The Challenge of Security – West Point's Defenses and Digital Age Implications, 1775-1777

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ABSTRACT

Although the cyber realm is a comparatively new environment, with professionals typically setting the origins in the mid-19th century with the communications network established in support of the Anglo-French-Piedmontese force in the Crimean War, many of the imperatives of security and defense in the physical realm offer significant continuity as well as areas for profitable comparison. The historical vantage point empowers, through the use of relevant analogy and studious research and analysis. A cyber-conscious study of the early progress toward fortification of the Hudson River during the American Revolutionary War illuminates themes about the primary security role played by defensive constructions: to guarantee time that permits an active and coherent response against an adversary. It also demonstrates the vital role played by leaders who recognize security challenges and the need for expertise that can translate policymakers' support and resources into an effective security system. This essay uses the period from 1775-1777 to highlight these issues, setting the stage for the development of expert-designed fortress construction beginning in the spring of 1778 (to be examined in the author's next contribution to the CDR).

INTRODUCTION

West Point's history as a layered defensive network and the security challenges its designers and personnel confronted offer useful areas for consideration when working to pursue cyber security. Interesting and significant parallels exist between the physical security challenges of the 18th century, and the attitudes and approaches to solving them on the one hand, and more modern problems and answers. Despite the differences in time and environment, multifaceted and relevant historical analogies and case studies contribute key tools in building a fuller and more meaningful understanding of new security environments.[1] The events surrounding the early period of Hudson

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River fort construction, from 1775 through 1777, suggest crucial points about key early actions and mindsets toward establishing security.

ORIENTATION TO WEST POINT

From the modern site of the Kosciuszko Monument, it is possible to get a clear sense of why West Point was once considered to be perhaps the most important single strategic point in the United States. Looking out to the river, we can see the Hudson River, a tidal waterway and one of the key transportation and communication avenues on the Atlantic seaboard. It leads, to the far right (south) to New York City, and the Hudson is essentially a straight north-south line the 44 miles to New York City.

Why does that matter? Because defending the river means slowing that enemy down long enough to shoot at it. In the days of wooden ships traveling by sail, the ship (simultaneously a weapons technology and a communication technology) is most vulnerable when attempting to turn or when adjusting to a turn in the wind. Since the local weather is practically beyond human manipulation, the best defensive geography is a place where the terrain itself forces the ship to slow down, deploy its sailors at the rigging (and therefore not at its cannon) to help the ship turn. Nodes and bottlenecks are just as significant in manufactured spaces as they are among natural terrain features.

The strength of this spot now becomes clearer. To the left, we see a projection of land, known as Constitution Island, which creates two bends in the river. A ship must make first one abrupt 90-degree turn to the left, and then another turn just as sharply to the right, within a few hundred meters.

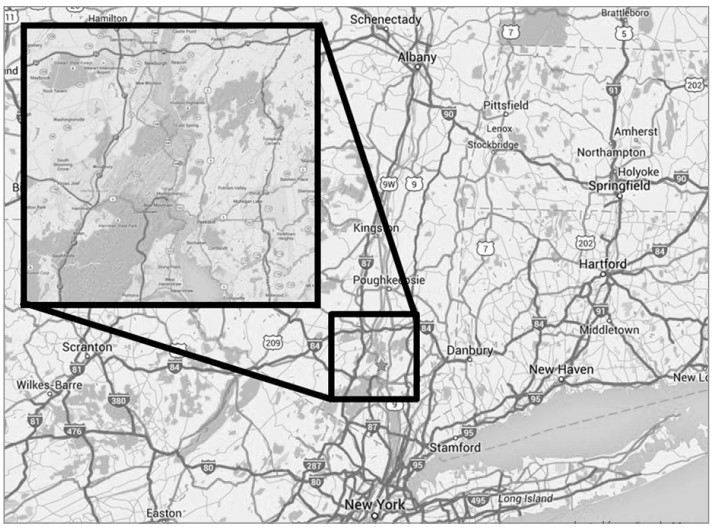
That is going to keep a ship and its crew busy. It makes for a slow-moving and vulnerable target. This is good news, and vital for anyone trying to defend upstate New York or inland New England from invasion.

Within six weeks of the shots at Lexington and Concord that marked the start of the American Revolutionary War, the Continental Congress realized the extreme importance of preventing the Hudson River from falling into British hands.[2] The matter was so serious that the Congress identified the need to defend the Hudson by May 1775—weeks before they had even embraced the idea that the American cause would need a formal army. They feared, and the British hoped, that capture of New York City and the Hudson River might slice away the northeastern Colonies that represented the heart of the rebellion. The Congress, therefore, dispatched two men, Christopher Tappan and James Clinton, to survey the Hudson River and search for the best candidate areas for establishing a fortress.

It is important for us to recognize that the first job of a fortress, whether here or anywhere else on the planet, is to establish a military presence and enable friendly forces to delay an enemy conquest. No fortress was ever built with an eye toward holding out forever, and there is no fortress ever built which could do so.[3] This applies to physical defenses just as much as in the world of cryptology or of cybersecurity: defenses buy time.

Time for what? Hopefully, time for friendly entities to be warned, informed, mobilized, and launch an action to reverse the effect of whatever inroads an intruder has made. The best defenses are those matching the needs and resources of the defender, and those needs are impacted by the enemies and technologies the defender expects to face. This also is true whether the defenses are physical, electronic, or intellectual.

Tappan and Clinton identified three candidate sites in this area. Two were a few miles to the south and were much less inviting for a defender: the river was wide, and its bend was subtle. In contrast, the area around the west point (a rock across the Hudson River from Constitution Island) appeared to have everything a defender might require.



The Hudson River's path ending New York City and beginning north of Albany. A tidal body for much of its length, the Hudson is deep enough to be navigable by many ocean-going vessels, and at few spots does the river bend appreciably enough to complicate transit. The only substantial challenges exist at the sites adopted for the West Point and Fort Montgomery defenses.

Almost everything.

The site where the Kosciuszko Monument stands is in itself a poor place for an 18th century fort to directly guard the Hudson River. Standing on a tall bluff, it gives an excellent view of the river, but that was part of the problem. Eighteeth century firearms had smooth bores and projectiles were driven by black powder. Black powder does not have a precisely consistent force, so two cannons firing a ball pushed by the same amount of powder may not land in the same spot. Furthermore, a smoothbore gun uses gravity to keep the projectile in the barrel. Firing a cannon from a height would mean either depressing a gun so much that the cannon ball would roll out before firing, or lobbing a cannon ball by a steep trajectory as if it were a mortar. Ten years later, the British defending Gibraltar would make some strides in successfully depressing smoothbore cannon, but this was not an option to American defenders in 1775. Firing a cannon like a mortar would accentuate all the problems of black powder's limitations. Therefore, a clear view of the river does not equal a clear choice of location for building a fortress.

EARLY WORK ON HUDSON RIVER DEFENSE

Tappan and Clinton opted instead for Constitution Island, on the east bank, where its low elevation would circumvent the thorny artillery challenges. But another inevitable problem arose. The United States (more accurately, the rebellious colonies, since the Declaration of Independence had not yet been written) did not have any indigenous military engineering experts. Tappan and Clinton found the next closest thing, which wasn't close. Bernard Romans was Dutch by birth, later a British subject, and an American sympathizer by 1775. Although scientific fields were not differentiated quite as they would become later, Romans was essentially a botanist, whose work had also involved civilian architecture and engineering.[4] By no stretch of the imagination did he have prior experience building fortresses, and fortress design and construction in Europe had been refined to a geometric and terrain-reading science since at least the time of Sebastien de Vauban, who in the late 17th century had girded France in belts of intricate and robust fortifications. Romans accepted Tappan and Clinton's recommendations to site the fort on the east back, and he set to work throughout 1776.

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New to an established and demanding field, Romans' efforts led him to sketch elaborate concepts. He did so, in part, because he encountered what trained military engineers had been taught: that any defensive position is completely compromised by a single significant weakness. Romans' solution led him to fortify (on paper) more and more, until his drawings called for a stone defensive position armed with more than 60 cannons. About two-thirds of these would be pointed at the river, and the rest would defend against landward attack. [5]

Romans' plan had several serious challenges. One obvious difficulty was that the Americans did not possess enough cannon to fill his proposed fort. The United States (which had declared its independence during the intervening months) did not have any cannon manufacturers and had only limited access to guns smuggled or imported from European states envious of Britain but by no means confident in the upstart country's chance of success. The fall of Fort Ticonderoga, orchestrated by an American officer Benedict Arnold and a Vermont leader Ethan Allen, had transformed the fort's armory into a modest source of cannon for all of the country's needs. Understandably, regarding limited equipment, weapons, and personnel, Washington's army in the field took precedence over a would be fortress location that was not yet imminently threatened. [6] By mid-1776, forty-one cannons were available, [7] but these were light field guns with calibers too small to offer any serious threat to a warship. The garrison, which doubled as the labor for improving the fort, comprised just 160 personnel who were "miserably armed," as at least a quarter of the firearms were rusted and "in very bad order." [8]

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Other problems were more avoidable. Romans demanded an extensive masonry complex at a time and place that lacked craftsmen able to do the work. The Hudson Valley was still a fairly rural area, and although rock was available, stonemasons were not. More avoidable still was Romans' restive refusal to update the state's authorities (this was after all seen as New York's responsibility first and a national responsibility second) about his progress and budget. The budget was a serious problem. A year after starting the project, Romans had committed £5000, when his allotted budget had been just £1500. By the end of 1776, Romans had been fired. [9]

ANALYZING THE DEFENSES

Before Romans' removal, American General William Alexander, known as Lord Sterling, inspected the status and progress of the Hudson River fortifications. These consisted of Romans' efforts at Fort Constitution on the east bank of the Hudson across from West

Point, as well as a pair of stone works a few miles to the south. There, local militia constructed two stone works they called Fort Montgomery and Fort Clinton, which straddled a tributary on the west bank of the Hudson. The forts were essentially low stone enclosures, laid out with little trained forethought. Again, this was less the result of negligence insteadof the mercantile-colonial environment not facilitating the development of military engineering know-how in the colonies. Stirling identified the particularly in expert dispositions of Fort Montgomery and Fort Constitution, which in both cases, were surrounded by terrain features that would make the fort's further defense untenable if they were occupied by the enemy. Stirling's visit in May 1776 coincided with the first anniversary of American attention toward defending the Hudson River.

The Hudson River defenses in the vicinity of West Point consisted of four artillery battery positions. Of these, two covered the approach that northbound ships would take up the river, another assisted river defense to a lesser degree, and the fourth was positioned far enough to the west that it would have a clear line of fire only at ships which had already completed the first of the two ninety degree turns dictated by the river. As such, Stirling noted, the fourth battery could "only annoy a Ship going past," despite the considerable cost of construction. Romans' aptitude for civilian architecture was evident in his aptitude for military design, as Stirling's report to General George Washington noted a wooden tower with garret windows that "looks very picturesque, upon the whole Mr Romans has

A view eastward across the Hudson River, from the west point toward Constitution Island. As designed, Fort Constitution was too expensive to build, required too many artillery pieces, and would be positioned too awkwardly along the river's first curve to impose major challenges to an enemy warship. **Photo Credit: Dr. Nicholas M. Sambaluk**

displayed his Genius at a very great Expence, [*sic*] & very little publick [*sic*] Advantage." [10] Given the scarcity of funds, materials, and craftsmen, this "great Expence" was an enormous problem.

Perhaps worst of all, Fort Constitution was dominated by nearby terrain. Stirling bluntly explained that "every work on the Island is Commanded by the Hill on the West point [*sic*] ... a Redoubt on this West point [*sic*] is absolutely necessary, not only for preservation of Fort Constitution but for it's [*sic*] own importance on many accounts." The general believed that "One good Engineer with Artificers from the Army" would do a great deal to improve "the whole Business." [11] The situation overall was one of flawed design, inadequate materials, and above all a lack of specialist know-how to direct and execute construction of a defensive system capable of meeting enemy efforts and delaying the enemy's passage and exploitation for long enough that the defenders could rally and respond. Lieutenant Colonel Henry Beekman Livingston agreed entirely with Stirling's estimate, explaining that "the work of most Consequence is Excluded, as it Commands at Point Blank All the fortifications Erected on this Island." As a stopgap before more permanent positions could be developed, Livingston urged the construction "immediately" of some hasty defensive position "on a Point Call'd West Point." [12]

"Difficulties and Obstacles" had slowed construction of the vital forts and troubled Washington, but with the Revolutionary main army requiring his attention and command, he was compelled to cite his unfamiliarity with the minutiae of the Hudson Valley's geography when a secret committee of New York patriot officials requested his "advice on this important subject." [13] However, the situation throughout the rest of 1776 and 1777 remained one characterized by the deplorable lack of progress. In fact, the ongoing problem of material shortages even prompted moves to redirect building resources and ordnance from one fortress project to another. [14] Nonetheless, along the Hudson River, the forts' wishful builders had presumably expected that state militia would throng to defend the forts upon notice of a British move up the river.

One vital continuity is the purpose of defensive systems: a defense is built to buy time for the defender, and crucially to buy time for the defender to take positive action.

THE CRISIS

Other problems beset the American cause, stemming from a shortage military intelligence, uneven generalship, and indiscipline with Washington confiding to his brother John in the hard autumn of 1776: "I am wearied almost to death with the retrog[r]ade

Motions of things," [15] Inadequate military intelligence contributed to major problems the next summer, when General Washington assured American Major General Israel Putnam that British forces under Major General William Howe made it "beyond all matter of doubt, that he has dropped all thoughts of an expedition up the North [Hudson] River," just days before British redeployments forced Washington to reverse himself and conclude that "Hudsons [*sic*] River seems to be the Object of his attention." [16] A British contingent under Major General Henry Clinton (not to be confused with the James Clinton who surveyed the Hudson or the governor George DeWitt Clinton who commanded state militia and was the namesake of one of the river's forts). The militia who rallied to the forts found that their numbers were too few to adequately defend both Fort Clinton and Fort Montgomery, and realized that both works were also too insubstantial to be defended for long. Nonetheless, the American force attempted to hold both sites on the west bank. When Henry Clinton sent a group of Tory militia overland to assault the forts from the landward sides and had warships approach on the river, the American defenses promptly collapsed, and the garrisons were killed or captured. A small contingent of 120 militia at Constitution Island unleashed a volley on a small party of British personnel later in the day and fled at nightfall. [17]

A view from Fort Constitution's artillery battery site, looking across the Hudson River to the far shore—a position that gave West Point its name. **Photo Credit: Dr. Nicholas M. Sambaluk**

If not for the nearly simultaneous reduction of John Burgoyne's army near Saratoga, the British would have effectively captured the Hudson River in October 1777. The American defenses along the river were utterly destroyed by Henry Clinton's modest force. The absence of instant communication spared the Americans the consequences of the British success on the Hudson River, as Clinton's British force was unaware of the dire predicaments facing Burgoyne's larger invading army barely 100 miles away.

At the climax of the crisis, Washington ordered a French officer dispatched to assist the American cause, Lieutenant Colonel Lewis de la Radiere, "to Fort Montgomery" to "take upon you the direction of such Works as shall be deemed necessary by the commanding Officer in that department." [18] When issuing the order, Washington did not yet know that Fort Montgomery had just fallen to the British contingent under Henry Clinton. [19] The British presence ended when they returned to New York City in late October to establish winter quarters. Given the frequent confusion of the various Hudson River forts, it is likely that Washington had in mind that Radiere would as a trained military engineer oversee construction in the entire area, including Fort Constitution and the as-yet unimproved area on the west bank.

American militia returned to the site of Constitution Island, now abandoned by the British. On January 27, 1778, American personnel crossed to the western bank of the river. Then, as now, the Hudson Valley is inhospitable terrain at the height of its winter, and after a few hours' presence, they returned to their camp on the east bank. Their return, three days later, marked the beginning of the US Army's permanent presence at its oldest continuously operated post. [20]

News of the American victory at Saratoga had an important impact on the defense of the Hudson. Certainly, the northern invasion threat disappeared and helped convince France's Louis XVI to enter a war that would (unbeknownst to him) further ensure revolution in his own a decade later. The formal French alliance made possible the delivery of French guns, ultimately of French sailors and soldiers, and also of French engineering experts. Covert French aid had already included a small cadre of desperately needed foreign officers with training and experience in military engineering. Lieutenant Colonel la Radiere, twice promoted in exchange for acceding to travel to America, was among this group. The American victory at Saratoga simultaneously opened the potential of releasing military units involved in Burgoyne's defeat that fall. The dearth of trained military engineers at West Point was coming to an end. An inverse problem arose, as the Hudson Valley would soon find that it had too many cooks in the kitchen.

> No fortified construct, whether physical or digital can be relied upon to hold off an attacker indefinitely.

CONCLUSION

What cyber lessons, parallels, and contrasts, can be identified in this exploration of the early fortification of the Hudson River? One vital continuity is the purpose of defensive systems: a defense is built to buy time for the defender, and crucially to buy time for the

defender to take positive action. No fortified construct, whether physical or in a digital environment, can be relied upon to hold off an attacker indefinitely. This point will be explored further in the second part of this project. A significant distinction between cyber and physical environments is that the terrain in a cyber environment is "built, not born." [21] This is undeniably true, although it is useful to remember that the construction of defenses (both cyber and physical) is a deliberate activity.

That deliberate action presupposes coordinated action. This initial action frequently has to occur before it is yet clear how best a challenge can be overcome—the identification itself is a necessary early step across different environments. The Continental Congress identified the need for Hudson River defenses even before it could agree to establish a United States Army. NATO members' identification of cybersecurity dangers is a precondition of effectively meeting those requirements. [22]

Translating these vital elements into an effective and coherent system is a complex challenge. Examining the organized planning, tangible development, and functioning maintenance of secure systems from 1778 through 1781 provides a lens through which to engage with these issues.

NOTES

1. Ty Seidule, "Conclusion," *Stand Up and Fight! The Creation of US Security Organizations,* 1942-2005, ed. Ty Seidule and Jacqueline E. Whitt (Strategic Studies Institute, 2015), 257-8.

2. Charles E. Miller, Donald V. Lockey, and Joseph Visconti, *Highland Fortress: The Fortification of West Point During the American Revolution, 1775-1783* (United States Military Academy, 1979), 15.

3. For a sample of the discursive study about the role and purpose of fortresses, and the terms in which these issues are currently presented to USMA cadets in their study of military history, see John Lynn's "Chapter 5: The French Army and the Wars of Louis XIV, 1661-1688" in *The West Point History of Warfare,* ed. Clifford Rogers and J.T. Seidule (Rowan Technologies, 2014), 25-29.

4. David Richard Palmer, *The River and the Rock: The History of Fortress West Point, 1775-1783* (Greenwood, 1969), 32.

5. Miller, et al, *Highland Fortress,* 18-21.

6. George Pappas, *To The Point: The United States Military Academy,* 1802-1902 (Praeger, 1993), 6.

7. Footnote 9, *The Papers of George Washington: Revolutionary War Series 4, April-June 1776,* ed. Philander D Chase (University Press of Virginia, 1991), 423.

8. From Lord Stirling [to George Washington], 1st June 1776, *The Papers of George Washington: Revolutionary War Series 4,* 420-1.

9. Miller, et al, *Highland Fortress,* 46.

10. From Lord Stirling [to George Washington], 1st June 1776, *The Papers of George Washington: Revolutionary War Series 4,* 418-20.

11. From Lord Stirling [to George Washington], 1st June 1776, *The Papers of George Washington: Revolutionary War Series 4,* 420-23.

12. From Lieutenant Colonel Henry Beekman Livingston [to George Washington], June 11th-14th, 1776, T*he Papers of George Washington: Revolutionary War Series 4,* 502.

13. From a Secret Committee of the New York Convention [to George Washington], 17th July 1776, The Papers of *George Washington: Revolutionary War Series 5,* June-August 1776, ed. Philander D Chase (University Press of Virginia, 1993), 361; To a Secret Committee of the New York Convention [from George Washington], July 19, 1776, *The Papers of George Washington: Revolutionary War Series 5,* 391-2.

14. Thomas Machin to General Putnam, 25th July 1777, *Public Papers of George Clinton, First Governor of New York, 1777-1795 – 1801-1804, Volume II* (New York: Wynkoop Hallenbeck Crawford, 1900), 133. From Lieutenant Colonel Henry Beekman Livingston [to George Washington], June 11th-14th, 1776, *The Papers of George Washington: Revolutionary War Series 4,* 501.

15. To John Augustine Washington [from George Washington], Nov 6-9, 1776, *The Papers of George Washington, Revolutionary War Series 7, October 1776-January 1777,* ed. Philander D. Chase (University Press of Virginia, 1997), 105.

16. To Major General Israel Putnam [from George Washington], 12th June 1777, *The Papers of George Washington, Revolutionary War Series 10, June-August 1777,* ed. Philander D. Chase (University Press of Virginia, 17; To Major General William Heath [from George Washington] July 4th, 1777, *The Papers of George Washington, Revolutionary War Series 10,* 189.

17. Theodore J. Crackell, *West Point: A Bicentennial History* (University of Kansas, 2002), 11-12.

18. To Lieutenant Colonel La Radiere [from George Washington] 8th October 1777, *The Papers of George Washington, Revolutionary War Series 10,* 440.

19. George Clinton to George Washington, 9 October 1777, *Public Papers of George Clinton, Volume II,* 380.

20. Crackell, 12.

21. Martin C. Libicki, *Conquest in Cyberspace: National Security and Information Warfare* (Cambridge, 2007), 5.

22. The White House, *National Security Strategy* 27 (2010), https://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf; Department of Defense, *Strategy for Operating in Cyberspace* (2011), http://www.defense.gov/news/d20110714cyber.pdf; Government of Canada, Canada's Cyber Security Strategy (2010), http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/cbr-scrt-strtgy/index-eng.aspx; HM Government, *The UK Cyber Strategy: Protecting and Promoting the UK in a Digitized World* (2011), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60961/uk-cyber-security-strategy-final.pdf.