



Maneuver Warfare and the Principles of Wars

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In 1989, when the Commandant of the Marine Corps, Gen Alfred M. Gray, signed *FMFM 1, Warfighting*, he struck the Principles of War from Marine Corps doctrine—although, as it turned out, not everybody got the message. *Warfighting* contains no discussion of MOOSE-MUSS or any other list of so-called principles. This was no mere oversight but intentional. This was revolutionary, as practically every foundational Western manual on warfare since World War II had started with a discussion of the Principles of War. First proposed in basically their current form by J.F.C. Fuller, the Principles were taken to be timeless, universal, authoritative, and binding. They were considered axiomatic to all military thought. If anything in the area of military theory qualified as Holy Writ, it was *the* Principles of War. This was as true for the Marine Corps as for any other Service.

How did the so-called principles of war gain such a strong hold on the Marine Corps? Equally important, how did they endure for seven decades as a primary doctrine for combat operations before disappearing from doctrine with the stroke of a pen? Most importantly, why are they incompatible with maneuver warfare theory? That story unfolds in the following narrative.

The Newtonian Paradigm

The effort to reduce warfare to a fixed set of concise principles long predated J.F.C. Fuller. The genesis of the principles of war rested on a scientific understanding of war and was an offshoot of Newtonian science, which conceived that the world was ruled by immutable natural laws, universal, mathematical, comprehensible, and predictable.¹ The universal principles of the natural sciences and their ability to objectively measure phenomena instilled in many military theorists—particularly the French theorists of the Age of Enlightenment—the belief that war, too, was subject to similar rules of universal validity.² For many theorists, discovering such principles offered the potential for conducting military operations with the same precision and certitude as solving a mathematical equation.

The Enlightenment, especially in France, produced an abundance of theoretical principles or rules for strategy and tactics. Count de Guibert, a French military writer, for example, claimed in his celebrated work *Essai Général de Tactique*, published in 1772, that tactics could be raised to “universal truths” that would be “the science of all times, all places and all arms.”³ He later repudiated the main ideas of *Essai*, citing his youth and addiction to modern philosophy as having clouded his judgment.⁴ Dietrich Heinrich von Bülow,

FMFM 1, Warfighting, deliberately made no reference to the Principles of War. (Photo by Cpl Robert Gavaldon.)

a Prussian officer, also claimed that he had synthesized the methods of the best of the eighteenth-century generals into mathematical rules. He contended that war was no longer an art but a science, and he based much of his theoretical work on geometrical principles. Those geometric principles collapsed when tested by Napoleonic warfare on the battlefield.

When faced with explaining the lack of progress in applying this military science in practice, theorists cited poor methodologies and a failure to examine sufficient historical examples as a primary reason.⁵

The search for universal laws extended into the nineteenth century, and even Carl von Clausewitz, influenced by Bülow's system, offered his thoughts on the principles of war in a memorandum for the military instruction of Crown Prince Frederick William titled "The Most Important Principles For the Conduct Of War To Complete My Course Of Instruction Of His Royal Highness."⁶ Six years later, in 1818, Clausewitz concluded he had failed to consider how these statements impacted the whole phenomenon of war.⁷

Clausewitz's dramatic change of perspective was influenced by his years of extensive combat service and what at the time was a growing opposition to the Enlightenment, particularly within Prussia and the other German states. While the Enlightenment philosophers and scientists believed that man, through proper application of reason, could fully understand the universe and its diverse phenomena, a contrary view arose.⁸ This view emerged from what some scholars refer to as the Counter-Enlightenment or Romantic Era, which judged social interaction and its inherent characteristics of courage, talent, values, passions, and moral force as primary factors in understanding war theoretically.⁹ It was a humanities-based outlook grounded in German Idealism, and it held that the natural world was not entirely subject to scientific rationalization. From 1818 until his death in 1831, Clausewitz developed and wrote of war from a humanities-based perspective. His wife, Marie von Brühl, published his writings in 1832 as *On War*.

Jominian Prominence

When first published, *On War* garnered little interest outside of Prussia, and its influence on the English-speaking world was minimal until the twentieth century.¹⁰ The overwhelming majority of early nineteenth-century thinkers continued to view war through the perspective of the Enlightenment, and this is the perspective upon which Gen Antoine Henri Jomini built his conceptual framework. The introductory language of his first book, *Treatise on Grand Military Operations*, reveals his intellectual direction:

The idea of reducing the system of war to its fundamental combination, on which all else depends, and which will provide the basis for a simple and accurate theory, offers numerous advantages: it will make instruction easier, operational judgment sounder, and mistakes less frequent. I believe that commanders cannot do enough to absorb this concept, and that it ought to guide all their plans and actions.¹¹

Jomini contended that through a comprehensive historical study of war and an examination of its individual elements

(reductionism), it was possible to identify the laws by which it functioned. His writings were prescriptive with an extensive geometric and spatial vocabulary that centered on a fundamental principle: place superior power at the decisive point.¹² He did not, however, create a list of principles, as would military theorists in the early twentieth century. Jomini's efforts had an enduring impact on professional military education, an impact that persisted through the nineteenth century and into the late twentieth century. His widely translated *Summary of the Art of War* became "the premier military-educational text of the mid-nineteenth century."¹³ His contribution to the development of the military profession was immense, including in the United States.

The Development of Scientific Principles in the United States

According to military historian Russell F. Weigley, "Jomini's interpretation of Napoleon became the foundation of the teaching of strategy at West Point ... cadets encountered his teachings in Dennis Mahan's explication of the art of war in the senior course which formed the principal introduction to the subject, for Mahan's ideas were formed upon Jomini's."¹⁴

Dennis Mahan served as a professor at the U.S. Military Academy at West Point from 1824 until his death in 1871. His students, his writings, and his mark on West Point swayed the American military well into the twentieth century. Mahan's legacy embraced Jomini's scientific views of war and a pedagogical outlook acquired not only from his time in France but also from Sylvanus Thayer, Superintendent of the Military Academy.¹⁵ That outlook included a closely prescribed curriculum with a heavy mathematical bias, small classes, an arduous daily program with frequent grading and interrogation, and a spirited competition for class standing.

Dennis Mahan's presence at West Point ensured that officers of the Army serving from the mid nineteenth century through the first half of the twentieth century were ingrained with Jomini's scientific views of war. His more famous son, Alfred Thayer Mahan, replicated this state of affairs at the Naval War College and within the officer corps of the Navy.

Credit for founding the Naval War College belongs chiefly to its first president, CDR Stephen B. Luce, who in his 1885 opening address to the inaugural class expounded on his vi-



Starting in the eighteenth century, military theorists sought to reduce war to a set of universal laws or principles. (Photo by Cpl Robert Gavaldon.)



By the end of the nineteenth century, the “Jominian principles” were a formal part of PME and were applied to land and naval warfare. (Photo by Cpl Robert Gavaldon.)

sion for the institution—a vision at odds with the views of many senior officers who saw sea duty and experience as the true professional school for educating naval officers:

Now naval history abounds in materials whereon to erect a science ... there is no question that the naval battles of the past furnish a mass of facts amply sufficient for the formulation of laws or principles which, once established, would raise maritime war to the level of a science.¹⁶

Luce thus laid the foundation for a Jominian approach to naval operations. Seeking a naval historian for the faculty, Luce selected CDR Alfred Thayer Mahan. With Mahan in place, Luce reportedly stated that he had found his “naval Jomini” and that his name was Mahan.¹⁷ Mahan served as a lecturer and president of the Naval War College from the summer of 1886 until January of 1889 and again from July of 1892 until May of 1893, as no classes convened during 1890 and 1891. “Like Luce, Mahan was a great believer in the immutable principles of strategy which would be ‘discovered’ by the use of the comparative method in the study of history and military strategy.”¹⁸ These lectures identified the factors that he contended gave a nation maritime power, and they set forth his views on how naval operations were subject to the same Jominian principles as land operations.

Mahan transformed his lectures into book format, publishing *The Influence of Sea Power upon History, 1660–1783* in 1890. Then in 1892, he published *The Influence of Sea Power Upon the French Revolution and Empire, 1793–1812*. These works brought Mahan world renown.

For decades, students at the Naval War College studied Mahan and the principles he embraced. In Mahan’s perspective, the immutable principles were (1) the importance of

concentrating the fleet for a climactic battle at the decisive location and time to win control of the sea and (2) the merits of fighting from the central position and along interior lines. Such principles, incorporated into his prose rather than an enumerated list, were crucial to Mahan’s scientific view of war. That is, observance of these principles greatly favored success in battle at sea, thus control of the sea and victory in war.

By the end of the nineteenth century, the Naval War College and the U.S. Military Academy, as well the several Army schools at Fort Leavenworth, had firmly established principles of war within American professional military education. These principles were the essence of the scientific view of war and the primary doctrine for combat operations by American forces.

The Arrival of J.F.C. Fuller

During the early years of the twentieth century, the Army continued to expand its professional education system at about the same time that J.F.C. Fuller of the British Army was popularizing the modern version of the principles of war. Fuller, although not the first to set forth such principles, proved eloquent and persuasive in advocating and enumerating them, which he first enunciated as eight strategic principles and three tactical principles in an anonymous article published in the *Journal of the Royal United Service Institution* in February of 1916. A revision of the *British Field Service Regulations* (Volume II, *Operations*) in 1920 incorporated Fuller’s work in an altered form as “The Principles of War.”

In October 1920, Fuller published an article that identified eight principles, not of strategy or tactics, but of war. Fuller

weighed in on the principles of war again in 1926. His book, *The Foundation of the Science of War*, published in that year asserted that the conduct of war “was founded on the science of war with definite principles and laws which governed its operations like any other science.”¹⁹ He further contended that the doctrine evolving from these principles, when taught in professional military schools, would avoid needless sacrifices in the next war. In the preface to the book, Fuller stated:

In this book I am attempting something new ... In a small way I am trying to do for war what Copernicus did for astronomy, Newton for physics, and Darwin for natural history. My book, I believe, is the first in which a writer has attempted to apply the method of science to the study of war.²⁰

Fuller’s principles of war, predicated on the Enlightenment and the search for a universal science of war, certainly constituted the continuance of Jomini’s scientific views of war, although Fuller never fully acknowledged a connection between his principles and the principles embraced by Jomini.²¹ Even though there is a lack of evidence in Fuller’s own works (or that of his biographers) linking him with Jomini’s theories, he nevertheless viewed war in the same scientific way as Jomini. In testing his prescriptions against the history of warfare, Fuller was hampered, for as military historian and theorist B.H. Liddell Hart stated, “Fuller’s historical knowledge was patchy and he was prone to make historical generalization.”²² Nonetheless, he was the twentieth-century’s successor to Jomini.

Resistance to the Principles

The scientific view promoted by Fuller asserted, in essence, that a military commander adhering to his principles could predetermine the outcome of events on the battlefield. His assertions regarding the principles were challenged, and in later years, he “agreed that his attempt to universalize the principles of war was a mistake.”²³ Moreover, Fuller’s principles were not universally accepted, even in Great Britain. German doctrine rejected the principles of war concept throughout the 1920s and 1930s, and French doctrine did not include such principles until 1936.

In the United States, a small number of officers also took exception to the notion of principles of war. The Infantry



Following World War I and into the 1930s, the Principles of War were rejected in German and French doctrine and were marginalized in U.S. Army and Navy PME. (Photo by Cpl Robert Gavaldon.)

School at Fort Benning, GA, when under the leadership of COL George C. Marshall, for instance, published a book with the lead sentence reading: “The art of war has no traffic with rules, for the infinitely varied circumstances and conditions of combat never produce exactly the same situation twice.”²⁴

The officer with the most persuasive and reasoned argument against the principles of war was RADM Edward Kalbfus, who assumed the Naval War College presidency in 1934. Kalbfus asserted that the use of the principles of war as a means of exercising effective command was

a very dangerous practice, for it led the unwary to believe that if he remembered the names of these nine so-called principles, which were, however, merely nine nouns and not statements of cause and effect, he could feel that he did really understand the fundamentals of warfare, particularly if this practice were approved and in effect at the only institution we had which covered the study of naval warfare.²⁵

Further, in *Sound Military Decision*, the college’s primary text beginning in 1936, there existed this expression of the college’s philosophy relative to the principles of war:

Certainly the preceding list [principles of war] of isolated expressions includes no item which, in the abstract, may not properly be considered as possibly vital from the strategical and tactical standpoints. But that these expressions are always vital, and that there are no other considerations, can scarcely be accepted as final. Even if this objection could be removed by the inclusion of all factors well known to be vital, the fact would still remain that these expressions, standing alone, fail to satisfy the real need; i.e., they fail to indicate any practical application of the concepts which they are intended to imply.²⁶

The Principles of War in the U.S. Army

Challenges to the value of principles of war, however, had minimal impact on the United States Army, which began the process of identifying specific principles during the 1910s. Officers in the Army, noting the rise of so-called “scientific management” in the corporate world and seeking to apply it to war, first introduced a list of principles into professional military education in 1914.²⁷ The *Field Service Regulations*, published by the Army in 1914, contained five lists of *general principles* and one list of ten *combat principles*. The updated *Field Service Regulations*, published in 1923, contained similar lists of general principles and a rewritten list of combat principles. The combat principles shared similarities with the principles of war published by Fuller in 1920, and they were viewed within Army professional military education in the same way as Fuller viewed his principles: eternal, universal, and fundamental.

Even though the *Field Service Regulations* of 1914 and 1923 contained lists of combat principles, they were not explicitly identified as the principles of war. Such principles of war were instead published in various training regulations and professional journals throughout the 1920s and 1930s. The appendixes of John I. Alger’s work, *The Quest for Victory*, contain four such lists of the principles of war that were associated with professional military education in the United States. For example, the War Department published *Training*

Regulation 10-5 in 1921 identifying the following nine axioms as “The Principles of War” for the United States Army:

1. The Principle of the Objective.
2. The Principle of the Offensive.
3. The Principle of Mass.
4. The Principle of Economy of Force.
5. The Principle of Movement.
6. The Principle of Surprise.
7. The Principle of Security.
8. The Principle of Simplicity.
9. The Principle of Cooperation.

Though not drafted as official doctrine, enumerated lists of combat principles or principles of war such as these remained in the mainstream of Army professional military education from the early 1920s and through World War II and after. These principles were seen as a useful means for expeditiously inculcating large numbers of students with a doctrine believed to lead to success in war. This was especially true as the small Regular Army and the ROTC met the requirement to scale massively and quickly for World War II.

In 1949, a slightly different form of these nine axioms finally became official Army doctrine when published in *FM 100-5, Field Service Regulations-Operations, 1949* as Army “Principles of War.” Those principles endure to the present time in Army doctrine. *Army Doctrinal Publication 1-01, Doctrine Primer*, adopted in July 2019, asserts that the greatest value of the principles of war is in educating the military professional.²⁸

The principles of war found less favor in the Navy. In addition to their derogation at the Naval War College, the failure of Mahan’s principles to manifest themselves during World War II minimized their place within Navy professional military education thereafter. Nevertheless, a list of nine principles of war remains in *Naval Doctrinal Publication 1, Naval Warfare* (April 2020), with just a single sentence explaining the purpose of the list.²⁹

The Principles of War in the Marine Corps

The concept of principles of war migrated to the Marine Corps primarily through Army publications. The Marine Corps Schools were established at Quantico, VA, in 1920. With few of its own academic resources during the early years, the Marine Corps modeled its instruction after U.S. Army instruction, especially the field officer course at Fort Leavenworth. The schools at Quantico copied Army textbooks and other educational material and used them extensively. Students in the early years often complained that using Army materials stifled initiative, even after those materials had been somewhat modified for Marine use.³⁰

The Commanding Officer of the Marine Corps Schools in 1929, Col James C. Breckinridge, sought to counter the concept of immutable principles of war often found in Army publications, writing: “There is no formula for waging war or fighting battles; to apply a rule is to invite, or demand, disaster.”³¹ He sought to teach his students how to think, not to recite rules and formulae.³² In 1932, Breckinridge authorized discarding of all course material developed from



Maneuver Warfare in the Marine Corps rejects the Principles of War as a manifestation of a doctrinaire approach “which sees the conduct of warfare as a scientific undertaking governed by immutable and predictable laws.” (Photo by Cpl Robert Gavaldon.)

the Army. With the staff and students turning to the development of a *Tentative Landing Operations Manual* and the approach of World War II, the importance of the principles of war diminished.

But they reappeared after the war. Newly commissioned officers arriving at The Basic School in the four decades following World War II learned the principles of war just as their predecessors had in the 1920s and the 1930s. The principles were an integral part of their professional education and central to Marine Corps combat doctrine. Few of these officers ever forgot the various acronyms, such as MOOSE-MUSS, used to memorize the list of principles and to recall them during exams. Arriving at their first duty stations they found the principles of war in Marine Corps doctrinal publications. *FMFM 6-3, Marine Infantry Battalion*, for example, described the principles of war as fundamental truths that are essential to the proper exercise of command and the conduct of war.³³ *FMFM 6-4, Marine Rifle Company/Platoon* of that era contained similar descriptions.

The Disconnect with Maneuver Warfare

By now, it should be clear that the scientific, Jominian approach embodied in the Principles of War is inconsistent with maneuver warfare. To be sure, none of the “nine nouns”—as Kalbfus called them—is inherently objectionable on its own. No Maneuverist would argue that mass, objective, or any of the other so-called principles is *wrong*—any more than he would argue that honor, courage, and commitment are wrong. How could he? They are so general that it would be impossible to find fault with them as isolated terms absent any context. You could no more say that any of the principles is always important than you could say that any one of them is never important. Nor could you say that other possible nouns are not as important.

What is objectionable is that the principles come directly out of the Jominian tradition, which sees the conduct of warfare as a scientific undertaking governed by immutable and predictable laws. By contrast, *Warfighting* rests firmly on a solid Clausewitzian foundation. Maneuverists believe that the idea that something as complex and unpredictable as

warfare could be reduced to an enumerated list of axioms is nonsense. To fight according to rules, as Breckinridge noted almost a century ago, is to invite disaster.

Each principle exists in isolation from the others. The list gives you no insight into the relationships among the principles. When does one principle take precedence over another? When and why can or should you ignore the principles? How do you resolve tensions between principles? How do you apply them in practice? Maybe most important, how do you combine them into an actual operational system? The Principles of War are mute on all these questions.

Yet, the phrase “the Principles of War” implies timeless, proven authoritativeness. The very words suggest irrefutable wisdom to use in solving today’s problems. Too often they were taught as such, and they were invariably the foundation for professional military education in all matters related to strategy, operations, and tactics in the post-World War II decades. That impression is misleading at best and dangerous at worst. In fact, the Principles of War promote a checklist approach.

The Principles of War are warfare as paint-by-numbers. A paint-by-numbers kit may help you produce a recognizable image of a bowl of fruit, but it will not encourage artistic mastery. In fact, we submit it will stifle mastery. Such an approach may be acceptable for raising a mass of novices to the level of basic competence quickly, but it is no process for ultimately creating true professionals in the art and science of war.

The Principles Persist

Yet, articles in various military journals and other publications have continued to endorse the scientific view of war. For instance, in “Rethinking the Principles of War,” published in *Proceedings* in 2003, RADM John G. Morgan and Dr. Anthony D. Mc Ivor contended that the principles of war shape current military doctrine and that “the profession of arms must be a principle-based enterprise.”³⁴ In another work published in 2005, edited by Mc Ivor and carrying the same title, *Rethinking the Principles of War*, there are numerous articles advocating the importance and relevance of the principles of war.³⁵ Not surprisingly, though, retired Col Thomas X. Hammes provides the voice of dissent, writing: “In short, principles of war aren’t.”³⁶

Certainly among the most fervent writings supporting the principles of war is Maj Gregory R. Ebner’s paper “Scientific Optimism: Jomini and the U.S. Army” published in 2004 and now part of the U.S. Army’s Professional Writing Collection.³⁷ Among his most implausible claims is that the Army’s planning process, based on Jomini’s work, has a lucidity and precision that trumps “Clausewitz’ friction and fog and offers the Army officer the ability to maintain command of the chaos of war.”³⁸

Even in the Marine Corps, the principles of war have proved hard to kill. While Gray may have removed them from doctrine with the stroke of a pen in 1989, he did not eliminate them. The Principles of War have risen phoenix-like from the ashes. By 2001, *MCDP 1-0, Marine Corps Operations*,

which attempts to translate the philosophy of *Warfighting* into operational terms, was stating that the “Marine Corps’ warfighting philosophy of maneuver warfare is rooted in the nine principles of war.”³⁹ This is a serious misreading of *Warfighting* and a misunderstanding of maneuver warfare—and evidence that the Marine Corps is due for a conversation about its own doctrine.

Conclusion

We leave the final word on principles to Sir William Slim, whose famous epigraph appears at the beginning of Chapter 4 of *Warfighting*:

Many years ago, as a cadet hoping some day to be an officer, I was poring over the “Principles of War” listed in the old Field Service Regulations, when the Sergeant-Major came up to me. He surveyed me with kindly amusement. “Don’t bother your head about all them things, me lad,” he said. “There’s only one principle of war and that’s this. Hit the other fellow, as quick as you can, and as hard as you can, where it hurts him most, then he ain’t lookin’!”

But this is so much more than a single principle or even several principles. For there are several key ideas here—violence, surprise, speed, criticality, and vulnerability—woven together into a unified operational logic that could even be described as an extremely concise, elegant encapsulation of maneuver warfare.

Notes

1. Steven Strogatz, *Chaos: Parts I & II*, (Chantilly, VA: The Teaching Company, 2008).
2. Not until after the mid-twentieth century did the scientific community thoroughly understand that when one views the universe as a system its separate components are also systems of which, most importantly, there are two types, *linear* and *nonlinear*. The phenomena of linear systems lend themselves to understanding through Newtonian science. These systems produce generally predictable behavior in which effects are proportional to their causes. On the other hand, nonlinear systems are disproportionate between cause and effect, which makes them dynamic and essentially unpredictable. Electrical circuits, clocks, automobiles, calculators, telecommunications, etc. exemplify linear systems. Examples of nonlinear systems include such phenomena as politics, weather, stock markets, war, etc. Efforts to comprehend war as amenable to Newtonian science have proved futile.
3. This characterization of *Essai Général de Tactique* is based upon the description provided by R.R. Palmer. See: Count de Guibert, *Essai Général de Tactique* in R.R. Palmer, “Frederick the Great, Guibert, Bülow: From Dynastic to National War,” in *Makers of Modern Strategy*, (Princeton, NJ: Princeton University Press, 1986).
4. Ibid.
5. Unaware of nonlinear systems, these writers and theorists were striving to create a science of war through studying and analyzing history. In essence, they were attempting to understand war, which is nonlinear, through a linear perspective.

6. Carl von Clausewitz, *Principles of War*, trans. and ed. Hans W. Gatzke, (Harrisburg, PA: The Telegraph Press, 1960).
7. Scott Helminski, "On War's Continued Relevancy: The Throng and Nature of War," *Marine Corps Gazette*, (Quantico, VA: June 2019).
8. Mark T. Calhoun, "Clausewitz and Jomini: Contrasting Intellectual Frameworks in Military Theory," *Army History Journal*, (Washington, DC: U.S. Army Center of Military History, Summer 2011).
9. Historians often view the Romantic Era or Romanticism as a literary or aesthetic movement. German Romanticism, the precursor to German Idealism, however, was not so narrowly focused. Beyond its literary aspects, German Romanticism also yielded a philosophy that integrated, among other matters, politics, ethics, and epistemology. Frederick C. Beiser writes about the expansive character of German Romanticism. See Frederick Beiser, *The Romantic Imperative: The Concept of Early German Romanticism*, (Cambridge MA: Harvard University Press, 2003).
10. For a comprehensive study of this subject see: Christopher Bassford, *Clausewitz in English: The Reception of Clausewitz in Britain and America 1815–1945*, (New York, NY: Oxford University Press, 1994).
11. John Shy, "Jomini," in *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, ed. by Peter Paret, (Princeton, NJ: Princeton University Press, 1986).
12. Christopher Bassford, "Three Competing Theorists," *Clausewitz and His Works*, (April 2002), available at <http://www.clausewitz.com>.
13. Ibid.
14. Russell F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy*, (New York, NY: Macmillan Publishing Co., Inc., 1967).
15. Thayer's tenure lasted from 1817 until 1833, and historians and others often identify him as "The Father of West Point." Moreover, he influenced the Military Academy and professional military education in the United States far into the twentieth century. This influence was scientific in character and traceable to France. During a European visit prior to his West Point appointment, Thayer had ascertained that French officers viewed studying and preparing for war as a scientific endeavor. That visit, two years in duration and directed by President Madison, began in 1815 when Thayer and LtCol William McRee departed for France. While there they studied at the *Ecole Polytechnique*—then viewed as the most famous scientific military school in the world.
16. Stephen B. Luce, "On the Study of Naval Warfare as a Science," *Proceedings*, (Annapolis, MD: U.S. Naval Institute Press, 1886): in *Makers of Modern Strategy*.
17. Alfred Thayer Mahan, *The Influence of Sea Power Upon History, 1660–1805*, 1st U.S. ed., (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1980).
18. *Professors of War*.
19. Brian Holden Reid, "Colonel J.F.C. Fuller and the Revival of Classical Military Thinking in Britain, 1918–1926," *Military Affairs*, (October 1985).
20. J.F.C. Fuller, *The Foundations of the Science of War*, (London: Hutchinson and Company, 1926).
21. *A History of Military Thought*.
22. Brian Holden Reid, *J.F.C. Fuller: Military Thinker*, (New York, NY: St. Martin's Press, 1987).
23. "Colonel J.F.C. Fuller and the Revival of Classical Military Thinking in Britain, 1918–1926."
24. United States Army, *Infantry in Battle*, 2nd ed., (Washington, DC: Army University Press 1939).
25. Dudley W. Knox, "The Role of Doctrine in Naval Warfare," (Annapolis, MD: U.S. Naval Institute Press, April–March 1915), citing Staff Study, *U.S. Naval War College*, 1954, Annex N-6: E.C. Kalbfus, "Memorandum Notes on NWC History."
26. United States War College, *Sound Military Decision*, (Newport, RI: Naval War College, 1938).
27. "Scientific Management" is often referred to as "Taylorism." Its basis can be found in the work of Frederick Winslow Taylor's *The Principles of Scientific Management* first published in 1911.
28. See Paragraph 4-23, *Principles of War and Principles of Joint Operations*.
29. The enumerated list on page 57 of *NDP 1, Naval Warfare*, is only explained on page 54 with the explanation "the nine principles of war provide a mental model to assist the commander's exercise of operational art."
30. Troy R. Elkins, "A Creditable Position: James Carson Breckinridge and the Development of the Marine Corps Schools," (master's thesis, Kansas State University, 2011).
31. Donald E. Bittner, *Curriculum Evolution: Marine Corps Command and Staff College, 1920–1988*, (Washington, DC: History and Museums Division, Headquarters Marine Corps, 1988).
32. Ibid.
33. Headquarters Marine Corps, *FMFM 6-3, Marine Infantry Battalion*, (Washington, DC: GPO, 1974).
34. John G. Morgan and Anthony D. Mc Ivor, "Rethinking the Principles of War," *Proceedings*, (Annapolis, MD: Naval Institute Press, October 2003).
35. Anthony D. Mc Ivor, ed., *Rethinking the Principles of War*, (Annapolis, MD: Naval Institute Press, 2005).
36. Ibid.
37. Gregory R. Ebner, "Scientific Optimism: Jomini and the U.S. Army," *The U.S. Army Professional Writing Collection*, (July 2004), available at <http://www.army.mil>.
38. Ibid.
39. Headquarters Marine Corps, *MCDP 1-0, Marine Corps Operations*, (Washington, DC: September 2001).

