

An American Weapon for the 21st Century

by Major Robert Bateman

“Revolution in Military Affairs”: A fundamental change in the nature of war occurring in a relatively short period of time, stemming from changes in organization, military doctrine, economic/social/political factors, or technology.¹

This article explores some of our current definitions about war and military affairs. By addressing a few simple questions, such as, “What is a weapon?” we may come closer to determining the real strengths of the United States. We may realize that our true potential as a nation, and by extension that of our military, lies not in the fact that we have the most main battle tanks, but in the fact that we have 45 million children who are perfectly comfortable using 700 MhZ computers to play games. The “revolution” that the United States is widely suggested to be leading in military affairs may have less to do with our expensive net of intelligence tools and precision missiles, and more to do with the fact that our country is so technologically saturated that we have more than a million people who consider themselves “hackers.”²

Many of the historically minded suggest that we may have, over the last fifty years, re-entered a period of “limited war” such as existed in Europe during the seventeenth and eighteenth centuries. Although at this point the Army still lacks an official definition of what a war is, and by extension what a war is not, we continue to wrestle with the idea. The irony is that we already have several modifications and refinements of the concept of armed conflict (high, low, medium intensity for example). At the same time, we are at a loss to adequately explain the vast realm of activities that take place short of declared war but in the absence of peace.³ If we, the military forces of the United States, are not considering these issues in any sort of organized manner, who is? In another article, I suggested that we define war as,

“The state that exists when one polity publicly commits to prolonged and significant violence upon another polity in order to force it to accede to its will.”

Given our difficulty defining even such a simple word as “war,” perhaps

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we need to re-examine our other definitions, such as that for “weapons.” In undertaking such a fundamental reassessment, we need to examine a basic idea: what is the intended end-state that we create “weapons” to achieve? We design those things that we refer to as “weapons” to destroy things, but their purpose in doing so is to compel. (That is, if we accept that the purpose of war from the American viewpoint is not destruction for destruction’s sake but compelling another to accede to your will through the use or threat of the use of force.⁴) Thus far in human history, the most direct method to force another polity to accede to your wishes was to physically destroy so much of the things that they valued (be it human life or property) that they were convinced that the balance and momentum of the war were not in their favor (and therefore future prospects were bleak) and their most logical act was surrender and/or a negotiated cessation of hostilities. This concept is the foundation to our modern perception of what “war” means. But what if there were another route to threaten the things that another polity valued, even human life, without committing direct physical violence. Is that war?

Download and the Lord of Destruction

D/L and L.O.D. wandered through the cavernous convention center in a daze for the first half of the day.⁵ True, each had been to numerous sites offering the “virtual DEFCON” tour before, many

times in fact, but actually being at DEFCON was different. For the first time in either of their young lives they were truly experiencing sensory overload. Nothing before this had ever excited their interests in quite the same way. Frankly, nothing “IRL” before DEFCON ’04 had much interested them at all.⁶ They, like roughly two million others in their age group, were children of the wired world.

Wandering from booth to booth, they salivated over the goodies displayed. Laptops with gig chips were the latest rage, though the potential speed advantages of the conventional desktops were tantalizing as well. Yet for all the hardware and “straight” software available on the floor at all hours, it was the “sub market” that held the most attraction for both of them. Both were self-declared hackers, and for them the DEFCON was just short of Mecca.

Turning the corner of yet another row of vendors they ran straight into a sight they would not have believed if they were not seeing it with their own eyes.

For years, the U.S. Department of Defense had taken to setting up a booth at DEFCON. Mostly these contained staid literature and descriptions of lame work at pay levels that were (for IT specialists) the equivalent of slave labor. Even the language used for most of their older hardware systems, ADA, was an antiquated beast. Moreover, the word had spread, top-down control and authoritarian bosses were not elements in the favored environment of most of the industry. The D.O.D. had become something of a joke at DEFCON in the past few years, relegated to a corner booth on a dead-end traffic lane in the convention floor layout.

What faced D/L and L.O.D. now was nothing like what they’d heard about Department of Defense displays of previous years. Smack dab in the middle of a high traffic lane at the epicenter of the convention midway stood a flat black cube, eighty feet on a side. Nothing on the outside gave evidence of the purpose for this massive block. On the side of the box, in black lettering of a

slightly different pitch there were the letters, in lower case, "d.o.d.," and nothing else. A single passageway stood available for entrance into the cube. Standing in line awaiting entrance to the cube, as though it were the Grotto of Bethlehem or perhaps more appropriately the entrance to the Borg, were no fewer than four hundred of their peers. Resistance was futile. Without a word they both got in line. No questions were asked, and none had to be.

Two hours later they gained entrance. The passage alone met all of their expectations. No signatures, no social security, no personal information...a digital thumbprint and retinal scan in a foyer just inside the entrance and then nirvana. Spread before them were desktops and laptops and piles of CDs, each in a discreet cubicle. Entranced and stunned, they moved forward and separated, each to his own cubicle.

The second that each sat down in their ergonomic chairs there appeared simple words on the screens of their flat screen monitors, words that spoke to every fiber of their 19-year-old souls.

"this is d.o.d."

"this system has never been cracked"

"break in and you may join"

"your qualification will only last one year"

"details to follow...if you succeed"

The screen blanked. It appeared that the system rebooted, when it came up again a standard boot sequence started and offered them their choice of operating systems. D/L chose a Windows environment while L.O.D. picked Linux. When the boot sequence completed there was arrayed for them on the desktop the most comprehensive cracker library either had ever seen, and nothing else.

Like many of their peers neither of them would leave for more than 16 straight hours.

In the sixteenth hour, L.O.D. left. He was tired, had not bathed in more than 36 hours, and wanted to see some of the fabled sights of Las Vegas. Twelve minutes later D/L made it in. His screen went black again.

"yes"

Six seconds later a bald man of indeterminate age wearing a black suit and sunglasses appeared at his shoulder. "Will you come with me sir?" the man asked. D/L, somewhat numbed by the emotional high of the crack and the

physiological drain of the time and attention quietly left with him. As he walked out, he saw a young fresh face moving through the entrance portal to the chair where he'd been... "this is dod" said the screen.

D/L moved zombie-like behind the silent and implicitly sinister agent of the government, for now it appeared that reality would bend to meet expectations. In a second room, a much smaller room within the cube, he came to rest on one side of a table. There were two chairs to the table. On the table were a keyboard, a pad and a screen, and a tablet of paper, a simple contract. It was frightening in simplicity. In return for one year of allegiance to the United States, it promised access to the best technology in the world...for one year. The language was that plain, and that alone was frightening in its power. The man in black said, "You have two minutes. Do you have any questions?" When D/L shook his head the man immediately turned and left the tiny cell.

Seventeen seconds later D/L signed his name, placed his eye at the retinal scan portal, and joined, whether he knew it or not, the Second United States Cyber Corps.

An hour after D/L got back to his dorm at Caltech there was a knock at the door. Three men in black suits stood in the doorway. Around them were a host of boxes, at least twenty of varying sizes, all of them flat black, all stamped "dod" in black lettering. The tallest of the men in black held out a computer clipboard. Upon the screen all it said was "Equipment received." D/L pressed his thumb to the screen and the men left. Inside the boxes were the wet dreams incarnate of every technophile in the world and a note. "Installation of hardware: You. Network installation Tuesday, 2100."

D/L was instantly a celebrity across the entire campus, despite the fact that he was a freshman. On the entire Caltech campus, only five people had received similar deliveries, and everyone knew within hours who they were, two professors and three students. Word on the street had it that their arch-rival, MIT, had only four packages delivered and backbone connections installed; the rest were assumedly scattered across the nation.

By the end of the week, thirty people had been identified as having received the ominous packages across the country. All of these had been to college

campuses or in a few cases to high schools. Rumors, especially ones about legendary cracking episodes, spread fast. In this case the rumors were constantly fueled by more hard facts. Over the course of the following year, the identity of only four more people that had managed to crack the "dod" would come to light, but by that time the pattern would be set.

D/L was, he soon learned, one of the '25,' the top half of the fifty that had succeeded in breaking in during DEFCON '04. Though neither he nor any of the other top half would reveal the specifics of what they had been asked to do, leaks were part of the process. D/L wasn't getting paid, in the conventional sense. He was richly rewarded in the currency he most valued though. He was now a de facto celebrity, a superstar in the only community that mattered to him. As one of the '50,' he had what every hacker seeks, bragging rights that won't bring the Department of Justice to your front door at six in the morning. He had hacked 'dod' and only 50 others had been able to do that in the time allotted. He was, by everyone's account, one of the best.

What he had been asked to do in return for the equipment and access, collaboratively with the others when possible, alone when he felt the need, was to design the environment to be cracked at DEFCON '05. That's all. He could work on the challenge when he wanted, in any way that he wanted, using any language he wanted. Total creative programming freedom. It became a labor of love. Twenty-five Doctors Frankenstein worked together over a year. Significantly, these were the better half of the '50.' They created a monster, surely no one could crack it. Over the course of the year, most of the buzz and tech-media attention focused on this half of the group. Nobody was quite sure what the other half was doing, but by most accounts it amounted to some simple contract work...

When D/L arrived in Las Vegas for the start of DEFCON '06, he was accustomed to celebrity, yet for all that he was somewhat apprehensive. Last year he and the others from "The Fifth Deviation" (another nickname for those of the top '25,' derived from the fact that it was estimated that they were five standard deviations above the "norm" in programmer and/or hacker skills) had been barred from entering the cube. Although those from "the fourth" had been allowed to enter with the rest of the applicants, everyone was waiting

to see what would happen this year when a "fifth" tried to gain entry.

When the first of them reached the front of the line last year (a line that was twice the length of the one in '04), one of the ubiquitous-but-silent MIBs stepped out of the portal and quietly barred her way. That was enough. There had been no explanation, nor warning, but none of the 25 protested. To do so would have been against their own emerging code of conduct; besides, they expected this. They assumed, correctly that they would only be allowed in the next year..."

Although this story presents an obviously fictional sequence of events in the near future, and portions of the acts recommended may well be patently illegal under current legislation, the story presented above serves as a useful illustration of several concepts. D/L and L.O.D., although fictional, are fairly typical depictions of a subculture that has few common denominators beyond a profound distrust of the government, and specifically the military. The irony is that they simultaneously represent both a significant threat to our computer infrastructure integrity as well as our greatest potential resource. What if the United States could tap into those million hackers we produce? What if we established a process, a meritocracy, where the technology and the hacker subculture itself worked to continually strengthen our information technology lead? D/L is part of that process, as each year the best of the best spend a year creating an even tougher "d.o.d." site to be cracked at the next DEFCON, thus creating a sort of virtual "natural selection."

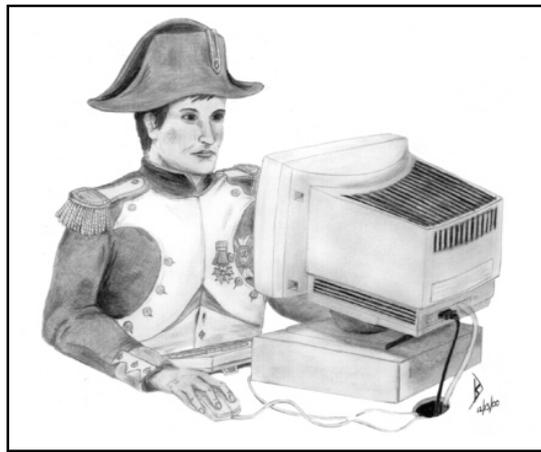
The lower half of the top fifty is asked, but significantly not "hired" and not compelled, to undertake a whole host of assignments. Some, in fact most of these, are entirely benign. The tasks themselves are selected by psychologists to lead these individuals to arrive at certain conclusions. They may get a file folder filled with a few articles from the *Washington Post* and the *New York Times* on recent changes in China's attitude towards the internet. There may also be an article or two about Tienamen Square for "background," and perhaps a few explaining Mao's "Great Leap Forward" (and the thousands killed in that process) so that the individual knows something about the people that design the systems they are asked to explore. That is all that

they are asked to do, explore the computer infrastructure of, say, China. Of course, it lays the groundwork for so much more... in fact, it might really reflect the true nature of the current "Revolution."

To understand some of this, however, we must look backwards.

The Napoleonic "Revolution"

Napoleon Bonaparte is credited by many with a military revolution all to himself, the "Napoleonic Revolution" of the beginning of the 19th century. It is not overstating the case to say that from roughly 1796 through his final defeat at Waterloo in 1815, Napoleon's system of warfare reigned supreme.



Art by SGT Benjamin S. Ormand

That is, all belligerents, if they maintained any hope for success, either had to adopt some aspects of the Napoleonic system, or develop tools of their own to counteract that system. In either case, even after the apogee of the French Empire passed, all belligerents were in a reactive mode in relation to the empire of Napoleon. For a long time, especially in military circles, the "Napoleonic Revolution in Military Affairs" was credited to Napoleon himself.

I suggest, however, that Napoleon was merely the right man at the right time. For all his genius, Napoleon was arguably just a good jockey riding the best horse in town. The question then becomes one of trying to figure out what made the horse so damned fast, not why was the jockey winning all of the time.⁷ What then was the basis for the phenomenal French success during this era? To answer that, and pull a little wisdom from history, requires some understanding of the Napoleonic system.

The components of the system have been studied and dissected for more than two hundred years. The two major factors that contributed to Napoleon's success were his relative velocity in comparison to his opponents at all levels of warfare and the size of the forces he could field. Speed and mass were the central elements of the Napoleonic game, and they were achieved through several interrelated changes.

Speed

Speed, being on the enemy before the enemy could prepare for battle, was Napoleon's earliest advantage. The French achieved this speed through some doctrinal adjustments adopted by Napoleon. One of the best known was the use of the corps structure and the deliberate movement along several parallel routes as a means of increasing the speed of the overall army. Napoleon referred to this as the *Battalion Carré*.⁸ He used the formation to famous effect in 1805 during the Ulm campaign and the next year during the campaign against the Prussians that ended in the dual battle of Jena-Auerstadt. Yet this operational maneuver formation required something that the armies of Napoleon's opponents did not initially have in their toolbags, which is why only Napoleon could move with such a great relative velocity. It requires a competent officer corps. The doctrinal concepts had existed for some time before Napoleon put them into practice, but it required a social change for an army to be capable of executing the ideas.

The French officer corps of the Napoleonic era promoted upon merit. Numerous historians have pointed to the early siege of Toulon in 1793, when Napoleon was a mere artillery captain. During the course of that siege, he came in contact with several other French leaders, common soldiers who would within little more than a decade be generals or marshals of France.

These were men such as Jean Junot (a sergeant who becomes a general), André Massena (an ex-smuggler, and former company sergeant, who becomes a marshal), Auguste Marmont (who started as an artillery sergeant, was a major at Toulon and would become a marshal), Claude Victor (the infantry sergeant who leads an assault at Toulon, and will later become a marshal),

and Louis Suchet (who starts out as a common soldier).⁹ In the French army, men earned their positions primarily (though admittedly not entirely) through the demonstration of their abilities; this was especially true in the earliest days of the Republic. While other armies of the day permitted the purchase of nearly all ranks, with the attendant inconsistencies of quality, the French system found the best and elevated them. Without this system, the operation of independent columns operating under guidance (as opposed to restrictive directions) would likely fall apart under pressure of enemy contact.¹⁰ This raises the obvious question, if merit-based promotion is so advantageous, why were the other nations of Europe incapable or unwilling to use this system?

On a similar theme, the French achieved speed through their reversal of the traditional methods of logistic support. Foraging while on the move is considerable less resource intensive and comparatively faster than support by wagon train from the rear. While the armies of the "Age of Limited War" that preceded Napoleon's relied upon an extensive system of supply bases and created a logistics tail that stretched from the area of tactical operations all the way back to the strategic center of that nation, Napoleon relied primarily upon foraging.¹¹ This was another reason for the dispersal of his forces: it took a considerable amount of territory to support a corps, or an army on the move. Were he to move along a single route, the surrounding territory would be stripped clean by his lead corps, leaving no alternative for the following corps but to rely upon logistics pushed from the rear.¹² By using multiple avenues, he spread the logistic burden across a broader front.

The great advantage in speed that the French enjoyed due to their use of a logistics system based primarily upon foraging was also dependent upon social changes, in this case the effects of nationalism. Soldiers of revolutionary France, motivated to fight for the new idea of the French nation, an idea that they participated in, were generally less prone to the great bane of the royal armies of the era, desertion. This is an important idea, especially if one hopes to allow large numbers of soldiers to disperse across the countryside with very little "loyal" (read officer) supervision in search of provisions. Thus, the true change that enabled the French shift in logistics, and therefore aided in their increase in relative speed, was not

a change in technology, or even a change in the military organization itself, it was a social concept which came about with the French Revolution.

Yet this also was not an original idea of Napoleon's, merely one that he was in the unique position to put into operation.¹³ Again, if foraging was so efficient, why was Napoleon the only one using it at first?

The answer to both of the questions posed above is that none of the other nations were prepared socially. This was the end of the age of absolute monarchies, but they would not go easily. They were not willing, or were unable, to effect the same changes within their societies as had the French and therefore could not execute the same changes. Remember that the definition of a "Revolution in Military Affairs" espoused here encompasses changes in technology, organization, doctrine, or social/political/economic factors. It was, in fact, the social changes brought to the front by the French Revolution that was at the root of the "Napoleonic Revolution."

The whole mess is intricately knotted together. For example, the aforementioned use of independent corps formations, one of the key elements to the success of Napoleon, was itself dependent upon the existence of competent officers. The mass of competent officers could only be provided by a system of merit based promotion. Merit promotions were only possible in 18th Century Europe in a nation that embraced the ideas of equality and egalitarianism. At that time, this was found in only one nation, revolutionary France. So as we can see, the whole issue of "Speed" comes back not to the "genius of Napoleon" but to the social changes wrought by the French Revolution.

Mass

The second aspect that made Napoleon's armies what they were was undoubtedly their size. Napoleon himself was famously quoted as claiming that God was on the side of the largest battalions. By extension, one could say that this extended to the size of the army overall. Napoleonic armies ballooned in size. This was not only because of the influence that new motivations such as nationalism had upon the common man, but because the state finally organized itself to more completely mobilize the people. One man gets the lion's share of the credit for making that happen, Lazar Carnot.

As the head of the "War Section" of the revolutionary French government, Carnot had great power. He was, for all intents and purposes, the man that created the weapon that Napoleon wielded to such great effect. Carnot was the man that reorganized the chaotic mess that the French military had become in the wake of the Revolution. Remember, all the French officers used to be noble prior to 1789. Imagine an army where 90 percent of the officers just quit one day and you have some idea of the scale of the administrative nightmare facing Carnot. More important even than that contribution was his organization of society.

France, by population, was the largest nation in Europe. The issue then was not one of a lack of bodies, it was a total lack of a system to get those bodies into uniforms. For all intents and purposes, Carnot is the father of the modern draft. It is his implementation of the *Levéé en Masse* that brings Napoleon's field army strength up to the half million mark and beyond again and again for nearly twenty years. (The total army strength might reach into the millions. Not a bad record for a pre-industrial society.) Carnot truly earned his nickname as the "Organizer of Victory." The question that this lesson in Napoleonic history leaves us asking is, who is our Carnot today?

Conclusion

Perhaps we need not worry over much this year or the next on the exact structure of the IBCT or whether the next armored vehicle will have wheels or tracks. Maybe the present day infantrymen who are panicked because some idiot is trying to foist a 22-pound rifle off on us are worried about the wrong issue. Our real strength, as an Army and as a nation, may not rest in the mere weapons that we are using today, just as Napoleon's real strength was not really a military strength at all, but a social one.

None of this is to suggest that we abandon the field of battle. Tanks, attack helicopters, field artillery, and infantryman will have a role in war so long as man retains the willingness to attach a rock to a stick and bash in his fellow man's skull. That will not go away. What we are seeing, however, is a new aspect to the violence. We are seeing, potentially, a subtle new way to destroy your opponent, one that we in the United States are uniquely positioned to exploit. We have the human potential to execute this in a way that no other society does. We practically

breed the type of behavior that produces hackers. Harnessing that energy would represent a true American advantage, one that cannot be simply copied by another nation unless they become just like us. Something that many are unwilling to do.

The “Napoleonic Revolution” did not originate inside the military; it was merely the military taking advantage of a social difference that existed between French society and the rest of Europe. This article suggests that the real benefit of our current “military revolution” has yet to be recognized and capitalized upon. Our national edge stems from the fact that in this country every single six year old, regardless of economic strata, has used computers more powerful than all five of those that took the original Space Shuttle into orbit. (Think about how much computing power is in the standard Nintendo 64.) The fact that we probably have more than a million kids in this nation capable of breaking into moderately secured computer sites should not be viewed as a threat by the Department of Defense... it’s our greatest national weapon! We just have to figure out how to aim the damned thing.

Notes

¹Robert L. Bateman, “Preface,” in *Digital War, A View from the Front Lines*, Robert L. Bateman, ed. (Presidio, 1999), viii-ix. This definition itself is derived from that in use in the Department of History at the United States Military Academy and was the joint creation of several officers and historians.

²The growing opinion among both our allies and those that may be our competitors is that the current transformation of war that most acknowledge is underway is an almost uniquely American phenomena. This theme is brought home again and again in essays from the French, English, Chinese, and Russians that appear in international defense trade journals. The reason is related to our technology, and the saturation of technology in our nation. See Martin C. Libicki, “What is Information Warfare?” in *Toward a Revolution in Military Affairs, Defense and Security at the Dawn of the Twenty-First Century*, Thierry Gongora and Harald von Riekhoff, ed. (Westport, Conn.: Greenwood Press, 2000), 51. Libicki quotes a statistic that some 60% of current U.S. candidates for the Ph.D. in computer science are not U.S. nationals. He therefore suggests that much of the threat from hackers is increasingly external. Nothing could be farther from the truth. The strange fact of the digital generation is that unlike MOST professions, academic training is often viewed as a value detractor. Few top programmers (or hackers) have so much as a masters degree in computer science, let alone a Ph.D. The cultural trend is towards “tinkering” and self-education rather than any formal education and

institutional accreditation. In the words of one hacker friend of the author, “The guys with Ph.D.s are the slugs that didn’t get the six figure offers when we were undergrads so they HAD to stay in school. They couldn’t get a job anywhere else.”

³Operations Other Than War (OOTW) and its subset Military Operations Other Than War (MOOTW) are obviously the first stumbling steps towards rectifying this doctrinal gap, yet there remains a long way to go in filling in all the gaps. Partially due to intellectual limitations imposed by the Constitution and the Congress upon the United States Military (and especially the U.S. Army) we as an institution are loath to address some areas of conflict. Because the military is so completely subordinated to civil control in the United States, there appears to be an almost pathologic reluctance to consider political factors as they apply to war. (For a brief overview of the history of this relationship see, Robert L. Bateman, “Without Malice, Without Sympathy: Civilian Antipathy for the Military, 1607-2000,” *Army* 49, No.1 (January 1999): 36-47.) This does not negate the fact that war is, at the ultimate level, a political act. A prime example of this phenomena is the uniquely American military reluctance to consider something as fundamental as economic warfare using civil assets in the prosecution of national goals short of or as a part of a larger war effort. (Think of the potential for destruction embodied by the assets of, for example, Solomon-Smith Barney or Merrill Lynch, let alone manipulation of the lending rate by Alan Greenspan.)

⁴As with all definitions, this still leaves some gaps at the edges. Ethnic cleansing, or more accurately genocide as an objective in war, does not attempt to compel, it seeks destruction. It is alien to the American concept of war. We recognize the violence, but do not associate with the intent.

⁵DEFCON is one of the more popular hacker conventions. This year (2001) it will be held in Las Vegas. See <http://www.defcon.org/>. The list of popular hacker/Phreak websites linked at the defcon webpage is a useful starting point to understanding the phenomenon. “D/L” and “L.O.D.” are rather typical of the types of screen names assumed by modern, if juvenile hackers. To some degree they are just being prudent, in that there are a fair number of “official” institutions more than a little interested in their collective activities. The curious fact is that even when people of this subculture meet in person, they often continue to refer to themselves and each other by their on-line “screen names.”

⁶“IRL” is online shorthand for “In Real Life.”

⁷This is not to say that Napoleon was not a military genius; clearly he was. Arguably no one without his unique combination of intelligence, insecurity, megalomania and daring could have “scrambled to victory” in such a consistent manner. For a well reasoned revisionist look into the leadership of Napoleon, see Owen Connelly, *Blundering to Glory, Napoleon’s Military Campaigns*, (Wilmington, Del.: Scholarly Resources, 1987).

⁸The doctrinal innovation belongs to another, but Napoleon certainly gets the credit for being the first to apply the doctrine to a concrete situation.

⁹The author wishes to thank Major James Haynesworth for his assistance in identifying these leaders.

¹⁰Much the same argument has been raised in a more modern context by Don Vandergriff in his argumentative essay, “The Culture Wars,” in *Digital War, A View from the Front Lines*, Robert L. Bateman, ed. (Novato, Calif.: Presidio Press, 1999), 231-240. Vandergriff argues that the United States Army, and especially the officer corps, has moved away from any true form of meritocracy over the course of the past century in favor of a centrally directed bureaucratically inspired process of “norming.”

¹¹For explanation of pre-Napoleonic logistics during the era of the *Ancien Regime* see John A. Lynn, “Food, Funds, and Fortresses: Resource Mobilization and Positional Warfare in the Campaigns of Louis XIV,” in *Feeding Mars, Logistics in Western Warfare from the Middle Ages to the Present*, John A. Lynn, ed. (Boulder, Colo.: Westview Press, 1993), 137-159. A succinct explanation of Napoleon’s methods of logistics is Gunther E. Rothenberg, *The Art of Warfare in the Age of Napoleon*, (Bloomington, Ind.: Indiana University Press, 1978), 129-130.

¹²David G. Chandler, *The Campaigns of Napoleon*, (New York: Macmillan Publishing, 1966), 829, 855-856. This method backfired horribly during the retreat from Moscow in the 1812 campaign. Accounts, or more specifically interpretations of the accounts differ, but nobody disagrees with the assertion that Napoleon’s logistic method broke down in this case. It was not so much that there were no supplies, it was that there was no adequate method of distribution.

¹³*Ibid.*, 139. Although it is important to note that there was an element of individual genius in Napoleon’s actions, it should also be pointed out that most of his doctrinal “innovations” had actually been created decades earlier. Pierre de Bourcet’s *Principe de La Guerre des Montagnes*, written at least 25 years before Napoleon’s rise to power (and one of his favorite books) contained the idea of operational maneuver by advancing upon multiple parallel routes while Guibert’s book *Essai Général de Tactique* (1772) contains the ideas that Napoleon put into use at the tactical level.

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