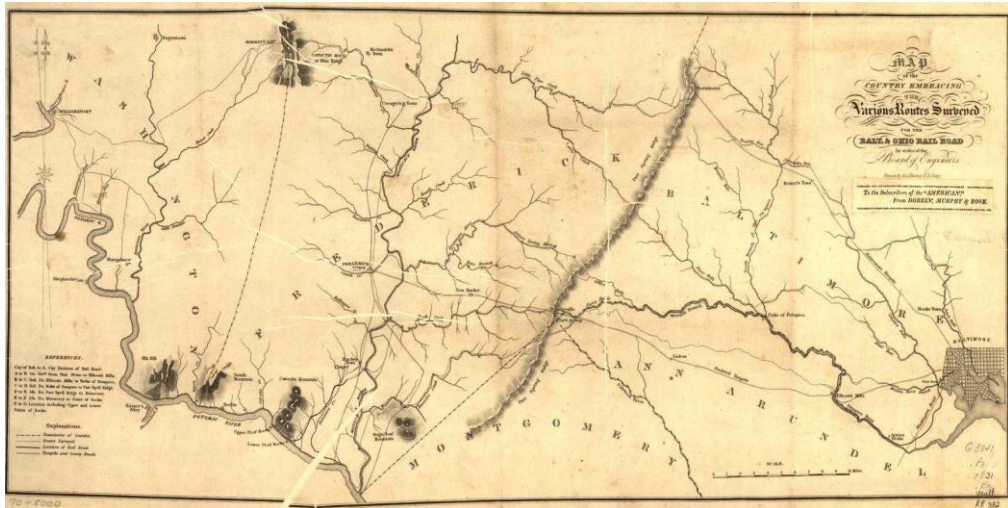


The Early U.S. Military Academy at West Point as a Nation Building Institution



1831 Board of Engineers for Internal Improvements "Map of the country embracing the various routes surveyed for the Balt. & Ohio Rail Road." The project was initially overseen by West Point engineering graduate William Gibbs McNeill. (Library of Congress)

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After the success of the American Revolution, the nation's founders grappled with the momentous task of building republican institutions that would define and develop the new nation. One glaring deficit was the complete lack of any formal institutions committed to the type of scientific and military training necessary to educate American youth to build and defend the country. Although the United States Military Academy at West Point was founded in 1802 as just that—a military academy—those who had conceived of it and ultimately built it into a successful institution had always understood it to be something much greater than merely a center for teaching the art of war. Rather, West Point was to become a vital source of engineering expertise in America's nation building era of internal improvements and beyond, despite concerted attempts to impede it by proponents of "Jacksonian democracy." By the 1830s, The United States Military Academy had become the premier center in the nation for educating and training professional civil engineers scattering its graduates across the country in the most intensive era of road, canal, and railroad building in the history of the United States.

Beginnings

In early 1776, Congressman John Adams complained to American General William Heath that "Engineers are very scarce, rare and dear. We want many, and Seem to have none. I think it high Time We should have an Academy for their Education."¹ The clandestine importation of leading French engineers to the new United States thus became a top priority of Benjamin Franklin and Silas Deane in their negotiations with the French regarding aid to the American cause for independence. Arriving in the summer of 1777, the team of French military engineers led by Louis Duportail played a critical role in training Americans. Duportail also

¹ J. Ledlie Klosky, and Wynn E. Klosky, "Men of Action: French Influence and the Founding of American Civil and Military Engineering," *Construction History* 28, no. 3 (2013): 70. <http://www.jstor.org/stable/43856053>.

designed and built a virtually impregnable fortification at West Point on the Hudson.² Although George Washington had formed an army Corps of Engineers stationed at the French-built West Point fort during the war, the specific idea of a creating an American military academy became a serious point of discussion between himself and Alexander Hamilton in 1783.³ It was not until Washington's second administration however that the idea of such an academy was finally seriously considered. In his Eight Annual Address to congress in 1796, President Washington emphasized "the expediency of establishing a national university and a Military Academy." In the speech, Washington had prefaced the call with an appeal to the congress to create the necessary institutions required to promote the sciences associated with agriculture and manufacturing.⁴ In 1799, Hamilton provided Secretary of War James McHenry a detailed plan of what such an academy must teach prioritizing a "Fundamental School" (geometry, mechanics, topography, geography, etc.) and a "School of Engineers and Artillerists" which, aside from the construction of military fortifications, would also include instruction in chemistry, hydraulics, mineralogy, and the "principles of construction, with particular reference to aqueducts, canals and bridges."⁵ Not surprisingly, the proposed site of the Academy would be the Hudson River fortification at West Point where the Continental Army Corps of Engineers had been headquartered during the war.

² Klosky, 74-76.

³ Stephen Ambrose, *Duty, Honor, Country: A History of West Point* (Baltimore: Johns Hopkins University Press, 1999), 11.

⁴ "Washington's Eighth Annual Address to Congress, December 7, 1796," *The Washington Papers*, The University of Virginia, <https://washingtonpapers.org/documents/washingtons-eighth-annual-address-to-congress/>

⁵ "Alexander Hamilton to James McHenry, 23 November 1799," *Founders Online*, National Archives, <https://founders.archives.gov/documents/Hamilton/01-24-02-0057> [Original source: *The Papers of Alexander Hamilton*, vol. 24, *November 1799–June 1800*, ed. Harold C. Syrett. New York: Columbia University Press, 1976, pp. 69–75.

Ironically, it was President Thomas Jefferson's signing of the Peace Establishment Act of 1802 that finally created the U.S. Military Academy at West Point. Jefferson had been originally opposed to the idea of a national military academy and, in a heated 1793 Washington administration cabinet discussion of the matter, had insisted that the creation of such an institution was beyond the constitutional powers of Congress. Now as president, Jefferson had completely changed his view. It seems that the president was eager to use the new academy to "Republicanize" the United States military which had become dominated by upper-class officers who were in large part allied with the Federalists. Through presidential controlled appointments and commissions, Jefferson hoped to purge the officer corps of Federalists while stocking the new Military Academy with the sons of good Republicans.⁶ That said, it should not be overlooked that Jefferson did also support the efforts of such a national institution in furthering the pursuit of "Science in all of its useful Branches."⁷

In consonance with its conceived role as a military *and* scientific institution, Benjamin Franklin's great-nephew, Jonathan Williams was appointed the first superintendent of the West Point Academy. Williams had spent the years during and immediately following the American Revolution in Europe working under Franklin's direction including participating in several scientific experiments. Williams had little military experience and was more respected as scholar than a soldier. Immediately after becoming the first superintendent, Williams insisted on establishing a "Military Philosophical Society" as a critical component of the new United States Military Academy. Although its expressed purpose was "promoting Military Science," the

⁶ Theodore J. Crackle, *West Point : a bicentennial history* (Lawrence, KA: University of Kansas Press, 2001), 50-51.

⁷ Sidney Forman, "The United States Military Philosophical Society, 1802-1813: Scientia in Bello Pax." *The William and Mary Quarterly* 2, no. 3 (1945): 276. <https://doi.org/10.2307/1921452>.

Society ended up becoming a true national asset as the largest repository of technical books in the United States including many from Benjamin Franklin's personal library. Ultimately, Williams's Military Philosophical Society would include among its members such notables as Thomas Jefferson, James Madison, John Quincy Adams, James Monroe, DeWitt Clinton, Robert Fulton, Eli Whitney, and Benjamin Latrobe as well as professors and researchers from Harvard, Dartmouth, and other academic institutions.⁸

But despite Williams best efforts, the early growth of the Military Academy was hampered both by a lack of qualified instructors as well as constant deployments of its Corps of Engineers students and staff to build and maintain coastal fortifications. With the expansion of the military in 1807, Williams requested additional science and engineering instructors and even proposed that the Academy move to Washington D.C. where he believed it could expand into a top-rate national scientific institution. Unfortunately, the move proved to be unpopular among certain members of congress who saw commissioned graduates of West Point as a threat to their patronage system of granting military commissions to members of their state militias. By 1810, with only forty-seven cadets attending (three less than its opening year in 1802), Williams wrote that "The military Academy as it now stands is like a foundling barely existing among the mountains...and almost unknown to its legitimate parents."⁹

The École Polytechnique upgrade

With the war of 1812, the nationalistic idea of "fortress America" drew widespread interest and support especially regarding the construction of coastal and frontier defenses as well as internal supply roads. This allowed for a major expansion of the U.S. Military Academy at

⁸ Forman, 283.

⁹ Ambrose, 34-35.

West Point immediately following the war under the leadership of superintendent Joseph Gardiner Swift who had been a member and chief organizer of Williams' Military Philosophical Society. As part of the expansion, Secretary of War James Monroe was instrumental in creating a completely new federal capability for West Point army engineers. Later known as the "Third System" of the military, Monroe organized a Board of Fortifications which integrated army, navy, and militia capabilities tasked with constructing "interior communications by land and water ...all combined, so as to form a complete system." With Madison's re-establishment of the National Bank, a pretty sum of \$838,000 was made available for the enterprise.¹⁰

At the same time, President Madison and Secretary Monroe had sent West Point engineering officers Sylvanus Thayer and William McRee to France to study military engineering techniques, especially those of the famed *École Polytechnique* which had been originally founded as the *École des Travaux Publics* (School of Public Works) by military engineering scientists Lazare Carnot and Gaspard Monge.¹¹ Both Swift and Monroe were well aware that the *École* had been the finest military and engineering school on the continent.¹² In France, McRee and Thayer purchased over one thousand books (many directly from the *École*) amounting to an encyclopedic library of all of the core discoveries and methods of the European continental school of science and engineering. Combined with its present stacks, this made the West Point library one of the greatest resources of scientific and engineering literature in the western world. Additionally, the Board of Fortifications was authorized to commission

¹⁰ Ian Hope, *A Scientific Way of War: Antebellum Military Science, West Point, and the Origins of American Military Thought* (Lincoln, Nebraska: University of Nebraska Press, 2015), 51-57

¹¹ Anton Chaitkin, *Who War Are: America's Fight for Universal Progress from Franklin to Kennedy, Volume 1* (Middletown, DE: Anton Chaitkin, 2020), 257.

¹² Jon Scott Logel, *Designing Gotham: West Point Engineers and the Rise of Modern New York* (Baton Rouge: Louisiana State University, 2016), 34.

Napoleon's former chief engineer Simon Bernard as a brigadier-general to oversee its national operations. École engineering graduate Claudius Crozet was also hired as a Professor of Civil and Military Engineering and pledged to faithfully "follow the methods of instruction and the authors of the École Polytechnique."¹³ By 1821, the West Point Board of Visitors (the oversight body of the Academy) was able to write with assurance that "this academy may, without expense, be made to furnish Civil engineers for roads, bridges, canals, and hydraulic constructions, as well as Military and Topographical Engineers... The Military Academy at West Point is the only establishment where a complete system of Instruction in Mathematicks, Descriptive Geometry, Mechanicks, Astronomy, and Civil and Military Architecture is procured and ...where [cadets] have an opportunity of exercising the different Civil and Military avocations, to which the application of exact sciences is indispensable."¹⁴

West Point and the General Survey Act solve America's engineer shortage

In 1808, Treasury Secretary Albert Gallatin had been commissioned by the U.S. Senate to produce the one hundred page "Report on Roads, Canals, Harbors, and Rivers" laying out numerous projects which would benefit the national interest. Due to the constant bickering between Federalists and Republicans in the Congress, the actual surveying and completion of many of these projects (especially interstate ones) often became embroiled in seemingly irreconcilable debates about the role of the federal government financing and oversight. More importantly, *there were simply no engineers available to build them*. When architect Benjamin Latrobe was asked in 1816 for a referral to head the Virginia public works department, he responded that "no practical as well as scientific Engineer could be obtained short of England or

¹³ Todd Shallat, "Building Waterways, 1802-1861: Science and the United States Army in Early Public Works," *Technology and Culture* 31, no. 1 (1990): 24. <https://doi.org/10.2307/3105759>.

¹⁴ Hope, 121.

France.”¹⁵ Although the addition of qualified engineers coming through the “on-the-job-training” program of the New York State Erie Canal project begun in 1817 did somewhat alleviate America’s engineering shortage, it was nowhere near enough to fill the void. As the demand for internal improvements projects grew, states and canal companies found themselves in constant competition with each other to secure one of the handful of experienced New York engineers who, even if hired, were generally only available to provide short-term consultations not full-time oversight positions.¹⁶

This is precisely where the United States Military Academy at West Point entered the national stage and stepped into the role that its initiators had intended for it. In 1819, John C. Calhoun issued his own “Report on Roads and Canals” updating Gallatin’s report. But unlike the Gallatin report written under the auspices of the U.S. Treasury Department, Calhoun’s was produced in his capacity as President James Monroe’s Secretary of War. In it, Calhoun put forth the bold idea that public internal improvement projects should be seen as an integral part of the defense of the nation:

A judicious system of roads and canals, constructed for the convenience of commerce and the transportation of the mail only, without any reference to military operations, is in itself among the most efficient means for ‘the more complete defence of the United States.’¹⁷

In essence, Monroe and Calhoun were proposing a unique solution to the long-debated constitutional issue of federal involvement in internal improvements as well as the chronic

¹⁵ Daniel H. Calhoun, *The American Civil Engineer* (Cambridge, Mass.: The Technology Press, 1960), 20.

¹⁶ Calhoun, 36-37.

¹⁷ Calhoun, 41.

problem of the shortage of engineers. By identifying internal improvements as necessary for both commercial purposes *and* the national defense, the West Point Military Academy engineering force could now be deployed into America's nation building project. Monroe was of course well aware of the remarkable capability of West Point army engineers who had already been surveying and constructing necessary military fortifications, coastal defenses, and supply roads under the Board of Fortifications. Likewise, Swift and his protégé Sylvanus Thayer (who had now become the West Point superintendent) had become accustomed to the idea of the army's Third System and saw no real bifurcation between military and civil projects deemed to be in the national interest.¹⁸

In his 1823 Annual Message to Congress, President James Monroe proposed that in the interest of forming “ a just estimate of our resources, revenue, and progress in every kind of improvement connected with the national prosperity and public defense” the congress should “authorize by an adequate proportion the employment of a suitable number of the officers of the Corps of Engineers to examine the unexplored ground ...it will likewise be proper to extend their examination to the several routes through which the waters of the Ohio may be connected by canals with those of Lake Erie.”¹⁹ In accordance with Monroe's proposition, the congress passed the General Survey Act in April 1824 authorizing the president “to cause the necessary surveys, plans, and estimates, to be made of the routes of such roads and canals as he may deem of national importance, *in a commercial or military point of view.*”²⁰ [emphasis added] Under the act, a new Board of Engineers for Internal Improvements was established headed by Board of

¹⁸ Hope, 115.

¹⁹ Chaitkin, 283-84.

²⁰ “April 30, 1824: An act to procure the necessary surveys, plans, and estimates, upon the subject of roads and canals,” *Acts of the Eighteenth Congress of the United States*, vol. 6 (1846): 22-23. <https://tile.loc.gov/storage-services/service/l1/lsl/l1sl-c18/l1sl-c18.pdf>

Fortifications supervisors Simon Bernard and Col. Joseph Totten. By 1826, fifty-three army officers were serving under the board and would remain there for the next decade of internal improvements.²¹

With the newly assigned nation building task at hand, West Point adjusted its curriculum to put “Civil Engineering” and the “Science of War” into a *single* course which included the design of roads, inland navigation, tunneling, and railroads. A more complete curriculum was added two years later to include instruction in choosing and procuring the requisite materials for road, canal, and railroad projects, as well as determining their “calculation of the economy.”²² In 1824 alone, Totten and Bernard were tasked to survey twenty-seven possible canal projects and assigned to rate them for both their military and commercial value.²³ That same year, when answering complaints that the Military Academy was graduating twice as many officers than were needed in the military, the War Department responded that “the benefit to be derived . . . from their educations will not be lost [but] on the contrary will be felt in the several States.”²⁴ In 1828, the nation-building side the U.S. Military Academy had become so developed that Secretary of War Peter Porter could rightfully claim that:

The Military Academy is scattering the fruits of its science not merely to the rest of the army, but to the youth of our country generally, and the interchange of the theoretic science of this national school with the practical skill and judgement of our civilian engineers, which is now going on throughout the United States, will soon furnish every

²¹ Hope, 113.

²² Calhoun, 41.

²³ Hope, 116.

²⁴ Calhoun, 42.

part of the country with the most accomplished professors in every branch of civil engineering.²⁵

In 1818 only one West Point graduate was working as a civil engineer on an internal improvement project. By 1838, that number had risen to over one hundred as the West Point Military Academy became the nation's premier center of churning out qualified civil engineers. Between 1824 and 1837, the Board of Engineers for Internal Improvements carried out the survey of one hundred and twenty-four internal improvement projects and assisted in the construction of ninety of them.²⁶ Since West Point active-duty engineering officers were only allowed to survey projects, many chose to obtain temporary releases from the military to actually work on the construction as well. As the internal improvements picked up greater steam, many West Point engineering graduates simply left the military altogether to join what was a growing "army" of professionally trained civil engineers deployed across the country. By 1840, this engineering capability had already allowed the United States to build almost 3,000 miles of operating rail lines—seventy-five percent more than all of those in of Europe combined, including Great Britain.²⁷

Science vs. populism

As the spirit of "Jacksonian democracy" swept the United States in the late 1820s and 1830s, populist opposition arose to the West Point involvement in internal improvements and to the very existence of the academy itself. Although Andrew Jackson himself was not opposed to

²⁵ Pamela Lowry, "West Point and the Tradition of the Army Corps of Engineers." *21st Century Science and Technology*, Spring 2001, 46. http://21sci-tech.com/Articles_2011/Spring-2011/West_Point_Tradition.pdf

²⁶ Stephen Minicucci, "Internal Improvements and the Union, 1790-1860," *Studies in American Political Development* 18, no. 2 (Fall, 2004): 164. <http://library.esc.edu/login?url=https://www.proquest.com/scholarly-journals/internal-improvements-union-1790-1860/docview/205464942/se-2?accountid=8067>.

²⁷ Chaitkin, 327.

the Military Academy per se, he personally despised superintendent Sylvanus Thayer comparing his tight control over the Academy with that of autocratic Russian Tsars.²⁸ Under the pressure, Thayer was forced to resign as superintendent in 1833. The more radical and vocal Jacksonians, however, were convinced that the Military Academy was “contrary to the true spirit of our country, and in opposition to all our Republican institutions” and therefore campaigned vigorously to have it shut down altogether. Attacks included everything from accusing the Academy of “aristocratic excrescence” to charges of squandering public money for private gain, a particularly popular criticism as more and more West Point graduates quit the military to join private sector engineering projects.²⁹ Jackson Democrats also reflected the romanticism and anti-professionalism that was becoming a popular prejudice of the day by attacking the heavy focus of the West Point curriculum on the technical sciences, insisting instead that it should “include more matter of practical utility.”³⁰

Perhaps one of the most important elements of this populist opposition to army engineers was the prejudice of “home grown” engineers and their local supporters against the “technicism” of the elite West Pointers. As professional military officers, West Point engineers were trained to produce the most competent and thorough surveys and reports using scientific parameters with little or no regard to political or local profit considerations. In contrast, local engineers and their employers were often driven by parochial concerns which frequently stood in the way of competent assessments and construction plans. In 1830, the West Point Board of Visitors stated bluntly that “the pupils of West Point will deliver the country from the quack engineering which

²⁸ Crackle, 102.

²⁹ Ambrose, 115.

³⁰ Hope, 141.

has ...inflicted deep wounds upon our system of internal improvements.”³¹ Although there are many examples of this conflict, two notable ones bear mention. First was the Board of Engineers’ 1826 survey and report on the construction of the Chesapeake and Ohio Canal. Using the advanced French science of descriptive geometry, the Army engineers produced a thorough report on the C & O project and priced the first section of it at \$8 million. However, a shortsighted House committee along with some of the canal’s investors chose instead to use the more “practical” and cheaper plan of two New York home grown engineers. The result was a financial and construction disaster. With the canal still incomplete in 1851, the West Point men had proven to be entirely accurate as to the cost, while the New York civilian engineers had underestimated it by almost three hundred percent. Explaining the difference, Simon Bernard wrote, “We were planning a work for the nation ...it did not belong to us to curtail the cost in order to derive from the capital a greater increase ...to the detriment of durability and conveyance.”³² The second example involved West Point engineer Williams Gibbs McNeill who had been secured as chief engineer for the Massachusetts Western Railroad. McNeill found himself embroiled in a heated conflict with certain civilian board members of the railroad who wanted to replace the army engineers with local civilians who were more “generally known and influential in the community.” That way, claimed the board report, “the road will be constructed at much less coast and with greater dispatch with better judgement and much less perplexity.” Fortunately, wiser heads ultimately prevailed and McNeill and his army engineers were kept on the project with the line being completed in good order.³³ A few sentences from General Bernard and Major Totten’s extensive 1823 report on the Morris Canal provides an excellent window into

³¹ Calhoun, 42.

³² Todd Shallat, “Building Waterways, 1802-1861: Science and the United States Army in Early Public Works,” *Technology and Culture* 31, no. 1 (1990): 34-35. <https://doi.org/10.2307/3105759>.

³³ Calhoun, 137.

understanding the army engineers' superior method of assessing the actual "value" of engineering projects and how it differed from that of the localist, cost-cutting "practical" approaches:

... the revenue from a canal may be much less than that on ordinary investment, and yet the benefits amount to much more, as regards national economy and advantage. On this hypothesis, the defect of revenue is amply compensated, as regards the nation, by the greater facility and speed of transportation, thereby making the articles conveyed less costly, the circulation of capital more rapid, and a large proportion of the labour of men and animals disposable for the other branches of industry; and also, by opening extensive regions to a market, which, without this cheap mode of conveyance, would be inaccessible.³⁴

*Scientia in Bello Pax*³⁵

The immense popularity of the professionally designed internal improvement projects and their incredible benefits of "national economy and advantage" would ultimately overwhelm the populist rants and local prejudices against the West Point trained engineers. Even an otherwise hostile congressional committee investigating the Academy had to admit that the number of successful internal improvement projects represented "some of the endearing memorials of the usefulness of the Military Academy and money which have been bestowed upon it."³⁶ West Point graduates would go on to contribute greatly to the further development of

³⁴ Lawrence G. Hines, "The Early 19th Century Internal Improvement Reports and the Philosophy of Public Investment," *Journal of Economic Issues* 2, no. 4 (1968): 388-89. <http://www.jstor.org/stable/4223970>.

³⁵ Forman, 273. The motto of the Military Philosophical Society "Science in war is the guarantee of peace," as translated by its founder Jonathan Williams.

³⁶ Ambrose, 120.

the nation and other nations as well. Notable are the careers of West Point graduates George Washington Whistle and Alexander Dallas Bache. Bache, the great-grandson of Benjamin Franklin, would go on to play a key role in the development of the Franklin Institute which became a principal center for the research and development of steam power that would fuel the industrialization of the nation. Railroad engineer Whistler would die in Russia a few months shy of his completion of the Moscow to St. Petersburg railroad, the first rail line ever constructed in Tsarist Russia. Among many other projects, West Point graduates would also play crucial roles in designing the Croton Aqueduct water system for New York City as well as the initial planning for Central Park.³⁷ West Point engineering instructor Dennis Hart Mahan's *Elementary Course of Civil Engineering* would become the standard text book for American civil engineers educated throughout the nineteenth century, producing a generation and more of engineers who went on to build the nation.³⁸ As science triumphed over populism, the United States Military Academy at West Point ended up serving the nation precisely as Washington, Hamilton, Jonathan Williams, and others had originally envisioned it would: as a national institution of science and learning that would build and protect the United States in peace and war alike.

³⁷ Logel, 67-71, 99-101.

³⁸ Logel, 52.

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