

Managing Men and Machines: U.S. Military Officers and the Intellectual Origins of  
Scientific Management in the Early Twentieth Century

By

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## Abstract

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By David Holden

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The U.S. Army officer corps experienced an intellectual revolution following the experience of WWI that fundamentally altered the relationship between man and machines in war. As a result, officers failed to develop the technology gene and began to think of war as being inherently quantitatively and technological based. This dissertation examines the relationship between technology and the U.S. Army and Navy officers specifically between 1900-1925. Furthermore, the treatise addresses the role of Frederick Taylor and the rise of scientific management within the U.S. Army and Navy.

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## Chapter I

### The Technology Gene

The U.S. Army today is the most powerful army the world has ever seen. For the last fourteen years this Army has conducted military operations against insurgents armed with assault weapons and primitive explosives. Several trillion dollars have been expended to fight this war. The Army lost-- they lost to an idea. The reason is that technology, in aggregate, produces a particular mindset, a *zeitgeist* that hinders the Army officer corps from developing an understanding of war. This study examines how the fundamental properties of the Enlightenment and Romanticism contributed to the forming of the Army officer mindset and how ideas of history, time, and heroes evolved, and then shifted, under the light of technology. The material examined is diffuse, and yet compelling. Few works exist that examine the relationship between man and machine. Thus, the thesis starts with a broad examination of ideas, values, and beliefs in order to demarcate the lines of inquiry that follow.

The thinking of the Army's officer corps about man's role in warfare and the relationship in war between man and technology passed through a turning point during the first quarter of the twentieth century. This turning point saw the machine supplant man. The purpose of this study is to show the nature of this turning point and explain how the new ideas about war, man, and technology gained traction a hundred years ago and continue to shape U.S. military officers thinking today. This study does this by focusing on the methods of Frederick Taylor and how he influenced the U.S. military. Frederick Taylor's influence in both the Army and the Navy were examined in detail. Letters from the



Frederick Taylor archive offer the balance of evidence. The Infantry Journal provides additional material through the critical period of WWI to evaluate the changing views of Army officers towards technology. Taylor's correspondence with Naval officers demonstrates that this phenomenon was part of a wider cultural shift within the military, if not within the nation. It becomes clear that the experience on the Western Front in WWI combined with massive industrial growth across the United States had a pronounced effect on the zeitgeist of the Army officer corps.

During the eighteenth and nineteenth century in Europe, the period known as the Enlightenment and its successor, sometimes called Romanticism, brought about two of the greatest intellectual shifts in Western history. Another titanic intellectual movement, the abandonment of historicism for what has been termed "technicism," began with the First World War. Humankind once revered the past for the light it cast on the future; now, the pace of technological change forever altered that perception. This intellectual shift swept with growing momentum and fervency through bureaucratic institutions. This changing perspective especially influenced the U.S. Army from the years just prior to 1914 until it reached maturity in the Second World War. The growth of technicism, social sciences, and the general quantification and measurement of all things, both material and otherwise, encouraged the displacing of man by machine. Complex human problems appeared as a matter of proper organizational and technological application rather than as conceptual questions.

War is first and foremost a human endeavor. Motivations in war run from irrational to rational, but in the end that seems to matter little. Ideas are the catalysts for war and the passions of the people provide the fuel. Thinking about the nature of war, Sun Tsu (Sunzi)

mused, “...those unable to understand the dangers inherent in employing troops are equally unable to understand the advantageous ways of doing so.”<sup>1</sup> Similarly, those unable to understand the nature of war are equally unable to understand the advantages and disadvantages of employing technology. The strategic approach Sun Tzu advocated began by looking at a situation as an eagle peering down from the heavens; technical analysis often advances from the opposite direction by slicing life into discreet subsections, categories, and classifications, a process of micro to macro.

The Greek term for technology (*techne*) included both art and trade.<sup>2</sup> Conceptualizations of the term progressed slowly until the early nineteenth century when it entered the lexicon in its more familiar modern connotations. However, not until the American Civil War did the term “technologist” come into common parlance.<sup>3</sup> One can follow the steady progress of this concept from its humble beginnings as men who practiced a trade and skill to men who specialized in the invention and operation of machines.<sup>4</sup> The evolving terminology closely paralleled advances in society. Technology continues to evolve and defies a single definition; the multiplicity of uses and the nature of technology itself necessitate a flexible definition. Define it too narrowly and it does not adequately include elements within its prerogative, conversely, too broad a definition would subsume nearly everything.

Lewis Mumford, arguably the most insightful observer of the complex relationship between man and technology, resisted a concise definition of *techne*. Although he

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<sup>1</sup> Sun Tzu, *The Art of War*, trans. Samuel Griffith (Oxford University Press, 1963), 73.

<sup>2</sup> Miguel Flach Aznar, *Technology Challenged: Understanding Our Creations & Choosing Our Future* (KnowledgeContext, 2005), 20.

<sup>3</sup> Frederick C. Mish, ed., *Webster's Ninth New Collegiate Dictionary* (Springfield, MA: Merriam-Webster Inc, 1984), 1211.

<sup>4</sup> Ibid.

acknowledged the Greek definition, he stressed that the Greeks made no division between the idea of art and industrial production. Mumford observed in “Technics and the Nature of Man” (1966) that modern man emphasized the utilitarian aspect of *techne* while eschewing the more significant and prevalent factor of art in the original conception and practice of *techne* in antiquity and pre-history.<sup>5</sup>

Thomas P. Hughes, author of *American Genesis* (2004), defined technology as “the effort to organize the world for problem solving so that goods and services can be invented, developed, produced and used.”<sup>6</sup> Brian Arthur in *The Nature of Technology* (2009) provided three definitions, “...technology is a means to fulfill a human purpose;...an assemblage of practices and components;... [and] the entire collection of devices and engineering practices available to a culture.”<sup>7</sup> The first definition, for example, could constitute a car that is a technology for the human purpose of transportation. The second, an “assemblage of practices,” also refers to the information necessary to use and develop such technology. The third is the traditional “mechanical” and “material” definition of technology.

However, Miguel Aznar approached the issue in *Technology Challenged* (2005), much like Clausewitz, seeking to define the essence of the subject and thus add an inclusive definition. He wrote that “technology extends the abilities of man,” a rugged definition that bears the many facets of technology from fire to information.<sup>8</sup> Similarly, in *Society and Technological Change* (2006) Rudi Volti defined technology as “...a system that uses

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<sup>5</sup> Lewis Mumford, “Technics and the Nature of Man,” *Technology and Culture* 7, no. 3 (July 1966): 309.

<sup>6</sup> Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970* (University of Chicago Press, 2004), 6.

<sup>7</sup> W. Brian Arthur, *The Nature of Technology: What It Is and How It Evolves* (New York: Simon and Schuster, 2009), 28.

<sup>8</sup> Aznar, *Technology Challenged*, 17.

knowledge and organization to produce objects and techniques for attainment of specific goals.”<sup>9</sup>

Following the Civil War, the technological professions developed along more rigorous lines as the field advanced. By the turn of the twentieth century the technological community, at least structurally, had developed into a “Mirror-Image Twin” of science. However, where science awarded the highest degree of prestige “to the most abstract and general...in the technological community it went to the designer or builder...scientist seek to know, technologist to do.”<sup>10</sup> Thus, a scientist sought to understand while a technologist aimed for practical application.

During the 19<sup>th</sup> Century, most U.S. Army officers failed to develop the “technology gene”, defined as an understanding of the limits of technology. The literature that bears directly on this subject is sparse and often tangential in nature. However, the proximate information provides a wealth of information that illuminates the broad outlines, allowing one to examine the process that led to this deficiency. This literature is divided into three separate themes constituting a triumvirate argument along philosophical, intellectual, and historical lines. First was the development of ideas within Western society and the US Army, regarding specifically how the perception of history evolved; second came the nature of technology and its reciprocal relationship with American culture; last was the intellectual development of the US Army officer corps.

Failure almost always has systemic explanations and in nature rarely is there a singular cause. The failure of the US Army, and specifically, the officer corps to develop the

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<sup>9</sup> Rudi Volti, *Society and Technological Change* (Macmillan, 2005), 6.

<sup>10</sup> Edwin Layton, “Mirror-Image Twins: The Communities of Science and Technology in 19th-Century America,” *Technology and Culture* 12, no. 4 (1971): 576.

technology gene was not the consequence of any single action or inaction. It would appear to be one-third nature and two-thirds nurture: inheritance imparted a particular mindset, the environment, including geography colluded to provide structure, and ideas about the nature of war animated the gene-deficient colossus. Historically, American Army officers have generally demonstrated only passing interest in military history, and have put a great deal more faith in the material tools of war.<sup>11</sup>

This dissertation draws on various approaches that infused the character of the US Army officer corps and the various elements that amalgamated into an American Way of War. If the officer corps constituted a patient, it would be difficult to remove any of the vital organs without flat-lining that patient, nor could one hope to demonstrate, by examining the organs in isolation, why the embryonic technology gene developed as incompletely as it did. Like a physician one must understand how each affects the other-contextually and historically. The typical American, like his European counterpart, shares certain philosophical mindsets that underpin Western civilization. Time, progress, and history are ideas that are interwoven and interdependent, but they require two points, such as those on a map that allow one to trace the journey. In the story being told here the traveler on this journey is the officer corps.

Niccolò Machiavelli (1469-1527) marks the start point for this journey. Secular and Christian values diverged in Machiavelli's mind. He wrote *The Prince* in 1513, and observed the political and moral spheres while demonstrating a keen perception of human motivations. Machiavelli broke with longstanding theological concepts of history.<sup>12</sup> Time

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<sup>11</sup> Colin S. Gray, *Irregular Enemies and the Essence of Strategy: Can the American Way of War Adapt?* (Lulu.com, 2006), 32.

<sup>12</sup> Niccolò Machiavelli, *The Prince* (University of Chicago Press, 1998).

no longer represented a countdown to the return of Christ, but instead a progression toward a positive if undefined future. Thus, Machiavelli and like-minded thinkers rationalized politics and governance. Morality was no longer bound to the Christian or Socratic tradition but instead assumed the mantle of what one day would be called *Realpolitik*.

Machiavelli had no qualms with the motivations of man, and took them for what they were rather than for what they could become, or should be in the Aristotelian or theological view of self-actualization. As for morality, Machiavelli observed that values are constituted and justified in the ends. His misgivings were not with Christian values themselves, but with the ones that he valued, which in this earthly paradise were not those of heaven. Rationalized governance, the growth of science, and propagation of knowledge, abetted by the printing press, aggravated and enlarged the breach between secular rulers and the church. However, with this increased freedom of thought came the knowledge that there were better ways, entirely un-divine, and yet effective, of earthly modes of governing. Machiavelli set man on a path that diverged from God towards that which man could control; thus, the intellectual path cleared and allowed for the progressive ideas of later men to propagate. One hundred years later Descartes followed in the path blazed by Machiavelli.

In 1637, René Descartes (1596-1650) wrote *A Discourse on Method*, building upon the rational structure erected on the ashes of theology by Francis Bacon's (1561-1626) science and Machiavelli's utilitarianism. The knowledge of the Greeks, of the ancients, could only support the ascension of man so far, and as a child must "put away his childish ways"

as he becomes a man, so now mankind, as a species, must abandon his simple ways.<sup>13</sup>

Descartes discovered in mathematics an order and symmetry that he found invigorating:

The long chains of simple and easy reasoning by means of which geometers are accustomed to reach the conclusions of their most difficult demonstrations, had led me to imagine that all things, to the knowledge of which man is competent, are mutually connected in the same way, and that there is nothing so far removed from us as to be beyond our reach, or so hidden that we cannot discover it, provided only we abstain from accepting the false for the true, and always preserve in our thoughts the order necessary for the deduction of one truth from another.<sup>14</sup>

Descartes believed that mathematics could uncover and test truth, that through the use of mathematics one could discover the hidden links that connected everything in the universe. This constituted the key that revealed where each piece of the puzzle fit. Thus, celestial elements were transposed into mathematical ones. It was no longer through faith but through science and mathematics, the light of Descartes, that one was able to deduce the interconnectedness and truth of this world.

Descartes approached problems from the specific to the general (inductive), a simple and profound reversal of the norm, which allowed him to break problems into their divisible parts. If one believed in the great chain of being with God at the top, then one reasoned the connectedness of life from that light, from the top down. This was not the case for Descartes, and his approach furnished an intellectual perspective that rendered a mechanistic view of the world and opened up the way for a deeper understanding of technological development. Antonio Damasio in *Descartes' Error: Emotion, Reason, and the Human Brain* (2005) argued that such a perspective led Descartes to believe that emotion inhibited reason, although current neuroscience, according to Damasio, indicates that

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<sup>13</sup> Thomas Nelson, *Holy Bible, New King James Version (NKJV)* (Nashville, TN: Thomas Nelson Inc, 2009), chap. 1 Corinthians 13:11.

<sup>14</sup> Rene Descartes, *A Discourse on Method*, ed. Ernest Rhys, trans. John Veitch (New York: J.M. Dent & Sons, 1916), 16.

emotion, despite flaws, is crucial to reasoning.<sup>15</sup> Nevertheless, Descartes assumed the world functioned as a great machine that could be understood if broken down into its divisible parts, and if one could understand the parts, then one could reassemble and understand the whole.<sup>16</sup> The seeds for the Enlightenment developed in the fertile ground of a Cartesian-influenced intellectual tradition in Europe and within a century the ideas therein reshaped the [mind of the West].

The emergence of modern science in the sixteenth century formed fissures in the intellectual foundation of Europe, and according to Hans Eichner in *The Rise of Modern Science and the Genesis of Romanticism* (1982), the rapid and radical departures from traditional Greek and theological concepts ushered in a new understanding of the cosmos and man's place within it. Nicholas Copernicus and Johannes Kepler revolutionized astronomy, Issac Newton and Galileo transformed ideas on planetary motion. The propagation of technological machines, including the clock and telescope, began to produce, initially slowly, and then with increasing speed and authority, the belief that world functioned by mechanical and mathematically deducible laws. Eichner noted that in this belief that something exceptional and unprecedented occurred in "Western thought" between 1500 and 1800.<sup>17</sup>

The intellectual historian Arthur O. Lovejoy observed that the objective of Western man was a "...long effort to make the world he lives in appear to his intellect a rational one."<sup>18</sup> U.S. Army officers find such an approach particularly attractive since the world they

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<sup>15</sup> Anthony Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (Penguin, 2005), xii.

<sup>16</sup> Descartes, *A Discourse on Method*, 16.

<sup>17</sup> Hans Eichner, "The Rise of Modern Science and the Genesis of Romanticism," *Publications of the Modern Language Association of America*, 1982, 8.

<sup>18</sup> Arthur O. Lovejoy, *The Great Chain of Being: A Study of the History of an Idea* (Harvard University Press, 2009), 47.



inhabit is one of chaos. Technology provided officers the tools to limit and minimize the unpredictability of their world. Nevertheless, some military officers in the early nineteenth century thought the solutions resided in a more introspective process.

*Bildung*, a word of German origin, is best translated as “self-education.” According to Reinhart Koselleck, it has a theological rooting implying a “transformation and rebirth,” a salvation from the old ignorant self to the enlightened through self-reflection.<sup>19</sup> This concept is foundational to the idea of military education, the cultivation and development of the mind. Charles White in *The Enlightened Soldier* (1989) found that within Europe two broad concepts of war emerged. Gerhard von Scharnhorst (1755-1813), a Prussian officer, facilitated the inculcation of *Bildung* into military officer education to lay the foundations for one of the most effective military organizations (some would say cultures) the world has ever seen, the general staff.<sup>20</sup> This fertile ground gave birth to one of the greatest military intellects, that of Carl von Clausewitz. White argued that Scharnhorst diverged from that which was common in officer education in Europe in 1801 by focusing less on the technical and technological aspects of warfare. “In this regard, only Prussia appeared to be aware of the broader scope of warfare.”<sup>21</sup> Napoleon cast a shadow over French military thought and over the American officer corps, and thus, both developed along a different path from that of Prussia, placing a far greater emphasis on the commander and engineering expertise.

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<sup>19</sup> Reinhart Koselleck, *The Practice of Conceptual History: Timing History, Spacing Concepts* (Stanford University Press, 2002), 176–177.

<sup>20</sup> Charles Edward White, *The Enlightened Soldier: Scharnhorst and the Militrische Gesellschaft in Berlin, 1801-1805*, Kindle (Westport, CT: Greenwood Publishing Group, 1989).

<sup>21</sup> *Ibid.*, 187.

Clausewitz' theory of war in *On War* comprised "three tendencies...deep rooted in their subject and yet variable in their relationship to one another."<sup>22</sup> Passion, reason, and chance comprise the Clausewitzian "trinity" of war. The first two elements are products of the human mind and the latter stands independent of man. Clausewitz believed that judgment, the developing of intuition, and insight formed the cornerstones, for which there is no substitute.<sup>23</sup>

Unlike other officers of his time, Clausewitz remained reticent, even hostile, to those that championed the view that war could be both controlled and mathematically reduced. Clausewitz was not unaware of scientific developments, and used scientific terms such as friction, magnetic, center of gravity, and polarity and to help him conceptually explain his ideas. However, his understanding of man and war were by no means bound to science they merely served as convenient ways to convey the concepts. The concept of war, similar to technology, required a nuanced definition. Clausewitz settled on three explanations to convey the concept. The first was "war is nothing but a duel on a larger scale"; second asserted "war is thus an act of force to compel our enemy to do our will"; third was "war, however, is no the action of a living force upon a lifeless mass (total nonresistance would be no war at all) but always the collision of two living forces."<sup>24</sup> Taken together, these descriptions provide a contextual foundation for understanding the nature of war.

Clausewitz lived at a turning point in history. War and the study of organized conflict contributed to an emerging professionalization of the military institutions of the era. Spread by French arms, nationalism ignited throughout Europe and powerful ideas of

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<sup>22</sup> Carl von Clausewitz, *On War* (Princeton University Press, 1989), 89.

<sup>23</sup> *Ibid.*, 141,578.

<sup>24</sup> *Ibid.*, 75,77.

human agency motivated individuals and groups to achieve new heights. Humanist philosopher Isaiah Berlin argued that something profound took hold of the Germanic mind between 1760 and 1830 and diffused from there.<sup>25</sup> Clausewitz, Prussian by birth, lived, fought, and wrote between 1780 and 1831. Lovejoy noted, “it is one of the instructive ironies of the history of ideas that a principle introduced by one generation in the service of a tendency or philosophic mood congenial to it often proves to contain, unsuspected, the germ of a contrary tendency- to be, by virtue of its hidden implications, the destroyer of that *Zeitgeist* to which it was meant to minister.”<sup>26</sup>

There are few more powerful examples of this than the Romantic Movement. This movement revolted against the subjugation of the Enlightenment –the tyranny of reason-- and produced a wholly new concept, one no longer based entirely on the objective, the ends, the result, but one that instead considered and valued intent and motive.<sup>27</sup> A war of ideas produced an entirely new understanding of life and reality, a way of thinking that until that moment lay dormant within the mind of man. Certainly these movements represent two of the most profound intellectual shifts in history. Notably, however, there would occur a third transformational paradigm.

Ideas are artifacts of the time and place from which they originate. Infused with life (because they are human creations,) some evolve while others, like the cultures they represent, recede into the abyss of time. Regardless, ideas are not static; they abut, subsume, fuse, contradict, compliment, and produce other ideas. Not all ideas that men choose to live by are equal, nor are they all relative. They represent human values; one is

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<sup>25</sup> Isaiah Berlin, *The Roots of Romanticism* (Princeton University Press, 2001), 12.

<sup>26</sup> Lovejoy, *The Great Chain of Being*, 289.

<sup>27</sup> Berlin, *The Roots of Romanticism*, 10–12.

defined by the values that animate one to act, that are ratified not only in the mind, but also in the heart; products of one's time, visible and reflected in the consummate beliefs of the individual, or collectively in organizations and nations, they are nonetheless limited by the light of their age.

One may measure men and women by their ideas, cultures by their creations and states by their actions. Collectively, some value peace, others trade, and still others, violence. Some rise to empires, but others, like Athens, are consumed in the process. Yet, two millennia have not effaced Thucydides' observation that human beings are motivated by greed, honor, and fear.<sup>28</sup> These ideas, though distinct, often amalgamate to govern and define actions.

One can understand, as Giambattista Vico claims, that it is possible to live, through imagination, in the shadows of another civilization; to know, albeit imperfectly, what it was to be Spartan, to value what they valued, to perceive through Peloponnesian eyes, to hate the Athenians.<sup>29</sup> There are limits, of course, and though one could understand, one could not live by their creed, for one's mind has been shaped by this world. Yet, if history is not a progression, a shift from imperfection to perfection, from disorder to order, it is nonetheless accumulative.

The ideas of grandfather shaped father, and father son, and these ideas accumulate, one upon another, to eventually produce, to borrow from Thomas Kuhn, a paradigm shift.<sup>30</sup> For millennia one could pluck a traveler from one age and anachronistically place him

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<sup>28</sup> Robert B. Strassler, *The Landmark Thucydides* (Simon and Schuster, 2008), 43. Greed is sometimes translated at "interest" or "profit."

<sup>29</sup> Giambattista Vico, *New Science* (United Kingdom: Penguin Books, 1999), xii,xxii.

<sup>30</sup> Thomas S. Kuhn, *The Structure of Scientific Revolutions: 50th Anniversary Edition* (University of Chicago Press, 2012).

hundreds of years into the future with the expectation that the traveler could function. Past and present, though separated chronologically by thousands of years, resembled each other more than not. However, [the Western mind] has changed over the last 300 years, though not at the neurological level (which would require a time scale vastly longer than is at question here). This change is the product of new ideas, ways of thinking, and existing.

The Enlightenment swept through Europe in the eighteenth century transforming how people perceived the world as traditional and theological dogma gave way to scientific explanations. Empirical evidence and reason became the common currency. Man, no longer dependent on God for revelation, could discover truth for himself, through his own observations. Gradually, but with increasing speed and frequency, only corporeal things counted. There is something within man, in his deepest being, where words cannot accurately or justly through any lexicon possibly quantify the essence thereof. In that place a spark ignited, by and against the Enlightenment, and fury ensued over Europe as when two weather fronts oppositely charged collide. Thereafter, these two intellectual movements defined Western thought for the next three hundred years.<sup>31</sup>

For millennia the logic of Plato, Socrates, and Christ (as articulated by St. Augustine) guided men's minds toward truth. That somewhere, someplace, somehow- through enough perseverance, discipline, and sacrifice one could discover the combination to life that would lay bare the secrets hidden by the gods. Berlin clarified his point through an analogy. A soldier, prior to the period in question, fought for truth as it applied to loyalty to his monarch, prince, or feudal lord—the only real true and authentic God whose will the lord presumably executed (i.e. the divine right of kings). Regardless of who one's enemy

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<sup>31</sup> Isaiah Berlin and Henry Hardy, *The Sense of Reality: Studies in Ideas and Their History* (Macmillan, 1998).

may have been, and whatever one believed in, an enemy soldier died a pointless death because he fought for false truths and dead gods (or false ones, thus identifying enemies as heretics)<sup>32</sup>. Courage, according to Berlin, remained a universally respected attribute, but however courageous the enemy soldier, one did not reason that he died for an equally valid truth, or even for his principles. Rather, one admired his courage and pitied the waste of such talent in support of false ideas. However, “by the 1820s you find an outlook in which the state of mind, the motive, is more important than the consequence, the intention is more important than the effect.”<sup>33</sup> Thus, fighting for one’s beliefs, one’s principles, being true to oneself, regardless of what those beliefs constituted, became the measurement by which one was defined. This radical intellectual departure represented a demarcation, whereby an individual a hundred years prior to being transported to 1820 would have experienced tremendous cognitive dissonance.

Over the vast expanse of recorded human history stretching over the last four thousand years, change from one generation to the next remained nearly undetectable. Father, son, and later progeny all used the same water holes, hunted, fished and later farmed in familiar lands. Tools of the trade, likewise, evolved little over generations. Skills and knowledge were passed from one generation to the next through oral traditions this constituted the bedrock of human knowledge. The very idea of progress was almost wholly unknown. Measurable change, that is, change within the lifetime of one individual, appeared only gradually in the fifteenth century. Only with the Industrial Revolution was the perception of time, for the first time, emancipated from chains of human endurance. Labor, travel, and communication were no longer measured in the capability of sinew and

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<sup>32</sup> Berlin, *The Roots of Romanticism*, 9, 10.

<sup>33</sup> *Ibid.*, 10.

blood, but of wheels, belts, and engines—and measured with timepiece machines of incredible accuracy and consistency. These timepieces eventually allowed the Europeans to conquer the oceans as well as time.<sup>34</sup>

Psychiatrist-Neurologist Iain McGilchrist in *Master and his Emissary: The Divided Brain and the Making of the Western World* (2012) contends that the “bihemispheric structure of the brain... ‘renders’ ...two fundamentally opposed realities, two different modes of experience... .”<sup>35</sup> This affects not just how one thinks about the world, but indeed how one experiences the world. McGilchrist points out that the nothing is entirely produced in one hemisphere or the other, but that the two perceive the world in starkly different terms.<sup>36</sup> Furthermore, McGilchrist’s primary contention, which is important for its relationship to technology, is that the Western world over the last few hundred years has favored the disposition (and processing) of the left hemisphere.<sup>37</sup>

The left hemisphere attends to the parts rather than the whole and is responsible for focused attention and analysis on examining detail. It prefers the inanimate to the animate and appears to treat things as tools, as means to an end. The gaining and use of power, the utility of all objects, acting on what it knows, and a preference for the mechanical are all traits associated with the left hemisphere.<sup>38</sup> Much of the knowledge gained in respect to the hemisphere comes from research of patients that have experienced various levels of left or right brain damage, as well as from sophisticated brain imaging technology.

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<sup>34</sup> Dava Sobel, *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time* (Bloomsbury Publishing USA, 2010).

<sup>35</sup> Iain McGilchrist, *The Master and His Emissary: The Divided Brain and the Making of the Western World* (Yale University Press, 2012), 3.

<sup>36</sup> *Ibid.*, 34.

<sup>37</sup> *Ibid.*, 6.

<sup>38</sup> *Ibid.*, 10,39,40,55,208,209.

By contrast, if McGilchrist is correct, the right hemisphere prefers and is the primary mediator of new experiences. Emotion, the ability to experience empathy, the ability to respond with flexible attention, difficult or complex predictions, pattern recognition and a preference for the living are all common attributes of the right hemisphere. Furthermore, theory of mind (the ability to understand what others might be thinking) and a sense of the past are both centered in the right hemisphere. “In humans, just as in animals and birds, it turns out that each hemisphere attends to the world in a different way...the right hemisphere underwrites breadth and flexibility of attention, where the left hemisphere brings to bear focused attention.”<sup>39</sup>

Technology is not just a human creation that extends our abilities of how we think about information, as Aznar defined it, but following McGilchrist’s logic, then it is also a facet, a preference, of how some people in the West perceive the world. This perception is a prism that favors the left over the right hemisphere. Technological ubiquity exacerbates the problems of the military mind. Already conditioned by the Western mindset to deconstruct problems into discreet parts, examining and resolving each individually, the soldier tends not to look at the overall situation.

Colonel Charles Ardant du Picq served in the French Army and was killed in 1870 by a Prussian shell. As a soldier and a theorist, du Picq examined ancient and modern warfare to deduce what could be learned from the former and applied to the latter. In his work *Battle Studies* (1880), published after his death, du Picq observed that a constant in war did exist-- human nature. Ancient man and modern man were both motivated by fear and pride according to du Picq. However, the modern battlefield required more preparation, because

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<sup>39</sup> Ibid., 27. Brain scanning indicates a preference for living objects in the right hemisphere.



it taxed the senses to levels unknown in antiquity.<sup>40</sup> Du Picq noted that other factors, such as organization and structure, are important elements in the formula to create cohesion and motivation within the unit, and there is a science to this, but those that place the greater emphasis on numbers and science misstep.<sup>41</sup> In this respect, du Picq did not conform to traditional French modes of thought on war, but his combat experience informed his theories, and as a result he arrived at a closer approximation to war's realities.

The increased tempo of modern life has changed one's perception of history and time, according to Koselleck in *The Practice of Conceptual History* (2002). He claims that history has effectively ceased to matter in a world of rapid and continuous change. Koselleck expresses the concept with clarity noting, "traditions are no longer passed down but are retrospectively established; any future is newly opened up without the knowledge of historical *Bildung* of the individual as well as of the society-being lost as a continuous process."<sup>42</sup> Thus, over time [the Western mind] has found history of less and less value, and placing greater value on that which has displaced history--technicism. The social tremors created by technology are frequently referred to as revolutionary, but in practice, omitting the occasional outliers, the largest social changes are intellectual and organizational. The frequent assumption among officers is that every new widget has the potential to revolutionize war. Instead, the most significant revolution might be the aggregative assumption of these errors. In other words, if a belief is enduring, prevalent, and powerful

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<sup>40</sup> Charles Jean Jacques Joseph Ardant du Picq, *Battle Studies: Ancient and Modern Battle*, trans. John N. Greely and Robert C. Cotton (New York, NY: Macmillan, 1921), 94–100.

<sup>41</sup> *Ibid.*, 148.

<sup>42</sup> Koselleck, *The Practice of Conceptual History*, 197.

enough then no amount of training, reeducation, and rehabilitation is going to get one any closure to reality.

The inherent risk for U.S. Army officers is that the above process leads to evaluation based on artificial and sundered situations. False assumptions, fabricated realities, and faulty reasoning colored the prism through which officers perceived the world. Thus, they arrived in one short intellectual leap from a process that led from control of the inanimate to the animate. If one can control and manage machines for efficiency then certainly similar methods can be employed with people. Social engineering emerged as the “science” to make possible control of human raw material. This perception formed the Army prism and ensured that each situation presented a similar hue, each premise had a corresponding proclivity, and each solution a like answer.

For a number of reasons the U.S. Army officer corps [circa 1800] was especially susceptible to this line of reasoning. First, the U.S. Army officer corps lacked the long-standing traditions of established militaries in other nations. No doubt there are benefits to youthfulness, but the lack of cultural maturity, remains a problem to the present. Second, the geographical location of the United States imputed a practicality to the American character that placed a premium on action. Third, the North American continent provided the U.S. Army, in many ways, an artificial environment. Unlike European nations, or even those in East Asia, the Atlantic and Pacific oceans provided walls, a geographical barrier that minimized threats and the need to think deeply about war. In comparison, Germany’s central position within Europe necessitated a completely different military culture. Here military competence defined survival. If nothing else, one could not spurn the military arts, one might ‘get it’ wrong, but one did not simply ignore it. Clausewitz notes, “... theory and

experience must never disdain or exclude each other; on the contrary they must support each other.”<sup>43</sup> [However, in the instance of the Army, the distortion, the exclusion, though not willful nevertheless transpired.] The French experienced something similar, a self-inflicted wound, but their myopia was intellectual. The U.S. apathy regarding military matters resulted from geographic, intellectual and technological factors, and perhaps a general poverty of imagination.

A more complex phenomenon affected the intellectual structure of the U.S. Army officer corps following World War I. The totality of this intellectual shift was not the result of any single agent but rather the convergence of a multitude of proximate causes and influences. Beginning in the mid-nineteenth century and culminating in the second decade of the twentieth century technology and history, communication and experience appeared to have fundamentally changed from all previous human experience. Time, similar to geography, has a ubiquitous quality that powerfully influences one’s perceptions, but the nature of that quality, like yeast, implicitly leavens the world where the effect is largely unseen and yet pronounced.

Time, and man’s understanding of it, changed over the last several thousand years. In antiquity the Greeks imagined time as a god that “dragged all things into a ceaseless flux.” Later, the idea of time involved into the realm of perfection or ideas, and the realm of decay; that which belonged to the gods and that in which man existed. The idea of time continued to progress and by 1690 John Locke succinctly defined it as, “duration is but as it were the length of one straight line extended in *infinitum*, not capable of multiplicity, variation or figure, but is one common measure of all existence whatsoever, wherein all

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<sup>43</sup> Clausewitz, *On War*, 61.

things, whist they exit equally partake.”<sup>44</sup> Thus, time is anywhere and everywhere the same for all individuals in all circumstances. The idea remained relatively stable until a young scientist two hundred years later advanced a new theory.

In 1905, Albert Einstein published “On the Electrodynamics of Moving Bodies” followed by *General Relativity* in 1915 whereby he postulated that time was relative, thus disproving the classical Newtonian theory of time as something with a constant velocity and vector. And for physicists, time is objectively relative.<sup>45</sup> However, for the officer, politician and citizen, perception renders a different reality. The classical theory of time, for these agents, remained as valid as the day Newton first described it.

One’s perception of time and space altered with technological advances. Perhaps, nothing exercised so powerful an influence on the mind as the locomotive in the nineteenth century. The steel beasts looked to be of another world, and next to the mechanical clock, with its growing popularity, encompassed the spirit of an age. It is no accident that Einstein’s thought experiment that resulted in the theory of relativity used the most powerful and ubiquitous example of modern technology in his time-- the train.

Time, fundamentally, is the measurement of motion, and thus has not objectively changed, though man’s interpretation and understanding of time has.<sup>46</sup> Time originally measured, at least in the West, from one human event to the next, or it counted down to the end of time with the return of Christ. Not until the secularization of the state and

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<sup>44</sup> G. J. Whitrow, “Time and Measurement,” in *Dictionary of the History of Ideas*, ed. Philip P. Wiener, vol. IV (Charles Scribner’s Sons, 1973), 389,391,404.

<sup>45</sup> Albert Einstein, *Relativity: The Special and the General Theory* (Andras Nagy, 2010).

<sup>46</sup> Gyorgy Buzsaki, *Rhythms of the Brain* (Oxford University Press, 2006), 8.

divergence from the church did one begin to measure time and think of it as progress toward something *improved* rather than a countdown to the end.<sup>47</sup>

Historian Lewis Mumford alluded to a change that took place in the Western mind with the advent, spread, and eventually ubiquity of the clock. The clock, for Mumford, represents a separation and abstraction of life, and though all time is based on some measurement of motion or planetary rotations, its measurement is the first step toward human servitude, of the living, the animate, being subordinate to the mechanical and inanimate. Previously, the seasons, day and night ordered much of humanity.<sup>48</sup> Time can now be accurately observed, time can be saved, life can be organized, ordered, by the clock, in short, one begins thinking in time.<sup>49</sup>

The ubiquity of technology served as a further abstraction from reality, both then and now, because it disassociates and divides life. It favors the particular, the specific, over the whole, the gestalt. Technology, in its various forms, generally enhances control; in many ways it provides a thin veneer of authority over reality. However, reality comprises chaos more than order; chance is bound up in the system itself. Thus, perception and reality diverge widely between that which can and cannot be controlled.

Technology, defined as a “tool that extends one’s abilities”,<sup>50</sup> assumed a shifting place in the human experience. Data are not just zeros and ones, or spears and hammers, but also, most importantly, and more commonly, information.<sup>51</sup> As such, technology does not define what it is to be human, but it does reflect, if only in part, what it is to be human.

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<sup>47</sup> Koselleck, *The Practice of Conceptual History*, 106,120.

<sup>48</sup> *Ibid.*, 102.

<sup>49</sup> Lewis Mumford, *Technics and Civilization* (University of Chicago Press, 2010), 14.

<sup>50</sup> Aznar, *Technology Challenged*, 11.

<sup>51</sup> *Ibid.*, 24.

Nevertheless, a complex relationship exists between man and technology, making it difficult to separate the two. Technology is an expression of human thought. One's intellect, ideas and creativity are made concrete through it. There is confusion in how one thinks about the role and purpose of technology, because technology naturally extends our abilities; therefore, it can and often does assume a sense of progress, potential, and capability.

The animate and the inanimate, man and technology, make up a symbiotic relationship with each affecting the other, but they are not equal nor are they always amiable partners.<sup>52</sup> People think about technology differently, and sometimes the same people, at different times, think about it differently. Certainly, the young French infantry officer of 1914 viewed technology radically differently if he remained alive in 1919. The American military tradition perceived technology as both means and end, as a tool to minimize chance, and to control it—not as the self-inflicted wound that our young French officer in 1919 might have perceived.

Army officers thus came to be subsumed in a technological environment, a process that gained considerable momentum in the first half of the twentieth century. It is, however, worth noting that technology only extends the abilities already inherent in the individual and organization--perhaps a banal observation, but a fundamentally, and frequently overlooked fact. Consequently, nearly every problem appeared to have a technological solution. Success and failure were predicated on correct tool selection to achieve the desired outcome. The most obvious current day example of this is the military targeting process contained in U.S Army doctrine is known as “d-cubed alpha”—decide,

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<sup>52</sup> McGilchrist, *The Master and His Emissary*, 6.

detect, deliver, assess.<sup>53</sup> War adds more layers to an already chaotic system. One is left with a profoundly unstable situation, one which is overlaid with systems of systems that attempt to balance countless variables through technological solutions to complex human challenges. The impetus for perceiving the world in this light may be as much a function of experience as of physiology.

The U.S. Army follows concepts such as the Military Decision Making Model (MDMP) and Design, both of which are models for controlling and managing variables.<sup>54</sup> Chaos, friction and fog of war are all factors that, given the right model, can be mitigated or minimized. McGilchrist found that “the left hemisphere builds systems, where the right does not.”<sup>55</sup> This is not to arbitrarily argue that systems, models, and processes are not without great value, but with growing confidence and greater conviction the U.S. Army officers have laid too much at the feet of this idol. Some military minds resisted this temptation.

Clausewitz hardly spared a word for technology, not because he was unaware of its existence, or even importance. He also dispensed with antiquity, not for lack of curiosity, but because he grasped the growing distance between antiquity and the present at the lower levels of war, an implicit acknowledgement of a change in the conduct of war over time. Expanding perspective up and out to the strategic level, Clausewitz sidelined technology, because he understood its temporal nature for this reason his work is not fixed in time, but aimed at the human values outlined by Thucydides and Machiavelli. For

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<sup>53</sup> Department of the Army, *Field Manual 3-60 (FM 6-20-10): The Targeting Process*, 2010, [http://armypubs.army.mil/doctrine/dr\\_pubs/dr\\_a/pdf/fm3\\_60.pdf](http://armypubs.army.mil/doctrine/dr_pubs/dr_a/pdf/fm3_60.pdf).

<sup>54</sup> Department of the Army, *Field Manual 101-5: Staff Organization and Operations*, 1997, [http://www.fs.fed.us/fire/doctrine/genesis\\_and\\_evolution/source\\_materials/FM-101-5\\_staff\\_organization\\_and\\_operations.pdf](http://www.fs.fed.us/fire/doctrine/genesis_and_evolution/source_materials/FM-101-5_staff_organization_and_operations.pdf); Department of the Army, *Army Doctrine Reference Publication 5-0*, 2012, [http://armypubs.army.mil/doctrine/dr\\_pubs/dr\\_a/pdf/adrp5\\_0.pdf](http://armypubs.army.mil/doctrine/dr_pubs/dr_a/pdf/adrp5_0.pdf).

<sup>55</sup> McGilchrist, *The Master and His Emissary*, 228.

Clausewitz, as for his predecessors, war was preeminently a human phenomenon and all other facets, characteristics, and elements of war played supporting roles.

For the officer, the study of history and the humanities, an understanding of Romanticism for example, allow the mind to penetrate and grasp the nuances and contextual factors that elude static and explicit analysis. Military history is not merely the collection of facts and figures, arms and armor, tactical and operational engagements, the actions of great men and lesser, or victorious empires and conquered ones. Instead military history is a “pasture” for reflection and imagination, not a store full of tools. Rather, and of far greater importance, it conveys and informs, not just at an analytical but a vastly more powerful intuitive sense; an understanding of man and the propensity of events.<sup>56</sup> Such an understanding is indispensable for the military officer. If the intent of war is “to compel our enemy to do our will” to superimpose the victor’s intent on that of the vanquished, then the mind shaped by an understanding of history is essential. Overreliance on technological solutions demonstrates a shallow understanding of man and war.

Clausewitz provided further clarity in respect to the military mind: “ the insights gained and garnered by the mind in its wanderings among basic concepts that theory can provide...it can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action.”<sup>57</sup> The mind, as Clausewitz described it, is not bound to or by theory, doctrine, or explicit boundaries. Rather he conveys a freedom, a “wandering” and that by this approach, and by no other method, does one achieve the zenith of military thought.

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<sup>56</sup> Tzu, *The Art of War*, 92-93.

<sup>57</sup> Clausewitz, *On War*, 578.



Berlin believed that “...we are children of both worlds..,” both of the Enlightenment and Romanticism, “...but at the same time – and to the extent the romantic ethos is true – are the persons who most strongly emphasized the unpredictability of all human activity.”<sup>58</sup> The officer’s mindset is on the mechanical, the technological, the tools. His focus is all too easily drawn to possibilities for control and thus risks the loss of an understanding of, the unpredictability that underlies human activity.

Clausewitz noted that theory and reality should never disdain each other, which leaves one to believe that he must have experienced such divergence on multiple levels and on numerous occasions.<sup>59</sup> The most common definition of war of the many that Clausewitz provided is “war is thus an act of force to compel our enemy to do our will.”<sup>60</sup> ‘Our will’ is a concept, an idea, a state that is absent in the present, though desired in the future. Hitler’s and Stalin’s beliefs were not compatible with this concept, for the ends of each required the submission or annihilation of the other. War is foremost a conflict of ideas. However, the conflict of ideas that necessitate war is not war. One’s reasons for waging war ought to be separate from the means by which one wages it.

“There are, in my view, two factors that, above all others, have shaped human history in this century [20<sup>th</sup>],” Berlin observed. “One is the development of the natural sciences and technology...the other, without doubt consists in the great ideological storms that have altered the lives of virtually all mankind.”<sup>61</sup> What is progress, if it exists, and how does one go about measuring it? Is it measured in chronology, in technological

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<sup>58</sup> Berlin, *The Roots of Romanticism*, 141, 147.

<sup>59</sup> Clausewitz, *On War*, 61.

<sup>60</sup> *Ibid.*, 75.

<sup>61</sup> Isaiah Berlin and Henry Hardy, *The Crooked Timber of Humanity: Chapters in the History of Ideas* (Vintage Books, 1992), 1.

development, in scientific achievement, in the emancipation of man toward individual freedom, in the abatement of human suffering, in peace? Or is it a march toward order that began in earnest with the Enlightenment? After all, according to Berlin, the one thing that the Enlightenment denied, in its totality, was the Christian faith. Men are born good, or at least morally neutral. With proper molding and nurturing, they can and will rise to new levels, they will progress.<sup>62</sup> Science and rationality conspired to slay the Hobbesian beast. Great minds believed that with the death of monarchies and the rise of republics of virtue, war would with time, effort, and perseverance be evicted from human memory.<sup>63</sup> Such was not to be the case.

If the Western world is the heir to two intellectual traditions, there are facets or spectra within each. If man is capable of acts of both depravity and sacrifice, it seems that the Enlightenment and Romanticism, being human creations, are equally so imbued. Technology, however, did not enter the consciousness of man as a driver of human progress until the Industrial Revolution. The awareness of technology, like the intellectual shift inaugurated by Romanticism, began as an opaque, intuitive feeling. This feeling was at the edges of humankind's consciousness, where one was mindful that something is there, that somehow things are changing, but unable to articulate the specific nature of what was changing. If the Enlightenment and Romantic movements consumed man with or without his consent, so then did technology. Technology is not an intellectual movement in the same way that the other two emphasize ways of thinking and being, for they are both purely intellectual frameworks upon which one may act, yet the impulse is wholly cognitive. They are spiritual, moral movements with all the power and resolution of a religion.

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<sup>62</sup> Isaiah Berlin, *Against The Current: Essays in the History of Ideas* (Random House, 2012), 20.

<sup>63</sup> Azar Gat, *War in Human Civilization* (Oxford University Press, 2008), 510.

Technology, at its most fundamental level, “extends one’s abilities.” Thus, it is both an ethereal product of the mind, and something later actualized in the physical realm. Though it has no inherent moral or spiritual qualities it is nonetheless animated by such impulses. In many ways, and perhaps this is Mumford’s actualized fear, man found himself subtly subdued by the promise of progress. In some manner or another, technology would reduce the burdens life placed upon humankind. Through time-reducing, muscle- saving, thought-minimizing technology, civilization would progress; and man, with his burdens reduced, could focus his efforts on the betterment of his fellow kin regardless of race, religion or creed. This philosophical belief or inclination has penetrated the psyche of the Army officer—it is the medium, the culture, in which the army exists and acts.

Punctuated equilibrium, often used in conjunction with explaining the theory of evolution, may aptly be applied to the technological world. The gradual and steady evolution of technology throughout history suddenly exploded in the seventeenth century. This was likely the result of the printing press, which accelerated the dissemination and accumulation of information. The danger is not that information is increasing too quickly or toward some kind of singularity, but that it appears to be the domain within which the vast majority of organizations, institutions, bureaucracies, governments, and of primary importance, U.S. Army officers assume the solutions reside. It can take many forms, often using more technology to solve the problem created by more technology, more process to control other processes, more rules to augment current rules, and more laws to rectify old laws. For example, the introduction of computers to the battlefield provided more information and increased lethality, but it also engendered, among other factors, a targeting solution mindset. A by-product of technology immersion is the illusion of control

and specious contextual understanding, one believes they perceive and know to a far greater degree than they actually do.

The increased tempo of daily activity, particularly the military thinker's desire to operate within the enemy's decision-making cycle, elevated time to a premium. Officers are trained to execute methods, processes, and systems that if followed theoretically produce an acceptable military solution. Erich von Manstein, the German officer who planned the invasion of France in 1940 and sent the panzers through the Ardennes forest, believed that logical military solutions were obvious to both friendly and enemy commanders alike. Therefore, intellectual surprise is only achieved when one strikes where least expected, and in the German case in 1940, that thrust traversed the "impenetrable Ardennes." One of the greatest military victories in history was produced by a mind that explored the impracticable.<sup>64</sup>

Bellicosity, in whatever forms it takes, frequently trends toward the most natural human instinct--imitation.<sup>65</sup> Thus, conflict not only escalates towards extremes, as Clausewitz notes, but also toward a sort of chaotic equilibrium; technological asymmetrical advantages vanish, all the more so given the instantaneous transmission of information in the digital age, all that remains, the only asymmetric advantage one may have that cannot be captured, mimicked, or duplicated is the cultivated mind with its intellectual agility, tolerance for risk, and contextual understanding. The development of the cultivated mind is a slow, arduous, a qualitative process. Technicism, technocracy, technological driven thought-- whatever form it takes-, by contrast, often produces a systematic, linear, and

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<sup>64</sup> Karl-Heinz Frieser and John T. Greenwood, *The Blitzkrieg Legend: The 1940 Campaign in the West* (US Naval Institute Press, 2005), 69.

<sup>65</sup> McGilchrist, *The Master and His Emissary*, 248.

superficial process that fails to penetrate the complexities that exist outside of the controllable variables.

The focus on technology by officers and Army educational institutions has produced a shallow and circumscribed mentality. This is especially reflected by the U.S. Army's institutional preference for training. Training has many benefits, which have been explored and exploited with industrious efficiency; however, its dangers are less clearly understood. Training appeals to the modern military bureaucracy because technology-focused systems or process are logical and therefore one can quickly train others to use technology and then exploit technology itself to do the training. Tempo is thus sustained through the relationship of training and technology all of which can be quantifiable and therefore measurable and in the end, monetarily justifiable.

The pervasiveness of technology has a further byproduct: reducing the depth and breadth of an officer's thought process. One can now do more things in less time (not necessarily better but faster), and as the familiar truism of Stalin holds, quantity has a quality all its own. Superficial solutions to complex problems, augmented by technology, creates a sinister cycle that bedevils humankind's every attempt to solve problems by creating more. Lewis Mumford described it best: "...Scientists created a habit of mind favorable to discrete practical inventions: at the same time it was highly unfavorable to all those forms of art for which the secondary qualities and the individual receptors and motivators of the artist were of fundamental importance."<sup>66</sup> Mumford aimed his words at the physical scientists and their habits of thought that exclude the unquantifiable, and his

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<sup>66</sup> Mumford, *Technics and Civilization*, 51.

warning has been fully realized in the modern technological world. War, after all, is more art than science because there are too many variables for one person or side to control.

The intellectual shift precipitated by technology did not touch society equally for some sectors experienced radical shifts while others were less affected. What did occur, through greater centralization of the state apparatus made possible by technological advancements, was a massive growth of industry to support the state by means of the military strength through a cyclical relationship, each supporting and reinforcing the other. According to Mumford, the army of Louis XIV made, “the first large-scale demand for absolute standardization [of] goods.”<sup>67</sup> The army and intellectual cadre, the officer corps, not only demanded the standardization of goods, but frequently also the standardization of thought. Few Western officer corps across time have paid more than lip service to the idea of valuing dissent of thought. This is, in part, because military command in battle requires a quick top-down system, in contrast, military innovation requires just the opposite.

Returning to Berlin’s analogy of how soldiers have wrestled with ideas from the Enlightenment through the 19<sup>th</sup> century, soldiers found that strength in the face of almost certain loss constituted a requisite element for success on the battlefield. Morale cannot be quantified. It defies measurement, it eludes capture, and exists and motivates the living. It is visible to the human eye, but, as Ardant du Picq observed, not all eyes perceive it, though it penetrates even the hardest hearts.<sup>68</sup>

The Western officers of the sixteenth through the early twentieth century were defined not, as one may suspect, by their differences, but rather by their remarkable similarity. Officer corps during this period developed organically from peculiar forms of

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<sup>67</sup> Ibid., 92.

<sup>68</sup> Ardant du Picq, *Battle Studies*, 118–129.

autocracies, republics, aristocracies, and oligarchies. Diverse historical, social, political, religious and economic factors colored the outlooks, like the uniforms, of these officers, and, perhaps not surprisingly, they demonstrated a fairly homogenous understanding of war. Essential features such as discipline, morale, and leadership ideas revived from the Roman Empire breathed new life into military affairs in the European sphere.

Romanticism birthed the idea of plurality; however, an understanding of motive and intent, of other ways of being. Pierced military ideas of standardization and mechanization of man and once again awakened the power of the will. Napoleon brought life and vigor to the concept of “popular will” that heretofore had been unknown. For the next two hundred years the Napoleonic model dominated, and in many ways its influence lives on. The intellectual penetration of Romanticism into the military profession, however, took hold only in part-- accepting the violent, unrefined, and passionate, while rejecting out of hand, plurality of thought. Fascism could furnish no finer example of this distortion. One-way of being, thinking, and believing permeated the Third Reich. Celebrating the heroic individual, the singularity of the cause, the power of the will ensured--despite all odds--ultimate victory. “The lights of perverted science” as Churchill warned, amalgamated with the spirit of Romanticism from whence it was born in the heart of Germany, to give birth to one of the most terribly violent, destructive and powerful forces to ever animate men and women to action.

Time for those caught up in mass movements assumes an immortal quality, and the present ceases to matter to the individual so raptured. The past provides the justification to fuel the passions, and reckless abandon, cavalier inclinations, and indifference to death are commonly shared attributes. Enormous numbers of human beings revolted against the

technicism and limitations. Their response was perhaps driven by a desire to have purpose, to achieve some sort of immortality. The mechanical and technological impulses of Western culture continue to constrain the human will. These frustrations find release on the battlefields where the spirit and machine duel for supremacy. Nowhere is this more evident than with the horrors of World War I.

The First World War appeared to have dealt a mortal blow to the will as the pivotal element of warfare. Élan died thirteen millions deaths, taking into the its embrace men that would never walk again and others never normally. The killing fields of Western Europe demonstrated that the determination to advance against the odds could not succeed in the face of modern firepower. The Napoleonic model, which stumbled at Waterloo, succumbed to its wounds at the Somme. The heroic legacy of Spartan fortitude while surrounded and trapped on an island at the Battle of Sphacteria against the Athenians and the sacrifice of the 300 at the Battle of Thermopylae withered in the mud Ypres and Verdun. This unbroken lineage of courage and bravery –the apotheosis of soldiering- ended its two millennial reign by ceding its power to the machine.

History mattered much because it changed so little. Humans are by their nature historical creatures. Past experiences are used to extrapolate a potential future--thereby allowing one to take action to ensure future survival. History, whether personal or collective, can provide the data to understand trends. One who understands current propensities is not guaranteed survival or success, but doing so definitely increases the odds in one's favor.

The relevance of military history seemed to be in question by the late nineteenth century. The past and present diverged on battlefields prior to and after World War I, at



least superficially, and the evidence of millions of dead convinced many officers that something had now certainly changed. For the first time in military history technology had apparently eclipsed the human element as the decisive factor in war. Thus, the potent intellectual shift that Berlin discussed produced a sibling that in many ways yielded comparable conviction. For the military officer, technology decisively displaced man. Just as the Enlightenment swept away traditional conceptions of Christianity, tradition, and the qualitative; technology swept away human moral primacy with sterile, dispassionate material factors.

In 1949, Joseph Campbell in *The Hero with a Thousand Faces* found that across all cultures and civilizations the most thought-provoking facet of the heroic formula, of mythology, was not the differences, but the similarities.<sup>69</sup> George Lucas cited Campbell's work as one of the most important influences in developing *Star Wars*. The hero's journey that Campbell abstracted is the exact trope that Lucas used to structure the *Star Wars* films. Likewise, Steven Spielberg has cited Campbell as a source of inspiration for his works. These directors went on to develop stories that are some of the most iconic and commercially successful in history, but they drew from an ancient blueprint.

Campbell's findings echoed those of Lovejoy and Berlin that values are finite, that there do not exist an infinite number of values, that these heroes, heroes of the East and those of the West, sought an experience, a passage, which reflected values if not in the details most certainly in their essence. Thus, Thucydides is not in error, but most certainly struck the crux of the matter. History, in the broad strokes, shares familiar hues because the heroes – what men aspire to- the values, perhaps not the same values, but values

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<sup>69</sup> Joseph Campbell, *The Hero with a Thousand Faces* (New World Library, 2008), 2,211.

nonetheless, as Berlin observed, that are discernible, understandable, and the stages of the journey that lead the hero to self-discovery are remarkably similar.

Officers, however, now perceived war through a new lens. Gone were the living heroes: petroleum, cold steel, and complex gears replaced blood, bone, and spirit. Industrial production, strategic material, scientific and technological progress defined how future wars would be fought-- war by math. Some military theorists had reached this point much earlier. Influenced by the Enlightenment, Antoine-Henri Jomini had abstracted and simplified war down to a game of numbers, but, notably, his first trade was banking.<sup>70</sup> Ivan Bloch, also a banker, predicted with some accuracy the coming carnage of modern war, although he further postulated that nations could not, because of financial and economic costs, go to war for any length of time; and should they do so anyway exhaustion would follow in short order.<sup>71</sup> Now war could be measured, counted, and predicted based on rational calculations. The vision of bankers, industrialists, scientists, and military officers bonded out of mutual self-interest.

The ideal soldier was always more machine than man and from his earliest moments under the flag he experienced extraordinary and arduous training. Incessant drills, marching, and calisthenics filled the young soldier's life. Choreographed movements matched the ancient and ritualistic motions of dance, but now curiously assumed mechanical functions; the first ennobled deep primordial human instincts, and the second fused the movement of both the animate and inanimate. So the template for the machine or mechanistic paradigm was always there. By the nineteenth century discipline, augmented by nationalism, infused the common soldier with hoped-for iron fortitude. Discipline,

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<sup>70</sup> Antoine Henri baron de Jomini, *The Art of War* (Philadelphia: Lippincott, 1862).

<sup>71</sup> Jean Bloch, *The Future of War* (Boston: Ginn and Company, 1899).

instilled through physical exertions, aimed to expunge thought. That one obeyed orders without thinking, that the response was immediate and exact, in many ways caused the soldier to predate and portend the machine.<sup>72</sup>

The illusion of control permeates American society, and none more so than in the U.S. officer corps. The arrival to this point in the evolution of this institution represents a slow, specious imitation of success-- a journey without direction and without philosophy resulting in a hollow colossus. The U.S. Army officer corps did not, and has not, come to grips with the nature of war, rather it substitutes technology as the proper reality to understand and to master.

William Skelton argued that roots of professionalism in the US Army took hold in the South prior to the Civil War.<sup>73</sup> Samuel Huntington believed that the process gained its impetus between the Civil War and the First World War.<sup>74</sup> Whether before or after 1865, the U.S. Army officer corps professionalized, but to what extent and to what degree is less certain. The philosophical roots of the officer corps lacked the environment necessary to produce a philosophy of war. This intellectual immaturity made the young officer corps susceptible to borrowed or spurious ideas—sometimes both. Thus, nature and nurture naturally amalgamated in the minds of these men to produce an entirely genuine, yet flawed, understanding of the nature of war and how one solved the problems it posed. The growth of technology, and its subtle but profound interaction with man's conception of time compounded these other conceptual errors and misunderstandings.

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<sup>72</sup> Mumford, *Technics and Civilization*, 89–95.

<sup>73</sup> William B. Skelton, *An American Profession of Arms: The Army Officer Corps, 1784-1861* (Lawrence: University Press of Kansas, 1992), xiii.

<sup>74</sup> Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MS: Harvard University Press, 1957), 237.

Intellectual acceleration is one of the most significant changes between this world and the nineteenth century. History no longer mattered, because it changed so rapidly—propelled, of course, by technological developments. Technology fundamentally altered the relationship between man and time. Reinhart Koselleck in *The Practice of Conceptual History* defined historical acceleration as, “the shortening of the time spans necessary for gaining new experiences that the technical-industrial world forces upon us.”<sup>75</sup> Technology has altered the relationship between the elements of Clausewitz’ trinity, because “the shortened temporal rhythms” have caused the trinity to collapse. The trinity is now nearly singular with the various elements interacting on an almost instantaneous level. In essence technology has increasingly eliminated space. The time it takes ideas, weapons, and people to travel has decreased to a point unseen in human history.

Conflict generates a magnetic or centripetal pull upon forces involved, not just escalation, but also a tendency to pull into conflict bodies in orbit toward the center. The collapse of the trinity resulted in [the heavenly bodies being pulled in amalgamating into a whole.] The combination of time pressures, avoidance of thinking, and ever increasing reliance on technology have resulted in an attempt to turn tactical and operational virtue into a coherent strategic policy. The U.S. Army of today even has a term for it—“strategic compression.”<sup>76</sup> Officers believe that even more technology is the answer to a technologically saturated world. As Thucydides notes, “...two things most opposed to good

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<sup>75</sup> Reinhart Koselleck, *Futures Past: On the Semantics of Historical Time*, Kindle (Columbia University Press, 2013), 113.

<sup>76</sup> Dave Dilege, “Thoughts on ‘Strategic Compression,’” *Small Wars Journal*, February 3, 2007, <http://smallwarsjournal.com/blog/thoughts-on-strategic-compression>.

counsel are haste and passion..." both of which are more likely under the auspices of technology.<sup>77</sup>

In 406 B.C. an Athenian fleet defeated a Spartan naval force at the Battle of Arginusae. Following the victory, eight Athenian *stratego*i faced two decisions that pulled forces in opposite directions. First, the Athenian fleet could capitalize on the victory and rush to Mytilene and relieve an Athenian force blockaded there, or, second, it could rescue sailors lost in battle clinging to flotsam. The *stratego*i decided that all would sail for Mytilene minus a few ships diverted to salvage the souls floating in the sea. Chance intervened, however, and neither the sailors nor the Spartan fleet encountered the Athenian fleet. Rather, a sudden storm prevented both actions, while the Spartans escaped and the Athenian sailors drowned.

The generals upon their return to Athens faced a hostile populace. The victory forgotten, the people demanded that the generals assume responsibility for their failure to save the sailors. Political intrigue and passions overwhelmed all reason and by some odd twist of fate, even Socrates, who presided over the assembly that day, and did everything in his power to prevent it, could not repel the irrational and cunning intent of those present. They were executed, and no sooner had the blood dried than the Athenians reversed their position, regretting their decision, and those most responsible for urging execution now faced death themselves.<sup>78</sup>

Antiquity furnished officers with friction of a different kind. Information, in whatever form it took, remained limited and bound to locomotion of that age. Today, the speed of information transmission seems an obvious observation, but how it influenced the

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<sup>77</sup> Strassler, *The Landmark Thucydides*, 179.

<sup>78</sup> Donald Kagan, *The Peloponnesian War* (Paradise, PA: Paw Prints, 2008).

education, action, and thought of Army officers is a profound question with far reaching implications.

## Chapter II

### Practical Leadership for Empire

Established in 1775, the U.S. Army developed an intense focus on practicality early in its evolution, nourished by the geographical and environmental features of frontier America. Once free of British control, Army units were largely deployed along the western boundaries of the U.S. to provide security to settlers, or along the Atlantic coastline to defend port cities. Army officers concerned themselves with the regimen of day-to-day life and patrols through the outer territories. For the most part, the old world remained a distant threat to army officers and the study of war received little attention during this period. The hardships of life in these small forts and posts afforded little time or an environment conducive to intellectual study.

The War of 1812 generated a surge of nationalism in the sons of many who had fought in 1776; a near disaster, it resulted in a realistic reevaluation of some of the founding generation's more romantic precepts.<sup>79</sup> The militia performed unevenly at best and failed miserably at the worst. The need for a permanent and professional army was painfully obvious, at least to the officer corps, in the wake of 1812.<sup>80</sup> Furthermore, by the early 1820's, the seeds of professionalization began to sprout in the fields of science, law and economics in the North. In the South, slavery rapidly transformed under the pressures

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<sup>79</sup> William B. Skelton, *An American Profession of Arms: The Army Officer Corps, 1784-1861* (University Press of Kansas, 1992), 116.

<sup>80</sup> *Ibid.*, 122.

of technological change yielding a far heavier and in the end unbearable yoke- the industrial institutionalization of slavery.<sup>81</sup>

The trends of professionalization naturally filtered down into the U.S. Army officer corps. The aristocratic and romantic sensibilities of the Southern elite fit comfortably in the Army with its focus on honor and sacrifice. Furthermore, the presumed ever-present threat of slave revolt throughout the South and the militant nature of southwestern slavery served only to reinforce the tendency, perhaps not unlike Sparta's enslavement of the helots necessitating a militant society, at least in the upper classes.<sup>82</sup>

West Point produced the vast majority of officers during this period, and was the intellectual center in the United States of the army.<sup>83</sup> Although, the War of 1812 left a few self-taught generals such as Andrew Jackson and Winfield Scott. The primary focus of West Point aimed not at the education of officers who grasped the nuances of war, but rather at producing engineers to help build the roads and bridges needed by the fledgling nation.

There are not an infinite number of factors that affect the intellectual development of an individual. The proximate influences, whether they be thirty, thirteen, or whatever the number may be, are finite. And though they may differ, they nonetheless provide for common understanding for those in within that field.<sup>84</sup> For the U.S. Army officer corps the dominant factor centered on engineering.

Clausewitz described friction in war as the, "countless minor incidents- the kind you can never really foresee- combined to lower the general level of performance, so that one

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<sup>81</sup> Vernon Louis Parrington, *Main Currents in American Thought, 1800-1860* (University of Oklahoma Press, 1987), 63.

<sup>82</sup> Huntington, *The Soldier and the State*, 211.

<sup>83</sup> Matthew Moten, *The Delafield Commission and the American Military Profession* (Texas A&M University Press, 2000), 56.

<sup>84</sup> Berlin and Hardy, *The Crooked Timber of Humanity*.



always falls far short of the intended goal.”<sup>85</sup> The U.S. Army experienced a similar frictional phenomenon throughout its early development. While none of these factors are significant taken individually, they formed early and provided the substrate from which the organism evolved and taken collectively compounded.

In his classic study, *The Soldier and the State*. Samuel Huntington argued that technicism, popularism, and professionalism are the roots of American military traditions.<sup>86</sup> Russell F. Weigley, seeking to synthesize the intellectual outlook of the U.S. Army’s leadership over its entire history, posited that the American way of war was annihilation based on mass-produced technology.<sup>87</sup> More recently, Brian Linn noted that improvisation and practicality appear again and again as hallmarks of American military action that take on the character of a utilitarian doctrine.<sup>88</sup> Faced with this discontinuity”, Linn continued, “between ideal and reality, the nation’s military leaders have been quite ready to abandon the ideal and embrace the possible.”<sup>89</sup> Linn argued that the hallmark of American officers was they learned to improvise, but certainly there must be more to it than this. The principle of the “Hiding Hand” by Albert Hirschman, a spinoff of Adam Smith’s invisible hand of the market, applies here:

We may be dealing here with a general principle of action. Creativity always comes as a surprise to us; therefore we can never count on it and we dare not believe in it until it has happened. In other words, we would not consciously engage upon tasks whose success clearly requires that creativity be forthcoming. Hence, the only way in which we can bring our creative resources fully into play is by misjudging the

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<sup>85</sup> Clausewitz, *On War*, 119.

<sup>86</sup> Huntington, *The Soldier and the State*, 193.

<sup>87</sup> Russell Frank Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (Bloomington: Indiana University Press, 1977), xxii.

<sup>88</sup> Brian Linn and Russell Weigley, “The American Way of War Revisited,” *The Journal of Military History* 66, no. 2 (April 2002): 430.

<sup>89</sup> *Ibid.*

nature of the task, by presenting it to ourselves as more routine, simple, undemanding of genuine creativity than it will turn out to be.<sup>90</sup>

Creativity in this context is the result of encountering the unknown and, when faced with seemingly insurmountable obstacles (including people ,e.g. army officers), searching for solutions beyond the traditional limits of acceptable responses. Second, if the costs could be counted accurately beforehand, many endeavors would remain merely graphite sketches. A typical career in the U.S. Army confronts the officer with multiple challenges that require practical innovations to surmount. Over time, this makes a successful officer very confident of his or her ability to meet any challenge. Thus, one could argue that the unknown contributes as much to failure as it unwittingly advances success.

The American way of war, in this case, is the collective cultural disposition to underestimate the time, cost, and blood required to achieve the desired end state; and thus, faced with a conflict beyond the expected scope, encourages the officer to improvise to achieve victory. It is doubtful that such courses of action are particular to the U.S. A German, Russian, or Chinese officer might approach problems differently, at least initially, but the matter of resolution would most likely be similar. How one frames a problem and embarks on a solution probably varies widely, however, the general steps of a resolution are similar – the conscious human mind generally thinks in a linear fashion- though the range and solutions themselves would vary as much as the original framework. Linn’s conclusion of improvisation, practicality and utility are not enough- it is too general and common of a solution- a pattern that is arguably human. One must inquire, then, regarding what

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<sup>90</sup> Albert O. Hirschman and Brookings Institution, *The Principle of the Hiding Hand* (Washington, D.C.: Brookings Institution, 1967), 13.

intellectual trends are particular to the experience of military service and how they originated—looking specifically at the historical experience of U.S. Army officers.

When the British surrendered at Yorktown, it appeared that a ragtag volunteer force of civilians had victoriously defeated the greatest empire on earth. The role of the French expeditionary force, and especially of its siege engineers, was ignored. This constituted a myth eagerly propagated by American pamphleteers and one that founding fathers were all too willing to harness as they forged a new nation. The vast sums of French military and financial aid were quickly forgotten and footnoted to history.<sup>91</sup>

The memory that remained that conformed to the American ideal generated images of fathers, mothers, sons, and daughters—sturdy yeomen--taking up arms much like the Greeks of Athens and the Romans of the early Republic, stories not unfamiliar in that period. The American Revolution reminded many of the biblical David and Goliath when a young farm boy took up arms against a giant schooled in the art of war. Jefferson believed that the citizen-soldier had proved its worth and that professional armies were not only costly, but also dangerous, and superfluous in times of peace.<sup>92</sup> Myths, perhaps common in the birth of most revolutions, provided a powerful and necessary catalyst that, left unchallenged, shaped the dominant narrative.<sup>93</sup>

The American military profession during the early days of the new nation found little support from the government willing only to authorize a tiny standing force. In

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<sup>91</sup> Michael David Pearlman, *Warmaking and American Democracy: The Struggle Over Military Strategy, 1700 to the Present* (University Press of Kansas, 1999), 66; MacGregor Knox and Williamson Murray, *The Dynamics of Military Revolution, 1300-2050* (Cambridge University Press, 2001), 63.

<sup>92</sup> Thomas Jefferson, *The Works of Thomas Jefferson: 1799-1803* (Cosimo, Inc., 2009), 139,381; Thomas Jefferson, *The Works of Thomas Jefferson: Correspondence 1771 - 1779, the Summary View, and the Declaration of Independence* (Cosimo, Inc., 2010), 181.

<sup>93</sup> Richard Hofstadter, *The Age of Reform* (New York: Random House, 1955), 43–53; Joseph Campbell and Bill Moyers, *The Power of Myth*, Kindle (Random House LLC, 2011), 31–32.

many ways the federal government acted antithetically to the interests of the military profession and the nation. Poorly led, trained, and funded, the nascent army served primarily as an anti-Indian force spread across scores of small forts that stretched the length of the country both along the seaboard and the western periphery of the nation.

Napoleon's success on the battlefield with armies manned by citizen-soldiers over the professional armies of Europe further confirmed the belief of many American politicians that the citizens at arms model was every bit the superior to the professional army model dominant in Europe for the previous two centuries. Jefferson, a Francophile in many respects, used the French as an example from which to draw support for his own conception of the proper civil-military framework. The prominence of the militia solution and colonial experiences combined with Jefferson's influence resulted in a de facto French approach to military matters in early America.<sup>94</sup>

With the establishment of West Point in 1802, the U.S. had its first military college. The curriculum initially lacked rigor, and instruction primarily consisted of lectures and a readings from a single fifty-page manual translated from French. Many of its earliest professors were either French-trained or French themselves. Professor Claudius Corzet, born in France and educated at the Polytechnic School, taught some of the earliest courses. His focus was engineering.<sup>95</sup> Sylvanus Thayer in 1817 expanded the curriculum with more works from France's Polytechnic School.<sup>96</sup> The influence of continental military thought at West Point and throughout the U.S. Army merely followed the form and function of the

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<sup>94</sup> Thomas Jefferson, *The Works of Thomas Jefferson: Correspondence and Papers 1808-1816* (Cosimo, Inc., 2010), 68-89; Skelton, *An American Profession of Arms*, 1992, 11.

<sup>95</sup> United States Military Academy, *The Centennial of the United States Military Academy at West Point, New York. 1802-1902 ...* (U.S. Government Printing Office, 1904), 275.

<sup>96</sup> *Ibid.*, 275-277.

French system. Much like a young predator that mimics the hunting patterns of its parent, Young West Pointers lacked the maturity to understand why a pattern of action was taken; , but they fully comprehended the observable results. Clearly, the lesson was to follow in the immediate footsteps of success, ignoring such issues as understanding why the footing was sound or knowing where the path leads.

The U.S. Army, the “last bastion of Federalism” during its first decades of existence, according to William Skelton, developed a peculiar understanding of military professionalism.<sup>97</sup> Military officers believed the impetus for such a system devolved from the aristocratic methods, and in one of the odd intellectual twists of military professionalism in the U.S., the Army plagiarized form and function, without the higher educational standards that were often found in European systems. Thus, the raw material remained qualitatively different. The end result was a system that at once rejected American strengths and adopted European methods in part. Guided by internal lights, as Tocqueville suggested, the Army blundered under the worst of both systems. “The distrust of the expert, rationalized into a democratic axiom during the Jacksonian era, was deeply ingrained in American character and persisted long after its original justification had passed,” Henry Steele Commager concluded.<sup>98</sup> The idea that the professional officer constituted the final word on military matters never achieved broad acceptance in the United States, especially in comparison to European and later East Asian colleagues. Equality is not merely a quality desired in the social medium of the United States; it is a

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<sup>97</sup> Skelton, *An American Profession of Arms*, 1992, 73.

<sup>98</sup> Henry Steele Commager, *The American Mind: And Interpretation of American Thought Character Since the 1880's* (New Haven: Yale University Press, 1950), 12.

value desired and pursued as a quintessential characteristic of the American psyche.<sup>99</sup> As such, in the U.S. Army professionalism assumed a condition far more comfortable with action and acts of heroism than with intellectual achievements.

Perceived French success under Napoleon exerted a powerful magnetic effect upon the minds of military men that crossed both temporal and geographical barriers, centuries and oceans. Napoleon's vaunted success compelled men to seek and wage battle in a like manner. However, patterning organizations on faulty propositions can and often does end in destruction, as when Baron Antoine de Jomini led many down a path of mimicry centered on a supposed universal principle of war. Dallas D. Irvine found that a French-influenced template centered on slavishly studying Napoleon's methods, or those of his interpreters like Jomini, propagated an officer system whereby staffs, and staff officers, were largely inconsequential. Men of merit, who could shoot from the hip and operated largely without advisory staffs, found sufficient employment in the Napoleonic armies.<sup>100</sup> "This state of affairs once established", observed Irvine, "...tended to remain fixed, for it accorded with the engrossing tendencies of strong and able characters...." The American Army enthusiastically accepted this French system.

Dennis Hart Mahan, father of the famous naval theorist Alfred Thayer Mahan, graduated from West Point in 1824 and for nearly the next fifty years served as a professor there. However, before Mahan settled in at West Point he departed for the battlefields, fortifications, and war colleges of Europe. Mahan over the next four years familiarized

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<sup>99</sup> Alexis de Tocqueville, *Alexis de Tocqueville: Democracy in America: A New Translation by Arthur Goldhammer* (New York: Library of America, 2012), 3; Morris Raphael Cohen, *American Thought: A Critical Sketch* (Piscataway, NJ: Transaction Publishers, 1954), 37-39; Commager, *The American Mind*, 7-8.

<sup>100</sup> Dallas Irvine, "French and Prussian Staff System Before 1870," *The Journal of the American Military History* 2, no. 4 (1938): 198.

himself with the intimate details of France's fortification and engineering minds, Vauban.<sup>101</sup> Mahan's time only reinforced his predisposition toward French solutions and engineering. Over time Mahan's influence and dominance grew within West Point until his course became the "capstone of the entire curriculum." Of material that comprised the capstone course only eight percent was not engineering related.<sup>102</sup> In one sense, therefore, the U.S. Army did have a philosophy--engineering. D.H. Mahan argued that fortifications were not only necessary for the success of militia against professional soldiers, but that it was the nation's duty to provide every means to improve their survival and success. His argument carried the weight of doctrine since he controlled military officer education for the better part of fifty years.<sup>103</sup>

Cadets at West Point were given an education that in its totality was French. They were required to learn French, most the books in the library were French, the engineering books were nearly verbatim copies of French works, and many professors were trained in France. The occasional tactics class used French methods and hypothetical European enemies. West Point, prior to the Civil War, embodied the U.S. Army intellectual professional framework, and that framework in most respects, with few exceptions, replicated everything French and focused on military and civil engineering.

Institutions, whether brick or flesh, are reliant upon and shaped by the foundation on which they are built. The edifice is not easily altered once laid, and change requires sufficient motivation and purpose, both of which are usually lacking short of a significant

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<sup>101</sup> Moten, *The Delafield Commission and the American Military Profession*, 57.

<sup>102</sup> *Ibid.*, 58.

<sup>103</sup> Dennis Hart Mahan, *A Treatise on Field Fortification*, 1852, viii.

threat. The U.S. Army formed from the French mold continued to develop along those lines well into the future.<sup>104</sup>

Prior to the influence of Thayer and Mahan at West Point, the U.S. Army had turned to ready-made French doctrine for the War of 1812.<sup>105</sup> The reliance on French military thought continued, almost unabated, until the Civil War. The cords of doctrinal dependence on France were severed only after the Prussians crushed France during the Franco-Prussian War.<sup>106</sup> Though the French defeat necessitated a re-evaluation of doctrine, and a shift to Prussian methods, the intellectual roots of the U.S. Army profession nonetheless remained French in thought and action.

The French observer of American culture and politics, Alexis de Tocqueville, noted in the 1830s: “There is not, I think, a single country in the civilized world where less attention is paid to philosophy than in the United States.”<sup>107</sup> Reason, according to Tocqueville, was the principal trait that dominated the American mind. However, the attachment to reason is not of others but derived from one’s own experience. This reliance upon personal revelation was the consequence of equality, and it is here that Tocqueville illuminated an American condition-- one that fuses with Irvine’s thesis, and infused the Army as an emerging modern profession. Americans perceived others’ capacity for reasoning to be much like their own. Thus, one arrived at a place a few steps removed from the belief that if powers of observation are relatively equivalent what gain is there in

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<sup>104</sup> Academy, *The Centennial of the United States Military Academy at West Point, New York, 1802-1902 ...*, 276; Skelton, *An American Profession of Arms*, 1992, 11; Henry Wager Halleck, *Elements of Military Art and Science: Or, Course of Instruction in Strategy, Fortification, Tactics of Battles, &c., Embracing the Duties of Staff, Infantry, Cavalry, Artillery, and Engineers* (D. Appleton, 1862), 134.

<sup>105</sup> Richard V. Barbuto, *Niagara, 1814: America Invades Canada* (University Press of Kansas, 2000), 125.

<sup>106</sup> Walter E. Kretchik, *U.S. Army Doctrine: From the American Revolution to the War on Terror* (Lawrence: University Press of Kansas, 2011), 69.

<sup>107</sup> Tocqueville, *Alexis de Tocqueville*, 483.



reading and studying the works produced by other individuals, an act wholly necessary in the development of a more broadminded approach to professionalism<sup>108</sup> The junior officers that filled the ranks of the early American army were not classically educated aristocrats. Instead, they came from the practical fields of mercantilism and farming. They desired the fruits of their labor that could be enjoyed and observed, the tangible, practical and immediate, less than the intellectual purity that often motivated their theoretically-minded aristocratic counterparts in Europe.<sup>109</sup> The U.S. Army preferred officers of another kind- men of action.

Promotions within the U.S. Army changed during the War of 1812, with seniority playing second fiddle to demonstrated ability. The decline of the seniority system during the massive expansion of state and federal forces during the War of 1812, lent itself to soldiers of merit, as well as those endowed with a generous dose of ambition and political connections, not unlike the French experience.<sup>110</sup> Furthermore, the low esteem of society for military officers in the U.S., with occasional exceptions during time of war, did not generally attract the best and brightest into its service.<sup>111</sup>

Tocqueville demonstrated an uncanny insight into the possibilities of equality. He noted, "I see two very clear tendencies in equality: one impels each individual toward new ways of thinking, while the other would induce him to give up thinking voluntarily."<sup>112</sup> One could argue that more of the later than the former had occurred with the ranks of the U.S. Army officer corps during its formative evolution in the 19th century. Equality of thought

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<sup>108</sup> Ibid., 483-485.

<sup>109</sup> Ibid., 484-485.

<sup>110</sup> Skelton, *An American Profession of Arms*, 1992, 49-50.

<sup>111</sup> Tocqueville, *Alexis de Tocqueville*, 764.

<sup>112</sup> Ibid., 492.

has the potential to breed thoughtlessness, and the willingness to assume the intellectual cloak without the rigors that enlighten the mind beneath.

By contrast, Clausewitz labored to penetrate the penumbral of war to understand a phenomenon that pervaded his life. Clausewitz found tutelage at the hands of Hans Gerhard Johann David von Scharnhorst; a soldier, teacher, and mentor who fully grasped the possibilities of military education. In many ways, the relationship echoed that of Socrates and Plato and the effects of the former on history were no less than those of the latter. Clausewitz provided a rich and fertile intellectual framework to study the nature of war; though, there were other theorists, notably Jomini, whom officers might study in the development of their military profession.<sup>113</sup>

The Prussian, British, French, and American military professions developed according to the peculiar social, political, and economic factors of their respective countries. The British always showed more concern about naval matters than those of their army—after all, the British army had chopped off the King’s head during the English Civil War. The duels between France and Germany primarily fueled the process ongoing in the United States and elsewhere (such as Imperial Russia). Some countries, such as the United States, during the nineteenth century altered their professional development, at least superficially, in accordance with the verdict from of the battlefields of Europe. Battlefields of the west and southwest as a result proved to be less influential than those halfway around the world.

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<sup>113</sup> Christopher Bassfors, *Clausewitz in English: The Reception of Clausewitz in Britain and America 1815-1945* (Oxford University Press, 1994); Peter Paret, *Clausewitz and the State: The Man, His Theories, and His Times* (Princeton University Press, 2007); Alan Beyerchen, “Clausewitz, Nonlinearity and the Unpredictability of War,” *International Security* 17, no. 3 (1992): 59–90.

The Mexican-American War (1846-1848) resulted in few, if any, significant innovations to the Army officer corps.<sup>114</sup> Officers interpreted the often-lopsided victories and lack of skill in their Mexican counterparts as confirmation of the superiority of American arms and manifest destiny.<sup>115</sup> Thus, the results of the war served as evidence of martial acumen. The real threat, and therefore lessons to be observed, emanated from across the Atlantic neither the Indian or Mexican threat breached that threshold.

In 1855, Secretary of War Jefferson Davis, dispatched three officers (collectively known as the Delafield Commission) to Europe with explicit instructions to study and examine foreign armies. The commission represented one of the first significant steps toward the development of the American military profession. However, the officers dispatched-- Major Richard Delafield, Major Alfred Mordecai, and Captain George McClellan--"had all graduated from West Point with a commission in the Corps of Engineers."<sup>116</sup> The three were highly intelligent and represented the best of the army, but they were unable to break free of the mechanistic thought patterns ingrained into them while at the Military Academy.<sup>117</sup>

The three officers set down in great detail the tactical, technical, and mechanical elements they observed of European armies, but, as historian Matthew Moten has noted, they utterly failed to analyze or even casually examine "the functions of high-level staffs."<sup>118</sup> They constructed, as they were taught and one would expect, the model West Point product

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<sup>114</sup> Russell Frank Weigley, *History of the United States Army* (New York: Macmillan, 1977), 189.

<sup>115</sup> Pearlman, *Warmaking and American Democracy*, 101,104.

<sup>116</sup> Moten, *The Delafield Commission and the American Military Profession*, 75.

<sup>117</sup> *Ibid.*, 211.

<sup>118</sup> *Ibid.*, 208.

crafted with the mind and the hand of an engineer. The reports were “widely distributed” on the eve of the Civil War, but it is difficult to evaluate their impact on the officer corps.<sup>119</sup>

The nature of the reports, though thorough and professionally written, did not, and could not, tend to motivate thinking that pondered the higher levels of war. According to Moten, the U.S. Army had three intellectual deficiencies in the mid-19th Century: “an overreliance on French expertise, exclusive concentration on engineering as the only military science worthy of study, and the rewarding of achievement in endeavors more civilian than military, more staff than line.”<sup>120</sup> The reports had no measurable effect on those failings by the start of the Civil War, and for the vast majority officers, both the blue and gray, French tactics and procedures continued to govern.

French General Victor de Chanal shadowed Union officers during the Civil War, observing drills, operations planning, and battles. His observations led him to conclude that “our methods have been copied very exactly.”<sup>121</sup> De Chanal’s thorough account examined the major branches of the army in detail and contrasted Union forces with those of the French Army. More often, the distinctions were not of method, but of detail. His analysis noted Union artillery, cavalry, infantry, and engineers replicated French drill in almost every aspect.<sup>122</sup> Furthermore, de Chanal extended his inspection to include West Point where he noted, “the work of the engineering corps, prove the excellence of the scientific instruction of the academy.”<sup>123</sup> His final thoughts on the Military Academy are most revealing: “The academy is, however, menaced with a reorganization, one of the causes of

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<sup>119</sup> Ibid., 203.

<sup>120</sup> Ibid., 205.

<sup>121</sup> Victor DeChanal, *The American Army in The War of Secession* (Leavenworth, KS: George A. Spooner, 1894), 26.

<sup>122</sup> Ibid., 25,45,48.

<sup>123</sup> Ibid., 132.

which is an unfortunate desire to imitate European systems.”<sup>124</sup> The ease with which the U.S. military profession alternated between the French and German model during the nineteenth and early twentieth century was symptomatic of larger and deeper issues and served to confirm the intellectual immaturity of the U.S. Army.

The amalgamation of these diverse factors denoted a bizarre alchemy that, while not altogether deadly to the patient, sufficed to distort, inhibit and permanently stunt the development of any American military philosophy. “Men who live in ages of equality are therefore not inclined to locate the intellectual authority to which they submit outside and above mankind,” according to Alexis de Tocqueville, “[for] usually they seek the sources of truth in themselves or in their fellow men.”<sup>125</sup> The observed practicality and individuality that stirred Tocqueville’s pen resulted from the strong undercurrents of Romanticism that fused with Christianity to animate the American spirit. A force no less powerful, though perhaps more diffuse, than the fanaticism that fueled a European army a century later, both of which would result in subjugation and conquest of the better part of continent. “To be a man is not to understand or reason but to act,” wrote humanist philosopher Isaiah Berlin, “...his hour of inspiration, of personal truth, when he knows what he must do to realizes his inner vision... to act, to live in a creative fashion...that is the heart of romanticism.”<sup>126</sup> To act, to move, to do something embodied the American character. In many ways it was their philosophy; boldness, in the words of Clausewitz, has a genius all its own.<sup>127</sup>

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<sup>124</sup> Ibid., 133.

<sup>125</sup> Tocqueville, *Alexis de Tocqueville*, 490.

<sup>126</sup> Berlin and Hardy, *The Sense of Reality*, 183.

<sup>127</sup> Clausewitz, *On War*, 190–192.

The obvious conclusion is that during its first century of existence, energetic action substituted for deep thought in the U.S. Army, and that approach arose from a deeper character trait in the American psyche- obsession with practicality. H. S. Commager noted, “No philosophy that got much beyond common sense commanded [the American’s] interest, and he ruthlessly transformed even the most abstract metaphysics into practical ethics.”<sup>128</sup>

Soldiers far from the familiar precincts of civilized life survived on the frontier of America in small outposts deep in the wilds of unconquered America. Here, more than anywhere else in America, soldiers lived day-to-day and practicality took on a whole new meaning; books were few, and the time to read and collaborate with others even less so.<sup>129</sup> Those lucky enough to be posted along the eastern seaboard had other duties and distractions. The U.S. Army, unlike the Germans or French, did not have to contend with the ever-present threat of invasion, for the Atlantic provided an insurmountable barrier. Without the constant threat of invasion, and with the focus on expansion in the west, any impetus for officers in the United States Army to develop their intellectual capabilities ranked considerably lower than such obsessions as polo, gambling, and attendance at musicals.

In sum, the poor performance of American militia in the War of 1812 came as a surprise to many observers who, after the American Revolution, predicted on selected evidence that citizen-soldiers properly led remained a match for any regular soldiers. The

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<sup>128</sup> Commager, *The American Mind*, 8.

<sup>129</sup> William Addleman Ganoe, *The History of the United States Army* (New York: D. Appleton and Company, 1924), 157; Oliver Lyman Spaulding, *The United States Army in War and Peace* (G.P. Putnam’s Sons, 1937), 91; Russell F. Weigley, “The Long Death of the Indian-Fighting Army,” Garry D. Ryan and Timothy K. Nenninger, eds., *Soldiers and Civilians: The U.S. Army and the American People* (National Archives & Records Administration, 1987), 27–29.

sobering results of the War of 1812 did not end the militia –though it hastened its end- but it did demonstrate the necessity of maintaining a professional, if small, army. Over the ensuing decades West Point officers began to fill the ranks of the Army, though the upper echelons occupied by colonels and generals were often political appointments.

Nevertheless, the Army officer corps matured in the middling ranks, led by intelligent and capable West Point graduates. However, French doctrine generally dominated instruction at West Point resulting in a corps that functioned and thought- in broad outlines- in a manner consistent with their engineering instruction. American culture already infused with a strong practical and utilitarian streak found further support in the educational curriculum of young officers.

### Chapter III

#### Origins and Context for the Army's Cultural DNA

The development of an army is a complex process. Its creators are not bio geneticists, who simply decide what particular characteristics are desirable in an army and then concoct a serum with the appropriate ingredients, place the mixture in a centrifuge, and then inject the solution. The analogy is not without its appeal, but the DNA of an army, of an officer corps, mutates over an extended period of time with each generation building upon the previous one. Social, political, economic and environmental factors among others contribute, though unequally, to the genetic makeup of an army. The process is not only one of choice, but of fortune and not always of the fortuitous kind. Many factors beyond the ones listed above provide genetic materials.<sup>130</sup> Nonetheless, there are dominant intellectual, environmental, cultural and professional influences, that deserve particular attention for the role they play in the development of officers.<sup>131</sup>

It would be the height of folly for any author to claim a complete understanding of the intellectual traditions of any people or to claim that environmental factors affected all individuals in the same manner. The multiplicity of influences, many of them obscured from historians, makes any such endeavor unwise. However, analytical insights are much like a river, fed from the runoff of mountains, springs, and various tributaries that allow one to examine the water and deduce general conclusions. An analysis of the American military tradition requires the study of its intellectual roots, and thus, it is essential to have an understanding of the experiences of early Americans because those manifestations of

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<sup>130</sup> Commager, *The American Mind*, 409.

<sup>131</sup> Ibid.



“character” have exerted potent and ubiquitous influence on the military profession to the present day.<sup>132</sup>

Early immigrants predominately came to North America for a better life and to escape the restrictions, in whatever form they existed, of old Europe. Such dangers and adventures attracted a particular soul, perhaps the desperate or the brave; arguably, venturing into the unknown recruited men and women of a different mettle.<sup>133</sup> These men and women were generally young, looking for a better life, and in colonial America they had reasonable expectations of owning some land.

In *The American Mind* Henry Steele Commager states “that so heterogeneous an inheritance should result in so homogeneous a character suggests that the environment was decisive.”<sup>134</sup> Those who came to the colonies were willing to stand apart from everything they had ever known. Traditional bonds unraveled with the sails that bore them across 4,000 kilometers of the Atlantic. The intellectual roots in Europe generally failed to penetrate the soil of the New World to any meaningful depth, and the challenges of subjugating an unyielding land shaped the ideas and outlooks of those who entered this environment. The New World was deficient in labor, had land in plenty with vast arable areas, once cleared, and a fertile fishing shore that stretched the entirety of the Atlantic seaboard and provided nearly unlimited food for the hardworking person. The physical character of the America the immigrants encountered gave priority to the pioneer, Conestoga wagon, and axe. Thousands of miles from Europe, what became known as the industrious American spirit was born, not out of design or intent, but of necessity.

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<sup>132</sup> Denis William Brogan, *The American Character, By D.W. Brogan*, 1944.

<sup>133</sup> George Santayana, *Character and Opinion in the United States* (Norton & Company, 1934), 169.

<sup>134</sup> Commager, *The American Mind*, 4.

The harsh and unconquered lands required the building of roads, canals, bridges, and harbors. Pioneers cleared lands, plowed and planted fields, constructed fences, dug canals, and built cabins. Each man used his own wit to meet the massive logistical and physical requirements of this endeavor. Self-reliance and individualism thrived when deprived of the restraining and containing hand of governance. Men made their peace through force—no other recourse to a higher authority, save God and guns, existed. At the individual level, these phenomena were executed countless times giving rise to corporate activity and therefore a mindset above all else that prized practicality. The philosophical and intellectual impetus withered in direct proportion to the physical demands of a new world.<sup>135</sup>

The environment, in its totality, lacked standing tradition in almost any form that might have functioned to restrict and retard the range of thought, and thus, the mind was given free rein. Imagination and discovery thrived in one of those rare periods where ignorance of the impossible made every endeavor seem possible, much like new eyes (or eye glasses) can solve a seemingly-intractable problem. Unmitigated possibility gave birth to vibrant and fertile ideas of unbounded opportunity that found resonance in the corporeal expanse of the West. The mind of men empowered by optimism animated the agency of the individual and collectively inspired a sense of the possible that endured, almost unimpeded, for two centuries in America. The conceivable became possible through the intense ingenuity and practicality of the common American- a result of, and made necessary by, the unfettering of the human mind from the limitations of anachronistic

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<sup>135</sup> Cohen, *American Thought*, 29,30,39.

tradition. "American optimism was," according to Commager, "in fact, impenetrable and unconquerable."<sup>136</sup>

Thus, what is generally deemed the American character is flexible, yet strong and robust in nature, but almost wholly unsuited for use in the construction of philosophical edifice. Americans, regardless of locality, whether living in Boston or Charleston, shared a deep and abiding belief in the unrealized potential of the future. Just as not every Prussian was at Jena, not every American traveled west; nevertheless they experienced vicariously the experience of crushing defeat and unbounded optimism. William Skelton in *American Profession of Arms* found a "spirit of adolescent rebellion that pervaded the early national period."<sup>137</sup> The bonds of early America were strong, the sinew of a youthful nation flexible, and as a result immediate experience rather than the dictates of tradition determined what it meant to be an American.<sup>138</sup> What happened in New York was not what happened in the Ohio Valley and that which happened in the Southwest was not what happened in Richmond, but the spirit of an age is not bound by geography, though it most certainly can be shaped by it.<sup>139</sup>

Colonials found solace in sturdy fences, a reliable musket, and dependable friends. Here pioneers had little time for profound thoughts and reflection. But if one found little time for philosophy that did not hold true for what we term psychology; some ideas are formed from thought, others from unconscious habit. The new psychology of democratic

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<sup>136</sup> Commager, *The American Mind*, 162.

<sup>137</sup> Skelton, *An American Profession of Arms*, 1992, 55.

<sup>138</sup> Commager, *The American Mind*, 5; Cohen, *American Thought*, 28–29.

<sup>139</sup> Robert M. Citino, *The German Way of War: From the Thirty Years' War to the Third Reich* (Lawrence: University Press of Kansas, 2008), XIV Citino explained that German methods of war developed in part from geography; Jared Diamond, *Guns, Germs, and Steel* (New York: Norton, 1997).

individualism emerged from day-to-day activities that sustained life in colonial America.<sup>140</sup>

The mindset of Americans in the early nineteenth century, by no means homogenous, did share qualities that later amalgamated under the threat of revived British tyranny and the stamp of Redcoat boots.<sup>141</sup>

The vast majority of early Americans farmed, fished or traded, with farming a distant first from the others. Southern staples included rice, indigo, and tobacco; while in the North grain, cattle and fishing dominated. The cultivation of rice and tobacco differed from others in their intense labor requirements. The increase in tobacco farming went hand in hand with a demand for more labor. White indentured servants, often with other opportunities, shirked the harsh demands of tobacco farming. Thus, a rapid increase in the demand for African slaves soon followed. Although Americans largely embraced practical trades they did harbor reservations toward others.

The belief that American society is, or has been, staunchly antimilitary since its inception is not entirely accurate.<sup>142</sup> An army, by its nature, is a collective of individuals engaged in a cooperative activity (albeit violent, or potentially violent) in the service of the state. However, the nature of a professional army is different from one comprised of warriors or militia, for a professional army incorporates full-time soldiers and officers educated during peacetime in the ways of war. It was that model that was anathema to American ideals that valued individuality and freedom of choice and action. By contrast, Japanese and Chinese cultures valued collective and corporate activity over the needs and

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<sup>140</sup> Vernon Louis Parrington, *Main Currents in American Thought: The Colonial Mind, 1620-1800* (Harcourt Brace Jovanovich, Inc, 1927), 131.

<sup>141</sup> *Ibid.*, 181.

<sup>142</sup> Jack C. Lane. "Ideology and the American Military Experience: A Reexamination of Early American Attitudes Toward the Military." In *Soldiers and Civilians: The U.S. Army and the American People*, ed. Garry D. Ryan and Timothy K. Nenner (National Archives & Records Administration, 1987), 15.

interests of the individual. Thus, unlike American culture, service to the whole above the individual came more naturally for some Asian cultures and Eastern resistance to militarization measured well below the trends unique to America.

Revolutionary era Americans held a heroic view of warfare, not an uncommon perspective in the West, dating to antiquity.<sup>143</sup> Heroic virtues were those an individual exhibited on the battlefield in the service of God and country, and it is noteworthy that they nevertheless magnified the achievements of the individual. They satisfied a deep-seated if not entirely human desire to be honored and esteemed.<sup>144</sup> Thus, within the American conception of war, the heroic, the idealized, and the individualized were clearly distinct from that of the components that comprised the professional army. The standing army in the eyes of early Americans represented everything they hated about the British, a costly and coercive organization that necessitated taxes. Such an army had a symbiotic relationship with government such that a larger and stronger authoritarian government generated a larger and stronger army and could then use, at will, force of arms to exercise arbitrary power in greater and greater measure at the expense of individual rights.<sup>145</sup>

Antipathy toward a professional army continued from the American Revolution through the post World War I era to varying degrees, but the idea that the standing army represented a serious threat to liberty abated significantly by the presidency of Andrew Jackson in 1829.<sup>146</sup> Circumstances and cost, and at times both, militated against a large standing army and for those reasons alone the United States Army remained at subsistence levels.

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<sup>143</sup> John Keegan, *The Mask Of Command: A Study of Generalship* (Random House, 2011).

<sup>144</sup> A. H. Maslow, "A Theory of Human Motivation," *Psychological Review* 50, no. 4 (1943): 381.

<sup>145</sup> Ryan and Nenninger, *Soldiers and Civilians*, 18–21.

<sup>146</sup> *Ibid.*, 22.

The Mexican-American War was largely unpopular, but its short duration combined with its successful outcome, the defeat of Mexican forces, demonstrated to the Army there was little need for reorganization.<sup>147</sup> Twenty years later, the American Civil War, despite differences in scale and magnitude, resulted in a quick return for the Army to prewar levels albeit the mean number of soldiers rose from a prewar level of around 16,000 to 29,000 by 1871 down from a high of 1,000,000 in 1865.<sup>148</sup> Army officers were slow to draw connections between the high casualty rates suffered on the battlefield and advances in modern weaponry. Thus, tactics continued trail technological advances in war.<sup>149</sup>

Until the turn of the Twentieth Century, war in the eyes of ordinary Americans did not appear to require any special training or weaponry. Man and musket (later rifle) sufficed in most situations. Numerous nineteenth century politicians, from Jackson to Garfield, had been successful wartime commanders without significant military training. Cast in the mythic image of antiquity, of republican Rome and democratic Athens, the United States inherited institutions of a similar quality and character, and like Rome and Athens found irresistible the riches to be gained in honor, land, and material by heeding the siren call of war. It is no small irony of history that some of the most “bellicose” nations in history are often those that bow most easily to the voice of the people.<sup>150</sup> The immense resources of the west compelled men of every stature to explore and strike their claims. The “peacetime” U.S. Army provided security for that westward expansion and was shaped by the actions therein.<sup>151</sup>

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<sup>147</sup> Weigley, *History of the United States Army*, 189.

<sup>148</sup> *Ibid.*, 567.

<sup>149</sup> *Ibid.*, 232.

<sup>150</sup> Azar Gat, *War in Human Civilization* (Oxford University Press, 2008), 510.

<sup>151</sup> Marcus Cunliffe, *Soldiers and Civilians: The Martial Spirit in America, 1775-1865* (Aldershot, UK: Gregg Revivals, 1993), 46.

Geography is easily overlooked. Because of its ubiquity, it can be accepted, much like time, as a mere fact of existence. However, geography has profoundly affected the history of humankind. Jared Diamond's thesis in *Guns, Germs and Steel* centered upon the role of geography in the development of human beings and civilization.<sup>152</sup> *The German Way of War* by Robert Citino and "The Martial Spirit- Navy Style" by John Kuehn both follow similar lines of analysis to Diamond's thesis. Geography is not the only element shaping the nature of warfare, but Citino believed that it was a significant if not a dominant contributor to the German way of war.<sup>153</sup> Likewise, Kuehn demonstrated the influence of A.T. Mahan, who argued the unique geographical location of the U.S. made the nation a natural sea power, thus shaping the evolution of the U.S. Navy and the approach Americans took to power projection.<sup>154</sup>

A "way of war", whatever it may be and regardless of national or cultural inclinations, is more than a choice. Rather, it is an amalgamation of qualities that give a particular character to the actions of a people. Those factors are dictated as much, if not more so, by environment than by choice. Great Britain decided to become a great sea power less as a clearly-defined choice than by the fact the British nation arose on an island. Japan could never become a great land power no matter its ambitions because of its limited population due to geographical constraints.

Frederick Jackson Turner proposed one of the most well-known theories on the shaping of the American character and its institutions predicated on the unique

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<sup>152</sup> Diamond, *Guns, Germs, and Steel*.

<sup>153</sup> Citino, *The German Way of War*, xiv.

<sup>154</sup> John T. Kuehn, "The Martial Spirit—Naval Style: The Naval Reform Movement and the Establishment of the General Board of the Navy, 1873-1900," *The Northern Mariner* XXII, no. 2 (April 2012): 8–12.

geographical properties of North America.<sup>155</sup> The American frontier offered unbounded opportunity, and unlike the Old World, the vast, sparsely populated expanses had a cathartic effect on the nation as a whole that limited violence and social tensions.<sup>156</sup> For the first century and a half of, first, colonial and, then, U.S. control, westward expansion was the dominant element of American politics and policy.

Turner's thesis can be extended for the light it throws on the evolution of the American Army and, by extension, its officer corps. To protect, advance, and make America a continental power required an army but the size and character of that army had yet to be determined. The militia, despite Jefferson's hopes to the contrary, never achieved the ends imagined for it, and in reality failed miserably in the war of 1812.<sup>157</sup> Washington despised the militia (having served with a Virginia militia unit during the Seven Years War against the French), and perhaps his proximity to the militia furthered his misgivings about reliance upon yeomen soldiers to achieve military goals.<sup>158</sup> Militia performance throughout the Revolution remained uneven, and after the war frontier demands asked too much of the militia. The fledgling Army of the Republic found itself stretched thinly along the frontiers of the nation. The manning of forts along the Atlantic coastline and protecting pioneers on the interior of the nation kept soldiers fully engaged and the part-time nature of militia combined with the challenges of arduous responsibilities called for a permanent force.

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<sup>155</sup> Frederick Turner, "Western State-Making in the Revolutionary Era," *The American Historical Review* 1, no. 1 (1895), <http://www.jstor.org/stable/1834017> .; Frederick Turner, "Western State-Making in the Revolutionary Era II," *The American Historical Review* 1, no. 2 (1896), <http://www.jstor.org/stable/1833651> .

<sup>156</sup> Turner, "Western State-Making in the Revolutionary Era," 3.

<sup>157</sup> Jefferson, *The Works of Thomas Jefferson*, 2010, 426.

<sup>158</sup> George Washington, *The Writings of George Washington Vol. IX. 1780-1782* (G.P. Putnam's Sons, 1891), 143,154,174,175,454.



The Army, following the Civil War, maintained a strength of around 25,000 until 1897. Likewise, officer strength found equilibrium around 2,100 active officers.<sup>159</sup> William Ganoe in his *History of the United States Army* was to observe: "Throughout the nineteenth century, with the exception of the Civil War, the United States had a lower ratio of military personnel to population than Japan or any European power."<sup>160</sup> The maps below graphically illustrate the widely spread distribution of active army soldiers; primarily along the entire western frontier from north to south. Francis Paul Prucha published *A Guide to the Military Posts of the United States 1789-1895* in 1964. The maps contained within that study demonstrate visually the difficulty officers encountered in their march toward professionalization.<sup>161</sup>

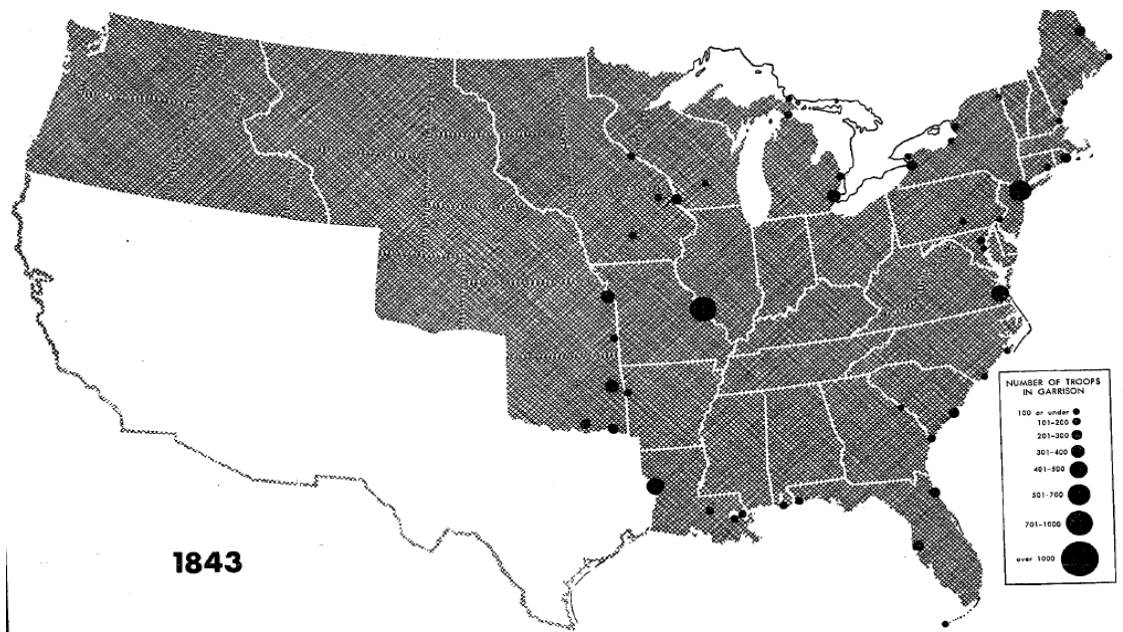
The geographical dispersion of the army proved formative both in form and character, and by 1843, when several dozen forts ringed the perimeter of the United States, most had fewer than four hundred soldiers and a handful of officers. Communication between the forts, and from the forts to the War Department, remained rudimentary and slow. The distance from Fort Leavenworth, Kansas, to Washington, D.C. is slightly over a thousand miles and travel by horseback at thirty miles a day, an optimistic pace, took a rider a little over a month to make a one-way trip. As the nation expanded westward, the construction of forts followed and on occasion led the way.

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<sup>159</sup> Weigley, *History of the United States Army*, 568.

<sup>160</sup> Ganoe, *The History of the United States Army*, 220.

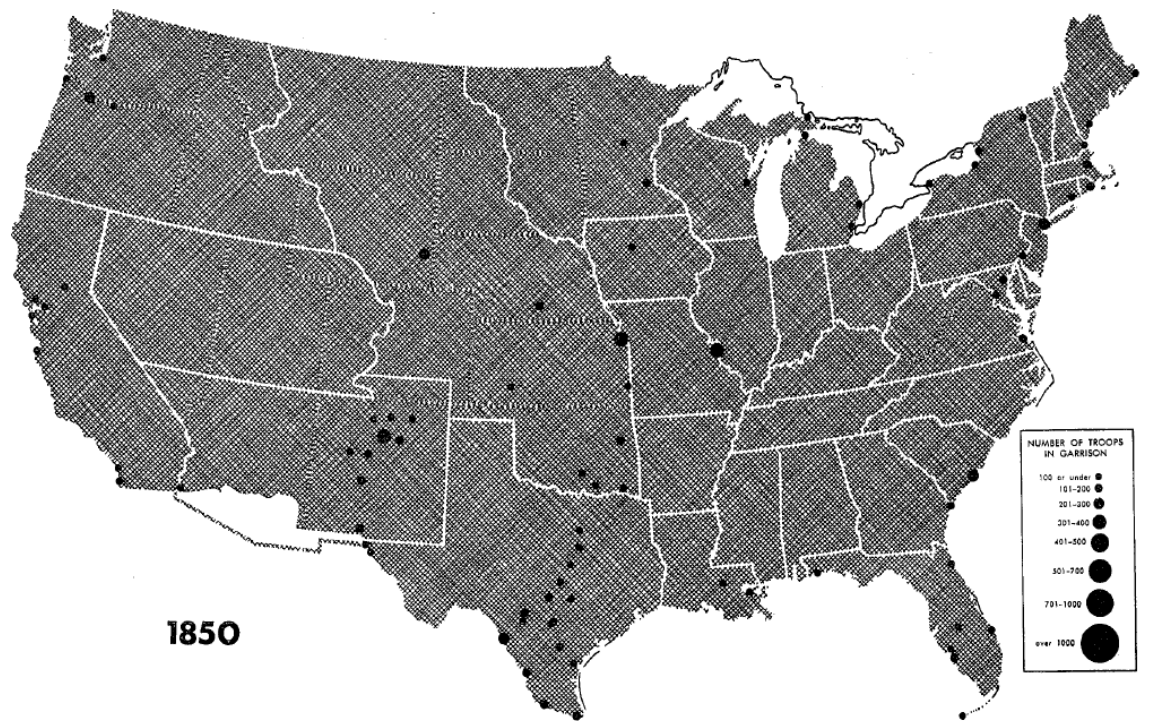
<sup>161</sup> Francis Paul Prucha, *A Guide to the Military Posts of the United States: 1789 - 1895* (Madison: State Historical Soc. of Wisconsin, 1964), 11-34.



Texas joined the Union in 1845 and California followed in 1850. As a result the army established new forts in these states. After the brief explosion in the army's size from 1846-1848 in response to the Mexican-American War, the officer corps expanded by twelve percent in the decade following the war.<sup>162</sup> The increase in size represented an astonishingly modest response both to the war and new territory acquired. Garrisons remained quite small, frequently less than two hundred soldiers with a few officers.<sup>163</sup>

<sup>162</sup> Weigley, *History of the United States Army*, 566.

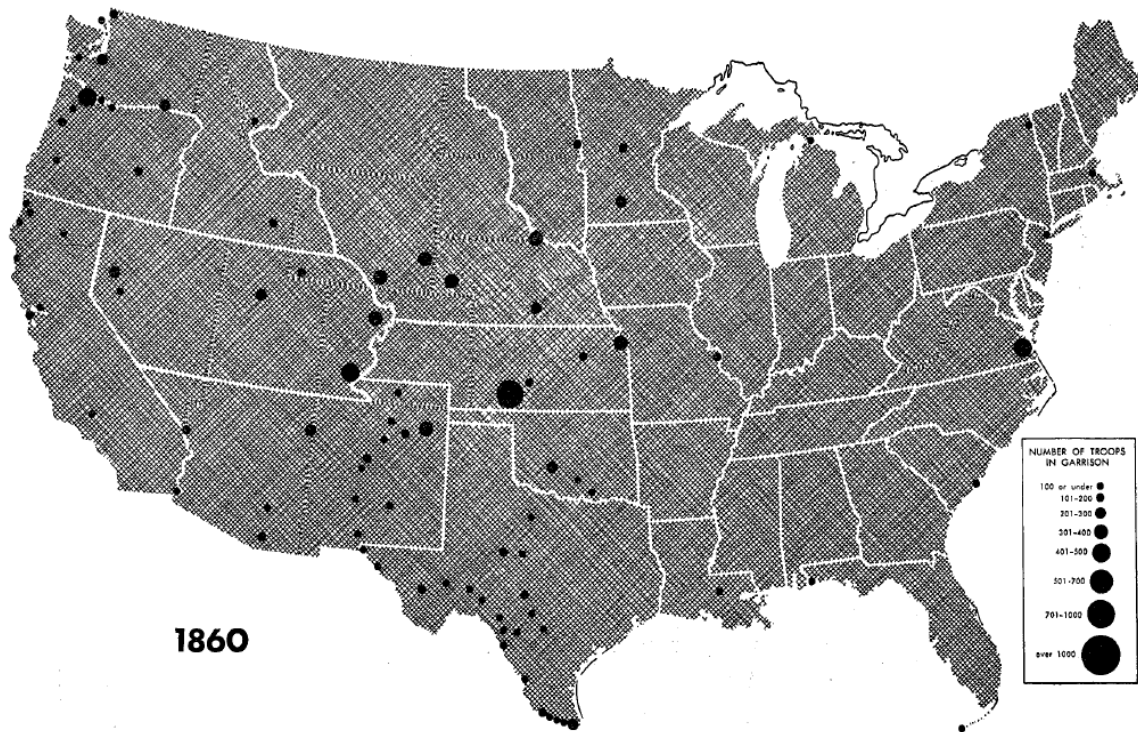
<sup>163</sup> Prucha, *A Guide to the Military Posts of the United States: 1789 - 1895*, 11-34.



Over the ensuing decade the army expanded into Oregon, Arizona, Utah, and Nevada to provide security for settlers and control Indian tribes. The Army's primary, if not sole, duty during this period was pushing Indians into reservations and opening vast new territories for white settlement. Understandably, most Indians stoutly resisted the flood of settlers into their traditional grazing and hunting lands. The dusty isolated posts did not afford officers the time to read and study, much less think about their profession. Their days generally consisted of backbreaking work, chasing bandits and survival. Even such simple tasks as finding firewood proved time consuming as most nearby woods were quickly used up in the construction of forts and for warmth in the winter; the task became more arduous with every passing year with treks of more than ten miles not uncommon.

If one examined the "typical" experiences of officers in the West during this period and used Maslow's Hierarchy of Needs as the template, the obvious observation is that officers spent the majority of their time in the lower rungs of security and survival. The

upper echelons of the hierarchy occupied by esteem and self-actualization proved difficult to achieve in the day-to-day demands of western service for all but the most senior U.S. Army officers.<sup>164</sup>



The Civil War represented a major change in this narrative. The peacetime army massively expanded from sixteen thousand soldiers in 1860 to a combined total of more than one million Northern and Southern soldiers by 1865. The army never returned to its prewar size despite discharging 950,000 soldiers back to the civilian world followed by gradual decline from 1866-1870 of another 20,000. The Army's return to normalcy never achieved that condition which came before; the new form no longer fit into the old. The army numbered 27,000 soldiers, plus or minus a few, over the thirty years from the Civil War's end to the onset of the Spanish-American War.<sup>165</sup> Nearly every major American

<sup>164</sup> Maslow, "A Theory of Human Motivation," 4.

<sup>165</sup> Weigley, *History of the United States Army*, 567.

conflict appears to end with a slight to moderate level increase in the army over the ante-bellum level. Later, what Eisenhower labeled the military industrial complex traced a similar path with shrinkage after war but never quite to prewar levels.<sup>166</sup>

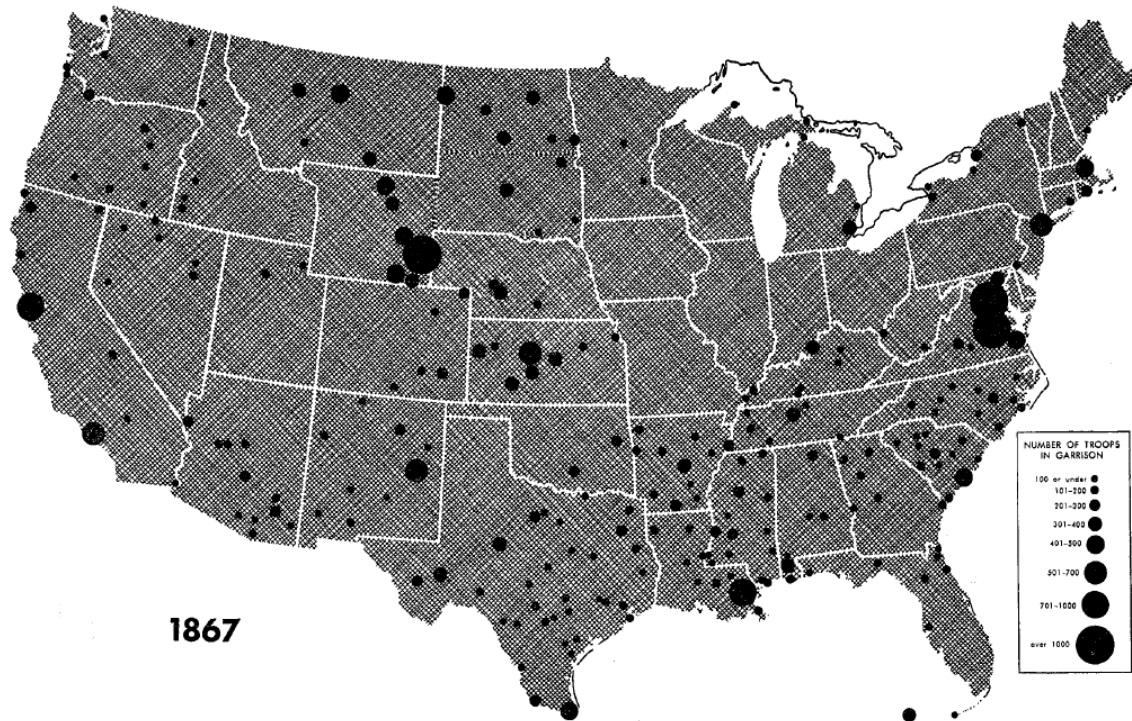
The gradual accumulation of residual artifacts, things related to war, whether industrial, technological, or doctrinal in no way imparted an understanding of war to U.S. Army officers. As the residue amalgamates these experiences can hinder the profession, imparting knowledge of things about war that officers may spuriously interpret as an understanding of war. They are tools of war, but they are not war. This misstep was fatal because it appeared logical.

With the conclusion of the Civil War, officers concerned themselves with the reconstruction of the South. Making use of existing forts (and some few new ones that dotted the South, detachments of soldiers helped rebuild roads, railways, and towns. Army officers who remained in the service now nearly universally had battlefield experience. That was a significant point, for there are many advantages to actual battlefield experience for an officer, and depending on the professional culture dominant at any time, it could be the single most important factor that shapes perceptions of war. However, it can also impart a degree of arrogance in any officer, but especially to those that lack a broad liberal education. It is a truism that the possession of a liberal education conveys an understanding of other ways of thinking and being. Lacking breadth of insights imparted by intellectual studies, officers may believe that they understand war more completely and

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<sup>166</sup> Dwight D. Eisenhower, "Eisenhower's Farewell Address to the Nation," January 17, 1961.

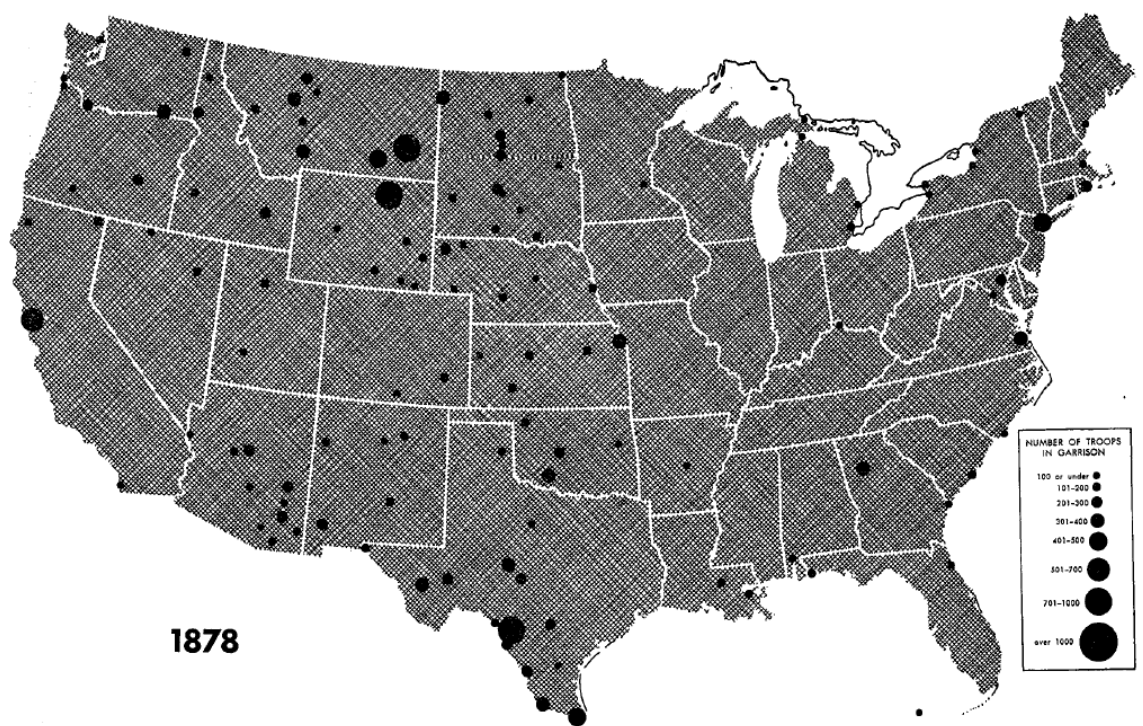
comprehensively than others based simply on their experience, an attitude that inhibits the development of the individual, and collectively, the profession.<sup>167</sup>



By 1878 the vast majority of forts in the South had closed shop and their personnel had been re-deployed to the west. Chasing rebellious Indian tribes and providing southern border security once again became the focus of the Army. Forts in Montana and Wyoming expanded to better control the large reservations and occasional Indian outlaws. The movement of forts westward left the Midwest nearly devoid of soldiers. Despite this, the army's western populations in these forts remained small, generally numbering fewer than three hundred soldiers with only three forts numbering more than a thousand. In 1878 the army included a mere 23,870 soldiers and 2,153 officers.<sup>168</sup>

<sup>167</sup> Jason W. Warren, "The Centurion Mindset and the Army's Strategic Leader Paradigm," *Parameters* 45, no. 3 (2015): 13.

<sup>168</sup> Weigley, *History of the United States Army*, 567.



1878

Life on the frontier did not afford many opportunities for professionalization and there did not seem to be any particularly pressing need to do so. Colonel Stephen C. Mills, writing about his earlier experiences in the west, summed up an average day:

You were wet, and cold, and hungry; or dry, and hot, and thirsty, according to your geographical location. You chased elusive Indians over routes of alkali, rock and sage, they usually got away from you and all you got in return were the jeers of the fellows who didn't happen to be out that trip... You were always behind on your paper work, and when you got the chance to make papers, it was usually done with the paucity of detail only equaled by Mark Twain's boyhood diary. A month's hard scouting was dismissed by the entry 'distance marched during month, 360 miles...' These were the good old days when one drill a day, five days a week, comprised military training. Target practice was practically unknown. I think the allowance of ammunition was 20 rounds a year, and by custom of the service it went in hunting.<sup>169</sup>

The environment, the physical geography, and daily demands on officers of nineteenth century America largely militated against the forms of professionalization seen in European nations, although there were "professionalizes" in the force. One recent

<sup>169</sup> George Croghan and Francis Paul Prucha, *Army Life on the Western Frontier: Selections from the Official Reports Made Between 1826 and 1845* (University of Oklahoma Press, 2014).

historical study has argued the “emergence of a stable profession occurred between the war of 1812 and the Civil War.”<sup>170</sup> However, both the quality and quantity of that professionalization must be in question. Certainly, when compared to the professionalization of the officer corps in France or Prussia, or even within other professions, the professionalization of the United States Army fell short of the ideal. What is not in question is that an army of diminutive numbers, both in size and ratio by any military European standard, found itself scattered over a geographical region vastly larger than any single European country.<sup>171</sup> The U.S. Army was widely scattered on the western frontier in small forts, and likewise its ideas remained equally separated by the distances and hardships imposed by frontier service.

The exchange of ideas, certainly a necessary prerequisite to any profession, were severely limited by the paucity or total lack of any road network connecting these posts. Historian William Skelton has noted at the turn of the nineteenth century that “economic activities combined with prolonged tenure at small posts to encourage local orientation in the early officer corps- a tendency to identify with a particular community or region more strongly than with the army as a national institution.”<sup>172</sup> Frederick Jackson Turner noted a similar trend in his work, *Geographic Sectionalism in American History*, stating that, “the United States being practically as large as all of Europe, it must be thought of in continental, and not merely in national terms.”<sup>173</sup> Thus, there were minimal standards, above and beyond *emergence*, that one must attain before such identity construction constitutes the

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<sup>170</sup> Skelton, *An American Profession of Arms*, 1992, XV.

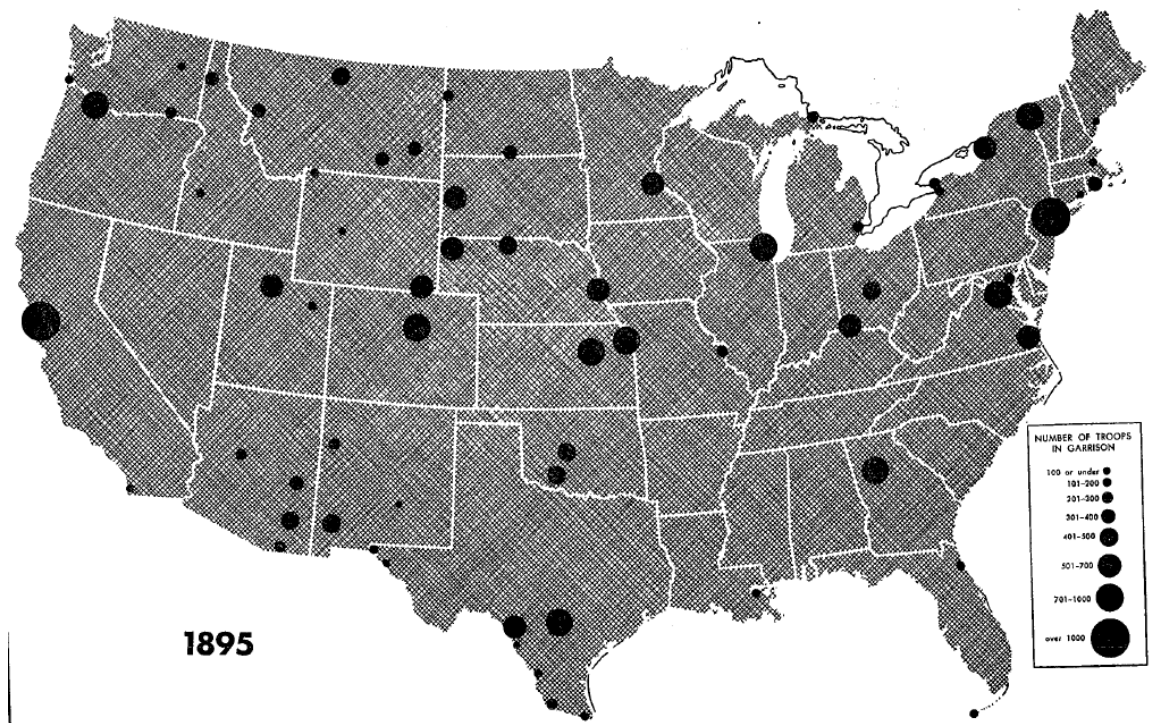
<sup>171</sup> Prucha, *A Guide to the Military Posts of the United States: 1789 - 1895*, 7-33.

<sup>172</sup> Skelton, *An American Profession of Arms*, 1992, 46.

<sup>173</sup> Frederick T. Turner, “Geographic Sectionalism in American History,” *Annals of the Association of American Geographers* 16, no. 2 (1926): 1.



actualization of a profession. If a militia were to acquire the title of an active army unit and then found itself in battle, it would still perform to standards as conferred by its training as militia, to say nothing of the notable time investment required to develop intellectual faculties compared to those of battle drills. American policy throughout the nineteenth century focused chiefly on westward expansion and the Army's primary, if only explicit, job was to support that end. The Army and Congress could conceive of no threat that justified an army beyond that of Indian depredations or coastal attack, and both the funding for the military and number of soldiers in uniform supported that outlook.



Furthermore, a subtle and largely unnoticed phenomenon of expansion and contraction was the creation of an organizational and intellectual “residue” in the officer corps. The War of 1812, Mexican-American War, Civil War, and Spanish-American War all required a large infusion of personnel within a brief window of time. Likewise, demobilization produced the same action but in reverse. Consequently, the system

adopted and conformed to these demands. Material and manpower demands could be met through [prodigious feats of action]. Intellectually, however, the officer corps suffered, unable to attract the best and brightest given the limited opportunities for advancement. Especially during the periods of economic expansion, financial and other rewards for military service contrasted sharply with the opportunities available in civilian life.<sup>174</sup> The process of rapid mobilization made sense in a country that prized equality, and if all are intellectually equal then one is defined and recognized by their deeds.<sup>175</sup> These individual facets amalgamated to produce a culture that prized managerial skills and practical accomplishment.

As the century came to a close and with the Indians largely subdued, the small forts disappeared. Forts decreased in number, but increased in size with a more equitable distribution across the Union, the largest concentration remained in the north-central states near the reservations. Samuel Huntington argued that isolation from politics is key to the development of a professional body.<sup>176</sup> In the 19<sup>th</sup> Century American context isolationism extended beyond just separation from politics, to include separation of officer from officer, and greatly hampered the process. The distances involved sufficed to suffocate the exchange of ideas necessary to fire army professionalization. Not until the 20<sup>th</sup> century dawned did the flames of professionalization burn with any degree of intensity, and it is no coincidence that the army was in a more geographically favorably position to capitalize on

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<sup>174</sup> Skelton, *An American Profession of Arms*, 1992, 118; Huntington, *The Soldier and the State*, 198–199.

<sup>175</sup> Huntington, *The Soldier and the State*, 203.

<sup>176</sup> *Ibid.*, 34.

the process by that time.<sup>177</sup> These experiences provided the contextual basis for the Army that transitioned into the twentieth century.

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<sup>177</sup> Todd R. Brereton, *Educating the U.S. Army: Arthur L. Wagner and Reform, 1875-1905* (U of Nebraska Press, 2000), 21-29; Spaulding, *The United States Army in War and Peace*, 394-397; Paul A. C. Koistinen, *Mobilizing for Modern War: The Political Economy of American Warfare, 1865-1919* (University Press of Kansas, 1997), 88-96.

## Chapter IV

### Journals and Professionalization

Professionalization grew apace during the nineteenth century in most fields, but in the U.S. Army, as previously emphasized, it tended to reflect the personal developmental inclinations of individual officers. One measurement of that progress was the publication of journals. Dr. Samuel Latham Mitchell published *The Medical Repository* (1797), the first medical journal in the United States.<sup>178</sup> Benjamin Silliman established *The American Journal of Science* in 1818.<sup>179</sup> *The New England Journal of Medicine* (1812) is the oldest continually published medical journal in the world.<sup>180</sup> *The Journal of the American Chemical Society*, established in 1879, is one of the first publications focused on chemistry and the *Journal of the Royal United Service Institution (RUSI)*, a British publication, first ran in 1857 and served to inform military officers.<sup>181</sup>

However, American military journals, especially those which focused on the United States Army, never enjoyed the same kind of financial success, and thus tended to have shorter lives than those in the engineering and medical fields experienced.<sup>182</sup> Although military journals briefly flourished in the second quarter of the nineteenth century, many died within years of first publication.<sup>183</sup> The second half of the century did see the

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<sup>178</sup> Richard J. Kahn and Patricia G. Kahn, "The Medical Repository — The First U.S. Medical Journal (1797–1824)," *New England Journal of Medicine* 337, no. 26 (1997): 1926–30.

<sup>179</sup> "American Journal of Science," *American Journal of Science*, 2014, <http://www.ajsonline.org/site/misc/about.xhtml>.

<sup>180</sup> "The New England Journal of Medicine," *New England Journal of Medicine*, 2014, <http://www.nejm.org/page/about-nejm/history-and-mission>.

<sup>181</sup> "The Royal United Services Institute Through History," *RUSI*, accessed April 21, 2014, <https://www.rusi.org/history/ref:L4607E6D83729C/>.

<sup>182</sup> Skelton, *An American Profession of Arms*, 1992, 258.

<sup>183</sup> Moten, *The Delafield Commission and the American Military Profession*, 56.

founding of the *Army-Navy Journal* during the Civil War by two brothers and the establishment of the naval journal, *Proceedings*, in 1874, and the *Journal of the Military Service Institution of the United States* in 1879.<sup>184</sup> Nevertheless, these journals were not specific to the army, generally lacked the rigor found in other professional publications, and frequently failed to generate scholarly debate—the primary purpose for their publication; it is worth emphasizing that concerns for rank, tradition, and lack of an existential threat combined with vast distances served as the primary impediments to scholarly debate.<sup>185</sup> *Proceedings*, a naval focused publication, represented the best example of an outlier in this respect.<sup>186</sup>

Professional journals demonstrate an intent both to expand specialized knowledge and to organize the field. The Army developed intellectually at a much slower rate than some of its competitors across the oceans. First, the geographical location of the United States provided a natural barrier to ongoing intellectual exchange among nations. Competing states both in Europe and in the Far East generally share borders with other maturing states. The proximity of these states to each other historically have created tensions, and thus, professionalization of officers and armies grew to defend state interest. The U.S. found itself in an enviable geographical position as Bismarck is purported to have observed: “the Americans have contrived to be surrounded on two sides by weak neighbors and on two sides by fish.” Thus, for most of its existence the United States did not face existential threats at any point on the compass. U.S. security threats, prior to the

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<sup>184</sup> “Proceedings,” *U.S. Naval Institute*, 2014, <http://www.usni.org/about/history>; “Army Officers Uniting: A Military Service Institution.,” *New York Times*, September 29, 1878; Frank Luther Mott, *A History of American Magazines, 1850-1865* (Harvard University Press, 1938), 547.

<sup>185</sup> Moten, *The Delafield Commission and the American Military Profession*, 56.

<sup>186</sup> Huntington, *The Soldier and the State*, 243.

atomic bomb emanated either from internal unrest or Indians. As a result, the United States' strategic atmosphere lacked one of the key elements necessary to catalyze officer professionalization, namely a proximate enemy.

In contrast, the Prussians, reeling under the 1806 defeat at Jena-Auerstedt professionalized their officer corps under the guidance of Gerhard von Scharnhorst, and by 1816 established the military journal, *Military-Weekly*. This military journal remained in publication for one hundred and twenty-five years.<sup>187</sup> Prussian, and later, German officers used it to exchange viewpoints and develop ideas on war, and it served in that capacity until 1942 when impending defeat, following Stalingrad, swept away any desire to continue. Conversely, the United States Army--established in 1775--predated the formation of the German state by nearly one hundred years. However, the U.S. Army's first professional publication, the *Infantry Journal*, did not begin publication until 1904, one hundred and twenty-nine years after the institution formed. Thus, using professional journals as a mechanism for measurement, the German-speaking military professionalized war nearly a century before the United States Army. The explanation is that the German strategic environment occupied a position polar opposite to the American, a position that compelled the Germans to make a close study of war.

The *Infantry Journal* was the first true journal reflecting concerns of the U.S. Army. It qualified as representative of American military culture since the infantry branch was the largest and most important branch of the army during this period. The journal, published quarterly, focused on the tactical level of war, though also including occasional pieces that examined policy driven concerns. One enlightening section devoted to foreign articles

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<sup>187</sup> White, *The Enlightened Soldier*, 158.

provided insight into how other armies functioned and covered a broad range of topics.

For example, in 1912 Major Immanuel, a German officer, authored “The Infantry Attack: A Comparison of the Principles of the Attack of the German, French and Russian Infantry”, an article that examined various historical experiences that led to differences in battle.<sup>188</sup>

However, taken as a whole the journal (notably differing from the Prussian *Military-Weekly* in this regard) served more as an organ of the army than as a venue to exchange competing ideas. Much like French Army policy of in the period between the world wars, if positions and concepts that appeared in popular journals or periodicals of the period did not conform to the accepted policy of the day the author often faced repercussions. For example, Dwight D. Eisenhower received a verbal reprimand from Major General Charles S. Farnsworth for publishing ideas that conflicted with doctrine. Eisenhower modified his position as a result of the implicit threat couched in Farnsworth’s warning.<sup>189</sup>

An analysis of 1100 articles from the *Infantry Journal* between 1904 and 1921 reveals several notable trends (see graph). Thematically, the journal divided into thirteen different sections: low technology (example: saddles, iron sights, backpacks), high technology (example: machine guns, airplanes, telephones), foreign articles on technology, foreign articles concerning regulations, training, doctrine (example: tactical, operational, theoretical), general (Example: company cooks and kitchens), management (social science of man), human element (spirit of man), education, policy (example: militia, strategic, diplomatic), and after action reviews (example: historical analysis, battle analysis, reflections) provided the structure for examination. Major articles, rather than opinion or

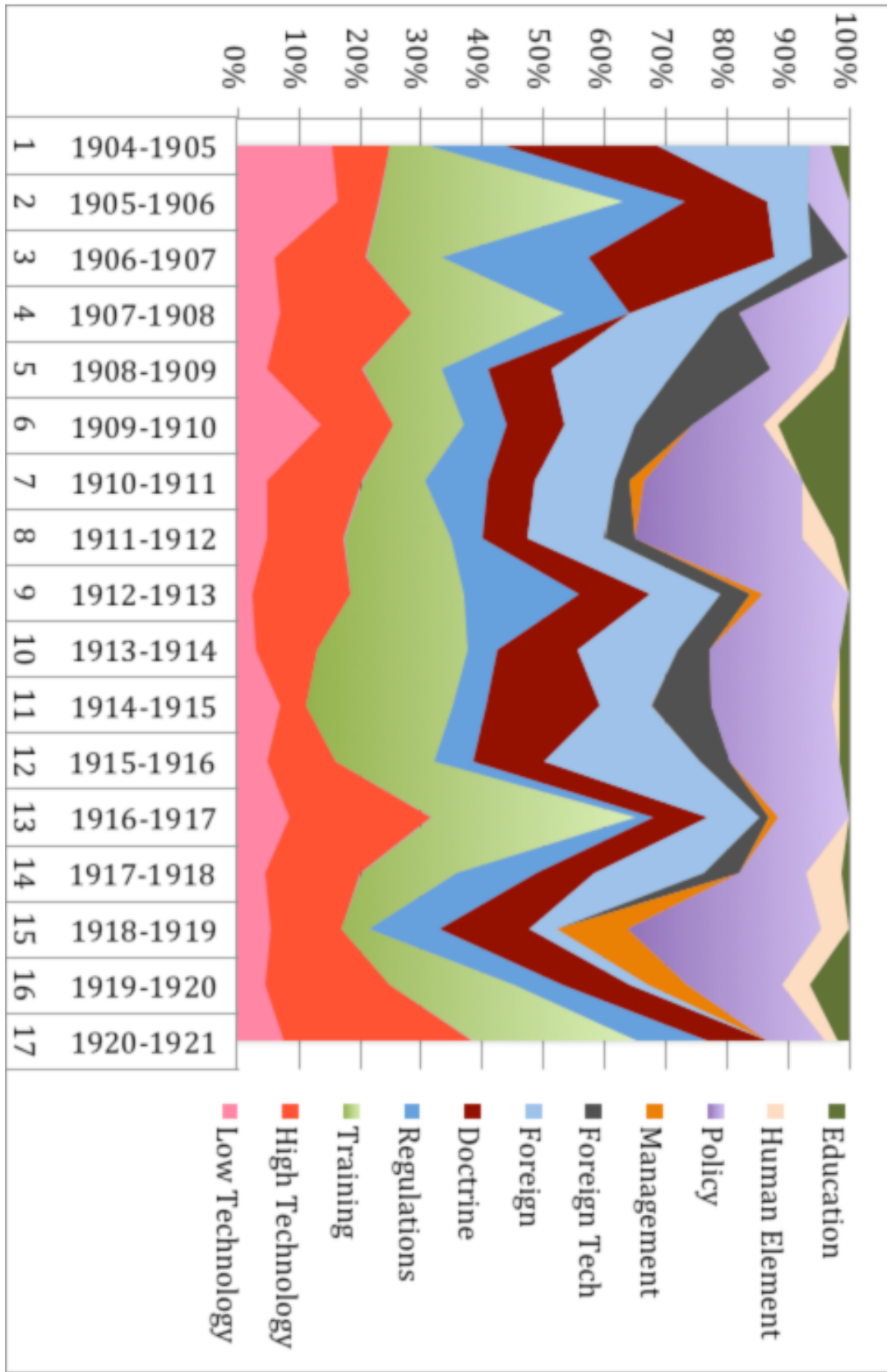
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<sup>188</sup> Immanuel, “The Infantry Attack: A Comparison of the Principles of the Attack of the German, French and Russian Infantry,” trans. H. J. Damm, *Infantry Journal* 9 (1912) First name not provided.

<sup>189</sup> Dwight D. Eisenhower, *At Ease: Stories I Tell to Friends* (Garden City, New York: Doubleday, 1967), 173.

editorial pieces, remained the focus of the analysis. The categories of after action reviews and “general” have been removed from the graph to facilitate greater clarity and focus on those topics most germane to the dissertation. The author created the graph depicted below to visual highlight topical changes within the Infantry Journal.





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<sup>190</sup> David Holden, "Infantry Journal Article Analysis from 1904-1921," October 5, 2015.

Training comprised tactical activities such as marksmanship, battle drills, and troop movement among other activities. However, such training was intended to achieve minimal competence at a given activity in a relatively short period of time. It did not begin to approach the development of expertise but aimed to provide basic knowledge to new recruits and practice to officers controlling large bodies of soldiers. In the pages of the *Infantry Journal*, training consistently ranked at or near the top with a considerable spike in emphasis during 1916-17 as the United States prepared to enter the First World War. A significant drop occurred once soldiers hit the battlefield. One might assume the importance of training would only increase, but once soldiers entered combat, experience became the primary instructor, and thus articles correspondingly shifted in emphasis.

The Army throughout its history tended to focus on the tactical minutiae of war above the strategic dimensions of organized conflict. This tactical focus is understandable given this is where the fighting and dying takes place; furthermore, victory at the tactical level intuitively implies victory in war, although in practice that is not always the case. Logically one must proceed from the other, but war is not rational and thus logic does not penetrate far into this opaque phenomenon. Nevertheless, the interest of army officers in the tactical level of war is reflected in the quantity of articles published on this topic in the *Infantry Journal*. However, a tactical mindset does not require much of an educational effort since it can largely be derived from personal experience without a deeper understanding of the nature of war and its relationship to social, political, and economic factors.

A tactical mindset, one needs to stress, is not a particular focus of the American officer corps, and it appeared to afflict the other armies to various degrees. Jonathan M.

House in *Toward Combined Arms Warfare* noted two technological waves that moved through Western armies from 1820-1890.<sup>191</sup> These changes directly influenced battlefield tactics, and, thus, generally contributed to a myopic view of war.

Technological developments distracted and concerned officers of the latter half of the twentieth century. However, the importance of technological change on shaping the battlefield remained an uncertain reality in the years before the First World War. Technology could and did influence battles during the seventeenth through nineteenth century, but the evidence was inconclusive as to what degree it proved determinative. The subject was often a topic of debate. Within the officer corps high technology ranks third in volume of writings, but second when foreign articles about advances in technology are combined with domestic analyses on the subject, edging out doctrine. The Russo-Japanese War attuned some observers to the changing conduct of war and provided readers with potential insight into technological trends. However, the battlefield carnage of the Russo-Japanese conflict often fell into existing interpretations, and thus, the bellwether tolled but few perceived the change in part because historically technology generally had a negligible effect above the tactical level.<sup>192</sup> Following that conflict, foreign technology articles generally declined in proportion to domestic articles, and by the start of the First World War the vast majority of technology articles were of domestic origin. Machine guns

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<sup>191</sup> Jonathan M. House, *Toward Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization* (Fort Leavenworth: Combat Studies Institute, 1984), 7-9.

<sup>192</sup> William H. Johnston, "A Lesson From Manchuria: What Would Kuropatkin Say of Us?," *Infantry Journal* VI, no. 6 (May 1910); Michael Howard, "Men against Fire: The Doctrine of the Offensive in 1914," Peter Paret, Gordon A. Craig, and Felix Gilbert, eds., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Princeton University Press, 1986), 518.

populated many of the early articles followed later by new artillery developments.

Airplanes and the radio, referred to then as the “buzzer”, appeared with World War I.<sup>193</sup>

Policy seized the third spot, though this may largely be the result of quantifying militia as an artifact of policy, but it seemed the most appropriate fit. Regardless, the significant quantities of articles that discuss the role and capacity of militia is further evidence of the slow intellectual progression of the army officer corps. Most nations had long since abandoned the idea that militia could serve on the modern battlefield while in the US training, equipping, and use of militia occupied an odd, if not anachronistic prominence in the American mind. A relic of another age with its sources in the wellspring of Jefferson and other founders, the militia’s conduct in the War of 1812 should have long dispelled such illusions.<sup>194</sup> However, the Constitutional limitations on the militia impeded development of a modern, German-style reserve force.<sup>195</sup> Demobilization in America and post war policy toward Germany consumed the latter pages of policy pieces and increased notably in 1918 and 1919. Questions on how and if Germany should be broken up frequently appeared. Pieces discussed with how large quantities of prisoners of war should be handled and then released after the war.<sup>196</sup>

Doctrine assumed fourth place behind policy and some distance behind training, although given the close relationship between doctrine and training one could potentially amalgamate the two without doing too much violence to the analysis. However, by maintaining the division the army’s emphasis on training and doctrine are amply

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<sup>193</sup> Holden, “Infantry Journal Article Analysis from 1904-1921.”

<sup>194</sup> Ibid.

<sup>195</sup> Jonathan M. House, “John McCauley Palmer and the Reserve Components,” *Parameters* 12, no. 3 (1982): 11-18.

<sup>196</sup> Holden, “Infantry Journal Article Analysis from 1904-1921.”

demonstrated as they assumed both first and fourth place. Doctrinal analysis exploded following the Russo-Japanese War as officers attempted to find battlefield solutions to the problems posed by the machine gun and modern artillery. Doctrinal analysis surged significantly as the Army prepared to enter the war drawing heavily from the French and British. However, prior to American entry into the war, officers frequently examined German doctrinal methods. This continued to a lesser degree once the US entered the war in 1917, when the focus shifted to American experiences. Officers no longer sought to imitate the Germans, but rather now that it depended on them, the focus of articles shifted to how and what tactical actions one might take to defeat the Germans.

Surprisingly, doctrinal discussion dropped off sharply as the army assumed its allotted place in the trenches on the Western Front. Initially American officers deviated little from the doctrine with which they had entered the war and resisted, if not outright dismissed, British and French experiences.<sup>197</sup> The battlefield arbitrates doctrinal theory from reality and delineates the distance between them. Unnecessary sacrifice is often proportional to the distance between the two, so that practical officers close the distance quickly; intelligent ones have a shorter journey and the cost is considerably less. Some officer corps are known to largely jettison doctrine once in combat in preference for what works; still, this generally results in only minor shifts rather than wholesale abandonment of peacetime doctrine unless probably defeat supplies the requisite impetus for change.

However, because of the close relationship between training and doctrine it should be acknowledged that some articles crossed the topical threshold from doctrine to training; a more equitable distribution probably would have resulted if that could be determined.

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<sup>197</sup> Kretchik, *U.S. Army Doctrine*, 128.

Given the tactical emphasis of the publication and the entrance of the US Army *en masse* into the war, it logically follows that officers focused on articles for training soldiers for the battlefields of Europe prior to the war. Once on the battlefield, officers had less time to write and probably improvised utilizing what they experienced.

Foreign pieces ranked fifth on the list, but provided some of the more intellectually interesting and thoughtful articles in the journal. Translated articles were frequently broken into segments and released consecutively over multiple issues. Foreign articles acquainted officers with recent changes on battlefields around the world that they otherwise would have lacked.<sup>198</sup> Russian and Japanese translations remained relatively rare with the vast majority coming from French and German sources with organizational and technological factors comprising most of the material. Works published by the German General Staff ranked near the top, if not the most common source for translations.<sup>199</sup>

The categories of regulations, general, and low technology grabbed the middling positions and are notable only for their mediocrity. They demonstrate neither a great interest, nor a lack thereof, and therefore are not examined in detail. The light burns brightest at the poles, where that which an organization values, and does not, is revealed.

Management may be defined as the control of both the inanimate and the animate for a given purpose. In this context management is concerned with the control of people that encompasses the social sciences, which at the turn of the Twentieth Century were rapidly expanding fields driven by progressive ideas and an optimistic view of human nature. If the human element is distinct with its focus on the spirit of man then

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<sup>198</sup> Holden, "Infantry Journal Article Analysis from 1904-1921."

<sup>199</sup> Ibid.

management embodies a mechanistic view of man. Management placed last, but that makes it notable not for a perceived lack of interest, but, to the contrary, that there would be so much emphasis on this concept in the emerging circumstance of what has been termed the “managerial revolution” in the United States.<sup>200</sup> That management be included at all is of interest. One of the first “management” oriented articles appeared in the September, 1910 edition of the *Infantry Journal*. Captain F. J. Morrow’s article entitled “Character Excellent”, examined how to collect “data” using forms to record “efficiency” and then use that data for a “pay...bonus.”<sup>201</sup> Frederick Taylor’s influence was unmistakable here and the importance of “time and motion studies” was to increase exponentially in the U.S. Army over coming decades.<sup>202</sup>

Management was a topic of considerable interest as the army entered the World War I. Army officers searched for methods to motivate and control men under the intense fires of machine guns and rapid-fire artillery. The human element, especially in the context of bayonet warfare, was a common topic, but generally psychological analysis on the face of battle is sparse at this point. Clausewitz and later Colonel Ardant du Picq theorized about emotion in war, but most officers discussed the importance of what came to be known as “morale,” assessing the spirit of soldiers, only in passing. The field of psychology was in its infancy with anecdotal evidence as the primary informing source.<sup>203</sup>

General Charles P. Summerall, Chief of Staff of the Army, spoke to the Army War College in February, 1927 on “The Human Element in War.” He emphasized the importance of this

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<sup>200</sup> Merritt Roe Smith, “Introduction,” Merritt Roe Smith, ed., *Military Enterprise and Technological Change: Perspectives on the American Experience* (MIT Press, 1985), 10–29.

<sup>201</sup> F. J. Morrow, “Character Excellent,” *Infantry Journal* VI, no. 2 (September 1910).

<sup>202</sup> Frederick Winslow Taylor, *Shop Management* (Harper and Brothers, 1919).

<sup>203</sup> Ardant du Picq, *Battle Studies*, 84–93.

element, especially the importance of leadership above all other factors in motivating men. Summerall's speech was intended to highlight the role of man in war, but itself assumed that a mechanistic formula could be employed. Soldiers are something to be managed through various methods employed by the leader. Thus, he celebrated the human element but then treated the subject as an objective governed by mechanical prescriptions. Summerall observed, "while the consideration of the human element is predominant in war, there is a great necessity of comprehending it as an essential in the management of men in peace."<sup>204</sup> Summerall's supposition might be indicative of the period as officers struggled on the precipice of technological change to comprehend the wrenching lessons of World War I.

Since the dawn of recorded history, masses of individual human beings bearing personal weapons had reigned supreme on the battlefield. However, the lessons of World War I indicated, if one looks at the sheer scale of battlefield casualties, that this paradigm no longer remained valid. Summerall equivocated about the issue, stating, "It is trite to say that the human element remains, as it has ever been, the determining factor in battle. Machines and arms may be multiplied and changed, but the man who uses them will determine the final issues of victory or defeat."<sup>205</sup> The role of machines and arms having been acknowledged, he held to the view, as emphasized in the latter half of the above quotation, that man not machine decides the outcome of war. However, the key word in the above passage by Summerall is "uses". Victory is now achieved by the soldier who best wields modern technology. Man no longer carries the battle alone but in conjunction with the tool, and eventually only the tool would become pivotal.

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<sup>204</sup> C.P. Summerall, "The Human Element in War," *The Coast Artillery Journal* 66, no. 4 (April 1927): 293.

<sup>205</sup> Ibid.



The so-called “American Way of War or Battle,” whatever nomenclature one prefers, begins to reveal itself here.<sup>206</sup> Quite apart from the German model that American officers desired to emulate, in many facets it remained in derivation closer to the French system. Nonetheless, a uniquely American synthesis of battle developed, but the evolution was less organic and more mechanical in nature. Historian Jörg Muth in *Command Culture* hit the mark when he stated:

If the most important verb and the most important noun should be found for the U.S. Army and Wehrmacht, according to the vast number of manuals, regulations, letters, and diaries, and autobiographies I have read, they would be “manage” and “doctrine” for the U.S. Army and führen (lead) and Angriff (attack) for the Wehrmacht. Such a comparison alone points out a fundamentally different approach to warfare and leadership.<sup>207</sup>

The American system of war developed mechanically from the armories, industries, and bureaucracies of capitalism in the geographical isolation of a North American continent devoid of other serious state predators. Conversely, the Prussian way of war developed organically from war where the most common verb and noun, as noted by Muth, were “lead” and “attack.” These terms are natural outgrowths of human conflict and capture the essence of war. One does not manage men in war, one leads and inspires. As Clausewitz noted “the most powerful springs of action in men lie in his emotions” and one does not manage their way to passion.<sup>208</sup>

Azar Gat in *War and Civilization* argued, “humans thus became quintessential first-strike creatures.”<sup>209</sup> Unlike animals, humans have weak senses and defenses, but have an incredible intellect. In the human realm, raids and ambushes are inherently superior form

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<sup>206</sup> Aunulio Echevarria, “Toward an American Way of War Echevarria” (Strategic Studies Institute, 2003), 3.

<sup>207</sup> Jörg Muth, *Command Culture: Officer Education in the U.S. Army and the German Armed Forces, 1901-1940, and the Consequences for World War II* (Austin: University of North Texas Press, 2011), 195.

<sup>208</sup> Clausewitz, *On War*, 112.

<sup>209</sup> Gat, *War in Human Civilization*, 2008, 129.

of warfare from a psychological standpoint. In the words of Erwin Rommel in his classic study, *Infantry Attacks*, “it is better to be the hammer than the anvil.”<sup>210</sup> “Lead” and “attack” formed the dominant mindset of the Wehrmacht-- note how closely those values correlate with those Gat observed in early warfare. The Germans intuitively nurtured and later consciously developed values that organically developed from continuous warfare over centuries. Conversely, the U.S. Army came of age during the Second Industrial Revolution, with a history infused with technological solutions, and in this age one managed machines. Men were considered machines (or cogs in a gigantic machine) and so one managed men.<sup>211</sup>

The Navy, a child of the same age, exhibited similar symptoms. Admiral Bradley A. Fiske in 1916 described the requirements of a modern naval force in *The Navy as a Fighting Machine*.<sup>212</sup> Fiske traced the mechanization of naval warfare back to the Civil War clash between the *Merrimac* and the *Monitor* with each subsequent year seeing more “machinery.”<sup>213</sup> Furthermore, he observed, “the attitude of officers...is so much more favorable to new appliances ...but a very few years ago many devices were lost to us because they were considered ‘not adapted to naval use.’ Now we endeavor to adapt them.”<sup>214</sup> Although Fiske appreciated the fog of war, the role of chance, and the importance of education he frequently returned to a mechanistic theme highlighting the importance of the machine above that of the individual.<sup>215</sup>

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<sup>210</sup> David Fraser, *Knight's Cross: A Life of Field Marshal Erwin Rommel* (New York: Harper Collins, 1994), 58.

<sup>211</sup> Mumford, *Technics and Civilization*, 46–51.

<sup>212</sup> Bradley Allen Fiske, *The Navy as a Fighting Machine* (New York: C. Scribner's sons, 1916).

<sup>213</sup> *Ibid.*, 197.

<sup>214</sup> *Ibid.*, 198.

<sup>215</sup> *Ibid.*

Fiske conceived of the Navy as a hybrid, a blend, a synthesis of man and machine; however, as Fiske noted, “...our material as material must be better than our personal as personal”, in this relationship the partners were not coequals.<sup>216</sup> In this respect, the Navy’s inclination toward the machine is perhaps a more natural tendency and appeared earlier than that of the Army. Nevertheless, the inclination of both services traversed a parallel path though perhaps not at an even pace.

Professional education in the American officer corps, beyond what we now call the undergraduate level, had never been vigorously supported and usually met with a healthy dose of disdain, especially among long-serving Army officers. Thus, it is no accident that when professional military education first came to the United States it came via the path of the Navy, not the Army.<sup>217</sup> Officers affected the world around them through action, not intellectual pursuits, and this was reinforced on a daily basis on the frontier. The growth of technology increased the widgets of war, and thus necessitated greater technicism within the officer corps. Technical knowledge is knowledge of the inanimate, the tools of the trade that are a subset of war proper.

The number of articles in *Infantry Journal* that discussed the officer education system ranked near the bottom, and that conclusion is supported throughout all volumes examined from 1904 to 1921.<sup>218</sup> This is not an unsurprising revelation, as Army institutions have rarely been cited as intellectual incubators. An aggregate assimilation in totality of material on the army officer corps across its existence indicates that if one imagined a continuum with an absolutely professional student of war on one end opposed

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<sup>216</sup> Ibid.

<sup>217</sup> Kuehn, “The Martial Spirit—Naval Style: The Naval Reform Movement and the Establishment of the General Board of the Navy, 1873-1900.”

<sup>218</sup> Holden, “Infantry Journal Article Analysis from 1904-1921.”

by an absolute warrior at the other, there is an undeniable tendency of military historians to incline the needle toward the warrior.<sup>219</sup> Historians and officers alike have a general lack of interest in professional education for officers, and a review of the *Infantry Journal* confirms this conclusion.

Samuel Huntington, in *The Soldier and the State*, one of the definitive works on officer professionalism, argued that the unique synthesis between democratic and aristocratic ideals both in Prussia and later France provided the fertile ground from which officer professionalism developed. Aristocratic beliefs in honor, courage, and fidelity co-mingled with the democratic notions of merit and the free exchange of ideas.<sup>220</sup> This unique amalgamation created the perfect environment for army professionalism to germinate.

As mentioned, historian William Skelton argued the roots of professionalism took hold in the South prior to the Civil War.<sup>221</sup> Huntington believed that the process gained its impetus between the Civil War and the First World War.<sup>222</sup> Whether the U.S. Army officer corps professionalized before or after 1865, the roots of the officer corps lacked the environment necessary to produce a philosophy of war. The U.S. Army developed in an environment distinctly different from that of Prussia. American society and Congress neither valued nor perceived the need for a professional army officer corps, preferring instead a dispersed constabulary whose officers were engineers and nation builders rather than soldier-intellectuals. However, while the geopolitical position of the United States

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<sup>219</sup> Muth, *Command Culture*, 1–13; Brian Linn, “The American Way of War Revisited,” *The Journal of Military History* 66, no. 2 (April 2002): 501–33; Huntington, *The Soldier and the State*, 194–204; Skelton, *An American Profession of Arms*, 1992, 238.

<sup>220</sup> Huntington, *The Soldier and the State*, 35.

<sup>221</sup> Skelton, *An American Profession of Arms*, 1992, xiii.

<sup>222</sup> Huntington, *The Soldier and the State*, 237.

generally subverted the intellectual development of the army it provided an obvious need and sound anchor for officer education in the Navy, spurred on by the first naval theorist in history. Although the army looked to and modeled itself off its European kin, it lacked the fundamental and necessary support of the state structure.<sup>223</sup> American society did not demonstrate anti-militarism so much as anti-professionalism infused with a hefty dose of government animosity. Therefore, the educational burden imposed on the officer corps was relatively light throughout the army's history.

In 1855, Secretary of War Jefferson Davis dispatched three officers, including then-Captain George B. McClellan, to study European Military Institutions.<sup>224</sup> In 1875 General William T. Sherman sent General Emory Upton to Europe to observe European and Asian armies. Upton chose to focus on European armies and upon his return published *The Armies of Europe and Asia* in 1878.<sup>225</sup> Spenser Wilkinson, a British military journalist and historian published *The Brain of an Army* in 1895 as an account of the German General Staff.<sup>226</sup> Other reformers to visit Europe included Arthur Wagner, John Schofield, Tasker Bliss, William Crozier, and A.T. Mahan. Officers drew upon their European observations and as a result army doctrine marched closely in step with that of Europe except for minor cultural influences, which are always present in armies, such as toleration of dissent, educational emphasis, and religious implications among others concerns. By the turn of the twentieth century, several U.S. Army fiascos, especially experiences in the Spanish American War, provided sufficient evidence to suggest that change was necessary.

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<sup>223</sup> Michael A. Bonura, "A French-Inspired Way of War," *Army History*, no. 90 (Winter 2014); Skelton, *An American Profession of Arms*, 1992, 249–250,255.

<sup>224</sup> Moten, *The Delafield Commission and the American Military Profession*, XI.

<sup>225</sup> Emory Upton, *The Armies of Europe & Asia* (Chicago: Griffin & Co., 1878).

<sup>226</sup> Spenser Wilkinson, *The Brain of an Army* (Westminster, England: Constable, 1895).

During the first decades of the twentieth century, the world outside the Army accelerated at a pace rarely seen before in human history. Electricity, the telephone, automobile and in the near future the airplane all contributed to social upheaval at the turn of the century. The Progressive movement captured much of the frustration, excitement and ideas generated in part by these new technologies. For its portion, the generally conservative officer corps struggled to cope with pressures brought to bear by society at large. The army remained caught between military virtues, traditions, and its past constabulary functions, all of which were juxtaposed to an uncertain future infused with social and technological change and growing American power and engagement in the world of geopolitics.

Nonetheless, the pages of the *Army's Infantry Journal* from 1904 to 1921 more directly reflected the coming changes of the new century rather than a look back to the peaceful, pastoral life of the [infrequently] armed yeoman. The mundane and trivial articles that filled the pages of the *Infantry Journal* in 1904 matured quickly. Technological progress over the last few decades started to converge at the turn of the century. The movement of people and ideas cross-crossed across the Western world with a tempo and sense of connectedness rarely experienced in history. The articles in the *Infantry Journal* reflected this change. Discussions on machine guns became more common as did those that dealt with foreign affairs. By 1906, articles on the Russo-Japanese War started to populate the pages of the journal, as officers acquired a greater interest in events outside the continental United States. As a result, discussions about the American Civil War and militia diminished to a trickle. The pages of the journal erupted with energy, if not urgency, with the start of the WWI in 1914.

Ideas on training, doctrine, and policy filled the pages of the Infantry Journal during the war. Likewise, interest in technology increased, but less than one might suppose. That lesson came only after the experience. The influence and role of advanced technology became one of the most enduring and powerful conclusions of the war. Victory was measured by celebrating tanks, artillery, and quantity of material, and, much less so, the human spirit. Likewise, ideas about future war were now derived from experiences on the battlefields of Europe, like the Somme and the Meuse-Argonne. Officers no longer reminisced about their grandfather's part at Bull Run or Gettysburg. Now they spoke of their own experience of combat.

## Chapter V

### Inroads of Efficiency

The United States experienced rapid and wrenching change during the closing decades of the nineteenth century and the first decade of the next century. Scientific advancement, technological development, and social change amalgamated into a volatile tonic that accelerated the pace of life. The governmental institutions crafted in an agrarian age under a slower tempo were strained (and in some instances broken) under the pressures of rapid, unrelenting change in this new machine age. The founding fathers had envisioned an agrarian state, geopolitically disinterested, and defended by citizen-soldiers; these assumptions and more faltered in a world made smaller by technology. The sons and daughters of Civil War veterans witnessed the introduction of electricity, the telephone, airplane, and, ultimately, the atomic bomb. Some bureaucratic institutions expanded and others were created to support the growing federalization of government. Both public and private institutions in America had to evolve in response to a changing world if they were to remain relevant.<sup>227</sup>

The pressure to induce action and revamp antiquated systems accumulated gradually in the system. Eventually, in 1883 Congress acted and passed the Pendleton Act, which represented the Federal Government's first deliberate attempt to improve efficiency of federal employees through legislation. The Pendleton Act introduced the merit system of promotion and protected employees from unlawful termination based on personal political

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<sup>227</sup> Hughes, *American Genesis*, chap. 3,4,5,6; Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Harvard University Press, 2009), chap. 4; Koistinen, *Mobilizing for Modern War*, chap. 4; Paul Kennedy, *The Rise and Fall of the Great Powers* (New York: Knopf Doubleday Publishing Group, 2010), 242–249.



affiliation.<sup>228</sup> Thus, it reduced the award of government jobs through patronage, nepotism and political relationships. The Pendleton Act moved the federal government toward a more equitable and efficient civilian personnel system. In many ways this put federal institutions on a similar footing found within the broader business world. In contrast, however, reform of mechanisms for selection and retention of the Army officer corps developed at an anemic pace in comparison. Only decades later was sufficient force brought to bear by those committed to equity and efficiency.

As previously noted, the U.S. Army officer corps incurred significant intellectual debts to their European counterparts that can be traced back to the colonial period. The young George Washington served as a militia officer in British service during the French and Indian Wars; later, Washington commanded the Continental Army, trained by the Prussian General Steuben, in the Revolutionary War against his former British mentors. Intellectual streams of British, Prussian, and French military thought mingled and influenced, to varying degrees, generations of U.S. Army officers.<sup>229</sup>

Major Sylvanus Thayer exercised significant influence on the early development of West Point to the degree that historians have given him the byname “Father of West Point.”<sup>230</sup> Thayer emphasized engineering in the West Point curriculum and visited France in 1815 for more instructional material. West Point was the only institution that taught engineering in America until 1824.<sup>231</sup> Interestingly, the focus on engineering diverged from the historical dominance of the infantry and cavalry officers among European nobility

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<sup>228</sup> “The Pendleton Act” (29 Cong. Rec. 416, 1897).

<sup>229</sup> Russell F. Weigley, *Towards an American Army: Military Thought from Washington to Marshall* (Columbia University Press, 1962), 7.

<sup>230</sup> Stephen Ambrose, *Duty, Honor, Country: A History of West Point* (The Johns Hopkins University Press, 1999), 63.

<sup>231</sup> *Ibid.*, 97.

and further highlighted the importance, if not elevation, of a technological field over the traditional branches. West Point's library was populated by French engineering works most of which were not translated.<sup>232</sup> Engineers frequently had short stints in the military and moved onto more the lucrative work in private employment. Nevertheless, by 1860 West Point graduates accounted for 76 percent of officers in the army.<sup>233</sup>

For much of the nineteenth century, traditional patterns of appointment and education held true for those who served as officers in the U.S. Army. Little was done to remedy the organization's leisurely if not apathetic approach to change. After the Civil War, veterans dominated senior positions and envisioned little change in the conduct of war; seniority combined with battlefield experience more than sufficed to suppress the ideas and concerns of less experienced officers and those whose rank did not allow them a voice commensurate to their arguments. Unconventional warfare received little attention in the doctrinal development in the post-Civil War period, despite the frequency army engagements with Indians and bandits in the west and southwest.<sup>234</sup>

John M. Schofield, who served throughout the Civil War and later as commanding General of the Army from 1888-1895, observed in 1879 that, "every progress made in the methods of war brings them more within the domain of science. The art of war has already approached the margin of the exact sciences, and the elements of the problems which war presents for solution are vastly more complex and difficult of exact measurement than those with which any other branch of science has to deal."<sup>235</sup> Schofield acknowledged not

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<sup>232</sup> Moten, *The Delafield Commission and the American Military Profession*, 31.

<sup>233</sup> *Ibid.*, 43.

<sup>234</sup> Kretchik, *U.S. Army Doctrine*, 81-83.

<sup>235</sup> John M. Schofield, "Inaugural Address," *Journal of the Military Service Institution of the United States* 1, no. 1 (1879): 3.

only an awareness of war's evolution, but also its growing complexity. He used the term "science," and that is frequently used as an inclusive term for technology during this period. Science and technology, although related, are also distinct, a division not readily made at this point.

West Point served less as a place to train military officers and more an institution to produce engineers, which realized President Jefferson's original intent.<sup>236</sup> However, like so many things in history the secondary and tertiary effects are often far beyond one's ability to foresee. Machiavelli appraised the matter and argued that not only are such effects difficult to foresee, but often, or at least in part, impossible to control in his opinion, "...that fortune is arbiter of half our actions."<sup>237</sup> Jefferson believed that the United States needed engineers if it were to develop and competitively compete in transatlantic commerce, and in that proposition he was correct. However, the byproduct of locating the engineering complex in, and as, the intellectual center of the army cast war in the shadow of an architect. Other intellectual barometers beyond West Point curriculum included frontier experience, journals, and military manuals.

The drill and doctrinal manuals provide insight into the methods and intellectual roots that provided a foundation for the American approach to the conduct of warfare. As late as 1891, *Infantry Drill Regulations* still emphasized methods of the Civil War.<sup>238</sup> The official manual focused heavily on various tactical formations from platoon to division, and other modifications were mostly minor adjustments.<sup>239</sup> The regulations provided

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<sup>236</sup> Thomas Jefferson, *The Writings of Thomas Jefferson, Volumes 3-4*, 1907, 471.

<sup>237</sup> Machiavelli, *The Prince*, 98.

<sup>238</sup> Perry D. Jamieson, *Crossing the Deadly Ground: United States Army Tactics, 1865-1899* (Tuscaloosa, AL: University of Alabama Press, 1994).

<sup>239</sup> U.S. Army, *Infantry Drill Regulations 1891* (D. Appleton and Company, 1891).

extensive examples of maneuvers for lower tiers of control and basic guidance is given for camps, marches, and battlefield actions. Bayonet exercises occupy a respectable eight pages compared to seven for firing positions.<sup>240</sup> However, though the topic of modern weapons was not unknown to officers, it was still somewhat foreign and had yet to make its way into the approved literature. The Franco-Prussian War had offered a glimpse into the future, and though it influenced the U.S. Army to some degree European experience and intimate knowledge of changes in warfare were generally considered to be irrelevant to America's situation.

American officers relied on what had happened in the United States over the previous century in the quarter century after Gettysburg. The strongest, most potent, and influential form of knowledge is that which is empirical. Knowledge derived from second order sources--even such visual evidence as photographs and films-- lack the pure visceral energy of first hand experience. It can be claimed that this tendency extends to nations, which frequently view events through an ethnocentric or cultural lens. Thus, European observers in the Russo-Japanese War could chalk up statistical outliers to cultural shortcomings of lesser peoples. In the First World War American officers largely failed to incorporate tactical lessons of the French and British experiences believing that American soldiers could be successful where others failed. Furthermore, in the Second World War, lessons from the Battle of Britain were again largely ignored by officers of the army air corps in regards to unescorted bombers. Thus, the army obtained information from military attaches and other observers of warfare across both Atlantic and Pacific oceans, but the knowledge provided remained distinctly secondary in nature. While one can

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<sup>240</sup> Ibid., 55.

legitimately note the power of exceptionalism for Americans, the tendency to emphasize personal experience or that of their own nation over the experiences of others is not entirely an American aberration. By nature, man generally values personal experience to those manifestations of culture and outlook that are deemed to be foreign. Nationalism, especially hyper-nationalism such as practiced by Nazi Germany, demonstrates this particular facet in spades.<sup>241</sup>

The 1891 *Infantry Drill Regulations* manual was renamed the *Field Service Regulations* (FSR) in 1905, and, while maintaining the primacy of the infantry, the name change alone signaled a shift in the currents of thought among army officers. More than merely a cosmetic name change, the *1905 Field Service Regulations* was no longer a composite of topics loosely connected. Rather it now offered a logical and ordered approach to the military craft and reflected a growing professionalization of the officer corps. Battle proper now consumed a far greater percentage of the manual than it had in the past. Orders, organization, list, and tables pervaded the 1905 addition providing a clear structure. Furthermore, and this was a significant change, the manual no longer simply stated what one does but it detailed how one did it, and to what degree, and what the finished product should approximate.<sup>242</sup>

The 1891 version began with definitions and moved directly to basic commands to control soldiers. However, the 1905 *Field Service Regulations* (FSR) progressed from a description of the U.S. Army's organization to general principles-- a natural descent from macro to micro. For example under the title "Orders" points 1-3 read:

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<sup>241</sup> Adolf Hitler, *Mein Kampf* (Bottom of the Hill, 2010), chap. 11 Nation and Race.

<sup>242</sup> U.S. Army, *Infantry Drill Regulations 1891*; War Department, *Field Service Regulations United States Army 1905* (Government Printing Office, 1905).

27. A military order is the expression of the will of a chief conveyed to subordinates. 28. The art of giving proper directions and orders to troops is one of the most important features in the exercise of command. 29. The higher the position of the commander, the more general in character will his orders be. At the beginning of operations, and from time to time thereafter, the plans and intentions of the supreme authority will probably be communicated in the form of letters of instructions. These regulate movements over a large area and for considerable periods of time.<sup>243</sup>

Army doctrine exemplified a subtle and cautious shift in thinking and remained the purview of the infantry for the foreseeable future. Walter Kretchik in *U.S. Army Doctrine* observed, “the 1891 and 1895 manuals, the direct descents in a line traceable to the 1779 *Regulations*, had been written to guide an infantry dominated force. When change came once more, it was again technology that drove it.”<sup>244</sup> Technology certainly served as a catalyst.

However, it must be noted that technological performance in American experience on the battlefield, both during the Civil War and against the indigenous native Americans, had been uneven, and thus, concrete conclusions could not be easily drawn. The legacy of Civil War industrial production proved more stable and its effect over the course of a war provided a quantitative edge both as driver on the battlefield and of the economy at home.<sup>245</sup>

The growing lethality of the battlefield, as demonstrated both by the Civil War and more recent conflicts around the globe, produced doctrinal consternation among army officers at the turn of the century. Infantry formations that had been used for the last several hundred years, harking back to the Roman legion and the Spanish *tercio*, offered

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<sup>243</sup> War Department, *Field Service Regulations United States Army 1905*, 27.

<sup>244</sup> Kretchik, *U.S. Army Doctrine*, 104.

<sup>245</sup> Koistinen, *Mobilizing for Modern War*, 88, 96; Knox MacGregor and Murray Williamson, *The Dynamics of Military Revolution, 1300-2050*, 1st ed. (Cambridge University Press, 2001), 4.

greater control and concentration of fire, but in the face of accurate artillery fire and rapid fire guns were tantamount to suicide, according to some junior U.S. army officers.<sup>246</sup> The Germans solved part of the problem through the philosophy of *Auftragstaktik* a form of decentralized control to allow subordinates to exercise initiative to achieve the objective.<sup>247</sup> Ranks were opened up and junior officers (and even non-commissioned officers in some cases) exercised greater control of the tactical engagement. However, during and after World War I U.S. Army officers maintained some distance from this innovation.

The 1895 *Infantry Drill Regulations* state on page one that “all persons in the military service are required to obey strictly and to execute promptly the lawful orders of their superiors.”<sup>248</sup> Expectations are clearly stated with absolutely no room left for initiative or interpretation. However, by 1905, in partial recognition of technological developments, the 1905 *Field Service Regulations* (FSR) stated, “An order should not trespass on the providence of a subordinate. It should contain everything which is beyond the independent authority of the subordinate, but nothing more.”<sup>249</sup> Furthermore, with a nod to German doctrine, the FSR continued, “...when an order may have to be carried out under circumstances which the originator of the order can not completely forecast...it should lay stress upon the object to be attained and leave open the means to be employed.”<sup>250</sup> This latter statement appears as if it had been lifted verbatim, which was not uncommon during this period, from a German manual.

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<sup>246</sup> Antulio Joseph Echevarria, *After Clausewitz: German Military Thinkers before the Great War* (University Press of Kansas, 2000), 23.

<sup>247</sup> Muth, *Command Culture*, 173; Echevarria, *After Clausewitz*, 38.

<sup>248</sup> “Infantry Drill Regulations 1895” (Government Printing Office, 1895), 1.

<sup>249</sup> War Department, *Field Service Regulations United States Army 1905*, 30.

<sup>250</sup> *Ibid.*, 31.

The U.S. Army's conduct in the Spanish-American War in 1898 could be succinctly described as fumbling forward as one unmitigated disaster followed another. Many observers, including A.T. Mahan, attributed its successful conclusion to fortuitous chance, brave soldiers, and an inept enemy.<sup>251</sup> In many respects the Spanish American War served to demonstrate that modest reforms in the interim could have precluded the summoning of vast material and human resources in a colossal effort to overcome shortsighted policy. Perhaps such knowledge is only granted through the lens of history; nonetheless, the propensity for such activities hints at a more systemic fault. The 1905 FSR was one result of the lessons learned from the Spanish-American War and aimed to remedy some of these faults.

Army performance at the turn of the century left much to be desired, and through the steady accumulation of near run disasters in the Spanish-American War, pressures for change reached a tipping point. Despite this, and the activism of junior officers, change required a strong personality and apt negotiator from outside the organization to bring change. Army regulations until the turn of the century focused less on battle and more on proper drill, both individual and unit. Proper formations, fire control, and basic troop leading procedures filled the pages of early army manuals. The American Civil War is arguably one of the first wars to fully capitalize on advances wrought by the Industrial Revolution. Yet, the American officer corps returned to project building and anti-Indian activities following the war. By the late 1890s, the American military found itself lagging decades behind the European military profession.

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<sup>251</sup> Ganoë, *The History of the United States Army*, 371–376; “The Work of the Naval War Board of 1898: A Report to the General Board of the Navy,” 29 October 1906. Alfred T. Mahan, *Letters and Papers of Alfred Thayer Mahan*, ed. Robert Seager II and Doris Maguire, vol. III (Annapolis, Maryland: Naval Institute Press, 1975), 627–643.



Elihu Root served as Secretary of War in the latter half of President William McKinley's term beginning in 1899 and later for President Theodore Roosevelt until 1904. Root a successful cooperate lawyer brought considerable political acumen and cooperate connections to the position though he lacked military experience that appeared to matter little in the end. Root, both intelligent and resourceful, grasped the need for institutional change and knew how to obtain the requisite information to make informed decisions. His successful tenure in the position of Secretary of War was followed, after the death of John Hay, as Secretary of State under President Roosevelt in 1905. Root embodied many of the ideals of the Progressive Era. An able diplomat and reformer; he took specific interest in reforming the US Army.<sup>252</sup> Root reorganized the upper echelons of the Army by introducing the office of Chief of Staff and "abolishing the office of Commanding General of the Army."<sup>253</sup> Furthermore, the Militia Act of 1903 provided funds to the National Guard for training and equipment. The National Guard took steps to modernize its structure and mirror the active duty Army.

Meanwhile, the federal government expressed an awareness, albeit slowly, of institutional ossification by the late 1890's and sought to remedy shortcomings. However, no meta-theory on efficiency yet existed on which to draw, thus it turned to American businesses. The professions of technology and business administration were in their infancy by modern standards, and as such, most solutions represented a tinkering around the edges over any large-scale structural changes in action or thought. Conceptual thought on science and technology during the nineteenth remained unified and continued along similar lines until after the Second World War. In other words, traditional views perceived

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<sup>252</sup> Philip Jessup, *Elihu Root*, vol. I (Dodd, Mead and Company, Inc, 1938), 215–230.

<sup>253</sup> James Donald Hittle, ed., *The Military Staff, Its History and Development* (Greenwood Press, 1975), 203.

technology and science as one in the same. That more science “beget” more technology, which is only true in the most distance terms.<sup>254</sup> Though related, the exact relationship between science and technology remained obscured by the fact that “both dealt with matter and energy.”<sup>255</sup> The concept of efficiency dated to antiquity, but the idea of best practices remained unexplored. Codifying those principles and then training people specifically to implement them only clearly broke the horizon as the world entered the twentieth century.

Congress continued its efforts to increase efficiency within the federal government in light of the growing body of professional knowledge on best practices. The *Review of the Work Done by the Joint Commission- Reorganization of the Accounting System and Business Methods in the Executive Departments* published in 1895 examined various governmental bureaucracies in an effort “to secure greater efficiency and economy.”<sup>256</sup> The U.S. government began a concentrated attempt to streamline its structure and it quickly became evident that American businesses possessed a repository of knowledge and capability. Additionally, the U.S. Army Armories had undertaken early experiences in efficiency upon which the Federal Government was able to draw.<sup>257</sup>

By the turn of the century, as borne out by the Spanish-American War, the obsolete military system had reached a point that its antiquated structure and processes failed to

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<sup>254</sup> Chalmers Sherwin and Raymond Isenson, “Project Hindsight,” *American Association for the Advancement of Science* 156, no. 3782 (June 23, 1967) Eight year study that examined defense spending in relation to technology and science to achieve breakthroughs. More science produced more science and more technology produced more technology. In short, defense spending on science did not translate into increased technological breakthroughs. This news came somewhat as a bombshell at the time.

<sup>255</sup> Layton, “Mirror-Image Twins,” 565.

<sup>256</sup> Alexander Dockery et al., “Review of the Work Done by the Joint Commission- Reorganization of the Accounting System and Business Methods in the Executive Departments” (53 Cong. Report No. 2000, March 3, 1893), 1.

<sup>257</sup> Merritt Roe Smith, “Army Ordnance and the American System of Manufacturing, 1815-1861,” Merritt Roe Smith et al., *Military Enterprise and Technological Change: Perspectives on the American Experience* (MIT Press, 1985), 39.

function adequately. Observers, both civilian and military, could no longer ignore the need for military reform. The Spanish-American War provided the catalyst, generally absent but necessary, to advance reform.<sup>258</sup> Root, with the support of Roosevelt, started his first reform efforts with the army's command structure. The army experienced reform from multiple directions often independent and unrelated to a broader plan resulting in redundant work and a loss of efficiency, but overall there occurred progress in reforming the mechanisms by which the nation's defense were to be achieved.

President Theodore Roosevelt had diverse interests (a fascination with the nature of technology, for example) and a progressive bent towards reform. Roosevelt appointed a committee, in line with his directive to Root to reform the Army, but for broader application to the federal government, and directed General William Crozier, Charles Walcott, Admiral Francis Tiffany Bowles, Gifford Pinchot, and James R. Garfield in 1903, "...to report directly to me upon the organization, present condition, and needs of the Executive Government work wholly or partially scientific in character."<sup>259</sup> The belief that science could be applied to other fields, to include those of man, and that a rational and logical methodology existed that once discovered or developed could then be applied broadly, pervaded this era. It constituted one of the defining tenets of the Progressive Era. Furthermore, the Progressive Era witnessed the rapid expansion of professional societies at the turn of the twentieth century devoted to increasing the knowledge and application of their particular fields.<sup>260</sup>

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<sup>258</sup> Ganoe, *The History of the United States Army*, 397.

<sup>259</sup> Theodore Roosevelt, "Letter from Theodore Roosevelt to Charles Doolittle Walcott," March 11, 1903, <http://www.theodorerooseveltcenter.org/Research/Digital-Library/Record.aspx?libID=o184453>.

<sup>260</sup> Robert H. Wiebe, *The Search for Order, 1877-1920* (Macmillan, 1967).

Elihu Root believed that the current system was not only inefficient but courting disaster.<sup>261</sup> One could argue, and indeed it would be accurate to state, that the Progressive movement within the US and the growing intricacies of war both contributed to the creation of a General Staff system in the U.S. Army. The French during the Napoleonic period, the Russians in the 1830's under the tutelage of Jomini, and indeed the Germans created such a system in 1813-14 well in advance of the U.S. Army. Root, aided by the works of Spenser Wilkinson author, of *The Brain of the Army*, and Emory Upton, influential advocate of a professional standing army on the European model, examined various European staff systems and found the Prussian model most impressive.<sup>262</sup> With the support of the president, Root attempted to push forward legislation to implement a type of General Staff Corps, although one particular to American circumstances.<sup>263</sup> Not surprisingly, however, the reformers encountered significant resistance to the idea especially from Civil War veterans and as well as some Army officers.<sup>264</sup>

Root in 1899 stated, "the American soldier today is a part of a great machine which we call military organization; a machine which, as by electrical converters, the policy of government is transformed into the strategy of the general, into the tactics of the field and to the action of the man behind the gun."<sup>265</sup> Admiral Bradley Fiske in 1916 employed similar language to state: "a navy being a machine composed of human and material

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<sup>261</sup> Elihu Root, "Establishment of a General Staff Corps in the Army" (Government Printing Office, 1902), 9–11; Wilkinson, *The Brain of an Army*.

<sup>262</sup> Root, "Establishment of a General Staff Corps in the Army," 3–4; Koistinen, *Mobilizing for Modern War*, 88–90; Spaulding, *The United States Army in War and Peace*, 395–397; Hittle, *The Military Staff, Its History and Development*, 195–209.

<sup>263</sup> Root, "Establishment of a General Staff Corps in the Army," 4.

<sup>264</sup> Philip Semsch, "Elihu Root and the General Staff," *Military Affairs* 27, no. 1 (1963): 16–27.

<sup>265</sup> Elihu Root, *The Military and Colonial Policy of the United States: Addresses and Reports by Elihu Root* (Harvard University Press, 1916), 3.

parts..."<sup>266</sup> The transition from man to machine occurred with less angst, and perhaps even some enthusiasm on the part of American society. American culture in general-- its business, institutions and even the youthfulness of the nation-- contributed to the favorable perception of technology. Army officers, especially in the more technical fields, displayed eagerness to embrace and capitalize on the potential of new technologies such as the telephone.

The army served as the progenitor of progressive organizations to come, in so far that it disciplined, organized, inculcated individuals efficiently, providing a blueprint for organizational control and collectivism. Walter Lippmann, a noted political commentator and journalist, observed in 1916 that, "the war [World War I] has given large numbers of Americans a new instinct for order, purpose, discipline. These Americans are distressed at the local selfishness and blind individualism of the United States. They feel that modern life requires a people screwed up to a higher pitch of devotion and forethought...it is from this sentiment...that Mr. Roosevelt has been drawing strength."<sup>267</sup> Armed conflict has been the great organizer throughout history as groups and nations assembled both for security and profit. However, in the American context the war served to move a highly individualistic society towards some degree of collectivism.

The most dominant cultural factors in a society decidedly shape armies, and likewise officers generally assume attributes from the environment in which they exist.<sup>268</sup> Culture is an amalgamation of one's history, institutions, technology, geography, and religion. Powerful ideas and movements such as the Enlightenment, Romanticism, Social

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<sup>266</sup> Fiske, *The Navy as a Fighting Machine*, 193.

<sup>267</sup> Dorothy W. Straight, ed., *The New Republic Book :Selections from the First Hundred Issues*. (Republic Publishing Company, 1916), 126.

<sup>268</sup> Clausewitz, *On War*, 100-101, 580.

Darwinism, and nationalism can serve as potent catalysts to transform attributes already inherent in a people.<sup>269</sup> At the tail end of imperialism, pejorative perceptions existed regarding most non-white nations and even in the West various nations jostled for superior position within a presumed Darwinian context. A belief persisted that tactical success might depend upon national virtues that one nation had but another lacked. Attacks failed not because they faced machine-guns or artillery but because they lacked sufficient *Elán*. The question of the superiority of man or machine had yet to be answered. Technology had clearly altered the formula of battle, but to what degree remained unanswered. And even when answered by the hundreds of thousands of British and French dead of 1914-17, the Americans had to try themselves. It was not enough to merely observe failure from afar; one had to experience it intimately, personally. Thus, one might share a similar doctrine with another nation, but failure, should it occur, reflected not doctrinal shortcomings but rather a national flaw or weakness.<sup>270</sup>

One should note that there were a few American reformers who sought to develop and advance the art of war, while taking into account the cultural particularities of American society, in the last quarter of the nineteenth century. Emory Upton, a career soldier served in the Civil War and later toured Europe in 1876 visiting the leading military institutions. Upon his return he compiled his notes that spoke highly of the German system, though the manuscript was only published after his death, which served to inform Root's reforms.<sup>271</sup> Arthur Wagner, a disciple of Emory, was posted to Fort Leavenworth Infantry

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<sup>269</sup> Strassler, *The Landmark Thucydides*; Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars* (Cornell University Press, 1984); MacGregor and Williamson, *The Dynamics of Military Revolution, 1300-2050*.

<sup>270</sup> Michael Howard, "Men Against Fire: The Doctrine of the Offensive in 1914," Paret, Craig, and Gilbert, *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, 510.

<sup>271</sup> Weigley, *Towards an American Army*, 104.

and Calvary School in the late 1890s. Once there, Wagner reformed the curriculum and increased the standards. One author referred to him as the, "...Sylvanus Thayer of the General Service schools."<sup>272</sup> Upton, Wagner, and Root each wrestled with how to amalgamate European methods of warfare to the American character.

American institutions, laws, and society in general did not share, at least not to the same degree, the militarism of Prussia or the imperialism of Britain.<sup>273</sup> Nor did Asian civilizations have the answer, in part because of the West's technological dominance, which cast other civilizations in an unfavorable light. Asian armies did not offer much of value to U.S. Army observers and therefore appeared weak and disorganized. Furthermore, the collectivism of Asian cultures, which contrasted sharply with the individualism found in the United States, has always been somewhat of an anathema to American society. As well, European powers exercised greater power over their populaces in comparison to the U.S., which stressed the individual above all else.

American officers were not the only ones who wrestled with technological advancements and their impact on the battlefield. Since American officers relied heavily on the European model, intellectual crises in the old world caused ripples in the new. The British Army, for example, enjoyed a distinct military culture and a long legacy stretching back hundreds of years that infused a heavy dose of tradition of the past into the present. Officers knew the importance of instilling a sense of pride in their soldiers and that pride found continuity and substance from the past. A unit's past, its reflected glory, honor and even collective sacrifice were cast forward like a setting sun upon the ocean illuminating the present in a hue of splendor. This splendor must be protected, defended, and if

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<sup>272</sup> Ganoë, *The History of the United States Army*, 363; Weigley, *Towards an American Army*, 145.

<sup>273</sup> Root, *The Military and Colonial Policy of the United States*, 3.

necessary sacrificed for that it might endure. The human of element of warfare, its centrality in defeat or victory, represented not only two millennia of recorded experience, but it also embodied a more recent but no less potent memory of those that had fallen in service to that unit and nation.

Some observers outside the military that attempted to grapple with the dangers of modern technology on the battlefield such as Jean (Ivan) de Bloch, a Polish banker and industrialist, who published *The Wars of the Future* in 1899.<sup>274</sup> Bloch posited that war should be avoided in the future because technological advances had increased the lethality of weapons to a degree that would be ruinous. War, if it came, would necessarily result in economic exhaustion in a matter of weeks. Bloch was not widely read prior to the First World War, and though correct in some observations, his analysis proved largely irrelevant to its participants. The focus continued to be on technology and the tools of war. More subtle but no less powerful were the intellectual fissures that were gaining force. Technology, though more specifically, the awareness of it, its effects, its influence on everyday life began to take hold in the U.S. Army officer corps as the twentieth century rapidly approached.

A survey of U.S. Congressional documents reveals that between 1880 and 1900 the word technology appears a mere 29 times; by contrast, between 1901 and 1921, a second consecutive twenty-year period, “technology” enters congressional parlance 410 times. Certainly, publishing increased over those periods, and there are unpublished documents to take into account; nonetheless as a general data point it does support the assertion that a line of demarcation has been crossed. A similar search of the term “scientific management”

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<sup>274</sup> Bloch, *The Future of War*.



yields a mere two mentions between 1800 and 1900. However, a query for 1901-1921 returns 67 matches. Interestingly, the use of this term reached its apex during the First World War and if the search is extended as a point of reference the frequency of the term drops off sharply in use after the Second World War.

Frederick Taylor, the father of scientific management, remained relatively unknown outside engineering fields until the First World War. His second work, *The Principles of Scientific Management*, published in 1911, articulated methods and processes whereby management in a factory could increase efficiency.<sup>275</sup> Taylor not only examined factory floor plans to develop the most logical and efficient layout, but also using similar methods how to achieve optimal performance from workers. The latter aspect generated a great deal of debate, because Taylor perceived workers in much the same way he conceived of machines. Awareness of moral and psychological elements hardly factored, if at all, into his formulas.<sup>276</sup>

In the early years of the twentieth century discovery, excitement and possibility infused the perception of technology in America. Those sentiments were not entirely alien to the army officers and in fact a great deal of excitement surrounded the radio, airplane and rapid-fire weapons. These technologies enhanced armies' and navies' capabilities in war, but did not appear to radically upset the equilibrium between offensive and defensive warfare. Secretary of War Root left no doubt as to what he thought were the dominant lessons of the Civil War and Spanish-American War when he observed, "...the machine was the machine by which was fought, through which were clothed and armed, equipped,

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<sup>275</sup> Frederick Winslow Taylor, *The Principles of Scientific Management* (Harper, 1913).

<sup>276</sup> Joseph Schumpeter, "Digital Taylor: A Modern Version of Scientific Management Threatens to Dehumanise the Workplace," *The Economist*, September 12, 2015.

transported and ordered, the armies which fought, the greatest civil war of modern times. It was the machinery that we received through that great generation...it has required the experience of another war to teach the American people where it needs improvement and change.<sup>277</sup> Root hailed from a business background his knowledge and expertise inclined him to perceive solutions not as a soldier but as a businessman. For him, present army shortcomings were the result of management, organization, and industrial failures that had accumulated in the system since the Civil War.

The creation of a General Staff represented a further development in the professionalization of organized violence. In many ways it mirrored the changing social and political landscape from tribe to the nation-state, from warrior to professional soldier. The embryonic American system had inherited form and also memory from its parent Great Britain's storied history. The Founding Fathers, well versed in Polybius and Tacitus, structured the American system to resist and actively hinder the possible rise of tyranny. Usurpers often emerged from the executive branches of government and their tool of control and oppression was often an army. Thus, the army, like the executive branch, found itself restrained by design. By delaying and retarding professionalization, politicians, deliberately or unconsciously, minimized the threat of a military coup to the American people.<sup>278</sup>

The safeguards against militarism built into the American system rendered both protection but also inefficiencies that extended to the Army's officer corps. Significant conflicts between the President and the Commanding General, as was the case between Lincoln and General George McClellan, became obvious in times of war. Moreover, by the

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<sup>277</sup> Root, *The Military and Colonial Policy of the United States*, 4.

<sup>278</sup> Semsch, "Elihu Root and the General Staff."

advent of the twentieth century these Constitutional safety switches had obstructed necessary intellectual development to a dangerous degree. Several military operations nearly floundered on poor service communication and overall ineffectual command. The Spanish American War, and specifically the invasion of Cuba succeeded only because of equal or greater ineptitude by the Spanish. The economic inequality that existed in Cuba further tilted the scales in favor of the Americans. However, the entire military enterprise was plagued with poor supply, transportation, and mobilization by the army. Comparably poor cooperation between the Army and Navy did little to enhance the chances of victory. Nevertheless, enterprising young officers and the aggregate mass thrown against the objective overwhelmed the Spanish, who demonstrated little enthusiasm for the war.<sup>279</sup>

None of the other European General Staffs developed the level of professionalism or were as intentional as the Prussians, nonetheless, the great European powers of the nineteenth century all found it beneficial and necessary to think and act along those lines—educating and practicing methodical planning led by a general staff.<sup>280</sup> However, the US Army lagged behind, despite strategic policy squabbles at the highest level and several operational near-debacles. Not until the Root reforms did the U.S. Army create a General Staff Corps, and even then Congress and most citizens make known no great internal desire or motivation for such an institution.<sup>281</sup>

The army appeared cognizant of the increasing technological aspects of war but it did not, as of yet, perceive those changes as radically changing battlefield conduct. Root did

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<sup>279</sup> Spaulding, *The United States Army in War and Peace*, 378–381; Pearlman, *Warmaking and American Democracy*, 172–175; Joseph C. Bernardo and Eugene H. Bacon, *American Military Policy* (Penn., Military service publishing Company, 1955), 274–285.

<sup>280</sup> Hittle, *The Military Staff, Its History and Development*.

<sup>281</sup> Root, “Establishment of a General Staff Corps in the Army,” 3.

not wear a uniform and he had almost no military experience. In spite of these shortcomings, Root experienced far more success than most initially thought possible. He instituted reforms to modernize the army officer structure and elevate the professionalism of the corps. On 14 February 1903 the President Roosevelt signed the bill and the American Army General Staff Corps came into being.<sup>282</sup> Root rationalized the command structure, but the Army's technological gene had already developed and through a process that represented less a choice than happenstance.

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<sup>282</sup> Semsch, "Elihu Root and the General Staff," 27.

## Chapter VI

### Frederick Taylor, Scientific Management, and the U.S. Army Armories

One notable anomaly in general pattern of federal subsidies for private economic activities was the establishment of armories to produce various types of weapons for the United States Army and Navy. The five government arsenals at the time were: Rock Island, Frankford, Springfield, Watervliet, and Watertown.<sup>283</sup> The Army's role in the development of the American system of manufacturing provided fertile ground for the ideas of Frederick Taylor. An engineer by trade, Taylor published *The Principles of Scientific Management* in 1911, a groundbreaking work that detailed general application of his ideas to maximize industrial efficiency. Scientific management was at first referred to as "Taylorism" or the Taylor system, but later, to distance the concept from the controversial figure, professionals modified the name to "scientific management." Scientific management utilized science and engineering to deduce the most efficient methods of a given activity. Taylor found the armories overseen by the War Department a veritable Eden to experiment with his methods of efficiency in a controlled environment.

The Harper's Ferry Armory, established in 1799 and located in West Virginia, was the nation's second government-operated arsenal.<sup>284</sup> Military management over the following decades implemented incremental efficiency changes at the armory, and as early as 1841, supervisors installed a clock to regulate working hours.<sup>285</sup> The US Army Ordnance Bureau maintained responsibility for the armories, and the early manufacturing practices

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<sup>283</sup> William Crozier to Frederick Taylor, December 14, 1906, Box 114, Frederick Winslow Taylor Collection.

<sup>284</sup> Merritt Roe Smith, *Harpers Ferry Armory and the New Technology: The Challenge of Change* (Cornell University Press, 1980), 41.

<sup>285</sup> *Ibid.*, 271.

put in place in the first half of the nineteenth century proliferated first to similar arms industries and then eventually to other fields entirely.<sup>286</sup>

The government's initial move toward efficiency predated Frederick Taylor's ideas and took concrete form with the creation of the Forest Service in 1905.<sup>287</sup> A search through a massive electronic database cataloging Congressional debates revealed that the term "scientific management" was rarely mentioned before 1894.<sup>288</sup> Taylor opened an independent engineering firm in 1893; thereafter, other bureaucratic changes followed within the Federal Government both in frequency and magnitude and were influenced in part by the adoption of Frederick Taylor's ideas over the next several decades. However, Taylor's greatest success resulted in his system being adopted, in whole or in part, at various federal armories.

Captain William Crozier, initially a coast artillery officer, played an important role in disseminating Taylor's ideas in the War Department and the Army. Crozier had demonstrated his engineering aptitude, honed at West Point, when he developed a gun carriage in 1893. Known as the Buffington–Crozier carriage, it was designed for use in forts along the coast.<sup>289</sup> The carriage allowed the cannon to be lowered to afford cover and concealment within the fort from enemy warships. Crozier's interest in technological manufacture, with which the Ordnance branch was intensely involved during this period,

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<sup>286</sup> Merritt Roe Smith, "Army Ordnance and the "American System" of Manufacturing, 1815-1861," Smith et al., *Military Enterprise and Technological Change*, 77.

<sup>287</sup> Francis Fukuyama, "America in Decay," *Foreign Affairs* 93, no. 5 (October 2014): 5–26.

<sup>288</sup> United States Congress, "Congressional Record: Vols. 1-156 Pt. 12 (1873-2010) (43rd Congress, Special Session to 111th Congress, 2nd Session)," August 2014, Heinonline, [http://www.heinonline.org.www2.lib.ku.edu:2048/HOL/Index?collection=congreg&set\\_as\\_cursor=clear](http://www.heinonline.org.www2.lib.ku.edu:2048/HOL/Index?collection=congreg&set_as_cursor=clear).

<sup>289</sup> "Big Army Contract to Be Let; Ten Disappearing Gun Carriages Wanted," *New York Times*, November 24, 1894, <http://query.nytimes.com/gst/abstract.html?res=F10C13FF355515738DDDAD0A94D9415B8485F0D3>.

continued throughout his career. The Ordnance branch was responsible for engineering, manufacture and production of Army weaponry and therefore appeared perfectly suited to capitalize on changes within these fields.

Crozier had a distinguished career that at various times put him in the presence of notable American pioneers. Crozier accompanied Captain Alfred Thayer Mahan to the first Hague Convention in 1899 as representatives of the United States.<sup>290</sup> An amicable and mutual respect developed between the two men and both played prominent roles in the development of the American military.<sup>291</sup> Mahan had published *The Influence of Sea Power Upon History, 1660–1783* in 1890, which in the following years profoundly influenced major powers around the world.<sup>292</sup> In Japan, Britain, Germany, and oddly to a lesser extent the United States, it inaugurated massive fleet expansions that contributed to a naval arms race.<sup>293</sup> Following the Hague Convention and their return stateside, Captain Crozier deployed to China around the time of the outbreak of the so-called Boxer Rebellion. There is no small irony for Mahan's part at the peace convention, followed by his inadvertent, though significant, role in precipitating the naval arms race that preceded the First World War.

Crozier made a name for himself on the staff of Major General Adna R. Chaffee in the relief expedition to Peking in August of 1900. Crozier provided a summary of his

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<sup>290</sup> Andrew White, *The First Hague Conference* (New York: The Century Company, 1905), 3; Alfred T. Mahan, *Letters and Papers of Alfred Thayer Mahan*, ed. Robert Seager II and Doris Maguire, vol. II (Annapolis, Maryland: Naval Institute Press, 1975), 641.

<sup>291</sup> Mahan, *Letters and Papers of Alfred Thayer Mahan*, 1975, III:38,106.

<sup>292</sup> Alfred Thayer Mahan, *The Influence of Sea Power Upon History, 1660-1783* (Boston: Little, Brown, and Company, 1890).

<sup>293</sup> See Lisle Rose, *Power at Sea: The Age of Navalism, Volume I* (Columbia, MO: University of Missouri Press, 2007), Prologue and Chapters 1 and 2, *passim*.

experience published in 1901 through *The North American Review*.<sup>294</sup> Chaffee, also submitted a personal account and recommended Crozier for promotion to major.<sup>295</sup> It seemed a fair recommendation, which Secretary of War Elihu Root took to heart, although strict seniority prevented the secretary from promoting someone to any grade below general officer. At the time, Army officer strength numbered between 2146 officers on the low-end in 1894 and 2486 on the high-end in 1900; with such low numbers, names and reputations were well known.<sup>296</sup> Root promoted and advanced Captain Crozier four ranks to Brigadier General and transferred him from the Coast Artillery Branch to become Chief of Ordnance of the United States Army in 1901. Crozier's interest in engineering soon led him to search for new methods and processes to increase output.

In 1903, Crozier served, by request, on a committee for President Theodore Roosevelt. Roosevelt demonstrated an understanding of expanding industrialization and changing character of American society and pace of the new century, and he desired more information on how to increase efficiency. Accordingly, Roosevelt wrote, "in view of the authority so conferred on me, I appoint the following committee to report directly to me upon the organization, present condition, and needs of the Executive Government work wholly or partly scientific in character, and upon the steps which should be taken, if any, to

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<sup>294</sup> William Crozier, "Some Observations on the Peking Relief Expedition," *The North American Review* 172, no. 531 (February 1901): 225-40.

<sup>295</sup> United States War Dept, *Annual Reports of the War Department for the Fiscal Year Ended June 30, 1903* (Washington, D.C.: U.S. Government Printing Office, 1903).

<sup>296</sup> Francis Heitman, "Historical Register and Dictionary of the United States Army" (Washington: Government Printing Office, March 1903).



prevent the duplication of such work, to co-ordinate its various branches, to increase efficiency and economy, and to promote its usefulness to the nation at large."<sup>297</sup>

In December 1906, now-General Crozier provided a tour of the Sandy Hook Proving Grounds to members of the Society for Mechanical Engineering.<sup>298</sup> Crozier invited The American Society of Mechanical Engineers (ASME) to Sandy Hook Proving Ground to demonstrate new approaches to the production of military ordnance. He described the tour as follows:

The members of the Society were the guests of the War Department... Secretary of War, William H. Taft, designated as his personal representatives to receive the Society at Sandy Hook, Brigadier General William Crozier, Chief of Ordnance... About 800 members of the Society and their guests made the trip... It was undoubtedly one of the most enjoyable as well as instructive excursions ever made by the Society, and everyone who took part understands in what large measure we are under obligation to the War Department for this special courtesy shown the Society.<sup>299</sup>

One of the society's members in attendance was Frederick Winslow Taylor, then serving as the organization's president. Taylor's presence was coincidental, at least for his part, but evidence suggests that Crozier knew of Taylor and his methods. Taylorism, as a term, had not yet become widely known. Outside the manufacturing field Taylor's name probably meant little, but his methods and ideas had begun to diffuse within American industry.

Crozier's experience and assignments likely provided him with some knowledge of the principal leaders and names of industry. The leading engineering journal of the period,

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<sup>297</sup> Theodore Roosevelt, "Letter from Theodore Roosevelt to William Crozier," March 11, 1903, <http://www.theodorerooseveltcenter.org/Research/Digital-Library/Record.aspx?libID=o184439>, Theodore Roosevelt Papers.

<sup>298</sup> William Crozier to Taylor, December 14, 1906.

<sup>299</sup> *ASME Transactions*, vol. 28 (New York: American Society of Mechanical Engineers, 1907), 7.

the *American Society of Mechanical Engineers* (1904), published articles on the work of both Taylor and Crozier.<sup>300</sup> Furthermore, there were only two major steel manufacturing companies in the United States at the time and Taylor had worked at both. Frederick Taylor worked for Midvale Steel Company from 1878 until 1890 where he learned the details and methods of managing a machine shop. Later, in 1898, he was employed by the Bethlehem Steel Company.<sup>301</sup> While at Bethlehem he refined and applied his system to improve efficiency. Taylor examined the, “Tasks for each employee...making a very careful analysis...using the stop watch to discover the ‘unit times’ required for the various work elements.”<sup>302</sup> Taylor’s experiences and process captured in the article, “Art of Cutting Metals” (1906) received significant exposure and made his synonymous with efficiency.<sup>303</sup>

Subsequently, a beneficial relationship developed between these two acquaintances that promised to bring significant savings and efficiency to Army arsenals.<sup>304</sup> Following Taylor’s visit to the proving grounds he sent a letter to Crozier thanking him for the “honor” of visiting and the “expense” of organizing the event.<sup>305</sup> From the earliest moment both men had realized the benefits of a union. Taylor observed, “It has been a liberal education to us, and I trust may also be of value to the department. I need not tell you how greatly interested I have been in the Ordnance Department for many years....”<sup>306</sup> Taylor continued by noting that he dispatched “several pamphlets on shop management” and

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<sup>300</sup> R. Birnie, “Ordnance for The Land Service,” *American Society of Mechanical Engineers* 25 (1904): 355,374; Frank Richards, “Is Anything the Matter with Piece Work,” *American Society of Mechanical Engineers* 25 (1904): 68, 75.

<sup>301</sup> American Society of Mechanical Engineers, “Frederick Winslow Taylor,” *Transactions of the American Society of Mechanical Engineers* 28 (1907): 28.

<sup>302</sup> Horace Drury, *Scientific Management: A History and Criticism* (P.S. King & Son, LTD, 1915), 210.

<sup>303</sup> American Society of Mechanical Engineers, “Frederick Winslow Taylor,” 31–350.

<sup>304</sup> Frederick Taylor to William Crozier, December 10, 1906, Box 114, Frederick Winslow Taylor Collection.

<sup>305</sup> Ibid.

<sup>306</sup> Ibid.

invited Crozier to dinner at his home to be followed the next day by visiting Taylor's shop so that Crozier could observe the system in action Taylor's invitation was readily accepted by Crozier.<sup>307</sup>

Correspondence between the Crozier and Taylor increased through the coming years; at times letters were exchanged several times a week. In January, 1909, Crozier along with several other Army officers visited Taylor. The trip was not only informative, but also symbolic since Crozier served as the Chief of Ordnance he implicitly spoke for the branch. Taylor elaborated in great detail the methods and effectiveness of his system. Following the visit Crozier returned to Washington genuinely enthusiastic about his experience and expressed considerable interest in Taylor's methods.<sup>308</sup> Crozier remained in frequent contact with Taylor and on multiple occasions over the next five years, often in response to newspaper articles on worker resistance, Crozier sent letters to Taylor prompting him to respond to the controversies, as well as provide solutions if the issues related specifically to the Ordnance department.<sup>309</sup>

Not surprisingly, workers bristled at the new level of supervision and mechanistic methods imposed by the Taylor system, a system that minimized, if not removed, the art and craft of the armorer. Arsenal quotas emphasized quantity and drove down wages. The Taylorism approach, which characterized men in the image of machines to be utilized as interchangeable parts, dismissed as irrelevant experience, expertise, and mastery of

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<sup>307</sup> Ibid.; Crozier to Taylor, December 14, 1906.

<sup>308</sup> William Crozier to Frederick Taylor, January 25, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>309</sup> William Crozier to Frederick Taylor, February 13, 1909, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, March 30, 1909, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, April 3, 1909, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, March 16, 1910, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, March 17, 1913, Box 114, Frederick Winslow Taylor Collection.

one's craft. Taylor viewed the artisan, as did Crozier though to a lesser degree, with skepticism not unlike how one might perceive children given a task which they were predisposed by nature to shirk. Thus, the children (workers) required careful supervision and ongoing inspection of their actions to ensure efficiency. Scientific Management provided that means.

In early 1909 Crozier implored Taylor in several letters to visit the Watertown, Massachusetts, arsenal to examine what should be done there to implement scientific management.<sup>310</sup> Taylor, uninformed about federal personnel policies and equally uninterested, largely failed to appreciate the obstacles and complexity Crozier encountered institutionalizing scientific management.<sup>311</sup> Federal workers had access to great resources and were better protected than their private counterparts, and they often contacted congressmen whenever their jobs were threatened by proposed reductions and changes to improve efficiency.<sup>312</sup> Thus, Crozier and the Ordnance arsenal managers worried over this kind of bureaucratic resistance as they sought to implement elements of Taylor's system, realizing that they faced potential Congressional scrutiny and even hostility.

Taylor rarely shared or demonstrated any great concern for the worker, at least not in the manner one might expect. Taylor's empathy, his contribution to their character development, was in making them work to their fullest potential. According to Aitken, "the introduction of the Taylor system of management at Watertown Arsenal was not merely a technical innovation. It was a highly complex social change, upsetting established roles and

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<sup>310</sup> William Crozier to Frederick Taylor, February 6, 1909, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, February 8, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>311</sup> William Crozier to Frederick Taylor, May 10, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>312</sup> Crozier to Taylor, February 13, 1909; Crozier to Taylor, April 3, 1909.

familiar patterns of behavior, establishing new systems of authority and control... ”<sup>313</sup> The threat of social change and the destruction of long established methods, especially the values of the master craftsman, the artisan, greatly increased discontent about the situation. The arsenals and later the Army officer corps inevitably experienced social upheaval with the introduction of scientific management that served as a precursor or prototype for the advance of social sciences. This change mirrored a broader professionalization that transpired within America during this period. Furthermore, the proximity and nature of these changes contributed to the intellectual framework of the Army officer corps.

Taylor was no less a progressive than others of his day, but his progressivism was of a different order, a view of “progress” that valued the tool, the machine, the system over the individual. The betterment of each individual could best be achieved through self-actualization. Even if he sympathized with Taylor’s views, and there is evidence he did, Crozier could not employ those ideas arbitrarily without causing worker strikes and political turmoil.<sup>314</sup> Through his relationship with Taylor Crozier scattered the seeds of scientific management within the Army. The qualities sought in officers, and the propensity of solutions to assume a mechanistic character informed by minds trained in the social sciences and complemented by a technological construct is rooted, at least in part, in the ideas and methods of Crozier and Taylor. Scientific management is most amenable to manufacturing plants that focus on repetitive tasks, but Taylor’s and Crozier’s acolytes exploited the potential to apply scientific management to the fields particular to

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<sup>313</sup> Hugh George Jeffrey Aitken, *Taylorism at Watertown Arsenal: Scientific Management in Action, 1908-1915* (Literary Licensing, LLC, 2011), 12.

<sup>314</sup> Crozier to Taylor, April 3, 1909.

man. Psychology, government, management and even war appeared to be fields that might benefit from scientific management.<sup>315</sup>

Taylor visited the Watertown arsenal and thought it should be classified as an “engineering establishment, rather than a manufacturing establishment” because of the diverse and complex nature of tasks.<sup>316</sup> The Watertown arsenal produced experimental weapons and equipment. They then conducted tests to evaluate the reliability and feasibility of items produced.<sup>317</sup> Taylor’s clarity on this point left something to be desired because the facts did not support the assertion that Watertown was the best location insofar as the principles of scientific management were concerned, however, both men desired to get the system implemented as quickly as possible. Regardless, the Watertown arsenal did offer a unique opportunity, and at the same time the proposal offered insight into the guiding assumptions held by military officers. Watertown remained the least amenable to scientific management in general and probably the most difficult of any of the arsenals because of the complex nature of the work there. The Taylor system demonstrated its greatest efficiency gains in plants in which worker movements remained repetitious and simple in nature.<sup>318</sup> In spite of this incongruity, the Watertown arsenal was where the Ordnance Bureau implemented Taylor’s system.<sup>319</sup> Crozier’s logic implied that if scientific management was successfully installed here then it was capable of being installed anywhere. Crozier ended his letter to Taylor observing, “I am glad that your judgment

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<sup>315</sup> Daniel Nelson, “A Mental Revolution: Scientific Management since Taylor,” 1992, chap. 1.

<sup>316</sup> William Crozier to Frederick Taylor, April 8, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>317</sup> Aitken, *Taylorism at Watertown Arsenal*, 53.

<sup>318</sup> Frederick Taylor to William Crozier, April 20, 1910, Box 114, Frederick Winslow Taylor Collection.

<sup>319</sup> Crozier to Taylor, April 8, 1909.

agrees with mine that this arsenal is the best place at which to make a commencement.”<sup>320</sup>

This assertion was based less on the merits of the system than on the resistance of workers.

In addition to any advantage gained in the implementation of Taylorism in the complex operations of the Watertown arsenal, with its evident difficulties, were offset with lower levels of opposition. In regards to, “...questions at the Rock Island Arsenal, “ Crozier explained to Taylor, “ where the suspicious feeling that the Government is not always doing its best for the workers seems to be rather stronger than at any other of our establishments.”<sup>321</sup> Crozier followed this observation with the implicit expectation that the “examination of the Watertown Arsenal” might be more fruitful in this respect.<sup>322</sup>

A few historians have delved into the gritty details of Watertown and its little known relationship to scientific management; however, almost no light has been projected onto the relationship between Taylor and Crozier specifically. The loose association that began in 1906 between the two men was by all accounts amicable and professional. The letters between them convey a genuine regard and above all other motivations a drive for efficiency and productivity. Taylor needed to turn a profit as head of a private firm, but for him profit was a byproduct and not the prime product. For Taylor, scientific management had an almost spiritual component. Horace Drury noted in *Scientific Management* (1915) that, by “... 1901, Mr. Taylor’s possession of a fortune enabled him to retire from work for pay; but it was only to give himself more completely to the cause of scientific management.”<sup>323</sup> He firmly believed that his methods were superior to those in use by most

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<sup>320</sup> William Crozier to Frederick Taylor, April 16, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>321</sup> Crozier to Taylor, March 30, 1909.

<sup>322</sup> Ibid.

<sup>323</sup> Drury, *Scientific Management: A History and Criticism*, 89.

industrial facilities at the time. It is clear that Taylor's enthusiasm for reform of American industry stimulated Crozier and men like him to take action.

Crozier's association with Taylor rapidly evolved into one of friendship. The letters gained a cordial tone and the two began exchanging ideas not only about scientific management, but people and politics. Taylor occasionally dined with Crozier at his home while in Washington, D.C., and a mutual respect formed between them. Crozier perceived a degree of genius in Taylor's methods and management techniques that could transform the arsenals, if outside factors could be kept at bay. After Taylor's death in 1915, Crozier's friendship with the brilliant, stiff necked engineer, caused him to refuse to use the less controversial term scientific management in place of Taylorism, because he believed that the system's author ought to receive credit for his labor.<sup>324</sup> For Taylor's part, Crozier played a critical role within the federal government to ensure that his methods gained wide recognition and implementation by federal institutions. That the federal government to a degree embraced scientific management served as a tacit form of approval to the manufacturing industries at large.

In addition to introducing scientific management at the Watertown Arsenal, an act of considerable personal satisfaction on his part, Crozier actively assisted Taylor in diffusing his methods throughout the federal government. In 1912, he informed Taylor that he had taken leave as Chief of Ordnance to spend a year at the Army War College. "...I have given up the charge of the Ordnance Department", lamented Crozier to Taylor, "...separated with my own consent, although...the change was something of a wrench...for

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<sup>324</sup> William Crozier, "Scientific Management in Government Establishments," *Bulletin of The Society to Promote the Science of Management* 1, no. 5 (October 1915): 5.



eleven years... I had worked in a good many improvements...and finally, the introduction of the Taylor system of scientific management...<sup>325</sup> Crozier was to continue his efforts until his retirement in 1918.

Taylor earnestly believed his methods were more efficient and better for the nation, the company, and even the individual. Informed by the ideas of Social Darwinism and infused with progressivism, Taylor argued that “soldiering” or doing the minimal work possible, had a corrosive effect on the character of the worker, and the nation could not afford to have men and companies functioning far below their potential.<sup>326</sup> Likewise, Crozier viewed the world through a similar, though military, lens. For officers such as Crozier, Imperial Germany, whose prowess in war and engineering was well established, lurked as an ever-present threat. The dangers threatening American security dictated as a matter of urgency, therefore, efforts to improve America’s production capabilities. In *The Story of Ordnance in the World War* (1920) Sevellon Brown detailed the difference between the American and French system:

In American the mechanic becomes a specialist in the production of a single part working to tolerances depending upon the accuracy of gauges to produce interchangeable parts requiring little or no hand-fitting and machining when the entire mechanism is assembled. But the French machinist is developed as a highly skilled artist working always with the picture of the completely assembled mechanism in mind and in the habit of doing a great deal of careful hand-fitting as the parts are assembled. The French thus gain perfection in their work at the expense of speed. Generally speaking, highly efficient industrial organization on the immense scale common in America is impossible under the French System.<sup>327</sup>

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<sup>325</sup> William Crozier to Frederick Taylor, October 10, 1912, Box 114, Frederick Winslow Taylor Collection.

<sup>326</sup> Frederick Taylor to William Crozier, April 15, 1909, Box 114, Frederick Winslow Taylor Collection.

<sup>327</sup> Sevellon Brown, *The Story of Ordnance in the World War* (Washington, D.C.: James William Bryan Press, 1920), 37.

The United States Army could ill afford inefficient officers and arsenals. Crozier perceived in Taylor's methods a solution to this problem, a uniquely American solution in the making that utilized management and technology to achieve efficient mass production.

Their purposes further converged under political pressure on the part of Congress and labor unions. Unions and workers feared an increased workload without adequate compensation; furthermore, workers naturally chafed under the implicit lack of trust that underlined scientific management. Crozier had invested himself, his officers, and the Ordnance Department in the implementation of Taylorism in the government arsenals to varying degrees. Crozier's legacy included the merit system, improvements in accounting, and theoretical and practical courses for officers, but those all paled --in his opinion—in comparison to the implementation of scientific management.<sup>328</sup> Crozier concluded, in a career spanning thirty-six years at the time of the comment, that his most important and enduring accomplishment was the implementation of scientific management. He therefore took great care in promoting officers who could protect and propagate scientific management-- his career's greatest triumph. Crozier and Taylor's joint legacies, in this respect, were united lest their work be undone. Crozier's firm support for the system and its merits was captured in *Annual Report of the Secretary of War* (1911) and portends the importance of scientific management to the future efficiency of government operations. While not directly attributable to Crozier, the tone and narrative were unmistakably his.

Pressure mounted to block reforms as Congressional committees, motivated by labor unions whose members were constituents and contributors to members of Congress in states in which federal arsenals were located, moved to examine that which was already

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<sup>328</sup> Crozier to Taylor, October 10, 1912.

known. One obvious criticism was, while the Taylor system did lead to increases in production the implementation of Taylor's pay system meant that workers were not compensated equitably. To weather congressional inspections, Taylor and Crozier colluded lest their work be undone.<sup>329</sup> Taylor conveyed to Crozier the most effective terms and methods to argue in favor of scientific management and offered to run articles in sympathetic newspapers to garner public opinion.<sup>330</sup> Crozier supplied names of important committee members so that Taylor could provide supportive material and amass appropriate pressure on them.<sup>331</sup> They discussed who and how to appear before congressional committees to achieve the most advantageous results. This collaboration served as a precursor to the conventional associations between serving and retired senior military figures and producers of the goods they purchased in the modern military industrial complex whose origins resided in spirit, if not also in part, in the relationship between these two men.

From 1909 until Taylor's death in 1915, the two men worked together to educate, implement, and expand the influence of scientific management. Daniel Nelson in *A Mental Revolution* (1992) found that, "Between 1901 and 1915 Taylor's associates introduced scientific management in nearly 200 American businesses, 181 or eighty percent of which were factories."<sup>332</sup> Following Taylor's death his acolytes began to expand scientific management into other fields outside of manufacturing and the military. The employment

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<sup>329</sup> William Crozier to Frederick Taylor, May 10, 1912, Box 114, Frederick Winslow Taylor Collection; William Crozier to Frederick Taylor, June 26, 1912, Box 114, Frederick Winslow Taylor Collection; Frederick Taylor to William Crozier, June 20, 1912, Box 114, Frederick Winslow Taylor Collection.

<sup>330</sup> Frederick Taylor to William Crozier, October 8, 1913, Box 114, Frederick Winslow Taylor Collection.

<sup>331</sup> William Crozier to Frederick Taylor, September 14, 1911, Box 114, Frederick Winslow Taylor Collection.

<sup>332</sup> Daniel Nelson, *A Mental Revolution: Scientific Management since Taylor* (Ohio State University Press, 1992), 11.

of scientific management did suffer setbacks and was even removed in part from Watertown and other arsenals in 1915. Crozier in stoic language informed Taylor, “...sorry to have to say to you that the anti-scientific management legislation placed on the Army Bill by the House will remain there...”<sup>333</sup> However, after World War I (and in part as a result of the military’s experimentation with “scientific” tests to assess the aptitudes of recruits and potential officers), the walls of resistance gave way to a deluge of scientific management initiatives that rapidly propagated throughout the fields of science, manufacturing, and the new field of “management” now separating from the discipline of engineering.

Peter Drucker, described as the father of modern management theories,<sup>334</sup> suggested in *The Practice of Management*: “Scientific Management is all but a systematic philosophy of worker and work. Altogether it may well be the most powerful as well as the most lasting contribution America has made to Western thought since the Federalist Papers.”<sup>335</sup>

Although Taylor’s work fell into disrepute among workers at the armories, which resulted in the halting of time-motion studies, their respite from the craze for efficiency proved short-lived. The necessities of World War I provided the perfect environment for Taylorism, which ran roughshod over opposition from unions and Congress with a speed and magnitude that only war could achieve. World War I catapulted industrial production, and the requisite ideal of efficiency to the forefront of American policy goals.

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<sup>333</sup> William Crozier to Frederick Taylor, March 4, 1915, Box 114, Frederick Winslow Taylor Collection.

<sup>334</sup> Steve Denning, “The Best of Peter Drucker,” *Forbes*, July 29, 2014, <http://www.forbes.com/sites/stevedenning/2014/07/29/the-best-of-peter-drucker/>.

<sup>335</sup> Peter Drucker, *The Practice of Management* (London: Routledge, 1955), 242.

Even so, that practical manufacturing knowledge resided in few places and was embraced by even fewer men.<sup>336</sup> Major General Clarence C. Williams, Chief of Ordnance from 1918 to 1930, observed in 1920, “As I have said it is impossible to improvise an Ordnance expert. Engineers who had won fame and success in private enterprise and were masters in their field came into the Ordnance Department...”<sup>337</sup> Those engineers “of fame” were largely Taylor’s disciples from the American Society of Mechanical Engineers. War proved the most important vector, but there were others.

Hindy Schachter, in *The role played by Frederick Taylor in the Rise of the Academic Management Fields*, noted, “Taylor’s work coincided in time with a major expansion of college education...American college enrollment was basically static from 1820-1880, [but] it grew by 20 per cent at private Eastern colleges and 32 per cent at state institutions between 1885-1895.”<sup>338</sup>

By 1908, Taylor was lecturing at the Harvard University School of Business and his work formed the foundation for the curriculum with enthusiastic support from Harvard’s academic dean.<sup>339</sup> Managers trained in scientific management then moved to positions in government and other segments of society.<sup>340</sup> The methods of Taylorism were extracted and then elaborated to produce “best practices” which thoroughly permeated managerial America.

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<sup>336</sup> Clarence C. Williams, Brown, *The Story of Ordnance in the World War*, 17.

<sup>337</sup> Ibid.

<sup>338</sup> Hindy L. Schachter, “The Role Played by Frederick Taylor in the Rise of the Academic Management Fields,” *Journal of Management History* 16, no. 4 (2010): 440.

<sup>339</sup> Ibid., 442.

<sup>340</sup> Nelson, *A Mental Revolution*, 1992, 23.

Taylor's greatest achievement may not have been Watertown or any of the other arsenals; rather, nothing so aptly demonstrated the master's fingerprint than what transpired in the Ordnance branch during the First World War. Crozier served as the Chief of Ordnance branch for 16 years between 1901 and 1917 and during his tenure he developed educational and training methods for Ordnance branch officers. Furthermore, Crozier's powerful position at the top of the hierarchy allowed him to position men of like mind steeped in Taylorism throughout the branch. The rapid expansion of the Army during World War I pushed those men into the upper echelons of the Army and committees throughout the federal apparatus and from there they implemented various principles of scientific management. The Ordnance branch alone expanded from a mere 97 officers to over 5000 officers and had supervision over 500 private industrial plants by war's end in November, 1918.<sup>341</sup>

At the beginning of America's entry into the war, the Taylor Society was one of only a few organizations that claimed to have the requisite expertise to implement systems that would massively increase industrial output. According to the *Bulletin of the Taylor Society*, published in February of 1919, "...the influence of war conditions on the affairs of the Society, especially the absorption of all of the officers and the greater part of the membership into war organization, made it expedient to suspend publication in 1917 for the better part of a year. In December, 1918, publication was resumed..."<sup>342</sup> The magnitude of this statement show how widespread and influential Taylorism became with the war; both in depth and breadth. By war's end, various principles derived from Scientific Management permeated the Federal Government.

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<sup>341</sup> Brown, *The Story of Ordnance in the World War*, 15.

<sup>342</sup> "Note," *Bulletin of the Taylor Society* 4, no. 1 (February 1919): 8.

The war brought with it hope for change, an end to the status quo and the emergence of a more efficient management system. Engineers, armed with scientific management precepts, believed that the common worker could achieve greater efficiency. Progressives believed that the war offered an opportunity to transform American society and in positions of leadership could manage, as well as, to moderate the mechanistic impulses of engineers toward workers, and social intellectuals conceived of a new order that emphasized and centered on collective objectives rather than those of the individual.<sup>343</sup> Dr. Ira N. Hollis, president of the American Society of Mechanical Engineers, observed, "We must again keep in our minds the fact that there are two efficiencies: one the efficiency of the individual; the other, the efficiency of the collective mass. Our efficiency as a whole will maintain the republic but the efficiency of the individual acting alone will create such division as to destroy it."<sup>344</sup> The war appeared to provide the perfect mechanism to introduce collective action into a distinctly individualistic American society.

Following the war, Army officers intimately involved with industry and manufacturing, and even some who served with the AEF in France, tended to view victory through the lens of America's production of the weapons of war. When judging the success of World War I, they proclaimed, one need chiefly to look to "American industry and engineering, to American science, that the credit for this achievement must be given. It was American industry and science that were on trial."<sup>345</sup> The Germans shared this view and coined the term *Materialschlacht*, translated war of material, to capture the essence of World War I. The heart and the soul of war no longer turned on the struggle of man against

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<sup>343</sup> David M. Kennedy, *Over Here: The First World War And American Society* (Oxford University Press, 2004).

<sup>344</sup> Donald Stabile, *Prophets of Order* (South End Press, 1984), 85.

<sup>345</sup> Brown, *The Story of Ordnance in the World War*, 14.

man, “a collision of two living forces.” It instead had become a question of “war by algebra”- -production.<sup>346</sup> Major General Williams concluded in 1920: “Nor could the power of our country have been made effective except at this composite mind harnessed science and industry in the service of the war machine.”<sup>347</sup>

The essence of Scientific Management is time; the measure of motion necessary to achieve the desired result in the smallest temporal window. These two compounds of time and motion amalgamate to form the modern idea of efficiency. Taylor’s methods spread from the shop floor, to armories, universities and ultimately to the supreme levels of power in the United States. However, ideas are not static and what was once “shop management” evolved into Scientific Management. Abstracted, Scientific Management no longer simply governed the basic motions of factory workers but mutated to an intellectual concept. If, as Roger Spiller observed on ideas, “...they're conceived and adopted by collections of people with a common interest and that interest is the fuel that keeps them going. But that fuel can spend itself over time and the idea's original potency slowly dims or else is transformed to accommodate itself with the rest of the universe of ideas. That is, ideas may not converge so much as grow comfortable in the space the world awards them.”<sup>348</sup> That observation has special relevance to the experience of U.S. Army officers over the course of the early decades of the twentieth century.

Then compelled by war, the interest of Army officers, politicians, and even workers converged, if only for a time, toward a common goal. War provided no small measure of propellant (in fact, nothing could have exceeded its potency) to propagate ideas of

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<sup>346</sup> Clausewitz, *On War*, 76–77.

<sup>347</sup> Brown, *The Story of Ordnance in the World War*, 16.

<sup>348</sup> Roger Spiller to David Holden, Email, (February 27, 2015).



Scientific Management throughout the Army and American society. Interestingly, the American philosophy of practicality combined almost with any difficulty with the ideas and assumptions of Scientific Management. Practicality, the only true American philosophy, provided the perfect soil for Taylor's ideas to proliferate and war afforded the opportunity and catalyst for their dissemination.

No Army officer explicitly articulated the conceptual change that transpired between 1914 and 1930. Certainly, the ramifications, byproducts, or upshots were discussed in there numerous echoes or physical reverberations whether tanks, planes, radios or *Materialschlacht*; the proximate causes, the second and third order effects, were visible.<sup>349</sup> It is clear, however, that the source and root of change remained cloaked behind the effects. Similarly, though to a greater degree, Scientific Management fixed closure to the source amply demonstrated the intellectual change toward time. Lewis Mumford perceived the evolution, the trend in societal change, observing in 1934, "In time-keeping, in trading, in fighting men counted numbers; and finally, as the habit grew, only numbers counted."<sup>350</sup> It is a truism and no less true that Army officers, beginning with World War I and in every major conflict thenceforward used the kill/death ratio - numbers - as the primary metric whereby victory and defeat were measured.

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<sup>349</sup> Poor mobilization of material and industrial capacity in WWI resulted in the creation of the Army industrial College. Scientific Management, with its focus on efficiency, certainly found a natural outgrowth in the AIC. Francis W. A'Hearn, "The Industrial College of the Armed Forces: Contextual Analysis of an Evolving Mission, 1924-1994" (Doctor of Education, Virginia Polytechnic Institute and State University, 1997).

<sup>350</sup> Mumford, *Technics and Civilization*, 22.

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## Chapter VII

### The Army by Nurture & the Navy by Nature

The U.S. Army arrived at the philosophy of scientific management organically and largely unintentionally. That journey was driven largely by environmental factors. The U.S. Navy embraced the concepts known as scientific management deliberately and forcefully. The striking difference between the two cultures lies at the heart of this analysis. The Army and Navy both confronted daunting change at the dawn of the twentieth century. Both were inextricably linked to preparing for war and the officers that filled their ranks valued similar traits of leadership, courage, and forbearance. Nevertheless, they conducted operations in separate and distinct environments. Tools of their trades were no less diverse. The Navy traded in vast steel seagoing titans. The Army dealt in bone and sinew. Similarities and differences aside, they both fundamentally pursued one end above all others-- efficiency.

Frederick Taylor bridged the Army and Navy as the foremost name in efficiency in the first decades of the twentieth century. He embodied the bow wave of managerial change sweeping through American factories, industrial establishments, and soon universities. For most who were aware of his theories, Taylor was no snake oil salesman pedaling spurious concoctions from the back of a gaudily-painted wagon. Taylor had a vision. And like all visionaries his dreams and ideas of change generated significant resistance. Through years of study and practical experience he had refined his methods for improving workplace efficiency. As a result, as earlier discussed, private and public

business and organizations frequently sought Taylor's expertise about how to do more with less.

Taylor's involvement with the Navy predated his involvement with the Army. This contact was greater not only in chronological order, but also in frequency and quantity of correspondence. It appears that Taylor personally invested his interests and energies more deeply in relations with the Navy. Of course, the Navy certainly represented the larger quarry of the two services by a large measure. Nevertheless, his engagement with the U.S. Navy bureaucracy and naval officers were demonstrably stronger than those with U.S. Army counterparts. Last, the Navy and Taylorism shared a common nature-- that of machines. It is necessary to emphasize, however, that scientific management for Taylor and the U.S. Navy officers with whom he dealt was not merely a set of procedures for tinkering with the production and repair of machines; it embodied a mindset, a way of thinking. In the end- it's all about time.

Fortune appeared to favor Taylor, but only in stints. Captain Casper F. Goodrich, a long-time family friend, proved to be an important and powerful ally. Goodrich was a strong advocate for Navy reform and served on the Navy Board that recommended the establishment of the Naval War College.<sup>351</sup> Their friendship, by tone and substance clearly predated the 1891 letter between the two which, represents one of the earliest communiqués between Taylor and an officer of the Navy. The letter was composed twelve years before Taylor published his famous work "Shop Management" in 1903.<sup>352</sup>

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<sup>351</sup> Kuehn, "The Martial Spirit—Naval Style: The Naval Reform Movement and the Establishment of the General Board of the Navy, 1873-1900"; Ronald H. Spector, *Professors of War: The Naval War College and the Development of the Naval Profession* (Newport, RI: Naval War College Press, 1977), 23–24.

<sup>352</sup> Taylor, *Shop Management*.

The early letters between Goodrich and Taylor frequently touched on matters of work and family in nearly equal measure. The term “Scientific Management,” as yet uncoined, never entered the discussions, although statements leavened with Taylor’s ideas about efficiency turned up occasionally. Generally, the warm and affable missives between Taylor and Goodrich closed with some variation of “love to all the family.”<sup>353</sup> There were signs that more substantive exchanges occurred. In December 1891, Goodrich encouraged Taylor’s early success by observing, “I hope things are running now without hitch and that the quantity produced is as ample as the quality is satisfactory. I am always with you in spirit and am always wishing you the best of luck in all things.”<sup>354</sup>

However, near the end of the century Taylor started to grasp the essentials of his system while working as a consultant at Bethlehem Steel. In March 1899, Taylor detailed information about his work in a letter to Goodrich that hinted at this progress. “It would give me the very greatest pleasure,” Taylor wrote, “to have you go through works here and look over the various lines in which we are trying to make improvements.”<sup>355</sup> Goodrich was unable to visit and it appeared his pressing naval duties took a toll on his time to write as well. Taylor pressed ahead, making significant advances in tool development and proclaiming his “new scheme of management.”<sup>356</sup> He informed Goodrich in a letter in the summer of 1900 as to his progress.<sup>357</sup> Goodrich complimented Taylor on his successes but did not as of yet inquire into the specific details of Taylor’s system. Goodrich appeared content, as friends are usually accustomed to do, to accept knowledge of a friend’s works in

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<sup>353</sup> Frederick Taylor to C.F. Goodrich, January 1892, Box 21, Frederick Winslow Taylor Collection.

<sup>354</sup> C.F. Goodrich to Frederick Taylor, December 29, 1891, Box 21, Frederick Winslow Taylor Collection.

<sup>355</sup> Frederick Taylor to C.F. Goodrich, March 14, 1899, Box 21, Frederick Winslow Taylor Collection.

<sup>356</sup> Frederick Taylor to C.F. Goodrich, June 16, 1900, Box 21, Frederick Winslow Taylor Collection.

<sup>357</sup> Ibid.

the most general terms. However, following extended service at sea during the Spanish-American War, on September 1901 Goodrich received orders to take command of the League Island Navy Yard outside Philadelphia. Discovering that his new command, at the naval yard, was paralyzed by traditional procedures and lacked efficiency, Goodrich knew exactly where to turn.<sup>358</sup>

Frank Copley stated in *Frederick Taylor, Father of Scientific Management* (1923):

It will be remembered that one of the reforms effected by Goodrich and Newberry upon the recommendation of Taylor was the concentration at League Island, in Philadelphia of all the tool making for the Atlantic yards. The organization of this tool-making shop was directed by Hathaway. It was always Goodrich's ambition to have Barth employed at the Brooklyn Navy yard, there to establish machine-shop standards for the entire service.<sup>359</sup>

Chance had smiled on Taylor. A long time family friend given a key position within the U.S. Navy's shipyards provided Taylor with the perfect opportunity to refine and expand his management methods on a scale not previously possible. The old adage that "it's not what you know, but who you know" fits aptly here. Nevertheless, Goodrich, like most line officers, expressed some discontent at giving up sea command, exchanging ship for shore duty. Goodrich did, however, confide to Taylor that "one of the redeeming features of my new duty-which I frankly do not like- will be the better chance of seeing you occasionally."<sup>360</sup>

The administration of Theodore Roosevelt proved a formidable proponent for government reform. Goodrich and Taylor benefited from the strong anti-union stance of Roosevelt and both men shared a similar view of "loafers" in government service that

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<sup>358</sup> C.F. Goodrich to Frederick Taylor, September 9, 1901, Box 21, Frederick Winslow Taylor Collection.

<sup>359</sup> Frank B. Copley, *Frederick W. Taylor, Father of Scientific Management*, vol. II (New York: Harper and Brothers, 1923), 304-305.

<sup>360</sup> Goodrich to Taylor, December 29, 1891.

needed to be removed.<sup>361</sup> Still unions and leisurely labor practices persisted within America's naval yards.

Goodrich was Taylor's oldest ally, but not his most ardent supporter. That title belonged to another officer. Goodrich, ten years Taylor's senior, employed a refined political acumen. Thus, Goodrich approached restructuring of the naval yards obliquely, if conservatively. He supported Taylor in his plans for the installation of scientific management ideas reform but his naval career superseded, should it come to a head, any commitment to his desire for substantial reform.

Goodrich might have been Taylor's oldest ally, but he was not his most ardent supporter. That title belonged to another officer. Naval Constructor Holden A. Evans discovered Taylor through a combination of word of mouth and professional development.<sup>362</sup> Taylor's reputation, for ill or well, gained considerable reach with his publication of *Shop Management*, and his notoriety increased as a result of well-publicized conflicts with labor leaders. Whereas Goodrich's appreciation and application of Taylor's management system had logical and reasonable limits, Evans had no such compunctions. He deliberately, if with a degree of relish, sacrificed himself on the shrine of Taylorism and in the name of efficiency.<sup>363</sup>

Ideas have the potential to ignite a fire in the hearts of those who embraced them. Such individuals are driven by single-minded commitment and a belief in the purity of their cause. They will immolate others, and even themselves, to see those beliefs realized. Inspired by Taylorism, Evans sacrificed his marriage and later his career in a crusade to

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<sup>361</sup> Frederick Taylor to C.F. Goodrich, May 7, 1891, Box 21, Frederick Winslow Taylor Collection.

<sup>362</sup> H.A. Evans to Frederick Taylor, June 28, 1906, Box 116, Frederick Winslow Taylor Collection.

<sup>363</sup> Holden A. Evans, *One Man's Fight for a Better Navy* (New York: Dodd, Mead, 1940), 182.

implement scientific management in America's naval yards.<sup>364</sup> The title of his autobiography, *One Man's Fight for a Better Navy* (1940) conveys the solitary tenor of his journey.<sup>365</sup>

Holden A. Evans graduated from the Naval Academy in 1892. Poor health nearly aborted his career before it was launched. However, fate smiled on young Evans. His father was a "life-long" friend of then Secretary of the Navy Benjamin F. Tracy. A cordial meeting put the matter to rest in minutes.<sup>366</sup> However, an unfortunate conversation between Evans and Secretary Tracy placed Evans as a line officer rather than a supervisor of naval construction. This occurrence demonstrates a clear demarcation between Goodrich and Evans. While Evans desired nothing more than a career in the field of shipyard management and eschewed a life on the line, Goodrich loved the life of a line officer and wanted nothing to do with naval yards. After a short tour as a line officer Evans was sent to Glasgow University for an education in naval architecture and shipbuilding.<sup>367</sup> In 1897, he reported to Newport Navy Yard to begin his career as a naval constructor.<sup>368</sup>

On June 28, 1906, Evans, writing from the Navy Yard at Mare Island California, dispatched the first of many letters to Taylor.<sup>369</sup> In this missive he requested a half-dozen articles and Taylor's monograph, *Shop Management*, because he was, "...anxious to go further into this subject..."<sup>370</sup> Evans was ambitious and curious, a powerful combination for change. A prolific publicist, Taylor rarely wasted time responding to requests for information about his methods. True to form, Taylor replied to Evans's request on July 4,

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<sup>364</sup> Ibid., 88.

<sup>365</sup> Evans, *One Man's Fight for a Better Navy*.

<sup>366</sup> Ibid., 59,60.

<sup>367</sup> Ibid., 90.

<sup>368</sup> Ibid., 111.

<sup>369</sup> Evans to Taylor, June 28, 1906.

<sup>370</sup> Ibid.



1897 and included a recently published article titled the “Piece Rate System.” He then noted that he had “forwarded the balance of your [Evans’] lists of pamphlets to the American society of Mechanical Engineers, with the request to them to forward these papers to you.”<sup>371</sup> Taylor had been elected president of the ASME that same year and made use of the organization’s staff to deal with such matters.

Over the next several years, Taylor found himself favorably positioned between Crozier with the Army and Goodrich and Evans with the Navy. Crozier and Goodrich both exercised a degree of caution in their implementation of shop management, while Evans utterly abandoned himself to the cause. Driven by his belief in Taylorism and infused with youthful idealism, his single-minded pursuit of efficiency nearly matched that of Taylor himself. He was not so fortunate in dealing with resistance within the system to his advocacy of scientific management. Taylor, unlike Evans, was positioned to weather the political fallout that was inevitable. Crozier and Goodrich understood that turmoil with shipyard workers might well sink any prospects, and their careers, of implementing change.

Nevertheless, Taylor and Evans continued an active correspondence over the next several years, especially during 1906-1909. Taylor, as he frequently did with bright prospects, invited Evans to come to Philadelphia to see shop management in action, Taylor suggested a stay of a “week to ten days” that he might “grasp the whole system.”<sup>372</sup> Taylor’s invitations extended to others, but one other important group -men of influence- found similar favor.

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<sup>371</sup> Frederick Taylor to H.A. Evans, July 4, 1906, Box 116, Frederick Winslow Taylor Collection.

<sup>372</sup> Frederick Taylor to H.A. Evans, April 29, 1907, Box 116, Frederick Winslow Taylor Collection; H.A. Evans to Frederick Taylor, July 30, 1906, Box 116, Frederick Winslow Taylor Collection.

Taylor discovered by chance, or perhaps it was by design, that shop management found greater success with a two-pronged attack. In essence, it appears that he attempted to influence engineers, builders, and practitioners such as Evans, men at the roots. If naval constructors and their counterparts in other industrial establishments adopted shop management for its benefits, then it propagated naturally throughout the organization.

Taylor possessed a sort of scientific mystique, an aura of confidence that caused people to admire him for mastery of a complex subject. The intellectual prowess of such individuals produces an allure, a magnetic attraction that conflates reality with magic within the apprentice. The master demonstrates an ability to elucidate data with elegance and precision that infects the novice with curiosity and enthusiasm. That sort of person connects opaque relationships between disparate aspects of the topic that appear obvious and self-evident but only in retrospect. Taylor had this in spades.

As previously discussed, the most common terms for Taylor's ideas were shop management, Taylorism, and scientific management. The idea evolved with time like the term itself. Initially, shop management aimed primarily at improving the mechanistic elements of a factory. Later, the idea evolved and applied to the individual, not just motions, but to thought. Evolution of the concept produced the more powerful element of scientific management.

Evans, the paragon naval constructor, found himself gripped by Taylor and his system. However, methods and processes alone do not generate the emotional appeal, the fervent dedication exhibited by Evans. Rather, such adherents began to grasp quite early the potential of Taylor's system.<sup>373</sup> For Evans it was a subtle, but natural, step from efficient

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<sup>373</sup> H.A. Evans to Frederick Taylor, December 29, 1906, Box 116, Frederick Winslow Taylor Collection.

action to efficient thought. He believed it was a matter of time until shop management became the law of the land.

Taylor's second mechanism for the promulgation of his ideas aimed to influence those at the top. For example, he met with President Theodore Roosevelt, the Secretary of the Navy and the Assistant Secretary of the Navy to discuss his system. He met with senators and invited them to visit his shops, as he did with Evans. Furthermore, Taylor appeared at congressional hearings both to further and at times defend his system. He frequently entered into the most powerful circles of American politics.

The Navy proved more important than did the Army to ensure the success of Taylorism. Complicated machines such as tanks had yet to be invented, and wheeled vehicles played only a minor role in the Army production and procurement system at the turn of the century. On the other hand, the Navy produced ships ranging from frigates to dreadnoughts, the largest machines the world had seen. As well, naval yards were highly visible, being located in or near large metropolitan areas, and they employed significant numbers of workers. The public and politicians remained keenly attuned to any changes at the yards. Thus, navy yards promised to be a marvelous site for the implementation of the principles of scientific management.

However, Taylor and his disciples faced some giant obstacles. If Frederick Taylor was David of Old Testament fame, the workers and their embryonic unions proved to be his Goliath--albeit an adversary that never quite stayed dead. Taylor fought them at every turn. He fought them in private industry. He fought them in the armories. He fought them in the

naval yards. He fought them in government.<sup>374</sup> But he did not fight them alone. His war on inefficiency enlisted capable men in every theater of action listed above.

Taylor's disciples in the Navy, primarily naval officers responsible for ship construction, demonstrated an unusual degree of loyalty to Taylor and his theories. Line officers were found in their ranks as well, but their numbers were limited. Taylor engendered this fidelity by nurturing personal relationships and advising his loyal supporters whenever they encountered an obstacle. He regularly advised Crozier and Evans, among others, as to how to deal with workers and unions.<sup>375</sup>

On 30 August 1907, Evans dispatched a letter to Chief Constructor W.L. Capps, Commandant of the Navy Yard at Mare Island, California. The formal request entitled, "Piece work- Recommended for scaling outside plating of ships" in which he enumerated point-by-point the reasons and benefits of this system. Evans ended the missive with his most compelling point, stating that "...piece work was briefly discussed with the Honorable Secretary of the Navy during his visit to this yard and I was informed by the Secretary that he would approve piece work..."<sup>376</sup> As it turned out, the letter to Capps proved a mere formality. Less than a month later Evans had his answer. Piecework was a go.<sup>377</sup> The letter to Capps proved a mere formality.

President Theodore Roosevelt-- a pragmatist in the truest American sense-- valued utility and efficiency. He made clear those values to members of his cabinet. Thus, Secretary of the Navy Victor H. Metcalf had no real objections to Evans' proposal for

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<sup>374</sup> H.A. Evans to Frederick Taylor, April 19, 1907, Box 116, Frederick Winslow Taylor Collection.

<sup>375</sup> Taylor to Evans, April 29, 1907.

<sup>376</sup> H.A. Evans to W. L. Capps, August 30, 1907, Box 116, Frederick Winslow Taylor Collection.

<sup>377</sup> W. L. Capps to H.A. Evans, September 20, 1907, Box 116, Frederick Winslow Taylor Collection.

piecework at the navy yards, although it was initially limited to wood caulking.<sup>378</sup> Capps, of course, followed suit. In his response he directed Evans “...to keep a careful record of the quantities and costs of piecework scaling done...” for comparison purposes.<sup>379</sup> From his conversation with Secretary Metcalf, Evans inferred, “...that he would look with favor on recommendations for the extension of the piece work system.”<sup>380</sup> Over the following months, Evans wasted little time in implementing and extending piecework at the Mare Island shipyard.

Evans and Taylor continued to exchange ideas on piecework and shop management. In fact, Evans stated in one communication on 27 July 1908, “your [Taylor’s] opinion is so valuable that I have taken the liberty of forwarding your letter...to the Navy Department.”<sup>381</sup> This demonstrated Evans’ faith that Taylor’s opinion not only that those in the Navy would know of Frederick Taylor but that his views carried significant weight. Taylor found himself in a unique position. Because of his friendship with Goodrich and Evans he had the potential to exert significant influence, and he did so as an intermediary shuffling situational or tactical level information from lower to upper echelons, a not uncommon tactic that leaders frequently employ to get unfiltered information. Evans once cautioned Taylor about blatant meddling.<sup>382</sup> The Navy might not look kindly on this kind of collusion if revealed.

The outlook improved for Taylor and Evans with the appointment of Truman H. Newberry to the position of Secretary of the Navy in December, 1908. Newberry, who had a

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<sup>378</sup> Evans to Capps, August 30, 1907.

<sup>379</sup> Capps to Evans, September 20, 1907.

<sup>380</sup> Evans to Capps, August 30, 1907.

<sup>381</sup> H.A. Evans to Frederick Taylor, July 27, 1908, Box 116, Frederick Winslow Taylor Collection.

<sup>382</sup> Ibid.

background in industry, appeared uniquely open to shop management. However, Newberry's interest extended only to the ends with little regard to the means. If scientific management increased efficiency, and in the end saved money, he fully supported it.<sup>383</sup> More importantly, Herbert L. Satterlee, the new Assistant Secretary of the Navy, appeared determined, as Evans reported to Taylor, "... to thoroughly reorganize the methods in the navy yards."<sup>384</sup> The future looked bright for scientific management.

In 1908, Evans enumerated in an article, "An Analysis of Machine-Shop Methods," the processes being implemented to increase efficiency. Evans repeatedly addressed the "...belief that all Government shops are inefficiently managed..." a belief with which he explicitly disagreed.<sup>385</sup> Yet, his arguments belied his own situation. Evans used considerable ink to catalog the problems that government officials faced that civilian counterparts did not. In his view, unions, bureaucratic entanglements, and lazy government workers combined to reduce the efficiency of naval yards. To combat these maladies, Evans noted, "I, however, believe that stop-watch time studies, as advocated by Mr. Taylor, can be used to great advantage in fixing standard time for premium system."<sup>386</sup>

Taylor's influence over Evans is unmistakable. Evans' titled his 1908 article "An Analysis of Machine-Shop Methods" a tribute to Taylor's *Shop Management*. Evans confessed, "I have been much impressed with the teachings of F.W. Taylor..."<sup>387</sup>. He also noted intellectual inspiration from F.A. Halsey, a prominent mechanical engineer and long time editor of the *American Machinist*. While Evans acknowledged his intellectual debt to

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<sup>383</sup> H.A. Evans to Frederick Taylor, November 12, 1908, Box 116, Frederick Winslow Taylor Collection.

<sup>384</sup> Ibid.

<sup>385</sup> Holden A. Evans, "An Analysis of Machine-Shop Methods," *American Machinist* 31, no. 1 (1908): 568.

<sup>386</sup> Ibid., 569.

<sup>387</sup> Ibid., 569.

Halsey, Evans' published works and his correspondence demonstrated how important was Taylor's influence.

On 19 November 1908, Taylor wrote Evans to stress the importance of getting the Secretary of the Navy to approve the methods of scientific management.<sup>388</sup> Taylor and Evans were working against the clock, for time and politics were not on their side. They needed to implement the system and net significant results before the unions gained adequate support to halt the process of implementing the reforms. Without the data yielded by the initial changes, they stood little chance of defending their methods if the political winds shifted against them. Scientific management necessitated a significant amount of data collection, sometimes called "red tape" by its advocates.<sup>389</sup> Objections to what was perceived as unjustified experimentation served as one focal point for resistance to scientific management.

In 1909 storm clouds formed on the horizon. The incoming William H. Taft administration appeared more sensitive to union concerns than had that of Theodore Roosevelt. Evans' window of opportunity to implement scientific management at Mare Island Navy yard was fast closing. Taft wasted little time in replacing Newberry with George von Meyer as Secretary of the Navy in March 1909. Meyer's specific feelings toward scientific management remained an open question, much debated, in the first few weeks after he took office. However, within the Navy bureaucracy resistance was growing noticeably and quickly. Taylor lamented to Evans, some three weeks after Meyer's

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<sup>388</sup> Frederick Taylor to H.A. Evans, November 19, 1908, Box 116, Frederick Winslow Taylor Collection.

<sup>389</sup> Ibid.

confirmation, “it seems most unfortunate that Newberry was not allowed to continue the fine work he had the nerve to start.”<sup>390</sup>

Taylor’s fear was confirmed when he received a letter from Evans on 15 October, 1909. Scientific management had not progressed fast enough in the navy yards. Union and bureaucratic opposition combined to force Evans and Taylor on the defensive. Meyer abandoned Newberry’s plans, as Taylor predicted because, “results had not been obtained from Mr. Newberry’s scheme.”<sup>391</sup> The initiative authorized by Secretary Newberry ran from February to July, hardly enough time to fairly adjudicate a method so complex and encompassing. The sun had set on the acceptance of scientific management by the United States Navy—at least for a time.

Evans floundered during the following months. Scientific management was more than a system, process, or method to him. Despair shadowed everything, as his deep and abiding belief, purpose in life, all his work turned, it seemed, to ashes. This loss was made all the more acute because what had happened flew in the face of logic. Meyer’s policy shifted with the political winds of labor policy, not on a basis of efficiency or what was best for the Navy. Shrewd political maneuvering and primal emotions drove these changes, and to a logical man such as Evans, emotions and politics seemed as arbitrary and random as a hurricane or flood. On 16 October, Evans confided in Taylor, “...I will never quit, but there is no use of expending one’s life in work where the conditions are such as to make it impossible to produce results.”<sup>392</sup> One of the official explanations proffered by the Meyer administration asserted...that the problem of handling shops of Navy Yard is a military

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<sup>390</sup> Frederick Taylor to H.A. Evans, March 29, 1909, Box 116, Frederick Winslow Taylor Collection.

<sup>391</sup> H.A. Evans to Frederick Taylor, October 15, 1909, Box 116, Frederick Winslow Taylor Collection.

<sup>392</sup> H.A. Evans to Frederick Taylor, October 16, 1909, Box 116, Frederick Winslow Taylor Collection.



rather than an industrial problem.”<sup>393</sup> To Evans and other proponents of scientific management, he claim was as thin as the paper it was written on.

However, the darkness was not all encompassing. Assistant Secretary of the Navy Beekman Winthrop demonstrated some interest in scientific management.<sup>394</sup> His support was qualified since, as Evans wrote Taylor, “...he wants to find out for himself the best methods.” Evans primed Taylor to expect a potential telephone call from Winthrop.<sup>395</sup> Meanwhile, he attempted to ameliorate some of his anxiety through prodigious correspondence, firing off three letters to Taylor in four days. On 15 October 1909, Evans again approached Taylor for help. For Evans, Taylor represented the final hope to overcome the resistance, the last reserve, the Old Guard. He wagered Taylor leveraged against Winthrop could place scientific management, perhaps under a different guise, back into the navy yards.<sup>396</sup>

In the interim, Evans published an article, “Reduction in Cost of Navy Yard Work” that captured his broader thoughts on scientific management within the naval establishment.<sup>397</sup> Evans had implemented scientific management, at least in part, several years before Crozier. Predictably, his attempts generated no small measure of discontent from workers and presaged similar unhappiness that occurred later at Watertown. However, Evans observed, “...another difficulty which probably every manager encounters when he attempt to introduce some radical improvement, that is, the opposition of his workmen...probably due to two causes... natural conservatism of workmen...and it gave the

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<sup>393</sup> Evans to Taylor, October 15, 1909.

<sup>394</sup> H.A. Evans to Frederick Taylor, October 12, 1909, Box 116, Frederick Winslow Taylor Collection.

<sup>395</sup> Ibid.

<sup>396</sup> Evans to Taylor, October 15, 1909.

<sup>397</sup> Holden A. Evans, “Reduction in Cost of Navy Yard Work,” *American Machinist* 33, no. 1 (1910): 3.

men less time to stand around.”<sup>398</sup> In his mind, workers disliked progress and were inherently lazy. Now he discovered the politicians played the part- and better.

Evans acknowledged in this article that, “...our navy yards have a poor reputation among business men and managers” in regards to efficiency.<sup>399</sup> He stressed that, the complex nature of work at the navy yards militated against any easy fixes. Only the application of Frederick Taylor’s theories would correct the problems.

It is clear that Taylor’s influence continued to spread throughout the constructor corps.<sup>400</sup> Name recognition of Taylor and Taylorism fueled both the spread and opposition to his methods. His work *Shop Management*, published nearly seven years before, gained considerable traction by 1910. The term scientific management, not coined until 1910 and not by Taylor, implicitly conveyed the idea of factual, eternal and universally applicable laws to increase efficiency. Men since the age of Aristotle had looked for the magic key to unlock the mystery of creation and Taylor, as it pertained to efficiency, appeared to have found the answer.

Evans remained steadfast in his faith. Unwilling to bend or rescind his methods, his days at Mare Island were numbered. The Navy, by the middle of 1910, reassigned Evans from the Mare Island Navy Yard.<sup>401</sup> There was no need to speculate as to the cause of his removal. Nevertheless, the seeds of a powerful idea had taken root. Evans’s “detachment” did not necessarily reduce his influence. Those who had not, by mere proximity, stumbled onto Taylor’s methods were led there by men like Evans.

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<sup>398</sup> Evans, “An Analysis of Machine-Shop Methods,” 156.

<sup>399</sup> Evans, “Reduction in Cost of Navy Yard Work,” 1200.

<sup>400</sup> H.A. Evans to Frederick Taylor, July 26, 1910, Box 115, Frederick Winslow Taylor Collection; G. S. Radford to Frederick Taylor, December 3, 1910, Box 117, Frederick Winslow Taylor Collection; G. A. Bisset to Frederick Taylor, “G.A. Bisset, Letter to Frederick Taylor,” November 29, 1910, 116, Frederick Winslow Taylor Collection.

<sup>401</sup> F. G. Coburn to Frederick Taylor, September 20, 1910, 116, Frederick Winslow Taylor Collection.

For example, in 1910 Evans introduced Navy constructor A.G. Coburn to Taylor.<sup>402</sup> Following their initial meeting, Coburn requested pamphlets, much as Evans had back in 1906.<sup>403</sup> Taylor's charm was evident here as well. Coburn noted, "...I feel the need of a first hand inspiration to keep me going for a while under the conditions which as you know are extremely uncomfortable."<sup>404</sup> Taylor promptly responded on 22 September writing: "...It would give me very great pleasure to have you come to my house," Taylor wrote, "at any time when you are in the neighborhood..."<sup>405</sup>

Furthermore, Taylor suggested that Coburn go to the Army's Watertown Arsenal and observe the system in action. On Taylor's recommendation, Carl Barth had worked there with Crozier to implement scientific management.<sup>406</sup> Taylor thus acted as a conduit to route a naval officer to an Army armory. Presumably, the informed naval officer, having observed scientific management in practice at an armory sanctioned by the government, and then returned to a naval yard to enact it, a form of intellectual cross-pollination. In early October Coburn briefly stayed with Taylor at his home.<sup>407</sup>

With time on his hands after his departure from Mare Island, Evans requested extended leave for advanced study under Taylor in scientific management. The request, despite a positive referral from Admiral Richard M. Watt, was denied.<sup>408</sup> The atmosphere had shifted decisively against scientific management, at least the kind advocated by Evans. Taylor wrote to Watt regarding what he termed the incoherence of the Taft administration. "It is, however, extraordinary", Taylor observed, "when one realized that the same

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<sup>402</sup> Evans to Taylor, July 26, 1910.

<sup>403</sup> Coburn to Taylor, September 20, 1910.

<sup>404</sup> Ibid.

<sup>405</sup> Frederick W. Taylor to F. G. Coburn, September 22, 1910, 115, Frederick Winslow Taylor Collection.

<sup>406</sup> Ibid.

<sup>407</sup> F. G. Coburn to Frederick Taylor, October 7, 1910, 116, Frederick Winslow Taylor Collection.

<sup>408</sup> R. M. Watt to Frederick Taylor, December 12, 1910, 115, Frederick Winslow Taylor Collection.

methods which are so severely condemned and which are being, "...torn out of the navy yards, are being introduced by General Crozier at Watertown with great rapidity and in the most thorough manner."<sup>409</sup> Taylor found that the Army armories proved a strong bulwark against hostility of politicians.

Taylor informed Watt that Crozier planned a meeting in early 1912 of the commanders of all arsenals for the purpose of "introducing the same methods."<sup>410</sup> If Secretary Meyer wanted a "thoroughly impartial" witness as to the viability of scientific management, Taylor argued, Crozier fit the bill.<sup>411</sup> Failing that, Taylor sought a meeting with President Taft.<sup>412</sup> Unfortunately, as Taylor recalled, the meeting lasted less than a minute.<sup>413</sup> In that span the president demonstrated little interest in scientific management or the Evans "matter." The president bluntly stated, "...he of course could not have much interest in a system which was in opposition to the view of the Secretary of the Navy."<sup>414</sup> Thus, the roadblock to acceptance of scientific management appeared to be, at least officially, Secretary of the Navy Meyer.

The treatment of Evans caused a high degree of resentment among fellow naval constructors. Coburn called the administration "shortsighted" and "bigoted" in its treatment of Evans' "case."<sup>415</sup> However, like Evans, Coburn expected little sympathy for Taylor's methods at his new duty station. Indeed, Taylor warned his protégée with a touch of sarcasm: "You will not...find the commanding officer... at League Island in great

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<sup>409</sup> Frederick Taylor to R. M. Watt, December 15, 1910, 116, Frederick Winslow Taylor Collection.

<sup>410</sup> Ibid.

<sup>411</sup> Ibid.

<sup>412</sup> Frederick Taylor to R. M. Watt, January 12, 1911, 115, Frederick Winslow Taylor Collection.

<sup>413</sup> Ibid.

<sup>414</sup> Ibid.

<sup>415</sup> F. G. Coburn to Frederick Taylor, February 7, 1911, 116, Frederick Winslow Taylor Collection.

sympathy with anything which involved progress.”<sup>416</sup> Taylor knew this because he resided not far from the League Island facility. Perhaps the only benefit of the new assignment was Taylor and Coburn would now see a great deal more of each other.

Most of Taylor’s naval contacts resided in the constructor corps amongst engineers and those in the navy yards, Goodrich being an obvious exception. However, one other source of support emerged—from a line officer. Taylor received an intriguing letter from Lieutenant W.B. Tardy on 6 February 1911. Tardy, a student of scientific management, inquired of Taylor whether an engineering section on board a ship might benefit significantly from such an organization.<sup>417</sup> Tardy noted, that if correct, delineating the time it took to do each job allowed for multiple improvements and increased efficiency aboard the battleship. With this action, scientific management expanded from shore to ship. The tasks were similar, but the context had changed.

A peculiar situation existed in the period before World War I. Meyer persistently touted the failures of scientific management, and naval officers, especially constructors, continued to implement it.<sup>418</sup> It is difficult to gauge the prevalence or popularity of Taylor’s methods in the Navy at this time. Suffice it to say that Meyer’s vocal opposition provided a valuable benchmark. Meyer was not totally opposed to the methods of scientific management, but he was opposed to anything that had Taylor’s name stamped on it. Where Taylor’s name popped up, storms followed. Taylor himself recognized that he was toxic. In a letter of 11 February 1911, he warned Tardy, “...I feel you will be more likely to succeed by calling your system ‘scientific management’ rather than branding it as the

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<sup>416</sup> Frederick Taylor to F. G. Coburn, February 13, 1911, 116, Frederick Winslow Taylor Collection.

<sup>417</sup> W. B. Tardy to Frederick Taylor, February 6, 1911, 115, Frederick Winslow Taylor Collection.

<sup>418</sup> Frederick Taylor to W. B. Tardy, January 31, 1911, 115, Frederick Winslow Taylor Collection.

Taylor system.”<sup>419</sup> General Crozier was aware of this sentiment as well, but thought Taylor deserved the name and the fruits of his labor.<sup>420</sup>

Whatever Meyer’s motivations and the political intrigue involved, in March 1911, he instructed Captain Andrews to invite Taylor, as the Secretary’s guest, to come aboard the U.S.S. *Dolphin*. From there the two would move to view naval gunnery in action on the U.S.S. *Vermont*.<sup>421</sup> Tardy also briefly spoke with Meyer who, “sincerely hopes he [Taylor] will accept” the invitation and for Tardy to ensure that he did.<sup>422</sup> This provided the two men ample time to discuss the merits of scientific management. From the moment he was sworn in Meyer had crushed every sign of Taylorism in the Navy, including reassignment of officers, like Evans, who got in his way. Now, it appeared, the invitation to Taylor, the embodiment of the movement, to dine aboard ship suggested that Meyer’s tune had changed. But every song comes to an end.

In a brazen breach of decorum Tardy implored Taylor to accept the Secretary’s invitation.<sup>423</sup> If Taylor’s record was any indication, he needed little prompting to accept Meyer’s offer. Dismissed by Meyer and deflected by Taft in 1909, Taylor now sensed a breach in the political barricade. With the characteristic conviction of a true believer, he charged in. Tardy played a dangerous game by dancing on the boundary line of collusion. However, Taylor and Tardy were family friends and their relationship, akin to that with Goodrich, provided Taylor with an inside seat.

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<sup>419</sup> Ibid.

<sup>420</sup> Crozier, “Scientific Management in Government Establishments.”

<sup>421</sup> W. B. Tardy to Frederick Taylor, March 27, 1911, 115, Frederick Winslow Taylor Collection.

<sup>422</sup> Ibid.

<sup>423</sup> Ibid.

Meyer's move toward scientific management caused a corresponding shift in the Navy. Officers and agents of scientific management now began to move out of the shadows. A jubilant Tardy observed to Taylor, "it looks to me, from what is apparent and what I get behind the scenes that the time is ripe for you to add the Navy scalp to your belt."<sup>424</sup> If Evans's career had suffered because of his belief in scientific management, Tardy sought to profit by the association with Taylor. Furthermore, Tardy's proximity to the Secretary provided him with confidential information about Meyer's naval plans that he shared with Taylor.<sup>425</sup>

In a hand written letter of 27 March 1911, after a friendly preamble, Tardy spelled out his plan. "My reasons for sending you a manuscript letter", Tardy explained, "instead of a typewritten one is because I am going to say things that I don't want a yeoman or clerk to see."<sup>426</sup> He no longer was dancing along the line of collusion; he clearly had chosen to erase it. Tardy described his plans in detail to Taylor:

...why I am so anxious to have you accept. Now for a little more prospective history, which will unfold other personal reasons why it is necessary to my career almost that you come. I am given to understand that I am to become a member of the board of officers who are to visit scientific [management] shops. That if I make good in that capacity I am to become the Secretary's aid for Navy yard organization and management. I believe I have a pretty clear concept of all the underlying principles of the Taylor system of management and I know that I am in full sympathy with you...now is the critical opportune moment for you to advance your religion of management by adding the Navy to the numbers of organizations that are operating under Taylor system of management. You can help me in my ambition to be of value to the service and to render you loyal assistance in reorganizing Navy Yards. You see if I am the officer designated to work with your representative and to see that each yard advances as rapidly and as uniformly as possibly you not only do not have a reactionary in me, but you have an enthusiastic disciple who will avail

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<sup>424</sup> Ibid.

<sup>425</sup> Frederick Taylor to R. M. Watt, March 29, 1911, 115, Frederick Winslow Taylor Collection.

<sup>426</sup> Tardy to Taylor, March 27, 1911.

himself of all the counsel you may care to give...please regard the above as confidential for the present.<sup>427</sup>

Taylor happily accepted the Secretary's invitation on 30 March, 1911.<sup>428</sup> No longer the pariah, fortune again smiled on his endeavors. The naval exercise was a success for all interested parties. Taylor felt liberated, if not vindicated. Tardy received the support he needed and the affirmation of the Secretary. And Meyer was now informed on the matter of scientific management. Taylor, confided in Admiral Watt, "I devoted all of my time with Mr. Meyer to this end..."<sup>429</sup>

Tardy wrote Taylor on 11 April to inform him that, as predicted, he had been appointed to a board assigned to investigate scientific management at various shops.<sup>430</sup> Tardy suggested to Secretary Meyer that Evans be appointed to the board because of his expertise in scientific management. Taylor, likewise, defended Evans at length while aboard the *Dolphin* and *Vermont* in the hope of mending the rupture between the two men.<sup>431</sup> The Secretary took the request under advisement. Tardy informed Taylor that "the Secretary authorized me to tell you [Taylor] in confidence that he had take up with Watt the question of appointing Evans to this Board, and that Watt thought Evans lacked judicial balance..."<sup>432</sup>

But matters were not as they seemed. Taylor promptly responded in a missive, on April 13, to Tardy. According to Taylor, Watt remembered the conversation quite differently. "Watt told me he strongly recommended Evans as a member of this Board,"

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<sup>427</sup> Ibid.

<sup>428</sup> Frederick Taylor to W. B. Tardy, March 30, 1911, 115, Frederick Winslow Taylor Collection.

<sup>429</sup> Frederick Taylor to R. M. Watt, April 10, 1911, 115, Frederick Winslow Taylor Collection.

<sup>430</sup> W. B. Tardy to Frederick Taylor, April 11, 1911, 115, Frederick Winslow Taylor Collection.

<sup>431</sup> Taylor to Watt, April 10, 1911.

<sup>432</sup> Tardy to Taylor, April 11, 1911.



Taylor recounted, “and stated that he was better qualified than anyone else in the Construction Corps... The Secretary refused to have Evans because he claimed Evans had attacked him in the press.”<sup>433</sup> Given the recommendation by Watt that Evans be allowed to take a year of leave to study under Taylor, the Secretary’s assertion appeared questionable. The rupture remained, and experienced U.S. Navy constructor, G.H. Rock, and Charles Conrad Paymaster of the Navy, were named the other members of the Board.

Taylor’s complex management methods required significant training and education. Without proper training, scientific management appeared burdensome to the uninformed. Copious records and detailed processes seemed unnecessary, and for the worker the requirement for rigorous repetition caused frustration and anger. Taylor feared that, lacking extensive education about methods, the board members would view scientific management “...as embodying a vast amount of red tape, the real meaning of which they would in no way appreciate.”<sup>434</sup> To forestall any such judgment, Taylor hosted the board, at his home in late April, 1911.<sup>435</sup> Its members made clear their commitment to impartiality and objectivity, and assured Taylor that he had nothing to fear from the board. The threat emerged from another quarter.

By August 1911 Taylor had defeated or outmaneuvered those who opposed implementation of scientific management in government workshops. Tardy was poised to introduce scientific management on a larger scale. And, surprisingly, Meyer relented and allowed Evans to join the board.<sup>436</sup> Evans also became a member of Admiral Charles E.

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<sup>433</sup> Frederick Taylor to W. B. Tardy, April 13, 1911, 115, Frederick Winslow Taylor Collection.

<sup>434</sup> Ibid.

<sup>435</sup> W. B. Tardy to Frederick Taylor, June 3, 1911, 115, Frederick Winslow Taylor Collection.

<sup>436</sup> W. B. Tardy to Frederick Taylor, July 23, 1911, 115, Frederick Winslow Taylor Collection; Frederick Taylor to W. B. Tardy, August 1, 1911, 115, Frederick Winslow Taylor Collection.

Vreeland's commission, which was also working on modern management for Navy Yards.<sup>437</sup> In principle, the Navy accepted scientific management as offering superior methods that if employed improved efficiency. Officers agreed on that much. Now the question revolved around the details of what would be done. Taylor assumed, as late as 27 August, that Meyer's introduction of scientific management was only a matter of time.<sup>438</sup>

On 12 October Taylor received a shocking letter from G.S. Radford, inclosing a newspaper clipping from the *Washington Post*. The article, "Will Try New Navy Plan: Sec Meyer to Import English System," indicated the possibility of Meyer moving in a different direction than he had intimated to Taylor.<sup>439</sup>

Washington, Oct 8—Casting aside all scientific systems of Navy Yard management advocated in this country, because he believes they involve too much detail and require serious changes to the Civil Service rules of employment, Sec of the Navy Meyer will import from England the system of management in use by Vickers, Limited...Every one in the Navy, it is said, except possibly some radical bureau or corps partisans, will welcome a system whereby the commandant will again be the chief of all matters at a Navy Yard.<sup>440</sup>

Meyer had once again changed his mind. He appeared to be steering by sail rather than rudder. Like most bureaucrats of the time, he appeared to be guided by the political winds. The *American Machinist* captured the confusion in a 11 April, 1912 article, "The Vickers System of Management." The piece stated: "Engineers and machinery builders in

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<sup>437</sup> W. B. Tardy to Frederick Taylor, August 28, 1911, 115, Frederick Winslow Taylor Collection.

<sup>438</sup> Frederick Taylor to M. H. Karker, August 27, 1911, 115, Frederick Winslow Taylor Collection.

<sup>439</sup> The Washington Post, "Will Try New Navy Plan: Sec Meyer to Import English System," *The Washington Post*, October 9, 1911.

<sup>440</sup> Ibid.

America were considerably surprised a few months ago to learn that Secretary of the Navy Meyer had decided against all of the systems of shop management in use in this country and determined to install the Vickers system of management from the great British.”<sup>441</sup> The dramatic shift in policy caught civilian and public engineers by surprise.

It is noteworthy that Meyer did not entirely torpedo the idea of scientific management. Instead, he separated the concept from its creator. Anything attached to Taylor’s name, in any form, became flotsam and was jettisoned overboard. Needing a substitute for Taylorism, Secretary Meyer dispatched two captains observe English production methods at Vickers, the giant manufacturing company producing every thing from steel castings to machine guns. Neither of the officers had any experience in scientific management.<sup>442</sup> Taylor cynically remarked to Radford that their trip will “no doubt... be a great success.”<sup>443</sup> Notably, their trip to inspect the Vickers factory lasted a mere two weeks.

Secretary Meyer in the 1911 Annual Report of the Navy Department stated:

I found in England, at the works of Messrs. Vickers (Ltd.), at Barrow- in-Furness, a most efficient simple system of management. Briefly, it may be said that this establishment has an engineering department and a shipyard department, with an electrical division under the engine department. They arrange, in the larger jobs, for the orderly passage of the separate parts from one shop to another, instruct the workmen how to work most efficiently, and follow the separate operations, by means of a corps of skilled progress men, until the assembly is completed. In a general way the work is thoroughly systematized on common-sense principles, but no attempt is made to go into the forecasting of minute details. In consequence the extra cost of elaborate planning is avoided. The greatest percentage of increased efficiency seems to have been attained by broad effects in systematization and in securing the cheerful cooperation of the workmen toward best results through proper recognition of their initiative and more efficient effort. The management at Vickers is thoroughly convinced that excessive prevision of detail does not pay. The

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<sup>441</sup> “The Vickers System of Management,” *American Machinist* 36 (April 11, 1912): 573.

<sup>442</sup> Frederick Taylor to G. S. Radford, October 24, 1911, Box 117, Frederick Winslow Taylor Collection.

<sup>443</sup> Ibid.

company is confirmed its experience at one of its own plants, at Erith, England, where for between three and four years there had been installed one of the most elaborate of the scientific management systems with unsatisfactory results.<sup>444</sup>

Meyer's motivations were questionable as they related to scientific management.

Perhaps Taylor's system did require too much paper work. Taylor himself noted that without adequate training novices failed to grasp the importance of detailed quantification.<sup>445</sup> However, Meyer also wanted a system that did not require years of training and education to be employed. Taylorism in that respect failed to meet a key threshold.

Meyer, along with the heads of other governmental entities, created multiple boards to study Taylorism. The completed reports generally concurred that the Navy Yards required organizational and management changes. Taylor's vast network of disciples always seemed to find their way onto these committees. Names like Henry L. Gantt, Harrington Emerson, Hollis Godfrey and Charles Day populate the literature on scientific management. After all, they were the efficiency experts. Their conclusions were what one might expect from a group of men associated with Taylor.<sup>446</sup>

Nevertheless, Meyer's opposition focused on Taylor himself. A system by another name such as provided by the Vickers investigation provided Meyer with the pretense he needed. H. F. Wright, a naval constructor, noted to Taylor on 9 November 1911, "I am more than ever convinced that the intention of those in authority is to institute scientific management as understood by you and to call it by another name."<sup>447</sup> Taylor replied on the

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<sup>444</sup> George von L. Meyer, "Annual Report of the Secretary of the Navy" (Washington, D.C., 1911), 22.

<sup>445</sup> Taylor to Tardy, April 13, 1911.

<sup>446</sup> Douglas D. Wilson, ed., "Report of the President of District No.44," *Machinists' Monthly Journal* 25 (1913): 1132; "Navy Yard System Is Declared Faulty," *New York Times*, March 9, 1912; "Scientific Management in the Navy," *Naval Institute Proceedings* 37 (1911).

<sup>447</sup> H. F. Wright to Frederick Taylor, November 9, 1911, Box 117, Frederick Winslow Taylor Collection.

13 November, “ he would like to get any benefits that would come from the principles of scientific management, but would prefer branding them as the Meyer System rather anything else.”<sup>448</sup> Taylor knew his name evoked resistance. However, the animosity between Taylor and Meyer had become personal. Taylor felt betrayed by Meyer after his overtly friendly gesture six months earlier.

One day later, Taylor disclosed to Coburn that the Army’s leadership provided solid support for scientific management. He drew strength from this success and reflected on it during times of trouble. The Secretary of War and General Crozier were outspoken supporters of Taylorism.<sup>449</sup> Crozier testified multiple times before congressional committees always to the benefit of Taylor. Taylor assisted Crozier with material support for the hearings before congress. Furthermore, Taylor claimed to know how to manage disgruntled workers, since his methods tended to create them. He passed on suggestions to both Crozier and Coburn about that subject.<sup>450</sup>

The *Army & Navy Journal* ran a small piece on 16 December 1911 highlighting the increased cost of repair, over 10%, between 1910 and 1911.<sup>451</sup> It was an oblique shot at Meyer. Taylor confided in Coburn, “...this might be unpalatable reading to Secretary Meyer... Rather unexpected [as] I had the impression that they [*Army & Navy Journal*] were very strict partisans of the line.”<sup>452</sup> The journal was quite popular with officers during this period. The Meyer’s administration was now coming under fire multiple directions. The Constructor Corps, under Meyer’s jurisdiction, continued to execute time and motion

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<sup>448</sup> Frederick Taylor to H. F. Wright, November 13, 1911, Box 117, Frederick Winslow Taylor Collection.

<sup>449</sup> Frederick Taylor to F. G. Coburn, November 14, 1911, 116, Frederick Winslow Taylor Collection.

<sup>450</sup> Ibid.

<sup>451</sup> F. G. Coburn to Frederick Taylor, December 12, 1911, 116, Frederick Winslow Taylor Collection.

<sup>452</sup> Frederick Taylor to F. G. Coburn, December 22, 1911, 116, Frederick Winslow Taylor Collection.

studies along, albeit covertly, with various other elements of scientific management.<sup>453</sup>

Internal frustration and loathing began to boil over.

It appeared Meyer's rapidly evolving management plans might cost the Navy one of its brightest officers. On November 19, Tardy informed Taylor that he had "...heard vague rumors that Evans is going to resign soon."<sup>454</sup> In fact, it was not a rumor. Evans had no intention of wasting his life in pursuit of a worthy ideal that the Navy refused to embrace. Meyer had changed his position for a third time regarding scientific management. Evans, emotionally exhausted, was done with it all.<sup>455</sup>

Tardy's intentionally belated letter provided Taylor with some insight into the Navy workings. The delayed response allowed events to mature, which afforded Tardy two revealing observations. First, the Navy leadership took "flight" at the "first" signs of trouble from organized labor. In principle, the Navy accepted the need for putting into effect scientific management. In practice, politicians and organized labor opposed the plan. Second, Tardy contended, "I do not believe for a moment that any effort is to be made to adopt Vickers management for the yards." Secretary Meyer was playing a shell game and one everyone appeared to recognize. "As I understand, whatever efficiency there may be in that system", Tardy explained, "is due to piece work and the premium system."<sup>456</sup> In short, the credit belonged to Taylor but he was not going to get it.

Despite interference by Meyer's administration, naval officers continued to implement scientific management in its various incarnations.<sup>457</sup> Line officers, especially

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<sup>453</sup> Frederick Taylor to G. S. Radford, November 18, 1911, Box 117, Frederick Winslow Taylor Collection.

<sup>454</sup> W. B. Tardy to Frederick Taylor, November 19, 1911, 115, Frederick Winslow Taylor Collection.

<sup>455</sup> Frederick Taylor to W. B. Tardy, November 21, 1911, 115, Frederick Winslow Taylor Collection.

<sup>456</sup> Tardy to Taylor, November 19, 1911.

<sup>457</sup> Taylor to Radford, November 18, 1911.

those aboard larger ships, used it to refine and hone sailor's actions. Those at shore used it to reduce cost and time involved in repairs and production.<sup>458</sup>

With unabashed advocacy, Crozier enumerated the benefits and value of scientific management at Army armories. He told the Secretary of War and Congress on multiple occasions that Taylor's methods delivered a superior product below traditional cost and at a faster rate.<sup>459</sup> Navy Constructor Corps officers drew strength from the Army's success. Rationally it seemed that if the government approved the process in one area that it ought to be applicable in another. The conclusion was that if they weathered Meyer's attempts to disassemble regarding scientific management the next administration might be amenable to the system.<sup>460</sup>

The approaching end of Meyer's term could not come fast enough for Taylor and his followers. If the night is darkest and the cold most penetrating just before dawn, Meyer's administration played its part well, exploiting Taylorism at its most vulnerable point. Nothing drove Taylor into a defensive fury like a potential strike. It threatened everything he worked for over the last twenty years. Turmoil menaced social stability. Politicians and employers could not abide organized worker opposition, at least for long.

On 1 January 1912, while most men recovered from the night before, Taylor feverishly fired off four letters. Taylor's correspondence with over a dozen naval officers spanned over fifteen years and the correspondence quantitatively measured hundreds of pages. On no other day did Taylor fire off four letters to naval officers, employing nearly verbatim language. Thematically, they were identical. Taylor expressed his views to the

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<sup>458</sup> Tardy to Taylor, February 6, 1911.

<sup>459</sup> Frederick Taylor to Geo H. Rock, December 20, 1911, 115, Frederick Winslow Taylor Collection.

<sup>460</sup> Tardy to Taylor, March 27, 1911; Coburn to Taylor, February 7, 1911; R. M. Watt to Frederick Taylor, April 1, 1911, 115, Frederick Winslow Taylor Collection.

recipients, Rock, Wright, Coburn, and James Reed, regarding the protests taking place at the Boston Navy yard and potentially other facilities.<sup>461</sup>

The special congressional committee assigned to evaluate scientific management, which examined Army arsenals and Navy yards, was nearing the end of its investigation, scheduled to conclude on 11 February, 1912.<sup>462</sup> With one month remaining, Taylor needed to demonstrate concrete examples of “loafing” at navy yards. He used the term “loafing” (and on other occasions, “soldiering”) to describe employees working at minimum capacity. Taylor inquired whether any of the officers might have such examples, preferring one in any about which a foreman might be willing to testify before the committee.

Taylor told Coburn that if he were willing to testify before the committee, he would pay for all expenses incurred.<sup>463</sup> Coburn agreed to Taylor’s request. However, Taylor subsequently learned that “the committee is not issuing subpoenas for people to appear before it, but I have no doubt that I can get them to write you, requesting that you appear before them.”<sup>464</sup> In a letter of January 12, Taylor informed Coburn: “I shall send your name to Mr. Wilson, the Chairman of the House Committee to Investigate the Taylor and other Systems of Management, and ask him to have you subpoenaed...” Over the years Taylor had developed an extensive and influential network that enabled him, at a minimum, to gain an audience with just about any politician.

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<sup>461</sup> Frederick Taylor to James Reed, January 1, 1912, 117, Frederick Winslow Taylor Collection; Frederick Taylor to F. G. Coburn, January 1, 1912, 116, Frederick Winslow Taylor Collection; Frederick Taylor to H. F. Wright, January 1, 1912, Box 117, Frederick Winslow Taylor Collection; Frederick Taylor to Geo H. Rock, January 1, 1912, 117, Frederick Winslow Taylor Collection.

<sup>462</sup> Clarence Bertrand Thompson, *Scientific Management: A Collection of the More Significant Articles Describing the Taylor System of Management* (Harvard University Press, 1914), 789.

<sup>463</sup> Taylor to Coburn, January 1, 1912.

<sup>464</sup> *Ibid.*



On January 19, 1912, Taylor wrote to Tardy, observing: “A good many witnesses have appeared before the Committee from the Boston yard and some from the New York yard, and the impression left upon the Committee by these men is that they are pretty badly treated in the navy yards...and...that if the Taylor System were to be introduced they would be driven to death.”<sup>465</sup> Taylor had a flair for caricature and his most frequent target, rivaled only by Meyer, was the common day worker. His experience as a young man and then as a contractor had fueled him with a particular disdain toward wage earners. Implicit in the piece-rate and premium system was the belief that day workers were not working to their full potential. Thus, Taylor’s system involved identification of the shirkers and achieved efficiency by rewarding those that exceeded the standard while those that did not received less pay. Unions and employees perceived the system as punitive. The enemy of every union system is the “rate breaker” who sets a seemingly-unfair standard for comparison to other workers performing similar tasks.

Taylor’s letter to Tardy continued with the warning that “...if they [the committee] were to recommend against time study it would become practically impossible in many cases to get a fair day’s work out of the workmen.”<sup>466</sup> His true feelings on these matters occasionally populated letters to his closest friends. He repeatedly claimed that scientific management assisted workers in reaching their full potential while his personal letters betrayed a different perspective. Towards the end of the missive, Taylor entreated Tardy to appear before the committee as well. Taylor played every card he possessed. In Tardy, Taylor found a man of like mind. On January 26<sup>th</sup> Tardy replied, “I firmly believe that we must come to scientific time studies and bonus or premium system of wages if we are to

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<sup>465</sup> Frederick Taylor and W. B. Tardy, January 19, 1912, 115, Frederick Winslow Taylor Collection.

<sup>466</sup> Ibid.

hope for even fair results.”<sup>467</sup> Taylor hoped with a critical mass of naval officers before the committee he might trump the voices of workers.

After Taylor testified before the Committee, he dispatched a letter to Tardy, on February 2, which revealed his personal thoughts about the Secretary of Navy.

In Taylor’s opinion:

...the Secretary of the Navy had announced in the most emphatic manner that he did not intend and never had intended introducing any element of scientific management into the Navy, that he was about to introduce the Vickers system...that scientific management had been used in one of the Vickers shops in England for years, and had resulted in loss of money to the Vickers Company, and that when the real Vickers system was substituted in its place this Department, which formerly operated at a loss, at once operated at a very large profit.<sup>468</sup>

Meyer used his position to broadcast his damaging views on scientific management to the public and the Navy. He adopted a populist stance, as had President Taft, that there was little need for specialists in Army and Navy facilities. The common man was just as capable as the educated professional. Naval officers demurred.<sup>469</sup> However, while Meyer still occupied the pulpit, Taylorism was the rising religion.

David Watson Taylor had served as a naval constructor from 1892 to 1894 at Mare Island Navy Yard.<sup>470</sup> Taylor eventually attained the rank of admiral and, “for about eight years from 1914 to 1922...served as the Chief Constructor and Chief of Bureau of Construction and Repair.”<sup>471</sup> On February 2, 1912, two years before he attained the rank of Admiral, constructor Taylor dispatched a letter to Frederick Taylor detailing his testimony before the committee. The testimony (for which he seemed particularly proud) strongly

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<sup>467</sup> W. B. Tardy to Frederick Taylor, January 26, 1912, 115, Frederick Winslow Taylor Collection.

<sup>468</sup> Frederick Taylor, “Frederick Taylor, Letter to W. B. Tardy,” February 2, 1912, 115, Frederick Winslow Taylor Collection.

<sup>469</sup> Ibid.

<sup>470</sup> William Hovgaard, “Biographical Memoir of David Watson Taylor 1864-1940,” *Society of Naval Architects and Marine Engineers* 22 (1943): 136.

<sup>471</sup> Ibid.

supported scientific management. Constructor Taylor described it as, "...the great mental revolution which takes place under scientific management, and which is its *essential feature* [my emphasis]."472

Furthermore, constructor Taylor informed his mentor that he had encountered a particularly beneficial individual in Washington, D.C., who helped prepare "all witnesses who appear for our side", Mr. Hollis Godfrey. As identified by authors of a study of shop management methods, Godfrey was a, "consulting engineer, associated with Mr. Frederick Winslow Taylor."<sup>473</sup> Four years later Woodrow Wilson was to appoint Godfrey to the Advisory Commission of Council of National Defense in, an oversight organization created to efficiently focus and manage the nation's resources in preparedness efforts for WWI.<sup>474</sup>

Only two letters between D.W. Taylor and F.W. Taylor have been found. However, the tenor and conversant language displayed in these missives argues for a familiarity only acquired through frequent communication. This relationship no doubt paid dividends later. D.W. Taylor's influence as Chief Constructor allowed him to put into effect scientific management in the Navy Yards throughout the war. D.W. Taylor worked closely with F.W. Taylor to prepare naval constructors for testimony before the congressional committee. The preparation would allow constructors to highlight the positive elements of scientific management and avoid "embarrassing" moments.<sup>475</sup>

The Committee's report found no damning evidence against Taylor or any other system of management. Despite Orwellian-like predictions, the Committee uncovered little

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<sup>472</sup> Frederick W. Taylor, "Frederick Taylor, Letter to D.W. Taylor," February 2, 1912, 117, Frederick Winslow Taylor Collection.

<sup>473</sup> William B. Wilson, William C. Redfield, and John Q. Tilson, *The Taylor and Other Systems of Shop Management*, 3 vols. (Washington, D.C.: Government Printing Office, 1912).

<sup>474</sup> *First Annual Report of the Council of National Defense* (U.S. Government Printing Office, 1917).

<sup>475</sup> Taylor, "Frederick Taylor, Letter to D.W. Taylor."

to support the notion that scientific management created draconian-like environments.<sup>476</sup>

Taylor had deftly dodged the coup de grace intended by the shipyard unions.

Nevertheless, Taylor received a shot across the bow from an unexpected direction. On 20 June 1912, Taylor received a letter from T. G. Roberts, a naval constructor. Roberts detailed two intriguing ideas. First, “some of my colleagues who have been associated with Evans, and are in touch, told me that the system installed at the Vickers works was introduced there by someone who got it from someone back in America...” The allegations proved to be true. In a missive to Roberts, Taylor acknowledged that Vickers did in fact send over several men in 1900 for three weeks to the Bethlehem works. According to Taylor, while there the men “...learned as much as they could about our system in that time, but that was mighty little...”<sup>477</sup> Frederick W. Taylor had an inventor’s disdain for imitations and those associated with it. However, Roberts also provided detailed information on a newly published attack on Taylorism.

Admiral John R. Edwards penned a scathing critique of scientific management in the journal of the American Society of Naval Engineers in May, 1912.<sup>478</sup> Edwards asserted that “...management is an art not a science, that the Taylor System antagonizes the workmen and neglects the personal equation...”<sup>479</sup> A graduate of the U.S. Naval Academy and an engineer, Edwards, according to his official biography, “...transferred to the Line of the

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<sup>476</sup> Thompson, *Scientific Management*, 15.

<sup>477</sup> Frederick Taylor to T. G. Roberts, August 8, 1912, Box 117, Frederick Winslow Taylor Collection; T. G. Roberts to Frederick Taylor, August 10, 1912, Box 117, Frederick Winslow Taylor Collection.

<sup>478</sup> John R. Edwards, “The Fetishism of Scientific Management,” *American Society of Naval Engineers* XXIV, no. 2 (May 1912).

<sup>479</sup> Thompson, *Scientific Management*, 22.

Navy in 1899.”<sup>480</sup> Edwards was a man of both worlds, and, thus, his perspective carried weight among his fellow officers.

Since it was explicitly drafted in response. Taylor wrote an undated document that correlated, in time, to the Special Committee’s report on Taylor and Other Systems of Management Consequently, one can confidently place the provenance of the document between May and August 1912. In the three-page document Taylor acknowledged Edward’s article, “The Fetishism of Scientific Management,” by name. Taylor did not wrestle with Edward’s major points, but merely observed, “Admiral Edwards has never been inside a single establishment in which scientific management has been introduced.”<sup>481</sup> Taylor assumed that was enough to discredit Edwards. One high ranking officers argument represented a threat to Taylor’s ideas, but any such attacks paled in magnitude to those of Meyer.

Secretary Meyer’s tenure was anything but palatable to officers in the Naval Constructor corps. Taylor shared the sentiment. To this end, on December 12, 1912, Radford dispatched a revealing letter to Taylor. The letter itself was largely unremarkable. Radford merely wanted Taylor’s input as to the potential of a new tool that Radford took the care to sketch. However, at the end of the typed letter, Redford, in manuscript, penned the cryptic message, “P.S. the 4<sup>th</sup> of March approaches”- nothing else is intimated, nothing else is said.<sup>482</sup> Four days later, Taylor responded. At the conclusion of his letter Taylor acknowledged Radford’s hand written message, “I note the very important fact stated by

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<sup>480</sup> “Papers of Rear Admiral John R. Edwards,” *Naval History and Heritage*, n.d., <http://www.history.navy.mil/research/archives/research-guides-and-finding-aids/personal-papers/d-e/papers-of-john-r-edwards.html>.

<sup>481</sup> Frederick W. Taylor, “Answers to Criticisms of Scientific Management with Reference to the Proceedings before the House Committee to Investigate the Taylor and Other Systems of Management, and Other Documents,” 1912.

<sup>482</sup> G. S. Radford to Frederick Taylor, December 12, 1912, Box 117, Frederick Winslow Taylor Collection.

you in MS. at the end of your letter. Let us hope for the best.”<sup>483</sup> The mysterious note referenced the end of Secretary Meyer’s term, on March 4, 1913.

With the exit of Meyer, one of the greatest obstacles to the acceptance of Taylor’s ideas by the military establishment of the United States threats was removed. Unions remained a problem, but a manageable one without a friendly ear into which to pour their entreaties. Despite Meyer’s hostility, naval officers, especially those within the Constructor Corps, sustained and expanded the use of scientific management within the Navy.<sup>484</sup> In the end, Meyer simply impeded the depth and breadth of Taylor’s influence, for a time.

The election of President Woodrow Wilson proffered the possibility of an administration amenable to scientific management. Although at this juncture, Taylor and the naval constructors would happily take a disinterested party.<sup>485</sup> Nevertheless, Taylor had doubts about the Navy’s new leadership, based on speeches by the new Secretary and Assistant Secretary of the Navy, Josephus Daniels and Franklin Roosevelt, respectively.<sup>486</sup>

Whether from fatigue, frustration, or teaching commitments Frederick Taylor’s correspondence with naval officers dwindled in the last two years before his death in March of 1915. Taylor’s supporters within the Navy had largely won acceptance of scientific management in the Navy, if not in name, then certainly in practice. However, debate about Taylor’s methods moved from within the Army arsenals and the Navy yards to the halls of Congress. In that venue unions and sympathetic legislators maintained the pressure.

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<sup>483</sup> Frederick Taylor to G. S. Radford, December 16, 1912, Box 117, Frederick Winslow Taylor Collection.

<sup>484</sup> Frederick Taylor to F. G. Coburn, November 5, 1913, 116, Frederick Winslow Taylor Collection.

<sup>485</sup> Frederick Taylor to T. G. Roberts, March 12, 1913, Box 117, Frederick Winslow Taylor Collection; James Reed, “James Reed, Letter to Frederick Taylor,” April 15, 1913, 117, Frederick Winslow Taylor Collection.

<sup>486</sup> Frederick Taylor to A. M. Cook, May 26, 1913, 115, Frederick Winslow Taylor Collection.

On January 22, 1915, Frederick Dietrick scored a major win for the unions. He introduced an amendment to the Army spending bill that stated:

Provided, That no part of the appropriations made in this bill shall be available for the salary or pay of any officer, manager, superintendent, foreman, or other person having charge of the work of any employee of the United States Government while making or causing to be made with a stop watch or other time-measuring device, a time study of any job of any such employee between the starting and the completion thereof, or of the movements of any such employee while engaged upon such work; nor shall any part of the appropriations made In this bill be available to pay any premium or bonus or cash reward to any employee -in addition to his regular wages, except for -suggestions resulting In improvements or economy in the operation of any Government plant ; and no claim for services performed by any person while violating this proviso shall be allowed.<sup>487</sup>

Two weeks later a similar bill killed support for time and motion studies in the Navy.<sup>488</sup> It appeared that scientific management in the Army and Navy had finally been dealt a deathblow. Yet again Taylors views were to arise, like Lazarus, from the tomb.

Evans, Tardy, Watt, and D.W. Taylor, among others Navy Constructors, grasped what many during the period understood only implicitly. Yes, most understood that scientific management rationally ordered work within the shop, arsenal, and naval yard --whatever the form— to increase efficiency. However, the latent potency of this process did not reside in the physical realm, but in the intellectual. Taylor himself did not appear to fully sense, at least initially and maybe never fully, what his method actually wrought. All ideas evolve and mature with time as they move from the mind to practice in the physical realm. The process does not only flow in one direction. Frequently, the spark created with the collision of the immaterial and material world illuminates other possibilities that remained dormant, unknown, and unexplored by the human mind.

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<sup>487</sup> (52 Cong. Rec. 2082, 1915)

<sup>488</sup> Aitken, *Taylorism at Watertown Arsenal*, 232.

Within the Army, scientific management moved forwardly largely at the behest of General Crozier. Ordnance officers such as Colonel Wheeler played an important role, but direction and force emanated from Crozier. He needed methods to reduce costs at the arsenals. To do more with less required radical change in selection of employees, tools, and methods. Crozier looked for solutions and found them in the ideas of Frederick W. Taylor.

As was the case in the Army, the Navy sought out Taylor. By no means a household name, he was nevertheless well known in the fields of engineering and industry. Taylor's friendship with Goodrich preceded his advances in management, and, thus, Goodrich's proximity to Taylor, in absolute terms, was much closer than that of Crozier. Goodrich exerted no time searching for someone who knew something about efficiency. Fortune had seen to that. However, the progression in the Navy of scientific management differed significantly at several key junctures. Both the Army and Navy launched from similar points in their pursuit of efficiency, but they rapidly diverged in execution.

If the French Revolution radically changed society from the bottom up and the Prussians aimed to, "...do from above what the French have done from below"<sup>489</sup> the United States Army and Navy's intellectual revolution followed along a similar path. Scientific Management propagated through the Army from above with Crozier, and, in contrast, the Navy's acceptance of the methodology was spearheaded by Evans and the constructors from below. Evans, driven by a devout belief in the efficacy of scientific management, forfeited his commission and his marriage to the cause. His capable and determined battle

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<sup>489</sup> Shearer Davis Bowman Assistant Professor of History University of Texas at Austin, *Masters and Lords : Mid-19th-Century U.S. Planters and Prussian Junkers* (Oxford University Press, USA, 1993), 123; *The Quarterly Review*, vol. 231 (London: Leonard Scott Publication Company, 1919), 37.



for scientific management elevated his name to the attention of eminent individuals such as President Taft.

Taylor and Goodrich had some success laying the groundwork in the Navy for scientific management under the Roosevelt administration. Meanwhile, Crozier imposed Taylorism on the arsenals largely unassisted and unopposed, albeit with the support of the Secretary of War. However, innovators in the Navy faced Goliaths of another size, and more than just one; Secretary of the Navy Meyer and the unions came in first and second respectively, and line officers placed a distant but still significant third. Construction Corps officers underwrote the successes and likewise shared in the defeats. The young officers advanced in the face of resistance through stubborn and not infrequently insubordinate actions.

Frederick W. Taylor throughout this pivotal period provided emotional and material support. Evans and Tardy, and many other constructors, held Taylor in almost spiritual regard--not as a demigod, but rather as a prophet, someone enlightened who brings a message of profound truth. Naval constructors were trained and educated engineers. These were not men, by and large; who were superstitious; rather they valued mathematics and logic. Taylor's rational system extolling efficiency doubtless appealed to them, and given the degree of support, provided an improvement over the structure, or lack of structure for the nation's navy yards, that previously existed.

To the Navy, and specifically to the officers of the Construction Corps, must go the honor of being the first of the two organizations to grasp the intellectual potential of scientific management as a system of thinking. The Army's heroic idea of leadership always caused tension in the relationship between men and machines. The Navy, in essence, was a

machine. It, of course, made use of human beings, but the tools, the ship, always loomed larger than men. From the inception of the United States Navy, naval officers embraced the machine, and the closer they connected with it the better it ran. Scientific management harmonized men with machines because it reduced errors, waste, and produced a methodical, calculable, and measurable set of outcomes. Properly applied, it reduced chance, the ever present specter for those who prepared for and engaged in organized conflict.

## Chapter VIII

### History mattered not, because it changed so much

In the final analysis, there is but one object of inquiry-- the will. Army officers are principally concerned with executing orders, orders that in some manner connect, or should connect, back to a political objective. Officers direct force toward aims that, at least in theory, reduce an adversary's resolution to resist. To do this, and do it well, one must intuitively grasp what animates men to action.

Technology has increasingly obscured the nature of war. Like layers of fog, it shrouds the sharp outlines from observation. The light of reality fades behind the accumulating layers of technology with knowledge and understanding of the phenomenon suffering proportionally. More to the point, the issue is less about technology than the way we think about it and how it conforms one's perceptions. This is especially true of Americans over the course of the past century or more, who tend to look for technological solutions to most problems. Given enough time, flawed assumptions, and mistaken beliefs, American military officers typically perceive the nature of war through the technological means of its execution. If the nature of technology is to order and control, then perhaps, war --chaos-- lends itself susceptible to such means.

Technology divorces war from its proper focus, which is man. Writing in 1934, Lewis Mumford observed, "...the principal aim of our mechanical routine in industry is to reduce the domain of chance..."<sup>490</sup> If that premise is correct, then the industrial management revolutionary Frederick Taylor brought about one of the greatest mental

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<sup>490</sup> Mumford, *Technics and Civilization*, 304.

revolutions since the Enlightenment and Romantic movements. While the Enlightenment and Romanticism described, “...ideas about what relations between men have been, are, might be, and should be...” scientific management aimed to prescribe, at least implicitly, the relationship between men and their machines.<sup>491</sup>

Taylor’s approach had far reaching effects. Army officers were born into a nation largely devoid of military traditions. There were few mores to confine or mold early military thought. Those that did exist were imported from France, Britain, and Germany. Military ideas and structures introduced from the distant shores of the Old World mingled and amalgamated into a uniquely American DNA. Encoded within the DNA was the source material that formed the substrate of the American military mind.

The rugged landscape of North America produced an equally tough and practical mindset in Army officers. There was no time for abstract thought, theory and philosophy as they attended to the demanding duties of westward expansion. Preoccupied with constabulary functions, Army officers expended precious little resources on the intellectual development of their profession.

Officers came from a people that prized liberty, individuality, and industrious action. These values, in a manner that no one could quite have predicted, produced an optimism that permeated American culture, a hope in the future, in the potential of this city on a hill. It was the *Zeitgeist* of the age. Driven by what they perceived to be divine statute, Americans expanded geographically with a conviction and determination rarely witnessed in history. The Army drew its officers from such stock.

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<sup>491</sup> Berlin and Hardy, *The Crooked Timber of Humanity*, 1.

By the 1860's, boys that had once shared an awe of those who fought in the American Revolution assumed the field in gray and blue while both sides invoked the spirit of '76. War, for them, was no longer a child's game and officers matured quickly in the battles they waged during four years of brutal conflict. Lessons were learned at a terrible cost. But if Alexander, Caesar, and Napoleon achieved victory through heroic leadership, the American Civil War whispered of change in the understanding of warfare. History exercises a powerful, if centrifugal, effect on the mind. It provides the raw material out of which the mind extrapolates potential and likely futures. Like a puzzle, the mind assorts the pieces to form impressions. Yet, the pieces are malleable, pliable, and impressionable. Beginning with similar such pieces, each mind constructs a unique, though related, picture. If a particular ideal or concept begins to permeate the organism, in whatever form that idea may be, it gains momentum, a propensity and a *Mentalität* is formed.<sup>492</sup>

As both larger societies and military organizations in the Western World professionalized at an accelerated rate at the turn of the twentieth century, there emerged a sense of increased tempo, of interconnectedness, and the importance of time management. Among officers in the United States Army, there was a growing awareness of America's increased role on the world stage. And though rarely explicitly stated, officers confessed that they were profoundly unprepared for this future. Rapid industrialization and proliferation of the machine hailed the dawn of a new age. Ideas about leadership evolved. In the factory, arsenals, and naval yards the mantra became efficiency. Leaders were not born as much as manufactured, and it seemed that one no longer led men--one

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<sup>492</sup> Dennis E. Showalter, "The Prusso-German RMA 1840-1871," Knox and Murray, *The Dynamics of Military Revolution, 1300-2050*, 112.

managed them. What has been claimed as the uniquely American philosophy of practicality fused naturally, almost organically, with the idea of management.

Naval officers, especially from its Constructor Corps, pursued scientific management with the zeal of true believers. The Navy, after all, was a fleet of machines. The union of Taylorism and the Navy made for a happy one, at least if Holden Evans had his way.

Nevertheless, the constructors divined the trend more clearly than most. Management is about control. It is a thought process that dictates how one arranges the pieces of the puzzle, a perception predicated on time.

Prior to World War I, Army officers had more difficulty harmonizing man and machine, and the trends of management were confined to arsenals and similar facilities. Armies still moved at the pace of beasts of burden. Pride of place still fell to the cavalry as it had for much of the past two thousand years. Perhaps nothing captured the heroic ideal better than the mounted officer leading his men from the front. Regardless, the U.S. Army Ordnance Branch and arsenals provided sufficient soil for the ideas of scientific management to take root.

World War I was a watershed event for the U.S. Army. The perceived existential threat thrust innovation to the forefront and neutralized the micro-management that a peacetime Congress had imposed on military procurement. Governmental funding pushed breakthroughs into mass production at a rate scarcely imaginable before the war. Fleets of airplanes and tanks appeared over and on the battlefields of Europe. Officers began to measure success by the number of artillery shells fired, leading to a four-year total of an estimated one billion shells. Heroism appeared to count for little in industrialized warfare.

Clausewitz observed, "...the superiority of numbers is the most common element in victory."<sup>493</sup> He was right, but he had in mind numbers of *men*. After the experience of World War I, officers thought in terms of *materialschlacht*, a battle of material. Primacy in battle moved from man to machine. Mumford perhaps captured it best: "In time-keeping, in trading, in fighting men counted numbers; and finally, as the habit grew only numbers counted."<sup>494</sup> The U.S. Navy epitomized this approach in the military realm, measuring the overall efficiency of the fleet in the number of battleships it claimed—48 in 1914 to be exact.<sup>495</sup>

Taylor's formulation of scientific management was predicated on the idea of efficacy through reductionism by eliminating wasted movements and unnecessary steps. Yet, scientific management portended a more significant change, one of thought, especially in management and leadership. It highlighted a shifting view of time. The artisan and craftsman gave way under the pressures of accelerating temporal rhythms. Modern conceptions of time, with increasing divergence from natural time, became something that one calculated, controlled, and saved.

The mechanical realm is controllable, orderly, and certain and when overlaid on man, in theory, produces predictable results. Thus, the ordering of the day, numbering and delineating of tasks, and the breaking down of one's daily life by time eliminates or at least reduces chance. Therefore, man appears to gain greater control over time and of the future. Historically, where once progress was almost imperceptibly slow, now progress

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<sup>493</sup> Clausewitz, *On War*, 194.

<sup>494</sup> Mumford, *Technics and Civilization*, 22.

<sup>495</sup> "Studies of the General Board of the Navy," November 17, 1914, 420–422, Record Group 80, National Archives and Record Administration (NARA).

became something that one not only perceives, but can also exert considerable control over.

In industrial warfare, chance frequently was portrayed in a negative light as something to be reduced and eliminated. However, chance is not necessarily a negative or even an undesirable event. Certainly, one desires reliability and control in nuclear reactors and the like, but creativity and spontaneity inevitably introduce an essential element of chance into war. It is fundamental to the human experience, and thus, intrinsically part of warfare. Officers pay lip service to its role while at the same time honing the skills of technicism designed to reduce chance.

The implications of technicism for military affairs were subtle and yet incredibly powerful. A byproduct of technological immersion is the illusion of control and specious contextual understanding, of eliminating or reducing the sources of Clausewitzian fog and friction. One believes that he can perceive and have knowledge of phenomena to a far greater degree than is actually the case. This illusion-- caused by technological determinism--distorts reality and forces warfare into a realm of abstraction in which it can be subdued, harnessed, and made rational. Intellectually, and thus, theoretically and doctrinally, the unquestioning embrace of technicism does violence to the authenticity of war.

Temporal acceleration altered and greatly contributed, at an intellectual level, to how men perceived modern warfare. Over the first three decades of the twentieth century in America, the spirit of Taylor and scientific management permeated academia, management, and political and military spheres. Officers and political leaders became more rational and scientifically minded in embracing intellectual processes. Thus war



became more rationalized. The mantra of “the war to end all wars” flowed freely and frequently on both sides of the Atlantic, a wholly understandable conclusion given the carnage of World War I. Echoes from the Western Front further confirmed the necessity for embracing an orderly, methodical nature of battle- reduced to timed movements and phase lines. The perfect synchronization of infantry and artillery to cross no-man’s land, the measured shells per meter of trench line to insure success all contributed to the belief in a rational, reducible, calculable method of warfare. The French, in the inter-war period, defined their army doctrine as “methodical” battle.<sup>496</sup> What is methodical but an entirely systematic, controlled, and rational time-bound process to achieve a desired end state, regardless of its physical and mental effects on individual participants?

If military minds, prior to 1914, perceived only minor temporal tremors in the conduct of war it remained essentially a contest between men, a contest of wills. The temporal pressures of modernity, of their age, remained trapped in the historical mind of man. History mattered because it resembled the present and thus cast light on the questions of the future. The linear flow of logic, of reason, requires extrapolation of past trends. But every trend comes to an end. Therefore, officers entered the First World War with a mind nurtured on the exploits of ages long past. Paul Fussell in *The Great War and Modern Memory* observed:

...the Great War was perhaps the last to be conceived as taking place within a seamless, purposeful ‘history’ involving a coherent stream of time running from past through present to future. The shrewd recruiting poster depicting a worried father of the future being asked by his children, ‘Daddy, what did *you* do in the Great War?’ assumes a future whose moral and social pressures are identical with those of the past...but the Great War took place in what was, compared with ours, a static world,

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<sup>496</sup> House, *Toward Combined Arms Warfare*, 58–60.

where the values appeared stable and where the meanings of abstractions seemed permanent and reliable. Everyone knew what Glory was, and what Honor meant.<sup>497</sup>

From the *Iliad* (circa 800 B.C.) to the present there is a discernable continuity to values and ideals celebrating the journey of heroes. Not that their ends are the same, for they are not, but the values –not what they serve- are nearly universal. Courage, honor, self-discipline, sacrifice, and truth were values that men sought, yet, the mind and imagination anticipate and, arguably, demands their exemplification in the face of mortal danger. In both prose and poetry over the centuries, heroism shines brightest in the shadow of death. Nevertheless, the image of the ideal hero and the reality of the modern battlefield seem almost incompatible. Paul Fussell purportedly said in an interview with PBS for “The Great War” series, “heroism doesn’t matter when you’re not fighting hand-to-hand.”<sup>498</sup> There is an undeniable logic to Fussell’s statement. Neither an artillery shell nor a guided missile has any regard for the soldier’s skill or bravery; these qualities never enter into the equation.

Therefore, the reality of scientific management, of the modern battlefield clashed with the deeper impulses of men. Officers were attracted cerebrally to science and technology, to numbers and ratios, to methods and formulas; quantitatively measurable and rational, these solutions provided an absolute means to contrast with the means available vis-a-vis other nations. Indeed, it was the officers’ duty to impose Jominian order on the Clausewitzian chaos of battle in order to achieve assigned missions. Technology at once increased and extended the ability of officers to control--while seemingly rendering

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<sup>497</sup> Paul Fussell, *The Great War and Modern Memory* (New York: Oxford University Press, 2000), 21.

<sup>498</sup> Paul Fussell, “The Heroic Connotation of War,” PBS, *The Great War*, (n.d.), [http://www.pbs.org/greatwar/historian/hist\\_fussell\\_02\\_heroic.html](http://www.pbs.org/greatwar/historian/hist_fussell_02_heroic.html).

the human element irrelevant or at least largely inconsequential. Courage still mattered, for an army of cowards wins no battles, but its significance diminished at the individual level. This was perhaps the thrust of Fussell's statement.

Thus, if the conduct of war has changed over time, which seems a reasonable proposition, it appears that man, in respect to the technology-driven advances in warfare, remained psychologically static. This discrepancy has created a great deal of tension clearly observable in how neurosis and shell-shock were first diagnosed. Line and medical officers alike struggled to explain how brave men "suddenly" became cowards. Technology transformed the battlefield and men psychologically grappled to function in, let alone understand it. World War I, for the first time in human history, stripped man of that psychological armor on a scale previously unimaginable. Men by the tens of thousands broke under the strain of industrialized warfare. British soldiers on the Somme could endure no more than Roman legionnaires two thousand years earlier.

The dawn of mechanized warfare swept those before it into a frenzy of technical and scientific prognostication. Scientific management of both men and material no longer belonged solely to the field of business, but now was the concern of states. Interestingly, the practical nature of Americans and the agrarian myth abetted this process. The United States came of age late in this process of nation-state development. Its history and heritage, and that of its officer corps, were necessarily young. The intellectual traditions that existed belonged to the old world. And as Tocqueville, Commager, and Hofstadter were to observe, a lack of tradition produced a spiritual reverence for the practical, the utilitarian.

The intellectual trends of the prewar era and lessons of World War I created a peculiar American *Mentalität*, a disposition to think along particular lines. Taylorism built on the strong undercurrents of American practicality and Army engineering. Soon, the U.S. tried to mass-produce combat-ready soldiers and leaders in the same manner it had cranked out automobiles. The convergence of these factors created a unique perspective of modern war. The industrial and manufacturing lessons were obvious, but those of leadership were less so. If victory on the European battlefields seemed a question of production then the age of heroic leadership was at a close. The application of scientific management to men “produced” a new type of leader, an upshot of the American synthesis - the manager.

Managers are not leaders in the traditional sense for their primary concern is for efficiency not men. Their concern for subordinates extends only so far as it affects production. Success and failure are reduced to numerical results. Indeed, the generals of the First World War steeled themselves to regard casualties as an inevitable, if inefficient, cost of doing business. Questions were of quantity, for only that which is reducible to measurement mattered. Conversely, heroes and leaders inspire, they consistently nurture values (or virtues as the ancients call them), qualities that are ethereal and distinctly intangible and often spiritual. While managers bet primarily on quantities, leaders depend mostly on qualities. In many respects, both are products of their time. Managers came into existence only with the industry while leaders are natural outgrowths of the human experience. This may explain the aversion that people generally demonstrate toward managers whose primary objective is numbers rather than people; such priorities appear

unnatural, even mechanical, especially to the soldiers who have to pay for the manager's success.

The *Mentalität* of the U.S. officer corps and the development of the manager, as a type in that body, go hand in hand. There is a propensity, a logic to the relationship. If war was becoming more technologically focused as a question of material, production, and numbers, then logic dictated that managers, as officers, play a larger role both on economic and battle fronts.<sup>499</sup> The increasing "temporal rhythms" of modern life provided further evidence of this change. History, at least superficially, appeared less and less illuminating the further one progressed into the twentieth and twenty-first centuries. The logic of circumstances drove officers to pursue the next widget of war that widened the gulf between human values and technicism, between heroic and material warfare. Mumford observed (1934), "[this] phenomenon...[can be] described as the 'cultural lag.' The failure of 'adjustment' may be looked upon as a failure of art and morals and religion to change with the same degree of rapidity as the machine and to change in the same direction. This seems to me an essentially superficial interpretation."<sup>500</sup>

It is a superficial interpretation because "...change in a direction *opposite* to the machine may be as important..."<sup>501</sup> Thus, propensity does not equate to rightness or correctness' it is merely the most obvious force. American Army officers after World War I perceived the general material trend and in the intervening years, with growing speed and momentum, moved toward a culture of technicism.

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<sup>499</sup> Brian McAllister Linn, *The Echo of Battle: The Army's Way of War* (Harvard University Press, 2009), 7.

<sup>500</sup> Mumford, *Technics and Civilization*, 316.

<sup>501</sup> *Ibid.*

The accelerated tempo of World War I and the wars that followed it imparted an idea of technological and scientific dependency. The trend apparent to officers created a divergence between the man and machine. The results of World War I indicated that victory resided with material dominance, and thus, tactical success on the battlefield through quantity of technology became synonymous with strategic victory. The ability to deliver overwhelming levels of fire became the U.S. mantra. By the post-Korean War era, attritional warfare, war by kill/death ratios, became a strategy even for nuclear annihilation. The divergence of man from war focused so heavily on the latter that strategists largely failed to account for the power of the will and other intangible factors.

Joseph Campbell in the *Power of Myth* argued: "People say that what we're all seeking is a meaning for life. I don't think that's what we're really seeking. I think that what we're seeking is an experience of being alive, so that our life experiences on the purely physical plane will have resonances within our own innermost being and reality, so that we actually feel the rapture of being alive."<sup>502</sup>

In a similar, if not more compelling, statement, George Orwell suggested in his 1940 review of *Mein Kampf* by Adolf Hitler:

Also he [Hitler] has grasped the falsity of the hedonistic attitude to life. Nearly all western thought since the last war, certainly all "progressive" thought, has assumed tacitly that human beings desire nothing beyond ease, security and avoidance of pain. In such a view of life there is no room, for instance, for patriotism and the military virtues...Hitler, because in his own joyless mind he feels it with exceptional strength, knows that human beings *don't* only want comfort, safety, short working-hours, hygiene, birth-control and, in general, common sense; they also, at least intermittently, want struggle and self-sacrifice...whereas Socialism, and even capitalism in a more grudging way, have said to people "I offer you a good time," Hitler has said to them "I offer you struggle, danger and

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<sup>502</sup> Campbell and Moyers, *The Power of Myth*, 1.

death,” and as a result a whole nation flings itself at his feet.<sup>503</sup>

The thought process of scientific management takes no account of the forces described by Campbell and Orwell. “War by algebra” only provides part of the formula, as Clausewitz observed, and arguably the less potent part.<sup>504</sup> In large measure this was not a failure of officers to adjust to the tempo of modernity, but a spurious interpretation of temporal compression that resulted in the conclusions of what scientific management and technology could achieve in relation to man. In the end, man is moved by ideas, values, and faith. Any successful geo-political strategy must acknowledge and account, to some degree, for these factors. The techno-centric officer corps overestimated the machine and underestimated the importance of the timeless values organic to man—perhaps history matters after all.

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<sup>503</sup> George Orwell, *The Collected Essays, Journalism and Letters of George Orwell*, ed. Sonia Orwell and Ian Angus, vol. 2 (Harcourt Brace Jovanovich, 1968).

<sup>504</sup> Clausewitz, *On War*, 76.

## Appendix I

### Literature Review

The literature review is divided into two sections to facilitate clarity. First, American society, with its diverse inclinations and attitudes, is examined to extract the common themes and shared beliefs that diffused throughout the corporate body. The review begins with a brief analysis of the nature of technology and then moves to examine the American mindset toward technology. Second, the attitude of the army and its associated institutions is examined to demonstrate the common bonds between the civilian and military world. The survey begins with the colonial period and develops chronologically from there laying the foundation for chapter three.

#### Americans' Relationship with Technology

Technology, science and industry are distinct though related concepts, often interdependent but developing along unique and divergent paths. The concepts of technology and science from the colonial period through the post atomic world science and technology were frequently conflated. Thus, historical terminology, given the proximate relationship, is somewhat loose, often using the terms interchangeably. Nevertheless, early Americans were not overly concerned with concrete definitions and by the early nineteenth century the belief that these mechanical marvels improved everyday life was quite prevalent.

Nearly every major work on the history and evolution of technology over the last eighty years begins with an ode to Lewis Mumford. The breadth, analysis and synthesis he applied to understanding the nature of technology remains unmatched. In *Technics and*



*Civilization* (1934) Mumford divides the last thousand years into three phases. The eotechnic phase, or Middle Ages, is where Mumford begins his analysis, believing that modern technology had its origins at this point rather than the more commonly-cited date of the mid-Eighteenth Century. Thus, the eotechnic phase extends from 1000 A.D. until the mid-Seventeenth Century and is primarily powered by the “water-and-wood complex.” The eotechnic phase is followed by the paleotechnic phase, fueled by a “coal-and-iron complex;” last, the neotechnic phase is driven by an “electricity-and-alloy complex.”<sup>505</sup>

Mumford never provided a concise definition of technology. Rather, and quite intentionally, he used the Greek word *Tekhne* that conveys a concept of both art and craft. Likewise, Mumford argued man’s nature -before anything else- was that of the “mind-maker” before “took-maker”.<sup>506</sup> Mumford described this phenomenon, and is perhaps, one of the first historians to underline the shift that McGilchrist later identified from a hemispheric perspective. Mumford ascribed this process to the propagation of technology. Technology has many modern definitions. Nearly all of them, regardless of where the emphasis falls, demonstrate a desire and intent to control that, according to McGilchrist, is one of the defining facets of the brain’s left hemisphere—a desire to control and see things, including people, as tools.

Mumford succinctly summarized the process whereby the living are reduced in order of precedence. Science deformed “experience as a whole...the instruments of science were helpless in the realm of qualities. The qualitative was reduced to the subjective, the subjective was dismissed as unreal, and the unseen and unmeasurable appeared non-existent. Intuition and feeling did not affect mechanical process or mechanical

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<sup>505</sup> Mumford, *Technics and Civilization*, 110.

<sup>506</sup> Mumford, “Technics and the Nature of Man,” 925.

explanations.”<sup>507</sup> Mumford believed that, in this respect, science did not bring one closure to an “objective experience”, but rather represented a “departure from it.”<sup>508</sup> Therefore, unlike Descartes, who believed that mathematics enabled one to discern truth, Mumford argued that mathematics did just the opposite in the human realm. If Mumford identified broadly across time and geography, Alexis de Tocqueville recognized trends particular to the American experience.

Few men were better positioned to observe this first stage in American invention than Alexis de Tocqueville, a French politician and historian who traveled America in the 1830s. His travels resulted in the publication of *Democracy in America* (1835). Alexis de Tocqueville observed that, “at a time when Americans were naturally inclined to ask nothing of science but its particular applications to the practical arts...among the enlightened nations of the Old World...they found celebrated scholars, skillful artists, and great writers, and they were able to gather up treasures of the intellect without needing to accumulate them.”<sup>509</sup> Even at this early stage in American development the technological character appeared vividly to the foreign observer, in part because the eyes of the old world looked upon the new. The utilitarian character of the common American struck de Tocqueville as somewhat peculiar and certainly different from that of Europe. Alexis de Tocqueville identified American qualities while Robert Gordon indicated the possible origins of those qualities.

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<sup>507</sup> Mumford, *Technics and Civilization*, 49.

<sup>508</sup> *Ibid.*, 50.

<sup>509</sup> Tocqueville, *Alexis de Tocqueville*, 517.

Robert B. Gordon in “Technology in Colonial North America” (2005) argued that “technology is a record of cultural choice.”<sup>510</sup> Not all emigrants shared the same values—those of Western Europe were not those of Eastern Europe, and those of Italy were not those of Norway. Thus, the colonial port of embarkation mattered in the direction of technological choice. Geography likewise inclined production and technological development in colonial America. The southern colonies and towns, being more isolated, matured along particular lines quite divergent from those in the Northern colonies. By 1785 colonies north of Virginia had begun to industrialize, providing the base from which the Industrial Revolution later launched in America. Nations, organizations, people rejected technologies and ideas that were not compatible with their values. In the American context the utilitarian inclination removed many of the barriers that typically inhibit adoption, especially in religion, as Charles Sanford noted.

“The Intellectual Origins and New-Worldliness of American Industry” (1958) by Charles Sanford observed that during the early Eighteenth century there remained significant reservations toward the moral degradations of industrialization.<sup>511</sup> Leading men, such as Thomas Jefferson, believed that a virtuous nation maintained that character through an agrarian economy. The idea of transitioning to an industrialized economy brought the horrors of manufacturing plants from Great Britain to the shores of the United States and threatened to corrupt the new world.

Sanford examined how early industrialists within America sought to minimize the effects of industrialization upon the American character. Through their work and the

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<sup>510</sup> Robert B. Gordon, “Technology in Colonial North America,” in *A Companion to American Technology*, ed. Carroll Pursell, 2005.

<sup>511</sup> Charles Sanford, “The Intellectual Origins and New-Worldliness of American Industry,” *The Journal of Economic History* 18, no. 1 (March 1958): 1–16.

effects of the War of 1812 the idea of economic independence gained popular acceptance and by 1817 garnered support from Jefferson and Madison. Furthermore, manufacturing eventually assumed aspects of spiritual regeneration, and as Gordon observed, the cultural choice freed Americans from European practices. Thus, industrial technology assumed not only support of the founding fathers, but also the mantle of spiritual renewal. This turning point went no small way in contributing to a generally positive view that Americans have toward technology and what it can achieve.

Americans demonstrated a marked difference from Europeans in their attitudes toward land. By the late eighteenth century, foreign travelers reported restlessness and a spirit of optimism permeated the American character. The subjugation of nature through the development of road networks and vast canals proceeded at a feverish pace in the early nineteenth century, according to James Williams in “The American Industrial Revolution” (2005).<sup>512</sup> The 363-mile canal that connected the Hudson River to Lake Erie dwarfed anything ever attempted in Europe. The “canal’s engineers had little or no practice building anything...they learned on the job...” Americans proved time and again that tireless effort and persistence could overcome even the apparently impossible. The rapid propagation of the steamboats, railroads, and the telegraph strengthened ties amongst a large though dispersed population in a vast country. The transportation and communication advances not only tightened social bonds but also set the stage for rapid industrialization in the mid-nineteenth century. Williams, like Smith, believed that the American arms industry provided the motive and energy to advance machine tools in place of the European traditional craftsman.

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<sup>512</sup> James C. Williams, “The American Industrial Revolution,” in *A Companion to American Technology*, ed. Carroll Pursell (Hoboken, NJ: Wiley-Blackwell, 2005).

National identities are not shaped by an infinite number of factors, nor are all influences equal and likewise they do not have an equal effect upon all members; however, a majority or vocal minority is often enough to incline behavior, in whatever form that takes, in a particular manner. Some corporate experiences deeply affect the minds of nations according to Henry Steele Commager in *The American Mind* (1950) as he examined major influences on American thought from the 1880s to the 1940s.<sup>513</sup> Commager argued that the American environment, in its totality, exercised and ingrained the American mind of the Nineteenth Century with a particular perspective. Breaking the traditional bonds of Europe, the land, religion, and freedom inclined the mind toward a newfound optimism at the possibilities inherent in America. As a result, the American mind eschewed the traditional, class-bound traditions of the old world and forcefully gravitated towards mechanical and technological solutions.

Gordon and Commager both believed that Americans assumed and demonstrated an appreciation for practical and technological solutions. However, Commager attributed that to newly developed and acquired traits through the broad abandonment of European values and the amalgamation of diverse peoples in an environment largely free from constraints. By contrast, Gordon argued that the settlers, where they came from, and the attributes of those people amalgamated into the American character. Both authors perceived a similar result, however, the means and methods were of different character, though not entirely in opposition.

Commager found an “intense practicality,” common sense, and “incurable utilitarianism” gripped the average American. The geography itself beckoned an intense

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<sup>513</sup> Commager, *The American Mind*.

individualism and a mechanical inclination and fascination grew apace within the American mind. Ideas ungoverned and unchained from the traditions of Europe gave breadth to the American mind, and the environment induced a utilitarian turn.

“Mirror-Image Twins: The Communities of Science and Technology in 19<sup>th</sup>-Century America” (1971) by Edwin Layton orients the narrative about the development of technology as a profession.<sup>514</sup> Layton demonstrates that the relationship between science and technology is not as clear and concise as is often assumed. The relationship is often described in the following manner “science creates new knowledge which technologist[s] then apply...that this view of science-technology relations has continued into the 20<sup>th</sup> century was demonstrated by Vannevar Bush, who headed the Office of Scientific Research and Development in WWII... .” Science and technology shared similarities but aimed to achieve different goals. Science aims to understand and enlarge knowledge in a particular field. However, that knowledge rarely creates technology directly. The first aimed for the abstract and theoretical while the latter aimed for the utilitarian and practical. One may build a technology without understanding the scientific properties of the various elements involved. Thus, the US military invested vast sums in the advancement of science following World War II with the expectation that such knowledge increased military technology. However, Project Hindsight, a 1963 Department of Defense (DoD) initiative, examined several weapons programs to evaluate the role of scientific funding in their development and found direct linkages quite tenuous.<sup>515</sup>

Layton does not explicitly address the American attitudes and mindsets toward technology that Commager and Gordon describe, but he does highlight a growing interest

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<sup>514</sup> Layton, “Mirror-Image Twins.”

<sup>515</sup> Ibid., 563–564.

and maturing of the American mind in this respect. The importance of technology gained momentum with the First World War and ascended to new heights following the Second World War. In this respect, Layton described what Mumford had feared.

Many historians interested in the impact of technology on the American psyche found World War I to be critical to redefining or perhaps intensifying that relationship. Thomas P. Hughes in *American Genesis* observed (1989) that, by the time of the First World War, American invention had shifted from the individual to managerial, corporate and governmental development.<sup>516</sup> Not until the development of the Internet would individuals arguably rise to the forefront of invention again. The role of the military in the advancement of technology is far greater, and started much earlier than is often assumed. According to Hughes, “by 1900 they had reached the promised land of the technological world...[and] had acquired traits that have become characteristically American.”<sup>517</sup> Hughes perceived a propensity in American behavior to seek technological solutions, in all arenas, with little regard to the social costs. Hughes acknowledged Mumford’s concern and addressed them to some degree in the *Human-Built World* (2005); nor did Hughes share Mumford’s discomfort with the military cast of innovation technology. To Hughes’ mind, technology is benign in nature, as is humanity. Mumford, however, is almost reticent to describe his view on human nature and its relationship with technology, but he conveys the feeling that he wishes that it were otherwise.<sup>518</sup>

Wherever the initial utilitarian impetus resided, as noted by Commager and Gordon, Hughes concludes that the rough outline took shape by the turn of the twentieth century.

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<sup>516</sup> Hughes, *American Genesis*.

<sup>517</sup> *Ibid.*, 1.

<sup>518</sup> Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (University of Chicago Press, 2005).

How different that transformation might have looked if the earliest colonists had not been of European descent is difficult to ascertain with any certainty. However, Hughes' argument does appear amenable to Commager's thesis. Freed from conventional and traditional constraints, the individual inventor found practical solutions to the challenges encountered in the new world.

Rudi Volti in *Society and Technological Change* (2006) examined the nature of technology, how it evolves, and the reciprocal relationship of technology and society. Volti warned that, "...the spectacular successes of technological development should not blind us to the fact that some of the inherent difficulties of life are simply not amenable to technological solutions."<sup>519</sup> If Hughes remained agnostic on the subject, a disinterested observer, Volti, much like Mumford, was more concerned by the direction of technology and its interplay with the military. However, Volti noted, the order and control that technology offers often subsumes most doubts on the ability of technology to solve the most complex problems. According to Volti, while technology might be highly successful in many venues, it is entirely unsuited to solving complex human problems. Hughes acknowledged this deficiency but his analysis is more descriptive than prescriptive. Volti went to great lengths to describe the error of attempting technological solutions to deeper social problems.

Brian Arthur in *The Nature of Technology* (2009) argued technology is inherently iterative, that it builds upon that with which existed prior. Technology also develops from the use and harnessing of natural phenomenon. There is arguably no good finite definition of technology, which attests to the multi-faceted nature of technology itself. Arthur tackled

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<sup>519</sup> Volti, *Society and Technological Change*, 316.



this question through a broad tri-tiered definition: "... a means to fulfill a human purpose, ...[an] assemblage of practices and components, ...entire collection of devices and engineering practices available to a culture."<sup>520</sup> Arthur, quite apart from Mumford, perceived technology as organic; it evolves, improves one upon the other, nor does he explicitly or implicitly have any discomfort with propensity of modern technology to control and order human life.

Arthur believed that "history is important" because all technological advancements are combinations of others that already exist or that develop from new domains that are discovered, but are also organically derived from what existed prior. Perhaps it falls out of his preview, but if history informs technological development and it evolves from what existed prior, then this propensity suggest that Mumford's concerns are justified. Arthur, not unlike Hughes, is concerned more with analysis, evolution, and technological processes than social tensions that result. Interestingly, as a professor of economics Arthur explained how initially "puzzled" he was that historians of all people seemed to have the most to say about the nature of technology. However, a historian's query is man, and technology, at its root, is an extension of man.<sup>521</sup>

In summary, the available studies that addresses American society's relationship with technology suggest that this relationship developed organically beginning in the early eighteenth century. By the turn of the nineteenth century the American mind, greatly influenced by the progress made during the Second Industrial Revolution, perceived that larger societal issues could be solved through technological means. The First World War brought that idea to maturity and the relationship inverted. No longer did the man wield

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<sup>520</sup> Arthur, *The Nature of Technology*, 28.

<sup>521</sup> Marc Bloch, *The Historian's Craft* (Manchester University Press, 1992), 26.

the tools (technology) of war, but now the machine assumed center stage and man assumed a subordinate role.

### The American Military's Attitudes Toward Technology

The literature reviewed here is focused principally on the US Army, although writers such as Colin Gray (2006) tend to lump the military as a whole together. His assessment, as such, amalgamates into large conclusions using a “way of war” construct to make broad generalizations about all the services’ dependence and reliance on superior technology.<sup>522</sup> However, there are fundamental differences between the Navy and the Army. Army officers have significantly more interaction with an enemy populace than the Navy while a naval officer’s work revolves entirely around the machine he captains. Thus, Army officers are expected to have a deeper, more comprehensive understanding of the cultural –and thus social--environment in which they operate. The proper relationship between the army and government was a debate of considerable importance in late eighteenth century America.

*The Federalist Papers* (1787) is among the first documents to reflect American attitudes at the time of the founding of the nation toward the military and how and what military should do to provide for the common defense as outlined in the U.S. Constitution. These writings predate the ratification of the U.S. Constitution, but what they had to say about using technology in concert with the military, how the military should or should not leverage the technology coming out of the Enlightenment, and the ongoing Scientific Revolution is, as expected, quite sparse. Early Americans demonstrated a deep-seated and broadly shared antipathy toward any kind of professional army, especially one controlled

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<sup>522</sup> Colin S. Gray, *Irregular Enemies and the Essence of Strategy: Can the American Way of War Adapt?* (2006: Lulu.com, n.d.).

by the federal government. Alexander Hamilton, in the Federalist 24, argued that Americans should not assume “an excess of confidence or security” afforded them by two vast oceans.<sup>523</sup> Commager’s argument on the role of geographical factors in shaping the American mindset are exemplified in this statement by Hamilton. The dangers of British territories to the north and west, and Spanish to the south required some kind of force in kind to protect the confederation’s interest. Indian tribes along the Western frontier could be relied upon to act in their own interest, and sometimes in consonance with that of Britain, for in this measure they intermingled; thus, a standing army albeit a small one was not only desirable, but also necessary under the circumstances. The propensity, thus established, shaped the structure, direction, and mindset of the military, and citizens toward it, for the better part of a century.

Technology remained of secondary or tertiary importance behind leadership and discipline for an army of this period. Technology was not a significant factor as of yet—at least for landlubbers! At this point the Army and Navy ideas about technology began to diverge. For the Army, the discussion turned on trained men, who controlled them, and the total quantity available. For millennia, across all civilizations, numbers counted for more than anything else, and this rule held true in late eighteenth century America. Americans at this time perceived technology as something that provided incremental advantages, but such advantages were largely subordinate to natural ability and leadership.

In the world of military education, the Prussians professionalized first following their crushing defeat at Jena-Auerstadt (1806) at the hands of Napoleon. Prior to the Civil War the US Army officer corps lacked a motivating experience of similar magnitude to

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<sup>523</sup> Alexander Hamilton, “The Federalist Papers No. 24,” accessed December 30, 2013, [http://avalon.law.yale.edu/18th\\_century/fed24.asp](http://avalon.law.yale.edu/18th_century/fed24.asp).

seriously consider professionalization. Although, the War of 1812 did provide some movement toward officer professionalization, but the nascent officer corps and larger political factors militated against significant Army reforms.

Technology is not necessarily limited to physical means; it can also be, and in the twenty-first century more and more commonly is, organizational and informational in nature. In this respect, both as to military thought and production, intellectual and material progress failed to take hold in any permanent form until after the First World War, although the Root reforms initiated movement. While the Civil War increased Northern industrial capacity, the long-term implications for the army were quite muted.

John Shy in *A People Numerous and Armed* (1976) examines the early American military experience and the propensity of American militarism assumed from those events. Shy found that an “...unthinking optimism about the natural American aptitude for warfare, and an ambivalent attitude toward those Americans who specialized in the use of force, all have had consequences in the twentieth century...”<sup>524</sup> In this respect, Shy’s findings do not differ much from the ideas that Hamilton confronted, although Shy perhaps identifies a more strident militarism in the colonial character. Not of a professional strain of course, but recourse to violence appeared more common and socially accepted, if not encouraged in this period. Since the first colonist set foot on the new world, enmity and insecurity had gone hand-in-hand with daily life as relationships with indigenous populations varied from tribe to tribe and from one moment to the next. Adequate security for the colonists among the outlying and scattered farms was beyond their capabilities. But “retribution” was

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<sup>524</sup> John W. Shy, *A People Numerous and Armed: Reflections on the Military Struggle for American Independence* (Ann Arbor: University of Michigan Press, 1976), 245.

something they could repay several fold and on their terms.<sup>525</sup> Men of natural ability, hunters, and other civilians provided for the general security, not professional soldiers. However, this also fed into Jefferson's hope of the citizen-soldier crafted in the shadow of Rome's Republican armies to provide for the common defense.

The Seven Years War, the American Revolutionary War, and the War of 1812 reinforced the perception that typical Americans –none of them professional soldiers- could achieve victory over standing armies commanded by aristocratic officers. Federalist No. 24 contrasted sharply with the common American citizen of the period. Hamilton, a man of formidable intelligence and knowledge, advocated a strong central government and envisioned a strong standing army to help solidify the American state. Hamilton was perhaps motivated by a darker or more realistic interpretation of human nature and its historical narrative up until the late eighteenth century and informed historically by the Roman experience. He thought a professional army a necessity. His views were the exception and appeared to conflict with actual experience as American amateurs racked up impressive wins over the next 150 years.

The decisive defeat of Mexico, the destruction of the Confederacy, and the dismantling of the Spanish Empire all contributed to and further reinforced the belief in American exceptionalism, which included being exceptional in what it could achieved without military specialists and professionals. America met the demands of the moment through fierce action. In some respects this affirmed the observations of Alexis de Tocqueville of the American propensity for utilitarian and practical solutions, eschewing more arcane and theoretical approaches (such as general staffs).

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<sup>525</sup> Ibid., 232–236.

Military professionalism hinted at an old world heritage that Americans had thrown off. These tendencies were thoroughly inculcated by the Army. A process of rapid military expansion followed by an equally, and sometimes sharper, contraction kept professionalism and army growth in check. This formula appeared to offer all the benefits of a standing army without any of the associated costs and dangers. American military action was not only decisive and effective as a way to decide national security affairs, but one might achieve those ends without the “unnecessary” burden experienced by nations with professional armies. Hamilton’s proposed old world approach never gained the necessary support, nor should it have when the citizen-soldier bore the burden with great success (or so the narrative went.)

Thinking deeply about war appeared neither desirable nor necessary in light of early American experiences. Thus, Shy observed, “new ideas were absorbed and reshaped by old, deeply imbedded modes of thinking about war.”<sup>526</sup> One can never outrun one’s history, entirely. And often those ideas, values, beliefs persist longer and influence to far greater degrees, whether consciously or unconsciously, than one would like to believe.

Marcus Cunliffe’s analysis in *Soldiers and Civilians: The Martial Spirit in America, 1775-1865* (1968) surveyed early American society and focused on the relationship and perception of civilians toward the Army and vice versa. In times of peace Cunliffe noted a general suspicion of the military fortified with a healthy degree of indifference. If Americans learned anything from war, specifically the Civil War, Cunliffe observed, “[it] was in fact optimistic.” Despite American animosity toward the Army, war (or at least its

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<sup>526</sup> Ibid., 250.

results) itself had favored the young nation. Force, more often than not, achieved results.<sup>527</sup> Shy, like Cunliffe, noted that Americans had shared a reservation toward a professional army that did not extend to the act of war itself. This tendency informed future generations and the path chosen for resolution. Hamilton might have thought a professional army necessary, but Cunliffe's observations confirmed Hamilton's experience of a general ambivalence toward things of a military nature and little changed between the Revolutionary War and the Civil War.

Technicism developed organically from the American experience. And by the early nineteenth century private and public development began to intermingle at an increasingly accelerated pace. Merritt Roe Smith in *Military Enterprise and Technological Change* (1987) posited that "...military enterprise has played a central role in America's rise as an industrial power and that since the early days of the republic, industrial might has been intimately connected with military might."<sup>528</sup> The Army Ordnance Corps provided an early and critical link with private industry to expand manufacturing processes. American armories served not only as repositories but incubators of knowledge for methods and processes that, in part, formed the bedrock for American industry. This line of development diverges from professionalism, or the lack thereof that Shy described, but the separation is neither wide nor absolute. Rather, the streams run parallel and at points converge. The Civil War served as another example of citizen-soldiers winning wars, even though most of the senior leaders on both sides were graduates of military academies. Likewise, the relationships between private and public industry formed important and

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<sup>527</sup> Cunliffe, *Soldiers and Civilians*, 435.

<sup>528</sup> Smith et al., *Military Enterprise and Technological Change*, 4.

memorable bonds in the Civil War. These bonds, like muscle memory, naturally renewed and increased with each war.

If the collective American mind seemed reticent and at times hostile to a professional army, as Shy observed, it held no such reservations towards industrial technology. The practical and utilitarian nature of Americans had no difficulty embracing the potential of industrial production. Where theory, military tradition, and the aristocracy belonged to the old world; the seeds of technology and production appeared fruits of the new. The Civil War brought officers and early industrialists together for mutual benefit—especially in the Northeast. Thus, the relationship between Army officers and industrial production sprouted early, at least in the Northeast, and suffered little from the negative associations historians have observed relative to military intellectualism.

American management practices colluded with scientific conceptions of best practices, which laid the foundation for Taylorism, a management system that sought to increase industrial efficiency by analyzing and standardizing individual tasks. The roots of technicism were firmly planted early in American history. The general acceptance of technological and scientific solutions to practical problems became a hallmark of the American character. Yet, as Shy noted, that American officer thought, though it certainly utilized, little about technology or its influence upon war until after 1890.<sup>529</sup> Despite this, the Civil War strengthened the bonds between the military engineer and private American industry and the relationship only grew closer as the years passed.

The abysmal conduct of the war of 1812 shocked the Army's nascent officer corps' (and the nation's) faith in the amateur citizen soldier. According to William Skelton in *an*

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<sup>529</sup> Shy, *A People Numerous and Armed*, 247.



*American Profession of Arms*, The officers who fought in this conflict were sufficiently motivated by its results to begin the process of professionalization.<sup>530</sup> The early officer corps drew frequently and deeply from the well of science.<sup>531</sup> The officer corps did not develop in a vacuum. In addition to West Point, which served as the first engineering college in America, the rapid growth of science and technology through the antebellum period produced a like-minded officer.<sup>532</sup> Additionally, European and especially French influence on the professionalization of America in general and the Army in particular, cannot be overstated. Thus, Gordon's thesis on the role of cultural origin in choice finds considerable support in later literature.<sup>533</sup>

Samuel Huntington in *The Soldier and the State* (1957) argued that the institutions of war, necessary for cultivating the military mind, manifested only after the Civil War, and on this point, Skelton and Huntington face off. Skelton, writing decades later, argued that the impulses for professionalization formed before, not after, the Civil War. However, the locus and quality of that professionalization are equally important questions. For Huntington, one cannot escape one's history, and thus, Jefferson's idea of the citizen-soldier continued into the future well beyond its usefulness. Ideas never perish, they merely slumber and for this reason, as Shy implied, Americans by character, culture and environment are reticent to fully engage in the theoretical study of war which is at odds with their willingness to often use war in all its forms as a practical tool to solve defense and security problems.

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<sup>530</sup> Skelton, *An American Profession of Arms*, 1992, 116.

<sup>531</sup> *Ibid.*, 123.

<sup>532</sup> *Ibid.*, 180.

<sup>533</sup> *Ibid.*, 240.

According to Matthew Moten in *The Delafield Commission and the American Military Profession* (2000), the Delafield Commission was dispatched to Europe in April of 1855 to observe all aspects of the military field. Secretary of War Jefferson Davis hoped to use the information gathered from the trip to rectify perceived shortcomings within the US military. Furthermore, Moten's analysis revealed "Antebellum expertise manifest[ed] three flaws." These included an overreliance on French military thought, West Point's engineering focus, and military officers finding recompense for civilian rather than military efforts.<sup>534</sup>

The US Army from its inception had developed from a nucleus of science and engineering at West Point conceived by Jefferson as a way to develop engineers that could assist with the development of the young nation's infrastructure. Jefferson firmly believed in the capacity of patriot soldiers and with equal fervency the danger posed by an elite officer corps. Moten's work was congruent with Huntington's earlier arguments about the officer corps' Technicism. Officers never developed a deep understanding of the nature of war and this was by design. As the United States matured it grappled with the study of war reluctantly, at first, and relied almost entirely on the old world for guidance—or in today's parlance, "best practices." The activity at the federal armories and West Point's engineering focus were congruent in nature and this harmony abetted a propensity in thought and action.

Professionalization moved through the corps in close conjunction with the professionalization of other fields in American society, but at a far slower rate.<sup>535</sup>

Professionalization near the end of the nineteenth century assumed, as Smith observed, an

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<sup>534</sup> Moten, *The Delafield Commission and the American Military Profession*, 55.

<sup>535</sup> Skelton, *An American Profession of Arms*, 1992, 116.

industrial and managerial component that initially developed earlier in the century in the armories and nested easily within an engineer's intellectual framework. An unintentional bifurcation of the officer corps occurred between those stationed in the east and northeast and those that served on the western frontier. Army officer professionalism, especially for those in the northeast, found its impetus not in potential threats or in the ashes of defeat, but rather in the impulse derived from a growing technical complexity as war appeared to have far more in common with science and technology than the humanities, and thus, the trend devolved in that direction. The technical focus of the east amalgamated with the practical bent of those officers serving in the west and southwest.

Carol Reardon in *Soldiers and Scholars* (1990) examined the gradual encroachment of civilian academia from 1865-1920 on the use and study of military history by officers. Military history waged from the onset a rearguard action against the encroachment of science, engineering, and eventually even social science on the development of Army officers. The Army officer corps of the late nineteenth and early twentieth century twisted and distorted military history on the alter of practicality and utility the damage thus inflicted rendered the results largely ineffectual.<sup>536</sup> The distance between reality and the Army fiction reached unsustainable proportions and was likely to have grave consequences in the future. The officers, true to the intellectual roots that Moten articulated, perceived history as a tool to be wielded -like science- without any regard to the art. The US Army officer corps, from its inception and certainly its professionalization, centered nearly entirely on this facet. The Army officer corps developed in isolation, as Huntington noted, especially in the west, but as Skelton argued it also professionalized with other fields in

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<sup>536</sup> Carol Reardon, *Soldiers and Scholars: The U.S. Army and the Uses of Military History, 1865-1920* (University Press of Kansas, 1990), 5-8.

America, but mainly in the east. For a soldier coming of age in the last several decades of the eighteenth century professionalization remained a distinctly subjective proposition. An engineer officer posted to the Watertown arsenal in Massachusetts probably understood professionalism to be quite different from an infantry officer serving on the western frontier.

In *The American Way of War* (1973), Russell Weigley found, like Moten, that the American military mind was predisposed to a particular way of thinking, in this instance, how it waged wars.<sup>537</sup> The U.S. military never developed its own philosophical thoughts on the nature of war. Rather it shifted with the vagaries of the European battlefield. At one moment French, the next German, and then back again, it was never quite sure of itself. As Cunliffe noted, Americans in general did not think deeply on things of a military matter, and as a result, the Army officer corps adopted foreign ideas readily. The Germans and French, staunch enemies, did not agree on much, but the legacies of Napoleon exerted no small amount of influence on the next two hundred years of war, and for that reason the search for decisive battles –annihilation- consumed the American military mind and constituted the American Way of War in the minds of some historians.

Brian Linn in *The Echo of Battle* (2007) expanded the trail first blazed by Weigley. Linn argued that there exist three traditions within the American Way of War. First were the “Guardians” who constituted a traditional view that war is both science and art. The Heroes were those that believed in the “human element” above all others. The Managers comprised the last group, believing that war was the art of production and resource

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<sup>537</sup> Weigley, *The American Way of War*.

management.<sup>538</sup> These three groups are not “mutually exclusive” and one finds advocates for each, but they do wrestle for ascendancy. Weigley argued that annihilation defined the American Way of War, while Linn assumed a nuanced argument that at different points in American history war was waged by different rule sets. Regardless, the horrors of the modern battlefield combined with power of modern firepower produced some of the first, and arguably the most clear, fissures in the preeminence of the heroic soldier image.

In *Beating Plowshares into Swords: The Political Economy of American Warfare, 1601-1865* (1996), Paul Koistinen examined the American experience, which seized upon technological solutions to a greater degree than most. Technology and the economy are two different though related products of man. The economy is the product of and produces technology in scale. War, especially since the late eighteenth century, has relied on the organized production of major end items to support the vast increase in the size of armies. Koistinen divided the economy of America into four major parts: political, economic, technological and military. Koistinen observed that the American economy developed through three clearly discernable stages preindustrial, transitional, and industrial over this period. Koistinen’s analysis closely parallels Linn’s three traditions, which mirror the economic development of the U.S. Army. The Army officer profession mirrored this economic development. Skelton alluded to this when noted how Army professionalism matured in parallel with other professions in American society.

The United States political system largely relegated the military to the sidelines during the preindustrial and transitional stages of economic development because one could meet the challenges of warfare during this period with citizen-soldiers, as Shy

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<sup>538</sup> Linn, *The Echo of Battle*, 2009, 5–7.

observed. This, however, changed as technologies advanced and the economy matured and the earliest seeds sprouted in the arsenals.

The most influential aspect of the four in determining the character and direction of the economy, according to Koistinen, is the political element. Koistinen does not provide a concise definition of technology, as that is somewhat peripheral to his main argument; however, his work contributes to a broader, if not more holistic understanding of the cultural context for the American Way of War and its economic development and how those forces helped shape how American officers perceive and conduct war. For the American Army officer, professionalism and the study of it became more about production and technology than the study of military theory. War, the nature of it, was a question of material, numbers, and management.

Walter Kretchik in *U.S. Army Doctrine From the American Revolution to the War on Terror* (2011) examined the evolution of Army doctrine. Kretchik traced the development or borrowing of doctrine, beginning with Baron von Steuben and the Continental Army. Early American doctrine through the First World War often consisted of gross plagiarism of French material, in some cases copied nearly verbatim. The US Army, a relatively young institution in comparison to its European counterparts, lacked a strong military tradition, and in many ways prided itself on that fact. Thus, without adequate tradition or desire the US Army simply looked, as noted by Molten, at the European battlefields for answers. And whichever military dominated at that period became the outline the Army attempted to trace. Most frequently this was the French Army, especially following Napoleon, with his success and dependence on mass conscription seemed the perfect fit for early America.<sup>539</sup>

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<sup>539</sup> Kretchik, *U.S. Army Doctrine*.

Kretchik observed that, “War college committees studying France, Germany, Great Britain, Japan and the Soviet Union, as well as other nations including Italy and Switzerland, were all filtered through an American Cultural lens. If foreign doctrine did not mesh with American political and societal norms, as well as military values, it was often discounted.”<sup>540</sup> The clear and rational Machiavellian approach is not displayed here, but a preference for the familiar, the known, not an impulse to explore and embrace future potential, but reluctance to break with the past. “Principles were the immutable truths,” Kretchik noted, “that anchored the intellect,” intellectually moored to the old world. Thus, Army officers never fully discovered the possibilities that resided outside the self-inflicted intellectual limits.

\*\*\* The civilian and military minds, in respect to technology, paralleled each other throughout much of American history. However, the alignment remained equivalent in direction only the diffusion and speed of technological adoption depended on the amalgamation of many disparate factors. Like most nations the U.S. was born through war, yet, in the American case the birth came relatively late in the process of state formation. Free from the inertia that often restrains social change Americans readily adopted technology in conjunction with utilitarian needs largely uninhibited by religious, institutional or bureaucratic barriers.

The emergence of the U.S. coincided fortuitously with the advance of science and technology. The meeting produced a *mentalität*, “...a common mindset generating similar approaches to common problems...”<sup>541</sup> The seemingly limitless potential of technology to solve every day problems that had bedeviled man for thousands of years imbued that

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<sup>540</sup> Ibid., 140.

<sup>541</sup> Knox and Murray, *The Dynamics of Military Revolution, 1300-2050*, 112.

technology with profound qualities, that when measured, it processed only superficially. Technological benefits, by their nature visible, were extolled in great measure and enthusiastically embraced by individuals and corporate bodies alike; yet, the social costs, the second and tertiary effects were no less acute albeit less amenable to quantitative measurement and frequently emerged only after an extended incubation period usually measured in a score or more- generational.

The Army was less an institution and more an organism, exemplifying the characteristics of a living creature with all of its instinctual and intellectual faculties that one might attribute to a predator. Technology enhances these instinctual skills-- the eyes, the limbs, the claws-- the ability to kill. Yet, technology only amplifies what already exists in the organism. It is not additive in nature, abilities are multiplied through the use and employment of technology, but smarter it does not one make.

The Army moved firmly and slowly but not out of step with the potential of technology. Initially, technology provided no absolute superiority on the battlefield tactical success depended more on discipline and leadership. Human attributes varied, but those prized here in the new world, as noted by de Tocqueville, were of a practical and utilitarian strain, of the blood and sweat kind. The Civil War demonstrated the power of manufacturing and advances in technology to many observers both foreign and domestic. Nascent Army professionalism and weak intellectual mooring provided the perfect environment for technicism to take root and over the next two hundred years it proliferated.

Some historians have studied the development of Army professionalization and still others have examined technology and its effect on the battlefield, but few have analyzed



the intellectual substrate of Army officers and its confluence with technology. In other words, this substrate was the Army officer *mentalität* that developed from the peculiar American experience.

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