprized to find nothing of this Kind of our Native Growth."<sup>182</sup> The book's intended audience was, "young officers, for whose Sake chiefly this book is published . . . for the Instruction of those yet to learn."<sup>183</sup> Therefore, the purpose of Bland's was an English language book on the art of war for the education of British officers as a whole. Consequently, the majority of the book concerns itself with the drill and operation of an army in its constituent parts.

Bland largely confines his discussion of artillery to the siege and to the march. Interestingly, he highlights the ceremonial and signaling role of the branch as well. He spends considerable space describing the role of the artillery in the "feu de joye" or celebration.<sup>184</sup> While a respecter of the effects of artillery in battle, he gives very little specific instruction for its use on the battlefield reserving comments instead for its provision in camp and on the march.<sup>185</sup> He is however specific about the organizational relationship of the branch to the army. Specifically, it had a special relationship as a "separate" corps answerable to the commander-in-chief. "Tho' the Train attends on the

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<sup>182</sup>Humphrey Bland, *A Treatise of Military Discipline*, 6th ed. (London: Buckley, 1746), Preface.

<sup>183</sup>Ibid.

<sup>184</sup>Ibid., 88-89.

<sup>185</sup>Ibid., 139, 206, 213, 236.

Army, yet it is a separate and distinct Body, under the Direction of their own Officers, and Independent of every General in the Army, but the Commander in Chief; (always understanding by Commander in Chief, the Officer commanding in Chief a Body of Men with whom they shall be Detached) whose Orders they receive.”<sup>186</sup>

Therefore, Bland’s unique contribution to artillery tactics was the exposition of another common practice, the relationship of the artillery to the commander-in-chief of the army. He signaled the importance of an artillery chief within each army whose primary role was to advise the commander on artillery employment and to administer the artillery corps of the army.

#### De Crisse

De Crisse, like other “art of war” works, expounds largely on the responsibilities of the army commander in the disposition, readiness and conduct of the army on campaign. After this lengthy discussion, the author then moves on to the hypothetical discussion of armies in “battles.” In describing the “Third Disposition,” De Crisse proposes a hypothetical enemy army posted in strong defensive positions supported on both flanks. In this, he shows the enemy artillery as entrenched with the infantry within a town. He also describes “five pieces of cannon, in order to flank the troops intending to attack the town.”<sup>187</sup> Also, “the whole front of the army lined with artillery.”<sup>188</sup>

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<sup>186</sup>Ibid., 254.

<sup>187</sup>Turpin de Crisse, *Essay on the Art of War*, vol. 1, translated by Joseph Otway (London: Hamilton, 1761), 293.

<sup>188</sup>Ibid., 294.

While in the defense, De Cresse recommended several proper tactical dispositions of artillery. First, commanders should support entrenched infantry positions with artillery. Second, the commander should design his artillery dispositions to enfilade an approaching enemy. Third, the commander should disperse his artillery throughout the formation to provide general fire support to the infantry.

In describing a hypothetical attack, De Cresse, in this “Third Disposition” espouses several interesting concepts for the use of artillery in battle. The most obvious is the use of artillery posted between attacking columns of infantry. This provided the frontal firepower lacking in a columned attack of reduced frontage. Here we can see that De Cresse recommended in the attack the use of artillery to augment the reduced firepower of the infantry column and brigaded artillery as a diversion in the secondary attack effort.

In the “Fourth Disposition” in which the enemy army inhabits an extremely strong defensive position, De Cresse advocates that the attacking army should have the “artillery distributed between the intervals of each brigade.”<sup>189</sup> De Cresse also sees “brigaded” artillery as essential to the cover of the Army’s retreat. “a brigade of artillery should be distributed among the intervals of each column, and keep up a constant fire. After firing the cannon should be loaded again, and retreat in such a manner, as always to preserve the intervals of the columns: if it does not retire at the same time as the columns, it will be in great danger of being taken.”<sup>190</sup>

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<sup>189</sup>Ibid., 300.

<sup>190</sup>Ibid., 91.

De Cresse's work adds to the tactical repertoire. He differentiated between artillery use in the offense and defense. In both, he clearly articulated artillery as a supporting arm to the infantry. He echoes the importance of enfilade fire, especially in the defense. He recommended dispersal throughout the formation and concentrated for tactical offense, particularly when the infantry is in column. He mentions the concept of "brigaded" artillery. This concept was a form of concentrating field guns from the intervals of companies to the intervals of battalions and brigades. This had the advantage of massing firepower into elements of four or more guns under the direction of a brigade, "division" or "wing" commander. Having examined the influential European works that informed Continental artillery tactics, the Continental Army did publish its own books midway through the war.

#### Steuben

No examination of doctrinal development during the American Revolution is complete without considering Frederick William Baron von Steuben's drill instructions. With von Steuben as author, the army formulated and later printed it at Valley Forge. Although primarily a text for the maneuver and drill of infantry formations, Steuben's work does at least mention the artillery, which he called "Field Pieces." Steuben wrote:

CHAPTER XII. *Of the Disposition of the Field-Pieces attached to the Brigades.* The field-pieces attached to the different brigades must always remain with them, encamping on their right, unless the quartermaster general thinks proper to place them on any advantageous ground in front. When the army marches by the right, the field-pieces must march at the head of their respective brigades; when it marches by the left, they follow in the rear, unless circumstances determine the general order otherwise; but, whether they march in front, centre or rear of their brigades, they must always march between the battalions, and never between the platoons. In manoeuvring they must also follow their brigades, performing the manoeuvres and evolutions with them; observing that, when the close column is formed, they must always proceed to the flank of the column opposed to that side

of their brigade is to display to; and on the column's displaying, they follow the first division of their brigade; and when that halts and forms, the field-pieces immediately take their posts on its right.<sup>191</sup>

Of particular interest is the divergence of Continental artillery practice from the British. The British Army used their "field-pieces" in the role of "battalion guns." That meant that the field pieces of the Royal Artillery served within the formations of infantry battalions, often in the intervals of companies.<sup>192</sup> In the Continental Army, as detailed in Steuben's manual, the artillery positioned itself within the Brigade formations, a significant difference in employment.<sup>193</sup> The British practice resulted in more dispersal, while the Continental practice resulted in more mass. The orders of battle in the Trenton, Brandywine and Monmouth campaigns clearly show the Continental disposition to brigades. While both Armies diverged from these practices at times, they did show a general trend toward these differences in disposition.

From the above works, an artillery battlefield doctrine emerges. First, organizationally, the commander had the option to employ artillery as "battalion guns" or "brigaded." The first option favored maneuverability and emphasized artillery as a supporting arm. The artillery held a special relationship with the commander-in-chief of

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<sup>191</sup>Baron de Steuben, *Regulations for the Order and Discipline of the Troops of the United States* (Boston: Thomas and Andrews, 1794; repr., Mineola, NY: Dover Publications, 1985), 62-63.

<sup>192</sup>This point is well established in Adrian Caruana, *The Light 6-Pdr. Battalion Gun of 1776* (Bloomfield, Ontario: Museum Restoration Service, 1977), 7-8.

<sup>193</sup>Washington's General Orders of 9 August 1776 issued from New York, clearly establish this organizational practice. In *Papers of George Washington*, 5:644. See also Knox's orders to artillery company commanders quoted in William E. Birkhimer, *Historical Sketch of the Organization, Administration, Materiel and Tactics of the Artillery, United States Army* (Washington, DC: James J. Chapman, 1884; repr., New York: Greenwood Press, 1968), 76-77.

the army. It existed as its own administrative organization with its own commander. The tactical command of artillery depended on its disposition as “battalion guns” or “brigaded.” Infantry commanders directed its positioning while artillery commanders determined its tactical employment. Second, the most effective employment of artillery was through the tactics of enfilade fire and ricochet. These concepts maximized the effectiveness of the fire of artillery on the battlefield by specifying how to attack targets. Third, the most advanced tactic involved the use of artillery in mass. This concept was different from “brigaded” guns, in that the commander-in-chief positioned ten or more guns to achieve a crucial battlefield effect. The next section will compare the tactics-in-use during the war to the normative doctrine established in books.

#### The Positive-Eighteenth Century Artillery Tactics-in-Use on the Battlefield

Common sense would suggest that books would have a greater impact on those who had less direct experience. Therefore, in the early stages of the American Revolution, one could reasonably expect to find a reliance on books for tactical guidance. Henry Knox was known to be thoroughly familiar with the military texts of the time, and it could have been this knowledge that so impressed Washington. However, an examination of the evidence shows the opposite. Books seem to have had a larger impact on artillery tactics as the war went on, with the greatest impact later in the war.

The artillery officer and non-commissioned officer had a series of tactical decisions to make. First, the chief of the piece, usually a sergeant or lieutenant, had to determine which target to engage. He could engage the enemy artillery, and attempt to render it useless either through disabling the piece by fire or creating enough casualties in

the enemy crew to cause combat ineffectiveness.<sup>194</sup> He could engage the enemy infantry, and wear down the enemy through attrition.<sup>195</sup> He could engage the cavalry, and attempt to disrupt their preparations or stall a charge.

Second, the artillery commander had to determine at what range to engage the selected target. Particular circumstances often governed this decision, such as ammunition available, terrain and the technical capabilities of the piece. In practice, the “gunner’s eye” determined this decision. Gunners developed this skill through practice and particular familiarity with the specific piece at hand. It involved at least three sub-skills for effective employment. The gunner must be able to accurately estimate range, know the achievable (called random) and effective (called point-blank) ranges of his gun and know the line of gun upon which he should sight horizontally. This third sub-skill of horizontal aiming varied from gun to gun based upon the trueness of the bore to the centerline of the gun. The manufacturing processes of cannon making contributed to these individual variations.

Third, the gunner had to decide which ammunition to use against the target. This decision had to take into account the first two decisions, the target type and the range. Solid ball ammunition was most effective at longer ranges while canister shot was best in close. Solid shot was effective at dismantling enemy artillery and damaging fortifications

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<sup>194</sup>In modern parlance called counter-battery fire. Reference specific artillery engagements on the battlefield at Brandywine and Monmouth and in the siege at Yorktown.

<sup>195</sup>Although advocated by Guibert, in practice this tactic was in common usage throughout the seventeenth and eighteenth century. In the American Revolution, reference the artillery engagements on most battlefields, most notably at Trenton and Guilford Courthouse.

and equipment. Canister shot was most effective when employed against soft targets such as infantry and cavalry formations. Its shotgun effect could produce significant casualties beyond effective smoothbore musket range.

Fourth, gunners and artillery commanders had to determine whether to emphasize the accuracy or volume of their fire. If accuracy was most important, like when engaging point targets such as specific areas of a fortification or enemy artillery, the gunner might take more time to make sighting adjustments both horizontally and vertically and ensure the piece returned precisely to its previous firing position after each round. If volume was most important, gunners forsook these minute corrections relying on the sheer amount of ammunition fired to produce the desired effect. Gunners took range and ammunition as a primary consideration in this decision as well. A moving target such as an infantry or cavalry formation at range would require accuracy, while if the enemy was close, volume was likely to be more important.

Fifth, senior commanders determined the disposition of their supporting guns. The British practice was to disperse their artillery, specifically into “battalion guns” which aligned themselves between two companies and were there for direct support to the infantry battalion. Battalion guns rarely consisted of more than two guns concentrated at any one firing point. Commanders might also decide to mass their artillery in “brigades” which would position them in the intervals of battalions and directly support an infantry brigade. “Brigaded” guns often were in firing points consisting of four or more guns. Lastly, piece commanders had to select which firing technique to employ against the enemy. As the other tactical decisions show, circumstances also shaped these decisions.

Two preferred techniques were firing ~~en~~ "ricochet" and ~~en~~ "enfilade." These two French terms, as previously discussed, originated in firing techniques of the siege, but applied in the field as well. Gunners regularly practiced ricochet fire by aiming short of a massed target, attempting to bounce or skip the round shot into the formation. This technique helped to increase the likelihood of creating enemy casualties.<sup>196</sup> Round shot fired ~~point-blank~~" (a straight line to the target) would often fly high of the intended target due to the inconsistencies of smoothbore cannon. Firing in enfilade was a preferred technique with all types of munitions. Gunners achieved it by positioning their piece so that it was at a perpendicular angle to a line of advancing troops. When guns fired either round shot or grape fired in this manner, casualties were often heavy. The linear formations of the 18th century allowed for round shot to continue traveling along its original trajectory and cause casualties all along its path. This was in marked contrast to firing at an enemy front, which had only one opportunity along its flight path and then would pass to the empty rear of the enemy formation.

### The Continental Artillery in Action

At the Battle of Trenton, in December of 1776, the Continental artillery played a special role. First, Jac Weller, in his study of artillery at Trenton, states very clearly, ~~artillery~~ "was a wet weather weapon."<sup>197</sup> Washington and Knox emphasized the artillery in this battle because the ammunition could be kept dry in covered carts and with the use

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<sup>196</sup>For one description of this technique in battle, of which there are many, see John F. Reed, *Campaign to Valley Forge, July 1, 1777-December 19, 1777* (London: Oxford, 1980), 134.

<sup>197</sup>Jac Weller, ~~Guns of Destiny: Field Artillery in the Trenton-Princeton Campaign,~~" *Military Affairs* (Spring 1956): 1, 8.

of tampions, ~~w~~ wooden cylinders to put into the mouth of guns . . . in travelling, to prevent the dust or wet getting in.”<sup>198</sup> Second, artillery was included at a very high proportion. At Trenton, the proportion of guns to infantry was near one (1) to one-hundred (100).<sup>199</sup> This is nearly ten times the proportion advocated in the standard works of the time. Third, the artillery led the attack; the destruction caused by the artillery on the German soldiers on King and Queen Streets directly led to the success of the operation. Washington and Knox expected the artillery to have a large role due to the weather conditions. In fact, artillery marched at the head of each column, presaging its eventual battlefield role. These contingencies are in direct contradiction to the extant theory of the time. Most military manuals omitted any discussion of the operation of artillery in poor weather, and did not advocate artillery at the head of the column while on the march. These two methods were improvisations based on experience, common sense and practical planning. No book guided the deliberate methods of employment during the Trenton campaign.

In September of 1777, at the Battle of the Brandywine, the Continental artillerists had the experience of Long Island, Trenton and Princeton under their belts. They ~~brigaded~~ their artillery into firing positions of four or more guns in established defensive positions. This method proved somewhat effective in previous engagements at Chatterton Hill before White Plains and in covering the withdrawal of Continental troops generally. It also capitalized on the particular strengths of the American soldier when fighting behind improvised field works. However, in this battle, these dispositions

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<sup>198</sup>Smith, *Universal Dictionary*, 242.

<sup>199</sup>Ibid., 7.

hampered the repositioning withdrawal of artillery on the battlefield. It resulted in the loss of several guns in the battle.<sup>200</sup>

In the summer of 1778, during the Battle of Monmouth, the Continental artillery applied two different dispositions at different phases of the battle. In the first phase, as Lee engaged the British and began a retreat, the artillery was in two-gun firing sections in direct support to the infantry regiments.<sup>201</sup> Later, in the final phase, as Washington rallied the retreating division and sought to reestablish a fighting line, Lt. Col. Oswald massed his guns to stop the British advance. Lt. Col Oswald testified at Lee's court-martial that he ~~formed~~ upon . . . [an] eminence, which I suppose was about a quarter of a mile in the rear of where I was [previously], [where] I discovered on my left General Maxwell's brigade and General Scott's detachment coming out of the wood upon this eminence I had formed for action, and had taken two pieces from General Scott's detachment and two from General Maxwell's brigade, making in all ten."<sup>202</sup> This was the first known instance of a significant massing of artillery in order to stop an infantry advance in battle during the American Revolution. Around the same time, Knox had ordered his adjutant Lt. Col. Thomas Antoine Maudit du Plessis, a French artillery officer, with six guns to occupy Comb's Hill, which faced at right angles to the advancing British line. One round shot fired from this position disarmed an entire infantry platoon by striking the muskets from

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<sup>200</sup>Bruce E. Mowday, *September 11, 1777: Washington's Defeat at Brandywine Dooms Philadelphia* (Shippensburg, PA: White Mane Books, 2002), 145-6.

<sup>201</sup>John Laurens quoted in Richard Wheeler, *Voices of 1776* (New York: Meridian, 1991), 268-69.

<sup>202</sup>Testimony of Lt. Col. Eleazer Oswald quoted in ~~Proceedings of a General Court Martial . . . for the Trial of Major General Lee. July 4th, 1778,~~ *Collections of the New-York Historical Society for the Year 1873* (New York, 1874), 135.

their arms.<sup>203</sup> When combined with the massed artillery formation supervised by Knox on Perrine Hill, which culminated the battle, the Continental artillery had successfully changed their artillery disposition in mid-battle from dispersal to mass and employed artillery to effect in enfilade.

An examination of the theory and the practice of artillery on the battlefield establishes that the seeds or kernels of the tactics-in-use existed in the theory, although they were scattered across multiple sources and contextualized differently. There was no straightforward essay or treatise available to the Continental Army that simply laid out artillery battlefield tactics. It was a difficult task to parse out of the available texts the requisite parts to form a coherent doctrine. However, some books were more useful than others.

#### Book Types—The Essay, The Treatise and The Handbook

One scholar, describing books on gunnery in Renaissance England, wrote of books with two purposes of use in mind. One type of book was for the general and theoretical education of the reader, or the “scientific”; and another was for the “practical” learning and use.<sup>204</sup> The scientific and practical appellations apply to eighteenth century printed books on artillery and gunnery as well. In an effort to provide some categorization, it seems that works of this period generally conform to three themes, in order of decreasing relevance, the Essay, the Treatise and the Handbook. The first two of

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<sup>203</sup>Christopher Ward, *The War of the Revolution*. vol. 2 (New York: Macmillan, 1952), 584; Michael Pearson, *Those Damned Rebels: The American Revolution as Seen Through British Eyes* (New York: Da Capo, 1972), 312.

<sup>204</sup>Steven A. Walton, “The Art of Gunnery in Renaissance England” (PhD diss., University of Toronto, 1999), 10, 127-128.

these categories we have treated earlier in this study; we discuss the handbook in context below. The essays of the period primarily deal with the larger questions of the art of war and as they refer to artillery, it is in its secondary and supporting battlefield role. The Treatise expounds upon the theoretical and scientific understanding of gunnery and relates specific information on the manufacture and use of the artillery system as piece, carriage, ammunition and transport. The Treatise is more or less useful depending upon the intended audience. The Handbook essentially provides tools to the practitioner in the form of memory aids, templates and charts.

The art of war essays generally educated officers on the higher military arts, of controlling and manipulating soldiers in the conduct of military campaigns and battle. They concerned themselves with camp discipline, marches, formations, dispositions, provisions and command. Their purpose was to describe the responsibilities of officers and to detail the importance of due diligence in the performance of their duties. They attempted to link a thorough understanding of officer duty with military effectiveness. These essays seem to have tried to convince officers of the importance of studying the military art through reason and its historical examples.

The artillery treatises are works primarily concerned with three focuses; the mathematics of gunnery, the construction of the piece, and the attack/defense of fortified places. Although impactful due to the descriptions and dimensions necessary for manufacture, none of these three provided specific tactical guidance to the young artillery officer or non-commissioned officer on the field of battle. Further, the described mathematics was of little use. While theoretically it might allow an officer to estimate range and understand the physical forces at play, it was not an effective predictor of the

actual flight of rounds. The best gunners were those trained by experiment and experience. The gunner's eye and feel were often much more useful than mathematics.

The third and most influential book type was the artillery handbook. The only surviving copy is British. The best example of this type of book is Fortune's *Artillerists Companion*. This work contains useful information for the gunner. Designed with the tactician in mind, and displaying an understanding of the intuitive nature of artillery in battle, it lists tables of ranges, provides advice for estimating range, gives templates to provide accurate personnel and equipment returns, and speaks to the specifics of artillery maintenance. It provides simple tactical instruction such as, "In pointing a cannon to hit a man, At 300 yards distance cut the ground short of his feet. At 400 yards point the gun to his feet."<sup>205</sup> There is no evidence that this work was available to the Continental Army. However, evidence of similar works does exist in the form of standardized personnel returns.

### The Impact of French Officers

It is difficult to determine the relationship that shows that the military corpus actually influenced the minds of those who read them, much less determined their behavior in war. Although books may have espoused the normative processes desired by officers, they did not directly represent their positive behaviors. Rather, the tactics-in-use of the period were reflective of experiences socialized through the middle ranks of officers and the veterans of the line. However, through the American Revolution, as shown by the difference between artillery tactics at Trenton in 1776 and then at

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<sup>205</sup>T. Fortune, *The Artillerist's Companion* (London: J. Millan, 1778; repr., Alexandria Bay, NY: Museum Restoration Service, 1992), 8.

Monmouth in 1778, the tactics-in-use in the Continental artillery did in fact change. The standard argument is that this was the result of a progressively increasing professionalization in some ways directly attributable to the increased study of books. That was surely Knox's intention. However, there is another, more experiential variable to consider in this development. The personal example of French artillery officers influenced the development as well. Duportail, along with several other French officers arrived in America in 1777. French officers such as Duportail, De Fleury, Du Plessis, and the Pole, Kosciusko made significant contributions. These officers were present at all of the major engagements that saw a marked increase in the proficiency of the Continental artillery in the field, particularly the Battle of Monmouth. In that engagement, Chevalier Maudit du Plessis commanded the six guns on Combs Hill that caught the British line in enfilade. Du Plessis also fought with distinction at Germantown, Red Bank and Yorktown. In short, by 1778, French trained officer advisors had permeated throughout the Continental Army. Kosciusko was at Saratoga, and significantly influenced battlefield preparations and behavior through his advice and active participation. These officers, although not all artillerymen, attended one of the regimental artillery schools in France. Through this education, they had access to the latest developments in artillery thought, and imparted this knowledge through their example and advice. They provided a vehicle for the practical transmission of European artillery ideas to the Continental artillery.

#### A Continental Pedagogy—Attempt at Formal Indoctrination

By 1779, Knox took formal efforts to educate his officers. In the artillery cantonment in the winter of 1778-79 at Pluckemin, New Jersey, with an Academy

building constructed, Knox was specific in what he intended his officers to learn. The following extended quotation is illustrative:

The Accademy is to be opened on Monday next with Mr. Colles the preceptor will attend every day in the week Sunday excepted for the purpose of Teaching the Mathematicks & cc. . . . As the Officers of the Corps will by those means have an opportunity of acquiring a more particular and expansive Knowledge of their Profession and Making Themselves better Qualified to discharge the duties of their Respective Stations—the General expects that they will apply themselves in good earnest to the Study of this so essential & necessary Branch of Science—The duty they owe themselves—Regard for their own Reputation and the Just expectations of their Country: The General Hopes will induce every Officer to pay the closest & most diligent Attention.<sup>206</sup>

Unfortunately, we do not know what texts the curriculum specified. Due to other duties and granted furlough, officers did not regularly attend the classes. The mere fact that General Knox had to include the justification and motivation for this in his orders reflects that he already perceived a general apathy toward diligent study among his officers. Further, reading between the lines of the order, one can see General Knox concerned about the reputation of his officers with the visiting French. He used the Academy building itself to host an “alliance ball” with French officers invited.<sup>207</sup> This academy represented the only formal attempt to educate artillery officers throughout the war. It is an indicator of an increasing will for professionalization.

### Conclusion

In the course of the war, the Continental artillery developed a doctrine that gradually approached professionalization. European books available to them at the time

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<sup>206</sup>Quoted in John Lewis Seidel, “The Archaeology of the American Revolution: A reappraisal & case study at the Continental Artillery Cantonment of 1778-1779, Pluckemin, New Jersey” (PhD diss., University of Pennsylvania, 1987), 213.

<sup>207</sup>Seidel, 217.

contain the seeds of that doctrine. The tactical development of artillery doctrine is evident in the increased sophistication of its practice over time. This development reached its zenith in 1778 at the battle of Monmouth. While no one book contained a coherent and published artillery doctrine, it existed in the minds of its officers. Self-study and the example and advice of European trained officers influenced and encouraged the development of this doctrine. Only after the war, and the establishment of a permanent professional military academy, would the American military publish a coherent artillery doctrine in Louis de Tousard's *American Artillerist's Companion* that was truly professional.<sup>208</sup>

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<sup>208</sup>Louis de Tousard, *American Artillerist's Companion or Elements of Artillery* (Philadelphia: C. and A. Conrad, 1809).

## CHAPTER 4

### THE LEADERS AND THE LED: A SELECTED COLLECTIVE BIOGRAPHY OF MIDDLE RANKING LEADERS OF THE CONTINENTAL ARTILLERY

Typical studies of the Continental Army tend toward two areas of focus—the leaders at the top or the soldiers at the bottom. The first variety of history focuses on the deeds, correspondence and actions of key leaders, emphasizing the impact of their decisions on history. The second variety uses statistical analysis to recreate the social environment of the soldier at the ground level. Some histories emphasize the “face of battle” and attempt to recount the horrendous conditions under which the common soldier fought. All of these are useful and illuminating to organizational history. However, in these types of work, historians are less attentive to a significant population of actors—the middle ranking leaders. The middle level of leadership provides the critical link between the vision of top leaders and the actions of its most active participants. As such, exploring this area of organizational leadership will illuminate many of the developmental dynamics in the Continental artillery. This chapter argues that an examination of the career paths through short biographies of middle ranking leaders shows that in the course of the war the Continental artillery gradually moved toward an increasing professionalization. Specifically, they point to an organization that retained officers, exhibited professional values, respected education, grew in tactical skill, maximized individual skills and rewarded talent while fighting the war. This analysis draws from a selection of twelve individuals. This pool was selected with an eye toward a cross-section of the Continental artillery as representative as possible given the space and scope of this chapter. It does not argue that these few individuals made marked contributions to this

development themselves. Rather, the organizational growth of the Continental artillery can be seen in the character or course of their individual careers. In other words, when viewed collectively, their individual biographies illuminate organizational development over time.

### The Sergeants and Lieutenants–Commanders of the Piece

Sergeants and Lieutenants were the direct leaders of the artillery. They provided daily management and leadership. They directly commanded the artillery piece in battle and made most of the technical and tactical decisions. Occasionally, if marked for preferment, they served on staffs as adjutants and aides. A few career examples of their particular circumstances will help explore the development of the Continental artillery as an organization during the war. The following biographies chart the careers of three lieutenants and two sergeants. The few biographies here are not a complete representative sample, but nonetheless provide a window into the life of junior leaders, particularly into the 2nd and 3rd Artillery Regiments.

#### Kollock

Sheppard Kollock was born in 1750 in Lewes, Delaware where he spent most of his youth. In 1767, he apprenticed to William Goddard as a printer in Philadelphia. Later, he was a journeyman printer in the town of Basse Terre on St. Christopher Island and printed a story on a devastating hurricane written by the precocious Alexander Hamilton.<sup>209</sup> This brief association with Hamilton provided an early personal link to the

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<sup>209</sup>John R. Anderson, *Shepard Kollock: Editor for Freedom* (Chatham, NJ: Chatham Historical Society, 1955), 6.

artillery regiment raised in New York. He remained in the Caribbean until the outbreak of war with Great Britain. He returned to the colonies and enlisted in the summer of 1776, at the age of 26 years, in an infantry regiment commanded by Colonel Richard Humpton, known as the “Flying Camp.” In January of 1777, he was appointed a first lieutenant in the 2nd Continental Artillery Regiment. Within six months, the regiment stationed him, along with the company under Captain Bliss, with the Northern Army commanded by General Gates. In this capacity, through the rest of 1777 and 1778, he served at West Point with some duty at Valley Forge and with the Main Army. He helped build the defenses at West Point and assisted in the laying of the “great chain” across the Hudson River.<sup>210</sup> He also participated in the battle of Monmouth.<sup>211</sup> However, by the middle of 1778, Kollock, along with other officers, became disenchanted with the promotion system and petitioned to resign. He wrote to Colonel John Lamb, his commanding officer, that he felt that he had been “passed over, with impunity. . . . [his] Grievances [were] of such a Glaring nature, I find it difficult to digest them. . . . [I] therefore beg, if I am not Capable of Promotion in my Turn, I may be discharged from the service.”<sup>212</sup> Around this time, Washington and Knox petitioned to Congress for a printing press to enhance propaganda and influence the hearts and minds of the New Jersey population in preparation for an anticipated campaign. Recognizing Kollock’s particular talents and skills, they accepted his resignation in January of 1779, understanding that his talents

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<sup>210</sup>Shepard Kollock, NARA Pension Application, W3143, Narrative (August 1832).

<sup>211</sup>John Anderson, *Shepard Kollock*, 8.

<sup>212</sup>Kollock to Lamb, 15 May 1778; *Ibid.*, 9.

might better serve the cause in printing rather than on the battlefield. Shortly thereafter, he printed the first *New-Jersey Journal*.<sup>213</sup> His journal ardently espoused the patriot cause for the rest of the war. After the war, his press became an advocate for a strong central government.<sup>214</sup> Personally, a founding member of the New Jersey Society of Cincinnati, Kollock served as a lay judge, postmaster and aide to New Jersey Governors.<sup>215</sup> The Continental Congress granted him a pension for his service. He died in Philadelphia on 28 July 1839.<sup>216</sup>

This short biography of Kollock shows how by 1779, Knox and other leadership in the Continental artillery learned to identify the particular strengths of its officers. With this recognition, the organization found ways to re-purpose dedicated personnel into roles that maximized individual skills while preserving the intra-regimental promotion system. In Kollock's case, that role was outside the Continental Army.

### Thompson

Thomas Thompson was probably born in England. Scholars know nothing about his age and only little of his pre-war background. By the time of the outbreak of the war, he enlisted in Captain Alexander Hamilton's New York Company of Artillery. This unit formed one of the companies that would comprise the 2nd Continental Artillery. He soon rose to rank as the company first sergeant, its senior enlisted man. He was literate, a

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<sup>213</sup>John Anderson, 9-11.

<sup>214</sup>Ibid., 110-111.

<sup>215</sup>Ibid., 125-126.

<sup>216</sup>Kollock, Pension Application Files.

disciplinarian and a veteran of previous wars in Germany. Hamilton thought him superior to all the officers in his company.<sup>217</sup> Hamilton described him as “a man highly deserving of notice and preferment . . . with uncommon fidelity, assiduity and expertness . . . a very good disciplinarian . . . having seen a good deal of service in Germany . . . of common sense . . . he will make an excellent lieutenant.”<sup>218</sup> When an officer vacancy came available, Hamilton promptly recommended Thompson to fill it. Thompson’s promotion would provide “an animating example to all men of merit.”<sup>219</sup> Hamilton’s judgment proved prescient. Thompson was one of the most active and valorous artillery officers of the war. After a proper examination, the state approved his commission as a lieutenant three days after his recommendation.<sup>220</sup> He served in Hamilton’s company during the Long Island and New Jersey campaigns. He was present at the battles of Trenton and Princeton. He commanded the company at Brandywine; the new commander John Doughty was away on recruiting duty. He participated in all the major engagements of Washington’s main army and was present with the company through Valley Forge. According to the muster rolls of Colonel John Lamb’s Regiment of Artillery, Captain-Lieutenant Thomas Thompson was never placed on furlough until he fell off the roster in 1780. In December 1778, Captain-Lieutenant Thomas Thompson was in de facto

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<sup>217</sup>Letter of Alexander Hamilton to the Convention of the Representatives of the State of New York, 6 March 1777, in *The Papers of Alexander Hamilton*, vol. 1. ed. Harold C. Syrett (New York: Columbia University Press, 1961), 200.

<sup>218</sup>Hamilton to the Convention, 12 August 1776, in *Ibid.*, 187.

<sup>219</sup>*Ibid.*

<sup>220</sup>Francis B. Heitman, *Historical Register of Officers of the Continental Army* (Baltimore, MD: Genealogical Publishing Company, 1967), 541.

command of the 4th Company, 2nd Continental Artillery Regiment while his commanding officer, Captain John Doughty was on furlough granted by Brigadier General Knox. Captain Doughty returned to the company in March 1779. Colonel Lamb appointed Doughty to duty as brigade major. By October, Captain Doughty was “Doing the Duty of Fort Major for the Garrison West Point.” Also, in the August 1779 return, a 3rd Lieutenant was appointed to the company, Alexander Thompson, promoted to Lieutenant on 31 May 1779. Captain-Lieutenant and Lieutenant Thompson, while other officers were appointed for Quarter Master and other special duties, remained with the company without leave from August 1779 through March 1780 when their company re-designated as 2nd Company, 2nd Continental Artillery.<sup>221</sup> During the battle of Springfield, New Jersey in 1780, Thompson performed his most heroic feat. His gun and crew were attached to Colonel Angell’s regiment and had the assignment of covering the bridge over the creek in front of Springfield. He and his men held the bridge against the British advance. A British unit continued to attempt to cross all the while sustaining casualties and heavy fire from Thompson’s gun. The British eventually bypassed the bridge by fording the creek downstream. At some point, Captain-Lieutenant Thompson was killed by enemy fire while serving his gun.<sup>222</sup> Greene wrote of the conduct of the artillery in his letter to Washington detailing the battle at Springfield on 24 June, “The

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<sup>221</sup>Muster Rolls of Colonel John Lamb’s Artillery Regiment, December 1778-October 1780, National Archives Microfilm Publication M246, Record Group 93; Revolutionary War Rolls 1775-1783, Roll 117, Continental Troops, Jacket Nos. 17-25, Washington: 1976.

<sup>222</sup>Letter of Nathanael Greene to George Washington, 24 June 1780, in *The Papers of General Nathanael Greene*, vol. 6. ed. Richard K. Showman (Chapel Hill, NC: University of North Carolina Press, 1991), 35, 37.

Artillery under the command of Lt Colonel Forest was well served. I have only to regret the loss of Capt Lt Thompson who fell at the side of his piece by a cannon ball.”<sup>223</sup> A letter from the American camp dated 28 June, subsequently published in the New Jersey Gazette stated, “only one officer fell—First Lieutenant Thompson, of artillery, a very brave man.”<sup>224</sup> Lewis Morris, present at the battle of Springfield, wrote to his father Brigadier General Morris of the action at the first bridge leading to the town, “The Enemy were obstinately opposed and several times repulsed, but after a fire of forty minutes, both artillery and musquetry, our brave fellows were obliged to yield to superior numbers.”<sup>225</sup>

Thompson’s career benefitted from Hamilton’s eye for talent. He continued to receive regular promotions and held positions of increased responsibility, often above his rank despite his humble beginnings as an enlisted man. His de facto command of the company from Brandywine through Valley Forge to Springfield evidences an organizational capacity to capitalize on individuals who had proven the ability to shoulder the responsibility. What is particularly telling about Thompson was that it happened with an officer with little pretension to “gentleman” social status. In other words, decisions about his duties seem to have been based solely on merit and skill rather than social identity.

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<sup>223</sup>Ibid., 37.

<sup>224</sup>Moore, Frank. *Diary of the American Revolution: From Newspapers and Original Documents* (New York: Charles Scribner, 1858, Repr.), 292.

<sup>225</sup>Lewis Morris to Brigadier General Lewis Morris, 24 June 1780, quoted in *Collections of the New York Historical Society for the year 1875* (New York: New York Historical Society, 1875), 458.

## White

Joseph White was 18 years old when he enlisted in Richard Gridley's Massachusetts artillery regiment in 1775. Most likely, because of his literacy, he initially served as an assistant adjutant under Jeremiah Niles. When the artillery regiment reorganized under Henry Knox's command, he continued in service with the unit, which would eventually become the 3rd Continental Artillery. During this period, he did duty with the Commissary-General department under Captain Richard Frothingham. In early 1776, he reenlisted and was promoted to an orderly sergeant in Captain William Perkins' company in Knox's regiment. Due to illness, he missed the battle of Long Island. As part of his recuperation, he moved to Fort Lee where he witnessed the fall of Fort Washington. While at Fort Lee, he fell under the command of Captain-Lieutenant David Allen, the second in command of Perkins company. After more temporary duty in the Commissary, Allen transferred him to a gun crew. In this capacity, he served on one of the field-pieces ordered to fire down King and Queen Streets during the battle of Trenton. He saw heated action at the Trenton engagement where his gun broke the axle-tree of its carriage during the combat. Knox ordered his gun crew to charge a Hessian artillery piece and they captured it. After the battle, he received recognition from Knox for recovering and withdrawing his gun from the battle despite the damage. He also participated in the "second battle of Trenton" on 2 January 1777. He directed a gun crew in the battle of Princeton on the left wing of the initial line. After Princeton, he reenlisted in the regiment and remained on active duty through March of 1777.<sup>226</sup> After many years, he applied for

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<sup>226</sup>Joseph White, "Narrative of Events, as they Occurred from Time to Time in the Revolutionary War," in *American Heritage* (June, 1956), 75-79. Extracts from the same narrative are also reprinted in Part 2, No. 115 in William S. Stryker, *The Battle of Trenton*

a pension that the United States government granted in recognition of his service. At the time of his application in 1818, he was a poor man.

White's biography highlights the limitations of the organization early while suggesting the importance of a key development in the artillery, longer-term enlistments. These enlistments, although approved in late 1776 only became effective in 1777.<sup>227</sup> White was a junior leader whose career grew with his demonstrated performance. Therefore, although his merit was recognized and he was promoted accordingly, he was lost to an expired short-term enlistment. After 1777, the organization had the capacity to keep in service enlisted men whose merits warranted continued preferment.

#### Callendar

Historians know nothing about the background or education of John Callendar. He was a resident of Massachusetts and received a commission as a captain in Gridley's artillery in May 1775.<sup>228</sup> Much later in the war, this unit was one of the original companies used to form the 3rd Continental Artillery. At about 10 o'clock on 17 June 1775, General Artemas Ward sent Captain Callendar's artillery company to Breed's Hill. It had only two light field pieces.<sup>229</sup> It went as reinforcements and it arrived shortly after the British. General Putnam initially directed them to Bunker's Hill. However,

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*and Princeton* (Cambridge: Riverside Press, 1898, repr., Boston: Old Museum Association, 2001), 478-480.

<sup>227</sup>Wright, 91.

<sup>228</sup>Hetiman, 140.

<sup>229</sup>John R. Elting, *The Battle of Bunker's Hill* (Monmouth Beach, NJ: Philip Freneau Press, 1975), 25.

recognizing the need for artillery near the breastwork, Putnam pushed them forward toward the gap between the hasty fort and a fencerow. During this movement, Putnam and Callendar had a disagreement about where to employ the guns.<sup>230</sup> Soon after, the British directed a general bombardment from all their available firepower at the American positions. They intended this barrage to cover the initial movement of the British army from the cover of Moulton's point into the ordered advance toward the American lines. The American field pieces could not possibly respond to the barrage as the British artillery positions and ships were hopelessly out of effective range. However, Captain Callendar had discharged a few rounds when he discovered his ammunition was incorrect and retired.<sup>231</sup> It is possible that his guns only had round shot and no canister or grapeshot to repel a British infantry assault. During his retreat, Callendar met again with General Putnam.<sup>232</sup> Putnam ordered him to turn back to the hill. He replied that his field pieces had the incorrect cartridges. General Putnam then examined the ammunition boxes and found cartridges present. Upon this discovery, and at gunpoint, Callendar turned his pieces around. However, when Putnam left his position, Callendar and his troops deserted his guns.<sup>233</sup> In his General Orders of 7 July 1775, General Washington reprimanded the

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<sup>230</sup>George E. Ellis, *History of the Battle of Bunker's [Breed's] Hill, On June 17, 1775: From Authentic Sources in Print and Manuscript* (Boston: Lockwood, Brooks, and Company, 1875), 37.

<sup>231</sup>Richard Frothingham, *History of the Siege of Boston, and of the Battles of Lexington, Concord, and Bunker Hill*, 4th ed. (Repr., Cranbury, NJ: The Scholars Bookshelf, 2005), 136.

<sup>232</sup>*Ibid.*, 138.

<sup>233</sup>*Washington Papers*, 1:74 which cites Force, *American Archives*, 4th ser., 2:1438.

cowardice of Captain Callender and ordered him cashiered (dishonorably dismissed), the sentence of a general court martial.<sup>234</sup>

In stark contrast, at the Battle of Long Island, on 27 August 1776, volunteer cadet John Callendar restored his honor through a conspicuous act of fortitude. Serving in Captain Pierce's company, his battery was about to be overrun by the British. The captain-lieutenant in charge died and the gunners panicked and began to run. Callendar quickly assumed command and turned back the retreating soldiers. He fought the guns fiercely, ramming home the charges himself while keeping the guns firing and fending off an assault. It took an attack from the flank to dislodge him and the gunners from their positions. A British officer in the assault recognized his courage and saved his life from a British bayonet. The British took him prisoner and he remained some time in British custody. Upon his exchange, General Washington revoked his earlier dismissal from service because of his valor at the battle of Long Island. He received rank as a captain-lieutenant in the 3rd Continental Artillery on 1 January 1777 and he continued to serve throughout the remainder of the war.<sup>235</sup> He transferred to the Corps of Artillery which brevetted him to captain on 30 September 1783. Callendar remained in service even after the war through June of 1784. After the war, he moved to Virginia and was one of the

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<sup>234</sup>*Washington Papers*, 1:71.

<sup>235</sup>Heitman, 140; Thomas W. Field "The Battle of Long Island," in *Memoirs of the Long Island Historical Society*, vol. 2 (Brooklyn, NY: Long Island Historical Society, 1869), 196-197; Fairfax Downey, *Sound of the Guns: The Story of the American Artillery* (New York: David McKay, 1956), 41-42.

original members of the Society of the Cincinnati from that state.<sup>236</sup> He died on 12 October 1797.<sup>237</sup>

Callendar's service marks a significant difference in the performance of an individual in different organizational atmospheres. The marked contrast between his performance at Bunker Hill and the character of the rest of his service is poignant. Admittedly, his actions at Long Island are partly attributable to a motivation to restore his personal honor, but his continuance in service after Long Island suggests an acceptance of improved organizational climate and commitment to its new ideals.

### Shaw

Samuel Shaw was born in 1754 to longtime residents of Boston. His father was a successful merchant. He attended the same Latin grammar school as Henry Knox.<sup>238</sup> His father paid particular attention to his education to prepare him to participate in the business. With the reluctant permission of his father, he enlisted in Richard Gridley's Continental Artillery Regiment in December of 1775 at the age of 21 years.<sup>239</sup> This regiment would become the nucleus of the 3rd Continental Artillery. Henry Knox quickly recognized some administrative talent in Shaw and selected him for duty as the

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<sup>236</sup>Bryce Metcalf, *Original Members and Other Officers Eligible to the Society of Cincinnati, 1783-1938* (Repr., Beverly Hills, CA: Historic Trust Eastwood Publishing Company, 1995), 73.

<sup>237</sup>Heitman, 140.

<sup>238</sup>Minor Myers, Jr., *Liberty without Anarchy: A History of the Society of the Cincinnati* (Charlottesville, VA: University of Virginia Press, 1983), 16.

<sup>239</sup>Heitman, 492.

regimental adjutant in May 1776.<sup>240</sup> He essentially served side by side with Knox in his headquarters throughout the war. His letters provide an account that mirrors the sentiments of Knox and Washington.<sup>241</sup> Shaw participated in all of the major engagements of the war, though he rarely had an opportunity to show particular valor or combat skill. His real skills were evident in the detailed management and staff work associated with a headquarters responsible for a complex organization. Throughout the war, he continuously served in positions above his rank, first as adjutant, then brigade major, and finally as aide de camp to Knox. Washington's General Orders of 11 May 1777 published his appointment to brigade major.<sup>242</sup> He served until the end of the war and was very influential in the instigation and organization of the national Society of the Cincinnati.<sup>243</sup> He obviously made a positive impression on both Knox and Washington. After the war, with their recommendations, he served as the first Consul to China.<sup>244</sup> He died on his return trip on 30 May 1794.<sup>245</sup>

Shaw's biography implies an organization willing to accept the brevet promotion of a relatively junior officer to the responsibility associated with a brigade major. In this capacity, Shaw often corresponded with, even directed, officers of much senior rank and authority. As the correspondence suggests, these seniors did not question his authority—

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<sup>240</sup>Ibid.

<sup>241</sup>Quincy, *Journals* (1847).

<sup>242</sup>*Washington Papers*, 9:384.

<sup>243</sup>Myers, 24.

<sup>244</sup>Ibid.

<sup>245</sup>Heitman, 492.

remarkable for a time when rank was implicit with personal honor. This was indicative of a growing professionalization that recognized the importance of competency.

#### The Captains—Company Commanders and Administrative Leaders

Captains were the administrative leaders of the artillery. They managed the first real administrative unit, the artillery company. They filed returns of personnel and equipment to their higher headquarters. In staff positions, they requisitioned and received weapons and their associated implements. They managed the pay and provisions of their companies. Although artillery most often served in two gun sections on the battlefield, in some cases, captains exercised direct battlefield command. Company commanders were responsible for the day-to-day training and preparedness of their commands. As such, a review of a few captain careers proves illuminating to the development of the Continental artillery as a whole.

#### Singleton

Anthony Singleton was an artillery officer in the 1st Artillery Regiment under Charles Harrison. The Continental Congress commissioned him as a Captain in the regiment in February of 1777. He received his commission from Congress after three appointed individuals refused commissions. He assumed command of Company No. 3 in the 1st Artillery Regiment in early 1777.<sup>246</sup> Under urgent request from General Washington, due to the expired enlistments of much of the Massachusetts artilleryman, General Washington urgently requested the accelerated recruitment and staffing of the Virginia based 1st Artillery Regiment. He also ordered it to join the main army as soon as

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<sup>246</sup>Birkhimer, 334.

possible.<sup>247</sup> The regiment was on the march in April and by May 1777, Singleton's company, along with a significant portion of the rest of Harrison's 1st Artillery Regiment, reported to Washington's headquarters.<sup>248</sup> They wintered with the main army at Valley Forge in the winter of 1777-1778.<sup>249</sup> For several years, Singleton's company maneuvered throughout the northern theater.<sup>250</sup> Responding to British operations in the southern colonies, in April 1780, Singleton and his company, along with two other companies of the 1st Artillery Regiment, marched back south under the command of General De Kalb. They arrived in North Carolina late in April.<sup>251</sup> His first recorded battlefield action was at the battle of Camden in the army under the command of Horatio Gates. In the battle where Gates lost most of the southern army, Singleton lost seven guns in the defeat. His guns were on the left wing of the army between militia units that fled. Despite this failure, he remained admired and respected by his superiors. The second in command of his regiment described him as –an officer on whose merit and good services

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<sup>247</sup>E. M. Sanchez-Saavedra, *A Guide to Virginia Military Organizations in the American Revolution, 1774-1787* (Westminster, MD: Willow Bend, 1978), 99-100.

<sup>248</sup>John Banister to Washington, 16 April 1778, in *Papers of George Washington*, 14:531.

<sup>249</sup>Valley Forge National Historical Park, –Valley Forge Legacy: The Muster Roll Project,” <http://valleyforgemusterroll.org>.

<sup>250</sup>W. T. R. Saffell, *Records of the Revolutionary War* (New York: Pudney and Russell, 1858), 245. At various times the company quartered at White Plains, NY; West Point, NY; Smith's Clove, NY; Pluckemin, NJ; and Ramapo, NJ.

<sup>251</sup>Henry Lumpkin, *From Savannah to Yorktown: The American Revolution in the South* (San Jose, CA: toExcel Press, 2000), 57.

you may rely.”<sup>252</sup> He redeemed himself and his command with valiant service at the battles of Guilford Courthouse and Hobkirk’s Hill.<sup>253</sup> In both of these engagements, his unit performed well in the face of significant casualties. Despite being ~~a~~ great favorite of the General’s [Greene],<sup>254</sup> his valor and long service of six years with the regiment, Captain Singleton never received a promotion. He remained a captain until the end of the war. After the war, Singleton returned to his work as a private citizen but remained active in the community. In 1788, the members of the Richmond Amicable Society elected him President. The purpose of the society was for ~~the~~ benevolent object of relieving strangers and wayfarers, in distress, for whom the law makes no provision.”<sup>255</sup>

His career reflects a glimpse into the organization at the company level. Singleton and his unit were formed relatively late in the war. They had the benefit of the focused training at Valley Forge and Pluckemin. Personally, whether from training, experience, or both, Singleton developed an attitude about militia shared by most Continental officers. After the battle of Guilford Courthouse, where Greene effectively deployed the militia he

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<sup>252</sup>Edward Carrington to Nathanael Greene, 6 December 1780, in *Papers of Greene*, 6:537.

<sup>253</sup>Lawrence E. Babits and Joshua B. Howard, *Long, Obstinate and Bloody: The Battle of Guilford Courthouse* (Chapel Hill, NC: University of North Carolina Press, 2009), 143-6; Hugh F. Rankin, *The North Carolina Continentals* (Chapel Hill, NC: University of North Carolina Press, 2005), 301-309; Lumpkin, 180-182.

<sup>254</sup>Francis J. Brooke, *A Family Narrative: Being Reminiscences of a Revolutionary Officer* (Richmond, VA: McFarlane and Fergusson, 1849; repr., Tarrytown, NY: William Abbatt, 1921), 23.

<sup>255</sup>Samuel Mordecai, *Richmond in By-gone Days* (Richmond, VA: G. M. West, 1856), 181.

commented, ~~the~~ militia, *contrary to custom*, behaved well for militia.”<sup>256</sup> This attitude is reflective of a prevalent attitude in regular officers who saw themselves as more disciplined and steadfast than militia. In short, the experience of this officer, and that of his unit, reflect a consistent growth in unit performance that by the end of the war was marked for their resilience and tenacity. After the battle of Guilford Courthouse, General Greene published in General Orders, ~~the~~ Artillery [was] so well served by Capts Singleton & Finlay [to] have rendered success dear to the Enemy.”<sup>257</sup>

### Bauman

Sebastian Bauman was born in 1739 in Frankfurt, Germany to a family connected to the Austrian court of Maria Theresa.<sup>258</sup> He served as an engineer in the Austrian service. He was educated at the University of Heidelberg. After an altercation with an Austrian noble ruined his welcome in Austria, he came to the British colonies and arrived in New York in 1760.<sup>259</sup> Soon after, he joined the British army as a volunteer and participated in the ill-fated Braddock campaign.<sup>260</sup> Bauman became disillusioned with the British prior to the revolution. In recognition of his skill as an engineer and his previous service, the New York provincial assembly commissioned him a captain of a company of

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<sup>256</sup>Rankin, *North Carolina Continentals*, 311.

<sup>257</sup>Nathanael Greene, General Orders, 16 March 1781, in *Papers of Greene*, 7:433.

<sup>258</sup>Powers, 799.

<sup>259</sup>Frederic Gregory Mather, *The Refugees of 1776 from Long Island to Connecticut* (Albany, NY: J. B. Lyon, 1913), 661.

<sup>260</sup>*Ibid.*; Mary C. Doll Fairchild, ed. *Memoirs of Colonel Sebastian Bauman* (Cincinnati, OH: Editor Publishing Company, 1900), 2.

artillery on 30 March 1776 at the advanced age of 38 years.<sup>261</sup> He distinguished himself at the battle of Long Island. Upon the retreat, under significant pressure of being cut-off by the British, he successfully withdrew his two howitzers with the main army. He was present at Valley Forge.<sup>262</sup> In August of 1778, a dispute over relative rank, specifically the date of rank, of captains in the regiment ensued due to an expansion of Lamb's 2nd Continental Artillery. This expansion required that several officers previously in the infantry regiments commission as captains in the artillery. A board of general officers met and reconciled the disputes giving regimental preference to longstanding artillery officers. As a result, their decision gave Bauman the first rank among all captains in the regiment.<sup>263</sup> In 1779, Lamb entrusted Bauman with the local command of the artillery at West Point. He attained the rank of major on 12 September 1779.<sup>264</sup> He was present during the defection of Benedict Arnold who had carried his plan of the fort to the British.<sup>265</sup> Bauman and his company marched with the main army south during the Yorktown campaign. When they arrived at Yorktown, he was one of three officers in the artillery command rotation during the siege.<sup>266</sup> After Yorktown, his company returned to West Point where Bauman remained on duty through 1784. After the war, he joined

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<sup>261</sup>*Washington Papers*, 5:249.

<sup>262</sup>Fairchild, 6.

<sup>263</sup>*Washington Papers*, 16:456.

<sup>264</sup>Heitman, 92.

<sup>265</sup>Sebastian Bauman, "Bauman's Map of the Siege of Yorktown," *Magazine of American History* 6 (January 1881): 54.

<sup>266</sup>*Ibid.*

Henry Knox as one of the original members of the Society of the Cincinnati. The government appointed him as the first Post Master of New York.<sup>267</sup>

Bauman's career represents an example of the organizational preference of officers of technical education and competence. It was not coincidental that much of Bauman's career was spent in the ever-increasing responsibilities of the technical aspects of the artillery. Specifically, he drafted plans for the fortifications of West Point, paying particular attention to the necessary range and angles necessary for its defense with artillery. At Yorktown, his map of the British fortifications and positions invoke an appreciation for their vulnerability to artillery attack. The fact that the Continental artillery retained and promoted an officer of his skill was indicative of an organizational appreciation for professional education.

### Sargent

Winthrop Sargent was born on 1 May 1753 to a wealthy merchant family in Gloucester, Massachusetts.<sup>268</sup> He grew up with a familiarity of seafaring and boat life being active in his father's merchant enterprises. The family fortune was enough to allow him to attend and graduate from Harvard College in 1771. While at college or before, Sargent was a member of Paddock's company of artillery, which was a militia artillery company formed and trained by David Mason in Boston.<sup>269</sup> After college, he travelled in Europe and later served as an officer of a merchant vessel that primarily operated in the

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<sup>267</sup>Fairchild, 6-7.

<sup>268</sup>Willa Low, *Winthrop Sargent: Soldier and Statesman* (Gloucester, MA: Sargent-Murray-Gilman-Hough House, 1976), 1.

<sup>269</sup>Low, 2; *Washington Papers*, 4:422; Drake, *Knox Correspondence*, 21.

West Indies.<sup>270</sup> Upon hearing of the hostilities with Britain, Sargent returned to Massachusetts and volunteered to work on the fortifications around Boston. Sometime during this period, Massachusetts offered him the command of an infantry company, which he refused because he doubted his own abilities.<sup>271</sup> However, in July of 1775, he accepted a lieutenancy in Gridley's Massachusetts Artillery Regiment at the age of 23 years. This organization would eventually become the 3rd Continental Artillery. A lieutenancy was a post in which he likely felt more comfortable given his background and experience.<sup>272</sup> Six months later in December of 1775, he was promoted to Captain-Lieutenant filling a vacancy due to a resignation.<sup>273</sup> Sargent continued in the regiment under Knox for the defense of New York. During this campaign, twice he acted with skill and bravery against enemy fire in safely bringing off his guns and equipment.<sup>274</sup> Upon the retreat from New York, Sargent's company had duty with the forces under Charles Lee. On 1 January 1777, he gained promotion to captain in the newly reorganized 3rd Continental Artillery Regiment.<sup>275</sup> In this capacity, he participated with the main army in the New Jersey campaign of 1777, fighting at the battle of Brandywine. He wintered with Knox and Washington at Valley Forge and through the winter of 1778 developed a relationship with both leaders. Washington trusted him to go with Knox to lobby

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<sup>270</sup>Low, 2; *Washington Papers*, 4:422.

<sup>271</sup>Low, 2-3; *Washington Papers*, 4:422.

<sup>272</sup>*Washington Papers*, 4:422.

<sup>273</sup>Heitman, 481.

<sup>274</sup>Low, 3.

<sup>275</sup>*Washington Papers*, 4:423.

Congress on behalf of the army. Despite physical illness, he rushed to fight at the battle of Monmouth.<sup>276</sup> From December of 1779, he served throughout the remainder of the war as aide-de-camp to Robert Howe with duty with the West Point garrison.<sup>277</sup> On 28 August 1783, he breveted to the rank of major. After the war, he continued in active military service in the management and governance of the western territories serving as Governor of the Northwest and Mississippi territories.<sup>278</sup> He died of stomach gout while at sea on 3 June 1820.<sup>279</sup>

Sergeant's biography suggests that the organization grew to recognize the value of mental maturity in its young leaders. His appointment as a temporary lobbyist to Congress for the army indicated a trust in his abilities to communicate the dire straits of the army and persuade them for redress. It is notable that this delegation was composed of artillerymen. The organization needed the wherewithal to maintain its growing professional obligations and only Congress could provide it. Washington chose his most senior artilleryman and a less senior protégé to convey that message.

#### Proctor

Francis Proctor, Sr. was born in Longford County, Ireland sometime between 1705 and 1720.<sup>280</sup> He was an older man at the time of his enlistment in 1775. He

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<sup>276</sup>Low, 3-4.

<sup>277</sup>*Washington Papers*, 4:423.

<sup>278</sup>Low, 6-24.

<sup>279</sup>*Ibid.*, 24.

<sup>280</sup>Genealogical records give his date of birth as 1705. However, given the nature of his service in the revolutionary war, and the fact that a 1705 birth would have him 70

mustered as a lieutenant and second in command of a Pennsylvania artillery company raised by his son Thomas in November of 1775. This company formed the nucleus of what would later become the 4th Continental Artillery. The company mission included protecting Philadelphia from British invasion by occupying the fort on Mud Island, which protected the river approach. Despite his age, he had a fiery disposition that would prove the ruin of his career. It did not take long before the Pennsylvania forces dismissed him from service, along with his son, due to an altercation with officers from a different Pennsylvania regiment in December.<sup>281</sup> They shortly returned them both to service. The senior Proctor raised another artillery company in Philadelphia in March of 1776 to assist in the defense of South Carolina. During the voyage from Philadelphia to Charleston, the British vessel *Syren* captured him and his company on the high seas. The British sent him to Halifax and then New York for imprisonment.<sup>282</sup> In March 1777, they released him as part of an officer exchange.<sup>283</sup> He returned to the regiment then commanded by his son and was present at Valley Forge in command of a company. In March 1778, a court martial accused and acquitted him for allowing his troops to plunder the home of a local

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years of age when the war started, it is unlikely that he was born that early. He was married in 1738 and sired his son Thomas in 1739. With a birth year in 1720 he would have been 18 and 19 respectively for both those events.

<sup>281</sup>John B. Linn and William H. Egle, ed. *Pennsylvania Archives*, 2nd Series, vol. 11 (Harrisburg, PA: Clarence M. Busch, 1896), 179.

<sup>282</sup>*Washington Papers*, 5:15.

<sup>283</sup>Heitman, 453; John B. B. Trussell, *The Pennsylvania Line: Regimental Organization and Operations, 1775-1783* (Harrisburg, PA: Pennsylvania Historical and Museum Commission, 1993), 196.

civilian.<sup>284</sup> Later at Valley Forge, he was tried by court martial and found guilty of –scandalous behavior unbecoming the character of a gentleman and officer.” The sentence cashiered him from service.<sup>285</sup> Officers in his regiment were previously very active in defending him from multiple charges. All of which he weathered.<sup>286</sup>

The last part of Proctor’s story shows the professional progress of the organization. A court martial presided over by his son, the colonel commanding the regiment, pushed out an officer whose lack of professional conduct had become unacceptable, even at the risk of family strife.<sup>287</sup> The 4th Continental Artillery began, like the rest, as an organization that depended on family and personal friendships to maintain its order and discipline. It grew into one that valued restraint and appropriate behavior, particularly in its officer corps.

#### Forrest

Thomas Forrest was 29 years old in May 1776 when the Pennsylvania legislature commissioned him a captain in the Pennsylvania marines in command of a company responsible for floating batteries in the defense of Philadelphia.<sup>288</sup> In October, Pennsylvania appointed him captain of an artillery company in the newly expanded artillery battalion formed under the command of Thomas Proctor, which eventually

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<sup>284</sup>*Washington Papers*, 14:172.

<sup>285</sup>Heitman, 453; Trussell, 196.

<sup>286</sup>John Crane to Washington, 17 March 1778, *Washington Papers*, 14:207-208.

<sup>287</sup>General Orders, 14 May 1778, *Washington Papers*, 15:121.

<sup>288</sup>Trussell, 192; *Washington Papers*, 19:501, 14:492.

became the 4th Continental Artillery.<sup>289</sup> While in command, he and his company distinguished themselves at both of the battles for Trenton. He became an overnight celebrity in the Continental Army when his battery directed its fire down King and Queen Streets in Trenton, clearing the Hessians from the roads as they stumbled out of buildings and alleyways.<sup>290</sup> In the second battle of Trenton, Forrest's company conducted a successful delaying action covering the main army from the advancing British as they crossed the Assumpink Creek. Washington and Knox recognized his valor and promoted him as the first major in the 4th Continental Artillery Regiment in February 1777.<sup>291</sup> In this role, he was at Valley Forge and served at the battle of Brandywine where his regiment performed well.<sup>292</sup> His promotion to lieutenant colonel was the source of some controversy. Forrest thought it necessary to defend his case for promotion. He anticipated being overwhelmed with responsibilities on the Sullivan campaign, while others remained with the main army to plead their case.<sup>293</sup> Despite his concern, Knox and Washington worked to ensure Forrest advanced to lieutenant colonel ahead of another major who clearly held seniority. This was a clear departure from precedent. However,

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<sup>289</sup>Heitman, 233.

<sup>290</sup>In this action, elements of Pennsylvania and Massachusetts artillery units participated. However, Forrest's company was praised in the after action reports. Jac Weller, "Guns of Destiny," *Military Affairs* (Spring 1956), 9; Henry Knox to Lucy Knox, 28 December 1776, in *Washington Papers*, vol. 7, 458; Diary of an Officer on Washington's Staff, 26 December 1776, in William S. Stryker, *The Battles of Trenton and Princeton* (1898, repr. Trenton, NJ: Old Barracks Association, 2001), 363.

<sup>291</sup>*Pennsylvania Archives*, 208; Trussell, 194.

<sup>292</sup>Thomas J. McGuire, *The Philadelphia Campaign: Volume 1, Brandywine and the Fall of Philadelphia* (Mechanicsburg, PA: Stackpole Books, 2006), 236-247.

<sup>293</sup>Forrest to Washington, 10 May 1779, *Washington Papers*, 20:421.

both Knox and Washington thought it justified given his demonstrated ability.<sup>294</sup> Meanwhile, the 4th Continental Artillery accompanied General Sullivan on his campaign against the Iroquois. On 11 August 1779, while Colonel Procter saw to the water-borne movement of the heavier artillery stores, Forrest commanded the field guns that covered Sullivan's crossing of the Susquehanna River.<sup>295</sup> By November of 1780, a settlement of relative rank of artillery officers pushed him to the point of resignation.<sup>296</sup> Washington did not accept his resignation and he stayed in service performing regular duty as a field grade officer.<sup>297</sup> At some point in early 1781, he petitioned Washington for the command and colonelcy of the late Colonel Flowers' regiment of artificers. Washington refused the request because the command was subject to a Congressional appointment.<sup>298</sup> Forrest resigned in October 1781, but Washington did not grant him a full discharge until January 1782.<sup>299</sup> After the war, he became a committed Federalist, serving on the sixteenth Continental Congress who appointed him the first chair of the Agriculture Committee.<sup>300</sup> He died in Germantown, Pennsylvania on 20 March 1825.<sup>301</sup>

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<sup>294</sup>Knox to Washington, 13 May 1779 and Washington to the Board of War, 14 May 1779, *Washington Papers*, 20:472 and 483.

<sup>295</sup>Trussell, 207; Fischer, 76.

<sup>296</sup>Washington to Forrest, 20 November 1780, *Writings of Washington*, 20:378.

<sup>297</sup>In fact, he served as President of a Court Martial in December 1780. See General Orders, 28 December 1780, *Writings of Washington*, 21:22.

<sup>298</sup>Washington to Forrest, 16 April 1781, *Writings of Washington*, 21:464.

<sup>299</sup>Washington to Forrest, 8 October 1781 and 3 January 1782, *Writings of Washington*, 23:201, 428.

<sup>300</sup>*Washington Papers*, 11:492.

Forrest's career is an example of an officer who demonstrated bravery and tactical skill who grew in responsibility and rank according to his ability. In his case, his performance persuaded his superiors to buck a powerful institutional norm—promotion by seniority- based solely on his merit. Knox wrote to Washington, ~~Major~~ Holmer is clearly the oldest Major. I wish that I could add that his knowledge of his profession, and his activity were such as that I could . . . recommend him . . . but I am sorry this is not the case. Major Forrest is next in rank—Your Excellency knows his zeal and activity . . . he is a proper subject for promotion.”<sup>302</sup>

### The Field Grade Officers—Making it all Happen

During the American Revolution, continental regimental artillery commanders were figureheads and administrators. Rarely did they tactically control their formations in the field. This was partly due to the nature of the artillery service of the time. Artillery often served in detached sections, attached either to specific brigades or on extended duty with a particular independent army command. The last artillery rank to hold a significant chance for battlefield as well as administrative duty was lieutenant colonel. The following biographies chart the career of two influential field grade officers throughout the war and provide a view into the organization's growing professionalism.

#### Carrington

Edward Carrington was twenty-eight years old when the Virginia legislature appointed him a lieutenant colonel and second-in-command of Harrison's 1st Artillery

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<sup>301</sup>Heitman, 233.

<sup>302</sup>Knox to Washington, 13 May 1779, *Washington Papers*, 20:472.

Regiment on 30 November 1776 upon the unit's activation. Before the war, he was a pillar of Virginian society, particularly in his home county where he practiced law and owned a plantation. George Washington knew his brother Paul Carrington as a distinguished Virginia jurist. Edward was an early patriot politician; he sat on the county committee organized to resist the British.<sup>303</sup> He also served as captain of an early militia company. In February of 1776, the Virginia legislature appointed him a lieutenant in the Virginia Company of Artillery raised by Charles Harrison. Most of his tenure in the company he served as acting commander at the age of 28 years.<sup>304</sup> Carrington was one of the longest serving and most able artillery combat leaders of the war. Throughout much of the war, he served as the acting regimental commander because Colonel Harrison was often not present. He suffered with his unit through the winter at Valley Forge. He performed a crucial role during the battle of Monmouth by coordinating the resupply of his guns throughout the fight and commanded the artillery that served with Stirling's division to repel the flank attack on the American left.<sup>305</sup> His superiors respected him enough to appoint him to command the artillery elements in General Gates' army sent south to meet the British invasion. He impressed many with his administrative talents as well as his combat skill eventually leading to his appointment by Greene, in addition to his artillery duties, as the Quarter Master General in the southern army. He performed

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<sup>303</sup>Michael Bellesiles, "Carrington, Edward," in *Encyclopedia of the American Revolution*, 2nd ed.

<sup>304</sup>Note 7, in *Washington Papers*, 17:4.

<sup>305</sup>Christopher Ward, *The War of the Revolution*. vol. 2. (New York: Macmillan, 1952), 582.

reconnaissance missions for Gates that later proved invaluable to Greene's campaigns.<sup>306</sup> He again served with distinction at the battle of Guilford Courthouse where he coordinated the fire of two physically separated artillery sections, a tactical challenge, both of which served with great skill. He also arrived with three six-pounders just in time to positively influence the battle of Hobkirk's Hill.<sup>307</sup> When the command of the 4th Artillery Regiment became available upon the resignation of Colonel Thomas Proctor in July of 1781, Carrington applied to Congress for the job. By seniority of rank, being the first lieutenant colonel in the artillery brigade, he was entitled to the command. However, Congress never confirmed his application and passed over him for promotion although he took effective command of the regiment upon its arrival in Virginia and fought with them at Yorktown.<sup>308</sup> After the war, he served as a Virginia representative to the Continental Congress. Washington appointed him as federal marshal for the state of Virginia during his administration.<sup>309</sup>

Carrington's leadership provided maturity and considerable skill to the newly formed 1st Artillery Regiment. Carrington's service, which also included commissioner for prisoner exchange, carried him throughout the former colonies, sometimes far from the front line and sometimes in the thick of the fight. Unlike many of his contemporaries, Carrington wrote Washington only once concerning the precedence of his rank, and that

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<sup>306</sup>Bellesiles, 171.

<sup>307</sup>Mark M. Boatner, III, "Carrington, Edward," in *Encyclopedia of the American Revolution*, Bicentennial Edition.

<sup>308</sup>Boatner, 185-186.

<sup>309</sup>Bellesiles, 172.

was more a concern for the seniority of his regiment.<sup>310</sup> His career also provides some detail about the artillery organizations penchant for cross-purposing. Recognizing his experience with the implements of war, as artillery service provided, particularly as a lieutenant colonel, Greene selected him to serve as the acting Quartermaster General for the Southern Department.<sup>311</sup> Greene, having had experience as Quartermaster General of the main army, knew this position to be of vital importance. This was especially true during his tenure in command; Gates had just lost most of the army at Camden. He selected a person of proven administrative skill and experience, an artilleryman.

#### Oswald

As a young man in 1770, Eleazer Oswald travelled from Falmouth, England to the British colonies in America. He grew up sympathetic to the patriot cause as a publishers' apprentice in New York City. He was 20 years old when he volunteered as a minute man in the militia that participated in the engagements against the British after Lexington and Concord.<sup>312</sup> Discovering that Benedict Arnold planned an expedition to Quebec, Oswald began a relationship with him through their shared hardship in marching through the Maine wilderness and in the storming of the walls of Quebec City.<sup>313</sup> Upon his exchange and return from Quebec, he travelled back with the other released officers to New York.

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<sup>310</sup>John Lamb and Carrington to Washington, 30 September 1778, in *Washington Papers*, 17:204-205.

<sup>311</sup>Greene to Carrington, 4 December 1780, in *Papers of Greene*, 6:516.

<sup>312</sup>Bellesiles, "Oswald, Eleazer."

<sup>313</sup>Justin H. Smith, *Our Struggle for the Fourteenth Colony: Canada and the American Revolution*, vol. 1 (New York: G.P. Putnam's, 1907, repr., Melrose, NJ: Scholar's Bookshelf, 2005), 586; *Ibid.*, 2:130.

In response to the British incursion to Danbury, Connecticut, while John Lamb, the now famous artillery colonel and fellow prisoner in Quebec, led the assembled militia infantry, newly minted Lieutenant Colonel Oswald, of the 2nd Continental Artillery commanded the cannons in the attack on the British at Compo Hill. He controlled a two-gun section on each flank of the American attacking force with skill. Unfortunately, the attack failed after Lamb was wounded and the British were allowed to retreat.<sup>314</sup> Colonel Lamb, with Oswald as his second-in-command, remained in the Hudson Highlands commanding the artillery. An altercation with General Putnam forced Oswald to submit his first resignation, which Lamb promptly redressed keeping him in service.<sup>315</sup> After a significant detachment of Lamb's 2nd Continental Artillery joined the main army, Oswald again distinguished himself in battle at Monmouth. Part of a picked force, he commanded the guns under General Lee's advanced guard during the morning and saved the retreating American forces by massing a 10-gun firing element which successfully blunted an advancing British counterattack.<sup>316</sup> Generals Knox and Lee praised Oswald for his performance at the battle. Knox called him "one of the best officers of the army, and an acquisition to the corps of artillery."<sup>317</sup> After the battle, a board of general officers convened to settle the disputed claims of field rank officers in the artillery. The General Orders of 15 September 1778 published their findings and concluded that Lieutenant

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<sup>314</sup>Leake, 161-162.

<sup>315</sup>Ibid., 168.

<sup>316</sup>David G. Martin, *The Philadelphia Campaign, June 1777-July 1778* (Conshohocken, PA: Combined Books, 1993), 222; Christopher Ward, *The War of the Revolution*, vol 2. (New York: Macmillan, 1952), 582.

<sup>317</sup>Knox Letter in Leake, 202.

Colonel Oswald would rank as the second Lieutenant Colonel in the corps.<sup>318</sup> As a result, Oswald resigned his commission. He wrote to Washington, ~~he~~ that will not contend for his own rights . . . will never defend the Rights of the Community.”<sup>319</sup> Oswald was caught up in the common concern of officers respecting relative rank in the army. He suspected that a decision against his interest impugned his honor and necessitated redress or resignation. Upon his resignation, he re-entered the publishing trade in Philadelphia, eventually becoming the public printer and coeditor of the *Maryland Journal*. Perhaps because of his perceived dishonor over his rank, he became an ardent opponent of Washington, Hamilton and the future Federalists publishing scathing criticisms. After expanding his publishing business to New York, he made his way to France where the French Army commissioned him as a colonel of an artillery regiment, which fought in the wars of the French Revolution. He returned to New York in the middle of 1795 and died of yellow fever shortly thereafter.<sup>320</sup>

Oswald career path spans the course of the most development period of the Continental artillery, 1775 through 1778. His career is an interesting display of the organization’s tactical skill through that period. He led the artillery on the brave but failed assault on Compo Hill and at the most tactically sophisticated artillery action of the war, Monmouth, he skillfully coordinated the guns by dispersing, displacing and massing as the situation changed or opportunity permitted. As such, his career provides a frame

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<sup>318</sup>General Orders, 15 Septebmer 1778, *Washington Papers*, 17:1.

<sup>319</sup>Oswald to Washington, 28 October 1778, *Washington Papers*, 17:621.

<sup>320</sup>Leake, 266; Bellesiles, 862.

for the increasing professionalization of the corps. His resignation shows how his personal concerns outweighed his sense of duty. The service facilitated his moving on.

### Career Patterns and Conclusions

The collective data pool of twelve middle ranking leaders in the Continental artillery illuminates professionalizing trends in the organization.<sup>321</sup> This database covers all years of the war from 1775 through 1783. It represents all four major Continental artillery regiments. It lists ranks from bombardier through lieutenant colonel. Although the small sample size and scope of the study limits the database, it remains somewhat representative of the middle ranking leaders of the larger organization. The database supplies answers to several questions. It interrogates these twelve individuals on several criteria: years of service, beginning and ending rank, number of promotions, pre-war education and vocations, valorous duty, reasons for retirement and mentor-patron relationships among other variables.

An examination of this data pool in aggregate suggests a few interesting patterns. On average, these twelve individuals served five years during the war and received one promotion over the duration of their service. There is a significant correlation with the rank of their mentor/patron and their length of service and number of promotions. Those with Henry Knox or Washington as patrons received higher than average promotions and had greater than average length of service. There is also a significant correlation with pre-war education and valor with length of service. These trends indicate an organization that overall kept and rewarded its officers of merit.

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<sup>321</sup>See Appendix B for the Biographical Database of the twelve leaders examined.

An analysis of the specifics of these biographies points to an organization that retained officers that exhibited professional values, respected education, grew in tactical skill, maximized individual skills and rewarded talent while fighting the war. In short, analysis suggests a gradual increase in professionalization.

First, the examples of Proctor and Callendar evidence an organization that could handle the un-professional conduct of its officers. In Proctor's case, the 4th Continental Artillery officer corps began as a family-based localized conglomeration that professionalized to the point where its commanding officer could oversee the court martial and cashier of his own father. In short, the unit gradually developed the ability to self-police. In Callendar's case, despite his early failures, the corps continued to give him opportunity to grow and flourish, to the point where an officer with sullied honor continued in the service until the end of the war.

Second, the organization valued personnel of education, advanced literacy, experience, technical/tactical talent and administrative skill. The careers of White, Thompson and Bauman illustrate this point. White was promoted because of his literacy; unfortunately, it would take an institution wide change in enlistments to retain education enlisted men of his caliber. Thompson's experience and talent were recognized early and his responsibilities grew as a result. Bauman's education and experience served the Continental artillery well with increasing technical demands over time.

Third, the biographies of Singleton and Oswald show an organization that learned over time growing considerably in tactical skill. Singleton's performance at Camden contrasts sharply with his performance in later campaigns. Oswald's career, though

constantly filled with courage, displayed a remarkable tactical growth from Compo Hill to Monmouth.

Fourth, the Continental artillery instituted means to manage assignments, retention and removal based on the maximization of individual skills. This was evident in the careers of Sargent, Kollock and Carrington. Sargent's selection to serve with Knox to Congress hoisted an important task on a young officer of insight. Kollock's resignation and directed retasking to printing service outside of the army addressed a wider need for favorable strategic publicity. Carrington's appointment to double duty in the south recognized the particular experiences of a senior artillery officer.

Last, the Continental artillery developed a system of leader management that promoted meritorious officers while it remained fair and sensitive to issues and questions of gentlemanly honor of the times. The careers of Thompson, Shaw and Forrest attest to this assertion. Out of the pool of twelve, these three officers were promoted at least three times in the course of their careers. Thompson was promoted three times. Thompson's experience and skill from the beginning of Hamilton's company through his death in 1780 was marked with repeated opportunities for service above his rank. Shaw's consistently superior administrative performance earned the respect of much senior officers. Forrest's performance won the praise of Washington and Knox where they risked alienating other officers to prefer his promotion to lieutenant colonel.

In the Continental Artillery, senior mentors often identified meritorious leaders. Geographically, the artillery grew from older local provincial organizations into units that would fight in distant cross-colonial environments. Importantly, the Continental artillery coalesced into its own distinct identity and developed a cohesiveness of its own by the

end of the war. The organization grew to exhibit the ability to harness and train specialized knowledge, make the most of its changing culture and police the unwanted actions of a few.

## CHAPTER 5

### Conclusion

This study has argued that the development of the Continental artillery became increasingly professional throughout the war. Historians have told and re-told the story of the professionalization of Continental Army. This enquiry has told the story of the professionalization of its artillery branch through four distinct methodological approaches. A traditional historical narrative described its structural development. A cultural analysis surveyed an early change in the organization. A theory and practice approach compared a doctrine found in books to tactics-in-use. A collective biography charted the course of development in middle ranking leaders. All of these methodologies led to the same conclusion, the artillery developed along a trajectory toward professionalism in the course of the war.

Chapter 1 argued that the organization changed its structure to accommodate the needs of war. The Continental Congress established its control through a regular regimental system. Its structural change resulted as much from necessity as design. Consequently, the organization mirrored existing conditions and reflected military realities. An artillery branch that began as disparate colonial units gradually coalesced into a structure that combined them into a Continental artillery consisting of four numbered regiments. While this regimentation came with challenges, it cemented the organization into a workable whole that allowed for better supervision and management. In this, it resembled the Continental Army. This structure contained a tacit understanding of the military reality that the army needed to meet and best the British on their own

terms with a regular standing force. However, structural change would not be enough, a cultural shift worked simultaneously toward the same end.

Chapter 2 argued that an early change in the leadership prompted a shift in the organizational culture. The decision to replace Richard Gridley with Henry Knox paved the way for a culture change that favored professionalism over provincialism. The external political and strategic environment also influenced this change. The strategic decision by the Continental Congress to seek independence prompted an operational approach that favored offensive action. The Congress appointed Washington, an aggressive commander, to command its army. Washington sought to transform the forces he found around Boston into an organization that resembled his enemy, a regular professionalized standing army. The decision to place Knox at the head of his artillery arm supported that intended change. In contrast to Gridley, Knox's personal predilections guided the artillery into a cultural development that emphasized discipline, learning and merit - hallmarks of a professional organization. In building that culture, Knox, a former bookseller, emphasized tactical suggestions found in military books of the time, a subject in which he was comfortable and knowledgeable.

Chapter 3 showed that the organization gradually embraced the seeds of an artillery doctrine contained in books of the period. This doctrine led to an increase in battlefield effectiveness. The combination of that emerging doctrine, training, experience and the influence of French officers contributed to a growing interest in professional knowledge. While doctrine in its current sense did not exist in the 18th century, the seeds of an emerging body of battlefield tactical knowledge did exist in books. These books, many written in French, recommended a few key concepts that the Continental artillery

embraced over time. It took three years for these skills to mature and peak at the battle of Monmouth. Throughout this maturation, French officers provided invaluable guidance and assistance. They also provided a model for the individual development of artillery leaders.

Chapter 4 charted the development of professionalism in the Continental artillery through the careers of some of its middle ranking leaders. In those careers, we found an increasing ability for the organization to balance talent, honor, and retention in professional ways. The survey of twelve individual leaders from the rank of bombardier through lieutenant colonel gave a flavor of artillery organizational development. It showed a preference for leaders who supported organizational goals, who exhibited required specialized knowledge and who displayed tactical and administrative skills. It presented instances of valor, unprofessional behavior, challenges associated with promotions and recognition of young talent. In all of these circumstances, the organization found suitable and reasonable ways to promote the common cause. In several cases, these leaders provided valuable service to the new independent United States.

The community created by the Continental artillery during the course of the war continued to contribute after its conclusion. Despite the near total dissolution of the Continental Army following the war and throughout the back and forth squabbles over the nature of a peacetime American military establishment, a core group of skilled artillery professionals provided a mainstay in professional ideals. Federalist and Republican battles over the size and organization of the establishment concealed an underlying recognition from both political factions, the need for a cadre of trained and

professional military technicians, particularly those with skills in artillery and engineering. The artillery provided continuity in professional ideals into the next century that culminated in the establishment of a professional military academy in 1802.

Henry Knox, the artillery chief, succeeded Washington as commander of the Continental Army. He oversaw the disbanding of the army with the exception of a single artillery company. As the first secretary for war under the Confederation, he supervised a new peace establishment that held a significant role for the artillery.<sup>322</sup> Alexander Hamilton, a prominent nationalist politician and former artilleryman, tirelessly pushed the new nation for a permanent standing army. Washington and Stueben voiced a common recognition gained in the course of the war and argued for a professional corps of artillerists. —The country needed an institution to keep alive military art and skill, to study war, and to serve as a model organizationally for the militia.”<sup>323</sup> Stueben noted, —To make any art a study . . . it should not only be a passion but a business.”<sup>324</sup> Washington’s sentiments were clear; the new nation needed —A regular and standing force. . . . Academies, one or more for the Instruction of the Art Military; particularly those Branches of it which respect Engineering and Artillery, which are highly essential, and the knowledge of which, is most difficult to obtain.” Washington elaborated further,

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<sup>322</sup>Richard H. Kohn, *Eagle and Sword: The Federalists and the Creation of the Military Establishment in America, 1783-1802* (New York: Free Press, 1975), 57, 60, 62; Puls, 184-185; Russell F. Weigley, *History of the United States Army* (New York: MacMillan, 1967), 80-81; McKenney, 70; William L. Haskin, —The First Regiment of Artillery,” in *The Army of the United States*, ed. Theophilus F. Rodenbough and William L. Haskin (New York: Maynard, Merrill and Company, 1896), 301.

<sup>323</sup>Kohn, 42-43.

<sup>324</sup>Baron Wilhelm von Stueben quoted in Kohn, 43.

That an Institution calculated to keep alive and diffuse the knowledge of the Military Art would be highly expedient. . . . Until a more perfect system of Education can be adopted, I would propose that Provision should be made at some Post or Posts where the principle Engineers and Artillerists shall be stationed, for instructing a certain number of young Gentlemen in the Theory of the Art of War, particularly in all those branches of service which belong to the Artillery and Engineering Departments. . . . And as this species of knowledge will render them much more accomplished and capable of performing the duties of Officers. . . . Of so great importance is it to preserve the knowledge which has been acquired thro' the various Stages of a long and arduous service. . . . For it must be understood, that a Corps of able Engineers and expert Artillerists cannot be raised in a day.<sup>325</sup>

The period between 1795 and 1800 found the opposing state-centered faction, under Thomas Jefferson's leadership, acquiescing to the need for a regular and professionalized standing army, particularly with the establishment of two regiments of artillerists and engineers.<sup>326</sup> In 1802, one of the first items on Jefferson's agenda was the creation of a military academy at West Point for the training of artillerymen and engineers.<sup>327</sup> The professional ideals fostered in the artillery of the American Revolution remained alive and well in the new United States of America.

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<sup>325</sup>George Washington, "Sentiments on a Peace Establishment, 1783," *The Potowmack Institute*, <http://www.potowmack.org/washsent.html>.

<sup>326</sup>Kohn, 224, 301; Haskin, 301.

<sup>327</sup>Kohn, 303; Theodore J. Crackel, *Mr. Jefferson's Army: Political and Social Reform of the Military Establishment, 1801-1809* (New York: New York University Press, 1987), 62.

## APPENDIX A

### Methodological Explanation of the Examination of Culture

Any study of culture is immediately plagued with its definition. What are the limits and boundaries proscribed to “culture”? What does culture look like? What are its distinctive features or elements? What forces play on the development and continuity of culture over time? Does culture change and under what circumstances? A scholar’s answers to these questions and others will shape the scope and nature of their study. For this study therefore, it may be helpful to look at how scholars have defined culture in the historical, military and organizational fields.

One methodological survey sees cultural history as heavily influenced by anthropology with an attempt to get at “the mental and social world they [historical persons] inhabited, seen from their point of view—the rational and irrational, the subjective and objective strategies by which they apprehended and manipulated family, communities, political parties, and networks of clients.”<sup>328</sup> Additionally, the authors have suggested that historians, while previously infatuated with the cultural artifacts of the elite in history, have now defined culture as “the system of meaning through which people experience the world.”<sup>329</sup> While recognizing the debt historians owe to cultural anthropologists in the study of culture, they caution against the anthropological tendency to seek out constancy and temper it with the historians view toward change.<sup>330</sup> Anna

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<sup>328</sup>Martha Howell and Walter Prevenier. *From Reliable Sources: An Introduction to Historical Methods* (Ithaca: Cornell University Press, 2001), 116.

<sup>329</sup>Ibid., 117.

<sup>330</sup>Ibid., 27.

Green highlights the importance of dualism in the cultural study of history. She points out the philosophical contrasts between the ideal and material and how cultural history studies can sometimes be categorized into dichotomies.<sup>331</sup> She suggests that cultural history has been shaped by the concept of *mentalite*. In describing this concept, she emphasizes “modes of thought,” “unspoken or unconscious assumptions,” “everyday thought” and “underlying structures of belief.” These ideas come awfully close to guiding philosophies of wider cultural analyses.<sup>332</sup> In discussing critiques of some cultural history works, she shoots down an over-reliance on consensus by suggesting that studies should leave room for cultural change.<sup>333</sup> In describing the impacts of anthropology she details the work of Clifford Geertz, particularly the concept of thick description in which “culture is understood from the perspective of the participants.”<sup>334</sup> In discussing the impact of “remembering” or memory in cultural history she highlights the “collective memorialization of war” through rituals and artifacts. She quotes Steven Rose stating simply that “memory defines who we are.”<sup>335</sup> In her conclusion, and apt for this study, she writes, “Cultural transformation may also be found at the site of encounter *between* cultures.”<sup>336</sup> Peter Burke, in his introduction to cultural history, while acknowledging that

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<sup>331</sup>Anna Green, *Cultural History: Theory and History* (New York: Palgrave MacMillan, 2008), 2-3, 70.

<sup>332</sup>Ibid., 28-29.

<sup>333</sup>Ibid., 34.

<sup>334</sup>Ibid., 57.

<sup>335</sup>Ibid., 82-83.

<sup>336</sup>Ibid., 118.

–Almost everything seems to be having its cultural history written these days,”<sup>337</sup> also describes one important contribution. Interestingly for this study, he introduces the concept of schema to cultural history. In reviewing Popper and Gombrich he suggests that –cultural schema” consists of the interplay between –truth and the stereotype” or –schema and correction” and that schemata are modified through observations of reality and experience.<sup>338</sup> Writing of the contributions of Bourdieu to cultural history, he expands the concept of schema to describe everyday practices as consisting of –sustained improvisation” within collaborating schemata impacted by culture.<sup>339</sup>

In regards to the sub-field of military history, Jeremy Black suggests that the cultural approach can be conceptualized as a counter-point to technological determinism. He writes that –cultural elements, especially the way in which understandings of appropriate military conduct, victory, defeat, and casualty are culturally conditioned.” He also cautions against overstatements about the significance of cultural factors and introduces the idea of studying the –organizational culture of particular militaries.”<sup>340</sup> Stephen Morillo, in his recent survey of the military historiography, suggests that military forces and their subsequent history appear different when examined through a cultural lens.<sup>341</sup> In describing Geoffrey Parker’s famous work he suggests that Parker’s implicit

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<sup>337</sup>Peter Burke, *What is Cultural History?* 2nd ed. (Malden, MA: Polity, 2008), 131.

<sup>338</sup>Ibid., 11-12.

<sup>339</sup>Ibid., 58.

<sup>340</sup>Jeremy Black, *Rethinking Military History* (London: Routledge, 2004), 55.

<sup>341</sup>Stephen Morillo, *What is Military History?* (Malden, MA: Polity, 2006), 9.

theme was that culture was an important factor in shaping military practice.”<sup>342</sup> Morillo asserts that, “when radically different cultural (and/or military) systems meet, radical change may be forced on some and likely all of the systems involved.”<sup>343</sup> The most recent and successful effort at the study of historical military culture was conducted by John A. Lynn. In his book *Battle*, Lynn outlines a detailed methodology for the study of past military cultures that emphasizes the interaction between the “discourse” and “reality” of war. In his work, he presents a dichotomy between the ideal and the real, he contends that the discourse of war is what is primarily shaped by culture, and that this discourse is often laden with preconceptions and notions of the ideal. Interestingly, he purports that this discourse, and its consequent culture, is continuously impacted and shaped by the realities of war and battle encountered through time.<sup>344</sup>

Military culture is also not easily defined. However, several studies suggest some interesting approaches to the definition of military culture. One such study imparts that “military culture is essentially how things are done in a military organization. It consists of the accepted values, philosophies, traditions and customs.”<sup>345</sup> Another more recent study defines military culture as “the basic assumptions about war of those groups within

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<sup>342</sup>Ibid., 42.

<sup>343</sup>Ibid., 52.

<sup>344</sup>See Appendix in John A. Lynn, *Battle: A History of Combat and Culture, From Ancient Greece to Modern America* (Boulder, CO: Westview, 2003), 331-341.

<sup>345</sup>E. Dorn, H. D. Graves, W. F. Ulmer, Jr., J. J. Collins, and T. O. Jacobs, *American Military Culture in the Twenty-First Century: A Report of the CSIS International Security Program* (Washington, DC: Center for Strategic and International Studies, 2000), 7.

the wider society who are professionally concerned with the use of military force.”<sup>346</sup>

Another suggests that “Military culture may be said to refer to the deep structure of military organizations, rooted in prevailing assumptions, norms, values, customs and traditions which collectively, over time, have created shared individual expectations among the members.”<sup>347</sup> Perhaps the most useful is a study by James Burk that states, “military culture is an elaborate social construction, an exercise of creative intelligence, through which we come to imagine war in a particular way and to embrace certain rationalizations about how war should be conducted and for what purposes.”<sup>348</sup> More specifically, he breaks down military culture into four distinct elements. The elements of discipline, professional ethos, ceremony/etiquette and cohesion/esprit de corps comprise military culture.<sup>349</sup>

Schein, in his work *Organizational Culture and Leadership* laid out the idea that in observation, the initial cultural encounter, or first layer of culture, will often be with the most easily observed, or the surface artifacts of the culture. The second layer is the espoused beliefs and values of the organization. The third layer is the underlying assumptions of the organization. These three, when considered in total with the primary

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<sup>346</sup>Benjamin Buley, *The New American Way of War: Military Culture and the Political Utility of Force* (New York: Routledge, 2008), 12.

<sup>347</sup>Charles B. Breslin, Lt. Col. US Army, “Organizational Culture and the Military” (Carlisle Barracks, PA: US Army War College, 2000), 10.

<sup>348</sup>James Burk, “Military Culture,” in *The Encyclopedia of Violence, Peace and Conflict*, vol. 2 (San Diego, CA: Academic Press, 1999), 447-462.

<sup>349</sup>Ibid., 448-454.

emphasis placed on the basic assumptions, describe the culture of an organization.<sup>350</sup> Schein further suggests that culture should be viewed as –a dynamic phenomenon that surrounds us at all times, being constantly enacted and created by our interactions with others and shaped by leadership behavior, and a set of structures, routines, rules, and norms that guide and constrain behavior.”<sup>351</sup> He defines culture as –a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.”<sup>352</sup> Here he outlines the two major organizational problems that culture must meet in order to be sustained, namely, external adaptation and internal integration. External adaptation deals with the growth and survival of the organization in response to external pressures. Internal integration is the efforts of the organization to facilitate routine operations and accommodate lessons learned.<sup>353</sup>

Schein, also, as part of his cultural model, in his second layer of culture, suggests that organizations often present espoused values. Espoused values are those that the organization aspires to, that are usually articulated in a vision or mission statement. He also implicitly indicates that espoused values are not necessarily the values actually acted on within the organization. Hence, organizational behavior may actually correspond to

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<sup>350</sup>Edgar H. Schein, *Organizational Culture and Leadership*, 3rd ed. (San Francisco, CA: Jossey-Bass, 2004).

<sup>351</sup>Ibid., 1.

<sup>352</sup>Ibid., 17.

<sup>353</sup>Ibid., 18.

other, unstated values. Pedersen and Sorensen, in their study, use a concept they call values-in-use. Rather than values that are clearly articulated and explicitly stated, they are the unstated values upon which the organization actually behaves. They wrote, “The ‘espoused values’ are primarily normative statements, which reflect attitudes, hopes or beliefs about how you would like things to be, as opposed to the ‘values-in-use,’ which actually function as guidelines of behavior.”<sup>354</sup> Values-in-use are more indicative of organizational culture than aspirations or values statements. In culture study, values-in-use point us toward the actual values that move and shape organizational behavior and are more useful to this study.

Joanne Martin, in attempting to define organizational culture suggests that it can be found in “the patterns of meanings” that exist when an organization is in states of harmony, conflict, and ambiguity.<sup>355</sup> Martin’s work highlights three primary approaches to cultural analysis in the social sciences. In one of these, which she calls “the differentiation perspective,” she suggests that within organizations, sub-groups develop distinctive cultural elements that differentiate them from the larger whole. She asserts that the existence of these sub-cultures requires action to maintain.<sup>356</sup> Organizational sub-cultures are often developed through functional or occupational differences within the

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<sup>354</sup>Jesper S. Pedersen and Jesper S. Sorensen, *Organisational Cultures in Theory and Practice* (Aldershot, England: Gower Publishing, 1989), 21.

<sup>355</sup>Joanne Martin, *Organizational Culture: Mapping the Terrain* (Thousand Oaks, CA: Sage Publishing, 2002), 119.

<sup>356</sup>Martin, *Organizational Culture*, 2002.

larger culture.<sup>357</sup> Additionally, one other study maintains that parts or roles within the exercise of ritual can also maintain sub-cultural boundaries and reinforce mechanisms for control.<sup>358</sup> Within the differentiation perspective studies also show that ambiguities exist within organizations and that different groups within an organization can develop diverse meanings and interpretations of the same phenomenon. Therefore, it is possible within an organization for cultural unity and cultural division to exist simultaneously.<sup>359</sup>

According to prevailing cultural change theory outlined by W. Warner Burke's model, organizational culture is primarily shaped and acted on by three transformational factors, namely, the environment or forces external to the organization, the mission and strategy of the organization, and organizational leadership.<sup>360</sup> Burke describes the Burke-Litwin Model as "causal" from the top down and as a complex "system," in that changes in any one factor resonate throughout the rest. In the causal aspect, changes are most likely effective the more engaged in "direct interaction with external environmental forces . . . [which] will as a consequence require significantly new behavior from

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<sup>357</sup>Martin, *Organizational Culture*, 103; P. J. Frost, L. F. Moore, M. R. Louis, C. C. Lundberg, and J. Martin, *Reframing Organizational Culture* (Newbury Park, CA: Sage Publishing, 1991), 94; Pedersen and Sorensen, 74; Allen English, *Understanding Military Culture* (Montreal, Canada: McGill-Queen's University Press, 2004), 9.

<sup>358</sup>P. J. Frost et al., 55; Michael Rosen, "Breakfast at Spiro's: Dramaturgy and Dominance," in *Reframing Organizational Culture*, ed. P. J. Frost et al. (Newbury Park, CA: Sage Publishers, 1991), 89.

<sup>359</sup>Ed Young, "On the Naming of the Rose: Interests and Multiple Meanings as Elements of Organizational Culture," in *Reframing Organizational Culture*, ed. P. J. Frost et al. (Newbury Park, CA: Sage Publishers, 1991), 91.

<sup>360</sup>W. Warner Burke, *Organization Change: Theory and Practice* (Thousand Oaks, CA: Sage Publishing, 2002), 202.

organizational members.”<sup>361</sup> In this model, the external environment refers to significant inputs that require an organization to survive and flourish such as political forces and economic changes. The mission refers to the purpose and direction of the organization while the strategy concerns the implementation of the mission, or the how. Leadership refers not only to command, but also to influence, direction and persuasion and is also exercised at all levels throughout the organization.<sup>362</sup>

Edgar Schein suggests that the role of the founder is critical to the development of organizational culture. Organizations tend to appropriate the cultural assumptions of their founders until those assumptions fail to respond to organizational needs. Therefore, the founder’s assumptions, although subject to incremental change, will often have the largest impact on the organizations culture.<sup>363</sup> Further studies in psychology suggest that the concept of schema, or one’s personal paradigm, often developed through personal experience, significantly impacts the leader’s decisions. One social psychologist defines schema as “cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information contained in the individual’s social experiences.”<sup>364</sup> One other study suggests that schema can also

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<sup>361</sup>Ibid.

<sup>362</sup>Ibid., 204.

<sup>363</sup>Edgar H. Schein, “The Role of the Founder in the Creation of Organizational Culture,” in *Reframing Organizational Culture*, ed. P. J. Frost et al. (Newbury Park, CA: Sage Publishers, 1991), 15.

<sup>364</sup>Markus, Hazel, “Self-Schemata and Processing Information About the Self,” *Journal of Personality and Social Psychology* 35 (1977): 64.

influence the leader's perception of other people as well.<sup>365</sup> Psychological research focusing on the significance of schema on individual behavior suggests that they impact both intrapersonal and interpersonal processes.<sup>366</sup> Therefore, if we accept that a leader's schema, significantly influenced by his past experience, can impact decisions, then it might be important to flesh out leader biographies in any examination of past organizational cultures.

In conducting this study, the methodology can best be described as a combination of comparative cultural analysis with traditional historical narrative. In operationalizing organizational culture theory for the purposes of this study it was necessary to conduct some synthesis. First, building on the work of Martin, and for help in defining the wider cultural environmental context, the artillery should be looked at as a sub-culture of the greater military and political cultures in existence at the time.<sup>367</sup> It would follow that the artillery would have differentiation from the larger cultures and also that it would borrow assumptions from those sources as well. Second, as Schein has pointed out, cultures must deal with both adaptations to the external environment and integration of the internal needs of the organization. With this in mind, we turn to Burke's model of cultural change in which the transformational factors of the environment, mission/strategy, and leadership, in the process of organizational adaptation, all externally affected the organizational culture of the artillery. Third, in analyzing the internal aspects of the

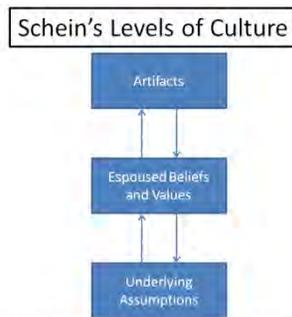
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<sup>365</sup>Lewicki, Pawel, "Self-Schema and Social Information Processing," *Journal of Personality and Social Psychology* 47 (1984): 1177.

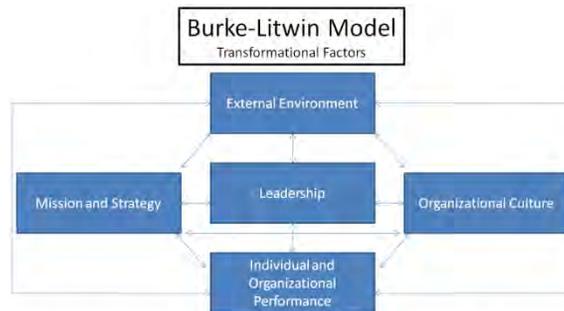
<sup>366</sup>Markus, Hazel and Elissa Wurf, "The Dynamic Self-Concept: A Social Psychological Perspective," *Annual Review of Psychology* 38 (1986): 300.

<sup>367</sup>Joanne Martin, *Organizational Culture*, 94.

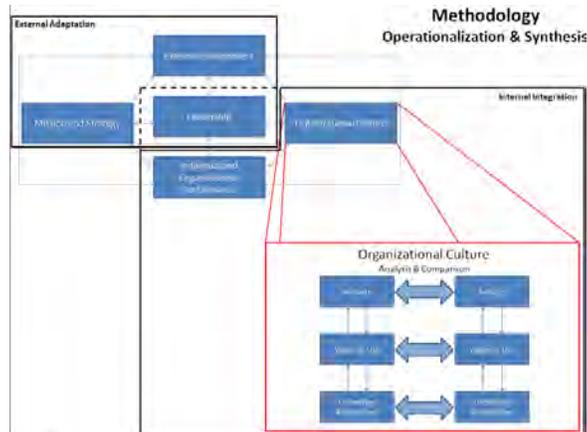
artillery culture, we return to the integration perspective of Schein to look in-depth at its artifacts, values, and assumptions. While looking at organizational values, we will shift from a focus on the espoused values in favor of Pedersen and Sorensen's concept of values-in-use, those values that guided behavior. Lastly, we have used a comparative method to highlight the significance of the cultural shift in early artillery organization.



Source: Figure 2.1 in Edgar H. Schein, *Organizational Culture and Leadership*, 3<sup>rd</sup> Ed. (San Francisco: Jossey-Bass, 2004), p. 26.



Source: Figure 9.3 in W. Warner Burke, *Organization Change: Theory and Practice* (Thousand Oaks, CA: Sage, 2002), p. 202.



## APPENDIX B

### Biographical Database of Middle Ranking Artillery Leaders

Name	Place of Birth	Year of Birth	Colony/State of Representation	Year of first enlistment	Year of final retirement	Method of retirement	Age at first enlistment	Age at retirement	Years of service	Regiment of service
Joseph White	Weymouth, MA	1757	Massachusetts	1775	1777	Resigned	18	20	2	Gridley's Artillery; Knox's Artillery
Winthrop Sargent	Gloucester, MA	1758	Massachusetts	1776	1783	End of War	23	30	7	Gridley's Artillery; Knox's Artillery; 3rd Cont. Art.
Shepard Kollock	Lewis, DE	1750	New York	1776	1779	Resigned	27	29	3	New York Militia; 2nd Cont. Art.
Thomas Thompson	England? Germany?		New York	1776	1780 (died)	Death - Springfield			4	Hamilton's Coy.; 2nd Cont. Art.
Thomas Forrest	Philadelphia, P	1747	Pennsylvania	1776	1781	Resigned 1781	29	34	5	Proctor's Battalion of Art.; 4th Cont. Art.
Anthony Singleton			Virginia	1777	1783	End of War			6	1st Cont. Art.
John Callendar			Massachusetts	1775	1783	End of War			8	Gridley's Art.; 3rd Cont. Art.
Samuel Shaw	Boston, MA	1754	Massachusetts	1775	1783	End of War	21	29	8	Knox's Art.; 3rd Cont. Art.
Sebastian Bauman	Frankfurt on Main, Germany	1739	New York	1776	1783	Continued Service	37	43	7	New York Art. Coy.; 2nd Cont. Art.
Eleazer Oswald	Falmouth, Eng	1755	Connecticut	1775	1778	Resigned	20	23	3	2nd Cont. Art.
Edward Carrington	Virginia	1748	Virginia	1776	1783	End of War	28	35	7	1st Cont. Art.
Francis Proctor, Sr.	Ireland	1720?	Pennsylvania	1775	1778	Cashiered	55?	58?	3	Proctor's Battalion of Art.; 4th Cont. Art.
<b>AVERAGES</b>	<b>4 of 12 Foreign born</b>						<b>29</b>	<b>34</b>	<b>5</b>	

Name	Beginning rank	Ending rank	Number of promotions	Valor	Pre-war education	Pre-war vocation	Post-war vocation	Mentor/Patron	Post-war Politics	Inter-state service	Cincinnati Member
Joseph White	Bombardier	Sergeant	1	Trenton	Literate					New York, New Jersey	Not Eligible
Winthrop Sargent	Captain-Lieutenant	Brevet Major-Aide-de-Camp	2		Harvard College	Officer of a Merchant Vessel	Soldier, politician, Governor of N.H. Tel./Mississippi Ter	Robert Howe; Henry Knox	Federalist	New York, New Jersey, Pennsylvania	Yes
Shepard Kollock	First Lieutenant	First Lieutenant	0		Well educated	Journeyman Printer	Editor New Jersey Journal	Alexander Hamilton	Federalist	New Jersey, Pennsylvania	Yes
Thomas Thompson	Sergeant	Captain-Lieutenant	3	Yes - Springfield	Literate			Alexander Hamilton		New Jersey, Pennsylvania	Eligible, Died on Duty
Thomas Forrest	Captain	Lieutenant-Colonel	2	Yes - Trenton 1 & 2	Literate		Politician		Federalist	New York, New Jersey	Eligible, not an original member
Anthony Singleton	Captain	Captain	0	Yes - Gufford & Hobkirk's				Nathanael Greene		New York, New Jersey, Pennsylvania, North Carolina	Yes
John Callendar	Captain	Captain	1	Yes - Long Island						New York, New Jersey, Pennsylvania, Virginia	Yes
Samuel Shaw	Lieutenant	Captain	2		Well educated merchants school		Politician-Statesman	David Mason, Henry Knox	Federalist	New York, New Jersey, Pennsylvania, Virginia	Yes
Sebastian Bauman	Captain	Major	1		Educated at Heidelberg as an Austrian engineer and artilleryist		Military Officer, Federal Post Master, Engineer		Federalist	New Jersey, Pennsylvania, Virginia	Yes
Eleazer Oswald	Lieutenant-Colonel	Lieutenant-Colonel	0	Yes - Quebec, Compo Hill & Monmouth		Publisher apprentice	Publisher; French Art. Officer	Benedict Arnold, John Lamb	Democratic-Republican	Canada, New York, New Jersey, Pennsylvania	No
Edward Carrington	Lieutenant-Colonel	Lieutenant-Colonel	0	Yes - Monmouth, Gufford & Hobkirk's		Lawyer-Plantation Owner	Lawyer-Politician	George Washington	Federalist	Pennsylvania, New Jersey, North Carolina	Yes
Francis Proctor, Sr.	Captain	Captain	0					Thomas Proctor (his son)		Enroute to South Carolina	No
<b>AVERAGES</b>			<b>1</b>						<b>6 of 7 of known politics were federalists</b>		<b>7 of 10 eligible for the society were original members</b>

## APPENDIX C

### List of Regimental Officers 1775-1776

ARTILLERY REGIMENT, June 1775 (Gridley)

#### Field Officers

Colonel Richard Gridley, Commander  
Lieutenant Colonel William Burbeck  
Major David Mason  
Major Scarborough Gridley

#### Company Commanders

Captain Edward Burbeck  
Captain John Callendar  
Captain Joseph Chadwick  
Captain Edward Crafts  
Captain Thomas Waite Foster  
Captain Samuel Gridley  
Captain-Lieutenant William Perkins  
Captain John Popkins  
Captain Samuel Russell Trevett  
Captain John Wiley

CONTINENTAL ARTILLERY REGIMENT, June 1776 (Knox)

#### Field Officers

Colonel Henry Knox, Commander  
Lieutenant Colonel David Mason  
Major John Crane  
Major John Lamb

#### Company Commanders

Captain Stephen Badlam  
Captain Edward Burbeck  
Captain Edward Crafts  
Captain Thomas Waite Foster  
Captain Ebenezer Stevens  
Captain Thomas Pierce  
Captain William Perkins  
Captain Dimond Morton  
Captain Eliphalet Newall  
Captain William Dana  
Captain Jotham Drury  
Captain John Popkins

Sources: Niles Papers, Knox Papers, Wright *Continental Army*, Birkhimer *Historical Sketch*, Heitman *Historical Register*

APPENDIX D

Richard Gridley's Louisbourg Map



Source: Richard Gridley, A Plan of the City and Fortress of Louisbourg, with a Small Plan of the Harbour, 1745, engraving by P. Pelham (Boston: J. Smibert, 1746), Massachusetts Historical Society website, [http://www.masshist.org/maps/2728\\_Gridley/2728\\_Gridleyborder.htm](http://www.masshist.org/maps/2728_Gridley/2728_Gridleyborder.htm).

## BIBLIOGRAPHY

### Primary Sources

#### Manuscripts

Gridley, Richard. "Transcriptions from the Public Records Office, London, England America and West Indies Vol. 82," Francis Parkman Papers, Massachusetts Historical Society, Boston.

Niles, Jeremiah. "Regimental Orders, Orderly Book of Adjutant Jeremiah Niles, volumes 1 and 2," Papers of Jeremiah Niles, Library of Congress, Washington, DC.

#### Microfilm

Knox, Henry. Henry Knox Papers. Microfilm, United States Military Academy Library.

Knox, Henry. Henry Knox Papers. Microfilm, Massachusetts Historical Society.

### Published Primary Sources

Adams, John. *The Adams Papers: Papers of John Adams*. Edited by Robert J. Taylor. Cambridge: Harvard University Press, 1979.

Brooke, Francis J. *A Family Narrative: Being Reminiscences Of A Revolutionary Officer*. Richmond, VA: MacFarlane and Fergusson, 1849. Reprint, Tarrytown, NY: William Abbatt, 1921.

Colston, Charles, Captain. Library Inventory. "Libraries in Colonial Virginia." *The William and Mary Quarterly* 2, no. 4 (April 1984): 247-249.

Drake, Francis S. *Life and Correspondence of Henry Knox, Major General in the American Revolutionary Army*. Boston: Samuel G. Drake, 1873.

Fairchild, Mary C. Doll, ed. *Memoirs of Colonel Sebastian Beauman*. Publisher Unknown, 1900.

Force, Peter. *American Archives*, 4th Series, Vol. 2. Washington, DC, 1853.

———. *American Archives*, 5th Series, Vol. 1. Washington, D.C., 1853.

Hamilton, Alexander. *The Papers of Alexander Hamilton*. Edited by Harold C. Syrett. New York: Columbia University Press, 1961.

- Leake, Isaac Q. *Memoir of the Life and Times of General John Lamb*. New York: Da Capo, 1971. Reprint 1850.
- Lee, Richard, Colonel. Library Inventory. —Libraries in Colonial Virginia.” *The William and Mary Quarterly* 2, no. 3 (January, 1894): 169-175.
- Library of Congress. *Journals of the Continental Congress, 1774-1789*. Washington, DC: U.S. Government Printing Office, 1904-1937.
- Linn, John B., and William H. Egle, eds. *Pennsylvania Archives*, 2nd Series, Vol. 11. Harrisburg, PA: Clarence M. Busch, 1896.
- Moore, Frank. *Diary of the American Revolution: from Newspapers and Original Documents*. New York: New York Times and Arno Press, 1969.
- Oswald, Eleazer. —Testimony - Proceedings of a General Court Martial . . . for the Trial of Major General Lee. July 4th, 1778,” *Collections of the New-York Historical Society for the Year 1873*. New York, 1874.
- Paine, Robert Treat. *The Papers of Robert Treat Paine, Volume 3: 1774-1777*. Edited by Edward W. Hanson. Boston: Massachusetts Historical Society, 2005.
- Pepperell, William. *An Accurate Journal and Account of the Proceedings of the New England Land Forces during Late the Expedition Against the French Settlements on Cape Breton, To the Time of the Surrender of Louisbourg*. London: A & S Brice, 1746.
- Quincy, Josiah, ed. *The Journal of Major Samuel Shaw*. Boston: Crosby and Nichols, 1847.
- Washington, George. *The Papers of George Washington, Revolutionary War Series*. Edited by Philander D. Chase, et al. Charlottesville, VA: University Press of Virginia, 1987.
- . *The Writings of George Washington from the Original Manuscript Sources*. Edited by John C. Fitzpatrick et al. Washington, DC: Government Printing Office, 1937.
- White, Joseph. —An Narrative of Events, As They Occurred from Time to Time in the Revolutionary War.” *American Heritage* (June 1956): 74-79.
- Wormley, Ralph, Colonel. Library Inventory. —Libraries in Colonial Virginia.” *The William and Mary Quarterly* 3, no. 2 (October, 1894): 132.

## Eighteenth Century Books

- Bland, Humphrey. *A Treatise of Military Discipline*. 6th. London: Buckley, 1746.
- Clairac, Chevalier de. *Field Engineer*, Translated by Lewis Nicola. Philadelphia: Aitken, 1776.
- Crise, Turpin de. *Essay on the Art of War*. Translated by Joseph Otway. 2 vols. London: Hamilton, 1761.
- Fortune, T. *The Artillerist's Companion*. London: J. Millan, 1778, reprint, Bloomfield, Ontario: Museum Restoration Service, 1992.
- Holliday, Francis. *An Easy Introduction to Practical Gunnery, or The Art of Engineering*. London: W. Innys and J. Richardson, 1756.
- LeBlond, Guillaume. *A Treatise of Artillery*. Translated by Unknown. London: E. Cave, 1746, reprint, Ottawa, Ontario: Museum Restoration Service, 1970.
- Muller, John. *A Treatise of Artillery*. 2nd ed. London: J. Millan, 1768.
- Pleydell, J.C. *An Essay on Field Fortification*. London: J. Nourse, 1768.
- Saxe, Maurice de. *Reveries or Memoirs on the Art of War*. Translated by Anonymous. London: J. Nourse, 1757.
- Smith, Goerge. *An Universal Military Dictionary*. London: J. Millan, 1779; reprint, Ottawa, Ontario: Museum Restoration Service, 1969.
- Steuben, Frederic Wilhelm Baron de. *Regulations for the Order and Discipline of the Troops of the United States*. Boston: Thomas and Andrews, 1794, reprint, Mineola, NY: Dover Publications, 1985.
- Teil, Jean Du. *De l'usage de l'artillerie nouvelle dans le guerre campagne*. Metz : Marchal Librairie, 1778.
- Tousard, Louis de. *American Artillerist's Companion or Elements of Artillery*. Philadelphia: C. and A. Conrad, 1809.

## SECONDARY SOURCES

### Articles and Dissertations

- Barker, Richard. "A Glance at Ricochet." *Journal of the Ordnance Society* 10 (1998): 1-16.

- Breslin, Charles B. Lt. Col. US Army. "Organizational Culture and the Military." Carlisle Barracks, PA: US Army War College, 2000.
- Burk, James. "Military Culture." In *The Encyclopedia of Violence, Peace and Conflict*. Vol. 2. San Diego, CA: Academic Press, 1999.
- Downey, Fairfax. "Yankee Gunners at Louisbourg." *American Heritage* 11, no. 2 (February 1955): 113.
- Field, Thomas W. "The Battle of Long Island." In *Memoirs of the Long Island Historical Society*, Vol. 2 (Brooklyn, NY: Long Island Historical Society, 1869): 196-197.
- Gruber, Ira D. "British Strategy: The Theory and Practice of Eighteenth-Century Warfare." In *Reconsiderations on the Revolutionary War*, edited by Don Higginbotham. Westport, CT: Greenwood Press, 1978.
- . "The Anglo-American Military Tradition and the War for American Independence." In *Against All Enemies: Interpretations of American Military History from Colonial Times to the Present*, edited by Kenneth Hagan and William Roberts, 21-47. Westport, CT: Greenwood Press, 1986.
- Haskin, William L. "The First Regiment of Artillery." In *The Army of the United States*, edited by Theophilus F. Rodenbough and William L. Haskin (New York: Maynard, Merrill and Company, 1896), 301.
- Higginbotham, Don. "Military Institutions of Colonial America." In *War and Society in Revolutionary America: The Wider Dimensions of Conflict*. Columbia, SC: University of South Carolina Press, 1988.
- Kipp, Jacob W., and Lester W. Grau. "Military Theory, Strategy and Praxis." *Military Review* 91, no. 2 (2011): 16.
- Lewicki, Pawel. "Self-Schema and Social Information Processing." *Journal of Personality and Social Psychology* 47 (1984): 1177.
- Love, Harold. "Early Modern Print Culture: Assessing the Models." In *The Book History Reader*, edited by David Finkelstein and Alistair McCleery, 2nd ed. London: Routledge, 2006.
- Markus, Hazel. "Self-Schemata and Processing Information About the Self." *Journal of Personality and Social Psychology* 35 (1977): 64.
- Markus, Hazel, and Elissa Wurf. "The Dynamic Self-Concept: A Social Psychological Perspective." *Annual Review of Psychology* 38 (1986): 300.
- McMaster, Fitzhugh. "Colonial Cannon: South Carolina Artillery 1670-1813." *Field Artillery Journal* 45 (September-October 1977): 47- 49.

- Nelson, Paul D. –“Citizen Soldiers or Regulars: The Views of American General Officers on the Military Establishment.” *Military Affairs* 43, no. 3 (October 1979): 127.
- Popkin, Jeremy D. –“Robert Darnton’s alternative (to the) Enlightenment.” In *The Darnton Debate: Books and Revolution in the Eighteenth Century*, edited by Haydn T. Mason, 105-128. Oxford: Voltaire Foundation, 1999.
- Powers, Sandra L. –“Studying the Art of War: Military Books Known to American Officers and Their French Counterparts During the Second Half of the Eighteenth Century.” *The Journal of Military History* 70, no. 3 (2006): 789-800.
- Seidel, John Lewis. –“The Archaeology of the American Revolution, A Reappraisal & Case Study at the Continental Artillery Cantonment of 1778-1779, Pluckemin, New Jersey.” Ph.D. diss., University of Pennsylvania, 1987.
- Selesky, Harold Edward. –“Military Leadership in an American Colonial Society, Connecticut, 1635-1785.” Ph.D. diss., Yale University, 1984.
- Steele, Brett. –“Military ‘Progress’ and Newtonian Science in the Age of Enlightenment.” In *The Heirs of Archimedes: Science and the Art of War through the Age of Enlightenment*, edited by Brett D. Steele and Tamera Dorland. Cambridge: MIT Press, 2005.
- Walton, Steven A. –“The Art of Gunnery in Renaissance England.” Ph.D. diss., University of Toronto, 1999.
- Weller, Jac. –“Guns of Destiny: Field Artillery in the Trenton-Princeton Campaign.” *Military Affairs* (Spring 1956): 1-8.
- White, John T. –“Standing Armies in Time of War: Republican Theory and Military Practice During the American Revolution.” Ph.D. diss., George Washington University, 1978.
- Zabecki, David T. –“Gridley, Richard (1711-1796).” In *The American Revolution 1775-1783: An Encyclopedia*. Vol. 1, edited by Richard L. Blanco. New York: Garland Publishing, 1993.
- . –“Oswald, Eleazer (1755-1795).” In *The American Revolution 1775-1783: An Encyclopedia*. Vol. 1, edited by Richard L. Blanco. New York: Garland Publishing, 1993.

#### Books

- Alder, Ken. *Engineering the Revolution: Arms and Enlightenment in France, 1763-1815*. Princeton, NJ: Princeton University Press, 1997.

- Anderson, Fred. *A People's Army: Massachusetts Soldiers and Society in the Seven Years' War*. Chapel Hill, NC: University of North Carolina Press, 1984.
- . *Crucible of War: The Seven Years' War and the Fate of Empire in British North America, 1754-1766*. New York: Alfred A. Knopf, 2000.
- Anderson, John R. *Shepard Kollock: Editor for Freedom*. Chatham, NJ: Chatham Historical Society, 1975.
- Babits, Lawrence E., and Joshua B. Howard. *Long, Obstinate and Bloody: The Battle of Guilford Courthouse*. Chapel Hill, NC: University of North Carolina Press, 2009.
- Bailey, J. B. A. *Field Artillery and Firepower*. Annapolis, MD: Naval Institute Press, 2004.
- Bailyn, Bernard. *The Ideological Origins of the American Revolution*. 1967; reprint, Cambridge, MA: Belknap Press, 1992.
- Beer, Carel de. ed. *The Art of Gunfounding: The Casting of Bronze Cannon in the late 18th Century*. Rotherfield, England: Jean Boudriot, 1991.
- Birkhimer, William E. *Historical Sketch of the Organization, Administration, Materiel and Tactics of The Artillery, United States Army*. Washington, DC: James J. Chapman, 1884; Reprint, New York: Greenwood, 1968.
- Bishop, J. Leander. *A History of American Manufactures: From 1608 to 1860*. Vol. 1, 3rd ed. 1966, Reprint, New York: Augustus M. Kelly, 1869.
- Black, Jeremy. *George III: America's Last King*. New Haven, CT: Yale University Press, 2006.
- . *Rethinking Military History*. London: Routledge, 2004.
- Billias, George A., ed. *George Washington's Generals and Opponents: Their Exploits and Leadership*. New York: Da Capo, 1994.
- Bishop, J. Leander. *A History of American Manufactures: From 1608-1860*. 3rd. ed. New York: Augustus M. Kelly, 1966.
- Boatner, Mark Mayo. *Encyclopedia of the American Revolution*, 3rd, ed. New York: David McKay, 1976.
- Brooks, Noah. *Henry Knox: A Soldier of the Revolution*. 1900, Reprint, Cranbury, NJ: Scholar's Bookshelf, 2005.
- Brown, Richard D. ed. *Major Problems in the Era of the American Revolution, 1760-1791*. Lexington, MA: D. C. Heath, 1992.

- Buley, Benjamin. *The New American Way of War: Military Culture and the Political Utility of Force*. New York: Routledge, 2008.
- Burke, Peter. *What is Cultural History?* 2nd ed. Malden, MA: Polity, 2008.
- Burke, W. Warner. *Organization Change: Theory and Practice*. Thousand Oaks, CA: Sage Publishing, 2002.
- Callahan, North. *Henry Knox: General Washington's General*. New York: Rinehart and Company, 1958.
- Campbell, Alexander V. *The Royal American Regiment: An Atlantic Microcosm, 1755-1772*. Norman, OK: University of Oklahoma Press, 2009.
- Carp, E. Wayne. *To Starve the Army at Pleasure: Continental Army Administration and American Political Culture, 1775-1783*. Chapel Hill, NC: University of North Carolina Press, 1984.
- Carrington, Henry B. *Battles of the American Revolution, 1775-1781*. New York: Promontory Press, 1974. Reprint 1877.
- Caruana, Adrian B. *The History of English Sea Ordnance. 1523-1875. Volume 2: 1715-1815, The Age of the System*. Rotherfield, England: Jean Boudinot, 1997.
- . *The Light 6-pdr. Battalion Gun of 1776*. Bloomfield, Ontario: Museum Restoration Service, 1977.
- Chernow, Ron. *Washington: A Life*. New York: Penguin, 2010.
- Cox, Caroline. *A Proper Sense of Honor: Service and Sacrifice in George Washington's Army*. Chapel Hill, NC: University of North Carolina Press, 2004.
- Crackel, Theodore J. *Mr. Jefferson's Army: Political and Social Reform of the Military Establishment, 1801-1809*. New York: New York University Press, 1987.
- Curtis, Edward E. *The British Army in the American Revolution*. 1926; Reprint Ganesvoort, NY: Corner House, 1998.
- Darnton, Robert. *The Business of Enlightenment: A Publishing History of the Encyclopedie, 1775-1800*. Cambridge, MA: Harvard University Press, 1979.
- Dastrup, Boyd L. *The King of Battle: A Branch History of the U.S. Army's Field Artillery*. Ft. Monroe, VA: Training and Doctrine Command, United States Army, 1992.
- Diamant, Lincoln. *Bernard Romans: Forgotten Patriot of the American Revolution, Military Engineer and Cartographer of West Point and the Hudson Valley*. Harrison, NY: Harbor Hill Books, 1985.

- Dorn, E. et al. *American Military Culture in the Twenty-First Century: A Report of the CSIS International Security Program*. Washington, DC: Center for Strategic and International Studies, 2000.
- Downey, Fairfax. *Sound of the Guns: The Story of the American Artillery from the Ancient and Honorable Company to the Atom Cannon and Guided Missile*. New York: David Mackay, 1956.
- Duffy, Christopher. *The Military Experience in the Age of Reason*. New York: Atheneum, 1988.
- Duncan, Francis. *History of the Royal Regiment of Artillery*, Vol. 1. London: John Murray, 1872.
- Ellis, George E. *History of the Battle of Bunker's [Breed's] Hill, On June 17, 1775: From Authentic Sources in Print and Manuscript*. Boston: Lockwood, Brooks, and Company, 1875.
- Elting, John R. *The Battle of Bunker's Hill*. Monmouth Beach, NJ: Philip Freneau Press, 1975.
- English, Allen. *Understanding Military Culture*. Montreal, Canada: McGill-Queen's University Press, 2004.
- Ferling, John. *Almost a Miracle*. New York: Oxford, 2007.
- Finkelstein, David and McCleery, Alistair. *An Introduction to Book History*. New York: Routledge, 2005.
- Fischer, David Hackett. *Washington's Crossing*. Oxford: Oxford University Press, 2004.
- Fischer, Joseph R. *A Well-Executed Failure: The Sullivan Campaign against the Iroquios, July-September 1779*. Columbia, SC: University of South Carolina Press, 2008.
- Fortescue, John. *The War of Independence: The British Army in North America, 1775-1783*. London: Greenhill, 2001.
- Frank, Edward Ross, ed. *Dictionary of American Biography*. Vol. 7. New York: Scribner, 1937.
- Frost, Peter J. Larry F. Moore, Meryl Reis., Craig C. Lundberg, Dr Joanne Martin, ed. *Reframing Organizational Culture*. Newbury Park, CA: Sage Publishing, 1991.
- Frothingham, Richard. *History of the Siege of Boston, and of the Battles of Lexington, Concord, and Bunker Hill*, 4th ed. Cranbury, NJ: The Scholars Bookshelf, 2005. Reprint 1873.

- Galowitz, Sam W. *Revolutionary War, Battle of Brooklyn: The Battle of Long Island*. Philadelphia: Xlibris, 2007.
- Gould, Eliga H. *The Persistence of Empire: British Political Culture in the Age of the American Revolution*. Chapel Hill, NC: University of North Carolina Press, 2000.
- Gray, Colin. *Fighting Talk*. Washington, DC: Potomac Books, 2009.
- Green, Anna. *Cultural History: Theory and History*. New York: Palgrave MacMillan, 2008.
- Griffin, Martin I. J. *Catholics and the American Revolution*. Ridley Park, PA: Martin Griffin, 1907.
- Griffith, Samuel B. *The War for American Independence*. Chicago: University of Illinois, 2002.
- Griffiths, Thomas M. *Major General Henry Knox and The Last Heirs to Montpelier*. Lewiston, ME: Monmouth Press, 1965.
- Gruber, Ira. *Books and the British Army in the Age of the American Revolution*. Chapel Hill, NC: University of North Carolina Press, 2010.
- Hall, A. R. *Ballistics in the Seventeenth Century*. Cambridge: Cambridge University Press, 1952.
- Headquarters Department of the Army, Field Manual 1-02, *Operational Terms and Graphics*. Washington, DC: Department of the Army, 2004.
- . *Field Manual 3-0, Operations*. Washington, DC: Department of the Army, 2008.
- Headquarters, Department of Defense. Joint Publication 3-0, *Joint Operations*. Washington, DC: Department of Defense, 2006.
- Heitman, Francis B. *Historical Register of the Officers of the Continental Army*. Baltimore: Genealogical Publishing Company, 1967.
- Higginbotham, Don. *George Washington and the American Military Tradition*. Athens, GA: University of Georgia Press, 1985.
- . *The War of American Independence: Military Attitudes, Policies, and Practice, 1763-1789*. New York: MacMillan, 1971.
- Hogg, O. F. G. *Artillery: Its Origin, Heyday and Decline*. Hamden, CT: Archon, 1970.
- Howell, Martha, and Walter Prevenier. *From Reliable Sources: An Introduction to Historical Methods*. Ithaca, NY: Cornell University Press, 2001.

- Hughes, B. P. *Firepower: Weapons Effectiveness on the Battlefield, 1630-1850*. New York: Sarpedon, 1997.
- Hutson, James H. ed. *A Decent Respect to the Opinions of Mankind: Congressional State Papers, 1774-1776*. Washington, DC: Library of Congress, 1975.
- Johnston, Henry P. *The Record of Connecticut Men of the Military and Naval Service during the War of the Revolution, 1775-1783*. Hartford, CT: 1889; Reprint, Baltimore, MD: Clearfield, 2003.
- Karsten, Peter. *Military in America: From the Colonial Era to the Present*. New York: Free Press, 1980.
- Ketcham, Richard. *Decisive Day: The Battle for Bunker Hill*. New York: Henry Holt, 1962.
- Kohn, Richard H. *Eagle and Sword: The Federalists and the Creation of the Military Establishment in America, 1783-1802*. New York: Free Press, 1975.
- Langins, Janis. *Conserving the Enlightenment: French Military Engineering from Vauban to the Revolution*. Cambridge: MIT Press, 2004.
- Leach, Douglas Edward. *Arms for Empire: A Military History of the British Colonies in North America, 1607-1763*. New York: MacMillan, 1973.
- . *Roots of Conflict: British Armed Forces and Colonial Americans, 1677-1763*. Chapel Hill, NC: University of North Carolina Press, 1986.
- Lee, Wayne. *Crowds and Soldiers in Revolutionary North Carolina: The Culture of Violence and Riot in War*. Gainesville, FL: University of Florida Press, 2001.
- Low, Willa B. *Winthrop Sargent: Soldier and Statesman*. Gloucester, MA: Sargent-Murray-Gilman-Hough House Associates, 1985.
- Lumpkin, Henry. *From Savannah to Yorktown: The American Revolution in the South*. San Jose, CA: toExcel Press, 2000.
- Lynn, John A. *Battle: A History of Combat and Culture, From Ancient Greece to Modern America*. Boulder, CO: Westview, 2003.
- . ed. *Tools of War: Instruments, Ideas, and Institutions of Warfare, 1445-1871*. Chicago: University of Illinois Press, 1990.
- Maier, Pauline. *American Scripture*. New York: Vintage Books, 1997.
- Manucy, Albert. *Artillery through the Ages*. Washington, DC: Government Printing Office, 1949.

- Martin, David G. *The Philadelphia Campaign, June 1777-July 1778*. Conshohocken, PA: Combined Books, 1993.
- Martin, James Kirby, and Mark Edward Lender. *A Respectable Army: The Military Origins of the Republic, 1763-1789*. 2nd. ed. Wheeling, IL: Harlan Davidson, 2006.
- Martin, Joanne. *Organizational Culture: Mapping the Terrain*. Thousand Oaks, CA: Sage Publishing, 2002.
- Martyn, Charles. *The Life of Artemas Ward: The First Commander-in-Chief of the American Revolution*. 1921, Reprint, Cranbury, NJ: Scholar's Bookshelf, 2005.
- Mather, Frederic G. *The Refugees of 1776 from Long Island to Connecticut*. Albany, NY: J. B. Lyon, 1913.
- Mayer, Holly A. *Belonging to the Army: Camp Followers and Community during the American Revolution*. Columbia, SC: University of South Carolina Press, 1996.
- McGuire, Thomas J. *The Philadelphia Campaign*, Vol. 1. Mechanicsburg, PA: Stackpole, 2006.
- McKenney, Janice E. *The Organizational History of the Field Artillery, 1775-2003*. Washington, DC: Center of Military History, United States Army, 2007.
- McNeill, William H. *The Pursuit of Power: Technology, Armed Force, and Society since AD 1000*. Chicago: University of Chicago Press, 1982.
- Metcalf, Bryce. *Original Members and Other Officers Eligible to the Society of Cincinnati, 1783-1938*. 1938, Reprint, Beverly Hills, CA: Historic Trust Eastwood Publishing Company, 1995.
- Middlekauf, Robert. *The Glorious Cause*. New York: Oxford, 2005.
- Mordecai, Samuel. *Richmond in By-gone Days*. Richmond, VA: G. M. West, 1856.
- Morillo, Stephen. *What is Military History?* Malden, MA: Polity, 2006.
- Mowday, Bruce E. *September 11, 1777: Washington's Defeat at Brandywine Dooms Philadelphia*. Shippensburg, PA: White Mane Books, 2002.
- Myers, Minor, Jr. *Liberty without Anarchy: A History of the Society of the Cincinnati*. Charlottesville, VA: University of Virginia Press, 1983.
- National Genealogical Society. *Index of Revolutionary War Pension Applications in the National Archives*, Bicentennial Edition. Washington, DC: National Genealogical Society, 1976.

- Newland, Samuel J. *The Pennsylvania Militia: The Early Years, 1669-1792*. Annville, PA: Commonwealth of Pennsylvania Department of Military and Veterans Affairs, 1997.
- Ott, J. Steven. *The Organizational Culture Perspective*. Pacific Grove, CA: Brooks-Cole, 1989.
- Paret, Peter. ed. *Makers of Modern Strategy*. Princeton, NJ: Princeton University Press, 1986.
- Parkman, Aubrey. *Army Engineers in New England: The Military and Civil Work of the Corps of Engineers in New England, 1775-1975*. Waltham, MA: US Army Corps of Engineers, 1978.
- Pearson, Michael. *Those Damned Rebels: The American Revolution as Seen Through British Eyes*. New York: Da Capo, 1972.
- Pedersen, Jesper S. and Sorensen, Jesper S. *Organisational Cultures in Theory and Practice*. Aldershot, England: Gower Publishing, 1989.
- Peterson, Harold R. *Round Shot and Rammers*. New York: Bonanza Books, 1969.
- Pocock, J.G.A. *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition*. Princeton: Princeton University Press, 1975.
- Puls, Mark. *Henry Knox, Visionary General of the American Revolution*. New York: Palgrave MacMillan, 2008.
- Rankin, Hugh F. *The North Carolina Continentals*. Chapel Hill, NC: University of North Carolina Press, 2005.
- Raven, James. *London Booksellers and American Customers: Transatlantic Literary Community and the Charleston Library Society, 1748-1811*. Columbia, SC: University of South Carolina Press, 2002.
- Rawlyk, G.A. *Yankees at Louisbourg*. Orono, ME: University of Maine Press, 1967.
- Reed, John F. *Campaign to Valley Forge, July 1, 1777-December 19, 1777*. London: Oxford, 1980.
- Riling, Joseph R. *The Art and Science of War in America, 1690-1800*. Alexandria Bay, NY: Museum Restoration Service, 1990.
- Risch, Erna. *Supplying Washington's Army*. Washington, DC: Center of Military History, 1981.

- Roberts, Oliver Ayer. *History of the Military Company of the Massachusetts now called The Ancient and Honorable Artillery Company of Massachusetts, 1637-1888*. IV vols. Boston: Alfred Mudge and Son, 1895.
- Ross, Edmund. *Dictionary of American Biography*. New York: Scribner, 1937.
- Rossie, Jonathan. *The Politics of Command in the American Revolution*. Syracuse, NY: Syracuse University Press, 1975.
- Royster, Charles. *A Revolutionary People at War: The Continental Army and American Character, 1775-1783*. Chapel Hill, NC: University of North Carolina Press, 1986.
- Saffell, W. T. R. *Records of the Revolutionary War*. New York: Pudney and Russell, 1858.
- Sanchez-Saavedra, E.M. *A Guide to Virginia Military Organizations in the American Revolution, 1774-1787*. Westminster, MD: Willow Bend Books, 1978
- Scheer, George F., and Hugh Rankin. *Rebels and Redcoats*. New York: World, 1972.
- Schein, Edgar H. *Organizational Culture and Leadership*. 3rd ed. San Francisco, CA: Jossey Bass, 2004.
- Smith, Justin H. *Our Struggle for the Fourteenth Colony: Canada and the American Revolution*, Vol. 1. New York: G.P. Putnam's, 1907, Reprint, Melrose, NJ: Scholar's Bookshelf, 2005.
- Starkey, Armstrong. *War in the Age of Enlightenment, 1700-1789*. Westport, CT: Praeger, 2003.
- Steele, Brett D., and Tamera Dorland, . *The Heirs of Archimedes: Science and the Art of War through the Age of Enlightenment*. Cambridge: MIT Press, 2005.
- Stryker, William S. *The Battle of Trenton and Princeton*. Cambridge: Riverside Press, 1898, Reprint, Trenton, NJ: Old Barracks Association, 2001.
- Shy, John. *A People Numerous and Armed: Reflections on the Military Struggle for American Independence*. Ann Arbor, MI: University of Michigan Press, 2000.
- . *Toward Lexington: The Role of the British Army in the Coming of the American Revolution*. Princeton, NJ: Princeton University Press, 1965.
- Triber, Jayne E. *A True Republican: The Life of Paul Revere*. Boston: University of Massachusetts Press, 1998.

- Trussell, John B. B. *The Pennsylvania Line: Regimental Organization and Operations, 1775-1783*. Harrisburg, PA: Pennsylvania Historical and Museum Commission, 1993.
- Walsh, Richard. *Charleston's Sons of Liberty: A Study of the Artisans, 1763-1789*. Columbia, SC: University of South Carolina Press, 1959.
- Ward, Christopher. *The War of Revolution*. 2 vols. New York: MacMillan, 1952.
- Webb, Henry J. *Elizabethan Military Science: The Books and the Practice*. Madison, WI: University of Wisconsin Press, 1965.
- Weigley, Russell F. *History of the United States Army*. New York: MacMillan, 1967.
- Wheeler, Richard. *Voices of 1776*. New York: Meridian, 1991.
- Wright, Robert K. *The Continental Army*. 2nd ed. Washington, DC: Center of Military History United States Army, 2000.

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