

The mission of America's military nation-builders: global development

by Graham and Pam Lowry

Since the untimely death of President Franklin Roosevelt in 1945, few American patriots have understood how close the United States was, to reasserting its founding mission as a “beacon of liberty.” Roosevelt’s post-war plans for global development, using the tremendous economic power the United States had mobilized during World War II, were intended to break the British Empire’s grip everywhere on the planet, and end the evils of colonial subjugation. Instead, the British ran rings around FDR’s befuddled successor, Vice President Harry Truman—and the historic opportunity was lost.

Yet the means were there. By the war’s end, the United States had the largest trained force in engineering and construction in the world. Its combined military and civilian mobilization had broken the shackles of British-dictated financial policies, which had crippled the nation even before the Great Depression. In the face of economic ruin and the growing threat of war, Roosevelt had already used his executive authority to foster the buildup of U.S. infrastructure, frequently deploying the Army Corps of Engineers. The results included major hydroelectric projects (such as the Bonneville Dam), rural electrification projects (notably the TVA), and vast improvements in water management and irrigation systems (which transformed California into one of the world’s most productive agricultural regions). Under wartime conditions, the civilian labor force was rapidly upgraded; the Armed Forces also developed units specially equipped to meet logistical infrastructure requirements. Led by a revitalized machine-tool sector, the postwar U.S. economy was fully prepared to begin the work of global reconstruction—building railroads and bridges, dams and canals, or whatever was needed.

But, lacking the authority and trusted leadership of Franklin Roosevelt, their commander-in-chief, a demobilized American people also became demoralized; for they no longer grasped their history, the purpose of their republic, or even the unique character of the American military’s role in nation-building.

Mobilizing for the future of the world

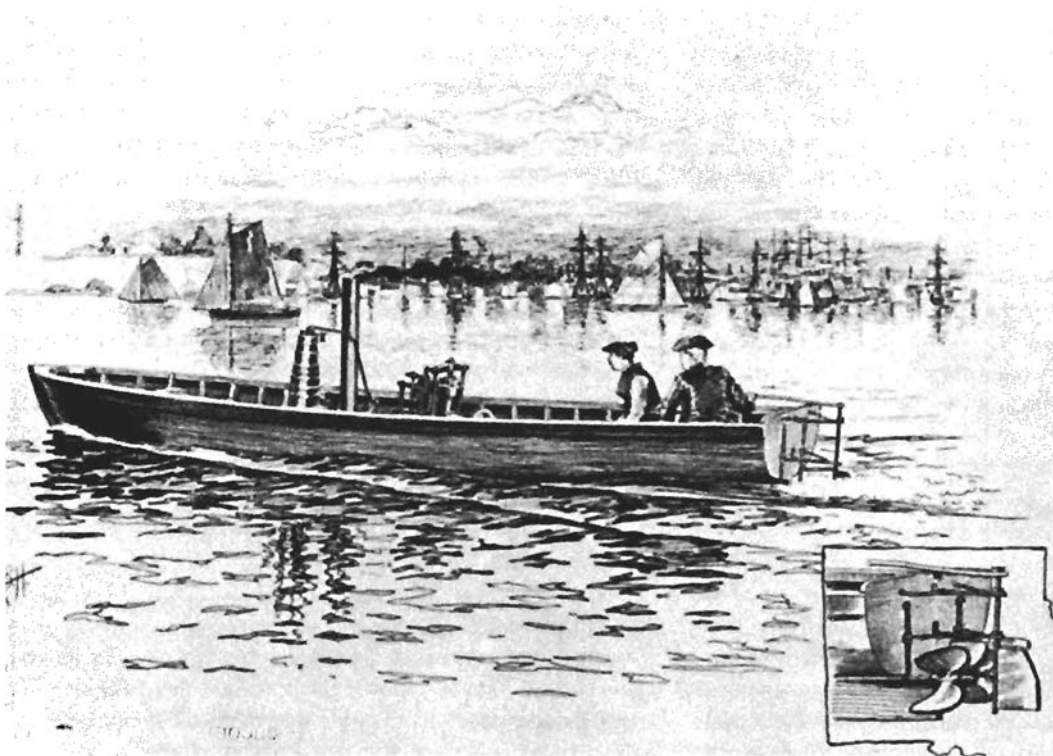
America’s War of Independence was mobilized around the highest conception of mankind, as boldly set forth in the

Declaration of Independence. Its military objective was to defeat the British Empire, *so that all of humanity might enjoy the blessings of being created in the image of God*. The foundations had been laid by Benjamin Franklin and George Washington, who seized every opportunity to promote scientific progress and economic development, and hammered the weak flanks inevitably exposed by any system of imperial rule. When the British Army surrendered in a rage at Yorktown in 1781, its fife-and-drum corps played the tune “The World Turned Upside Down”—which was exactly what the United States intended to do, by encouraging similar efforts to overturn oligarchical oppression anywhere in the world. Great Britain refused to formally accept defeat, until signing the Treaty of Paris in 1783.

The British Empire’s worst nightmare had only begun. Its former American colonies had long been crippled by imperial prohibitions against industrial and infrastructural development. They were ravaged by seven years of war; buried in public debt; without even a central government until 1789; and continuously besieged both within and without by the British enemy. Yet the United States mobilized a campaign for technological progress which astounded the world. Some of the daring plans for the new republic were devised during the Continental Army’s encampments at Valley Forge, Morristown, and Newburgh—where Washington and his officers discussed the requirements for rapidly developing the nation, especially the territories between the Great Lakes and the Ohio River, and west to the Mississippi River.

Within 20 years of George Washington’s taking his oath of office as President and commander-in-chief, the United States had initiated a vast system of inland waterways, developed the steamboat and the high-pressure boiler, opened the first fully automated factory in the world, begun an industrial engine-building and machine-tool complex, and even demonstrated the first automobile. The catalyst for these achievements was the lifelong leadership of Benjamin Franklin and George Washington, who personally laid out the plans for America’s early infrastructure projects, and then sponsored and encouraged four of America’s most dedicated inventors: James Rumsey, Robert Fulton, Oliver Evans, and John Stevens.

Washington recruited Rumsey as chief engineer for the



John Stevens's screw-propeller steamboat of 1804. Stevens, who had fought in the American Revolution, devoted his life to developing steam-powered transportation and an ironclad U.S. Navy.

Potomac Canal project in 1785. By 1787, with scientific input from Benjamin Franklin, Rumsey was also demonstrating his first steamboat on the Potomac River's Appalachian reaches, to the cheers of onlooking veterans of the Continental Army. Robert Fulton, sponsored by Franklin in post-Revolution Philadelphia as a young painter of miniatures, was soon understudying Rumsey on developing the steamboat, and formulating a plan for an integrated system of U.S. canals. Oliver Evans's design for a fully automated flour mill was embraced in 1791 by President Washington, who had one constructed for his farm at Mount Vernon. Evans moved to the nation's capital at Philadelphia in 1792, where he developed the high-pressure steam engine, a steam-powered automobile, and a machine-tool complex to produce them. John Stevens, a young captain in the Revolution, who raised funds to support the starving Army during Washington's New Jersey campaign, dedicated his life and his fortune to developing steam-powered transportation and an ironclad U.S. Navy. Stevens's uncle was Revolutionary War Gen. William Alexander, who in 1778 exposed the Conway Cabal, a British-backed plot to remove George Washington as commander-in-chief. His grandfather James Alexander—deported to America for his part in the 1715 Scottish rebellion against Britain's King George I—became America's leading American astronomer, and was recruited by Benjamin Franklin as a founding member of the American Philosophical Society in 1744.

America's engine of development was further acceler-

ated by the establishment of West Point, the military institution first fought for by President Washington. When President Thomas Jefferson finally abandoned the "states rights" arguments he had used against it as a member of Washington's cabinet, the Congress authorized in 1802 the creation of a Corps of Engineers, which "shall be stationed at West Point . . . and shall constitute a military academy." The chief engineer, as commander of the Corps, would also serve as the superintendent of the Academy. The first superintendent was Benjamin Franklin's grandnephew Jonathan Williams, who soon founded the United States Military Philosophical Society, using the books he had inherited from Franklin, as the core of its scientific library. The Society exemplified the fact, that both the political and military objectives of the United States, were to develop the nations of the world. George Washington wrote of this goal earlier, when he said, "I hope, some day, that we will become a storehouse and granary for the world." In that spirit, two early members of the Military Philosophical Society, John Quincy Adams and Robert Fulton, were working together in 1812 on a project for Russia, to connect its vast territories by means of Fulton's steamboats.

Launching the American System

Immediately following the news that Britain would sign the Treaty of Paris in 1783, Washington left his encampment at Newburgh, New York, and traveled up the Hudson to the Mohawk River, to survey a westward water-link to Lake

Erie—which later became the route of the Erie Canal. He envisioned a comprehensive transportation system of rivers and canals—from the Great Lakes to the Ohio River, and on through the Mississippi Basin—to link the original 13 states with those which would emerge from the Northwest Territory. Washington had already secured legislation in Virginia’s colonial assembly in 1772, authorizing a canal to connect the tidewater of the Potomac River with the Ohio River. The project had to be abandoned during the Revolution; but in 1785, the Potomac Company was officially organized, with Washington as its first president.

Washington had already encouraged James Rumsey, his chief engineer for the Potomac Canal project, to develop a steamboat, as the necessary technological breakthrough for turning the nation’s inland waterways into highways of commerce. Benjamin Franklin, on his return from France, presented a paper to the American Philosophical Society on Daniel Bernoulli’s work in France on water-jet propulsion, which Rumsey incorporated in designing his steamboat. In 1786, Franklin’s protégé Robert Fulton was dispatched from Philadelphia for a two-month visit to Berkeley Springs, Virginia, to observe Rumsey’s experiments and acquire the training to continue his work. After several successful steamboat trials in 1787, Washington and Franklin combined to set up the Rumseian Society, which raised the money to send Rumsey to Britain, seeking to obtain a Boulton and Watt steam engine for his boat. Because of the technological embargo Britain imposed on its former American colonies, no such engines could be exported to the United States; and America had not yet developed the machine-tool requirements to forge the type of boiler needed.

Not coincidentally, Fulton’s patrons in Philadelphia found the money in 1787 to send him to England, to study painting under another Franklin protégé, Benjamin West. West’s American students had long doubled as an American intelligence network, listening quietly while painting portraits of Britain’s lords and ladies. Rumsey and Fulton were in close contact in London; and when Rumsey died under very suspicious circumstances, just days before his first steamboat trial on the Thames River, Fulton stepped in and took over the project. In 1796, Fulton published his “Treatise on Canal Navigation,” which proposed a system of canals to link all American cities, using standardized boats and fees, under centralized management. The first copy was sent to George Washington. Fulton moved from Britain to France in 1797—the year that Washington’s beloved Lafayette was finally freed from his British-dictated imprisonment in a Hapsburg prison at Olmutz, Austria.

With the benefit of years of experiments in France, Fulton devised significant improvements in the steamboat. His subsequent demonstrations of the submarine and torpedo to the British, whose imperial power depended on wooden sailing ships, made them very nervous indeed. Fulton returned to America in 1806, just as the threat of renewed war with Britain

was emerging. In 1807, he launched the trial voyage of his *North River* steamboat—later known as the *Claremont*—up the Hudson River from New York to Albany. From that time forward, the steamboat conquered America’s waterways. When the British tried to reconquer the United States in the War of 1812, Fulton built a steam warship named the *Demologos* (the “reason of the people”), and armed it with Columbiad cannon, red-hot shot, and a huge steam-powered hose, to blast the crews off enemy decks and douse their guns, so that they could not fire. The British were so afraid of this ship, that they staged an unsuccessful commando raid on a house on Long Island, where Fulton was expected to spend the night. Unfortunately, Fulton died of pneumonia in 1815 before the ship was finished, and before he could design the steamboats to connect Russia’s cities.

But the wave of scientific progress rolled on. In 1805, long before Thomas Edison had even dreamed of his laboratory at Menlo Park, Oliver Evans set out to organize a private association called “The Experiment Company,” to perfect the steam wagon (automobiles and trucks) and foster new inventions of every sort. Evans also thought that the federal government should sponsor research and development. He published an educational guide for young steam engineers in 1805, which was also translated and published in Paris. It included the argument that “if government would, at the expense of the community, employ ingenious persons, in every art and science, to make with care every experiment that might possibly lead to the extension of our knowledge of principles, carefully recording the experiments and results so that they might be fully relied on, and leaving readers to draw their own inferences, the money would be well-expended; for it would tend greatly to aid the progress of improvement in the arts and sciences.” With George Washington’s sponsorship, Evans had also published *The Young Mill-Wright and Miller’s Guide* in 1785, which went through 15 editions by 1860—some of them published by Mathew Carey and Son of Philadelphia.

Evans himself contributed some 80 inventions to the young United States, the most important of which was his high-pressure “Columbian” steam engine of 1801. In addition to powering river and ocean steamboats, it also served for such industrial and agricultural applications as grinding grain, sawing lumber, drawing wire, rolling and slitting iron, grinding lead, spinning cotton, and manufacturing cloth. In 1804, Evans demonstrated the first American automobile (“Oruktor Amphibolos”) on the streets of Philadelphia, before driving it into the Schuylkill River, where it also functioned as a steam dredge. By 1806, Evans had opened the Mars Works in Philadelphia, which he developed into a machine-tool and industrial complex for manufacturing steam engines.

Perhaps the most significant contributor to George Washington’s military-driven agenda for development was John Stevens, whose scientific credentials included a Socratic ability to demolish the quackery of Descartes and Isaac Newton.

Following his service in the Continental Army, Stevens purchased an estate at Hoboken confiscated from a New Jersey Tory, and proceeded to sell off the lands to finance his scientific experiments. Working with friends in Congress, Stevens helped to frame the act establishing the first U.S. patent laws, passed in April 1790. With some assistance from Washington's protégés Rumsey and Evans, Stevens became well-trained in steam engineering. In 1804, he launched the *Little Juliana*, one of the first ships driven by twin screw propellers. Stevens also developed the *Phoenix*, a 100-foot steamboat, which became the first ocean-going steamship in the world.

With steamboat development well under way, Stevens turned his attention to railroads. In 1824, at the age of 76, Stevens demonstrated America's first steam railroad on a half-mile circular track in his backyard, and whisked his passengers around at six miles an hour. Stevens's proposals for a vehicular tunnel under the Hudson, and an elevated railroad system for New York City, had to wait until later generations could implement them.

Stevens trained his sons as inventors, and with them developed the shaped projectile for artillery, and preliminary

plans for an ironclad battleship. As early as 1815, Stevens proposed an armored U.S. Navy. With the support of West Point officers, the Stevens sons were finally awarded a government contract to build a demonstration ironclad; but British pressure on succeeding administrations eliminated all funding. Undaunted, the Stevens family continued to sell off their possessions, and poured hundreds of thousands of dollars into the ironclad steam battery they were building at their pier in Hoboken. Their efforts finally bore fruit in 1861, when the Navy realized what the unfinished ship could have done to defend Fort Sumter. Two of the Stevens family's supporters encouraged John Ericsson to build his famous *Monitor*.

The development role of the U.S. military

Within a few years of West Point's opening in 1802, Superintendent Jonathan Williams succeeded in establishing the U.S. Military Philosophical Society, for the purpose of advancing science and disseminating it throughout the nation. Williams had been in France during the Revolution, serving as American consul at Nantes, and working with Franklin's ally Caron de Beaumarchais, to funnel munitions and funds

John Stevens on the philosophical war

Late in life, the brilliant scientist and inventor John Stevens composed a treatise on metaphysics, distinguished for its Socratic method of demolishing the absurdities of British empiricism. The surviving manuscripts include these observations on Isaac Newton and René Descartes:

"To say that the primary parts of matter must consist of solid atoms, because we cannot conceive how properties can subsist without substance, is certainly taking great liberties with nature. The fact is, the hardness and what is vulgarly called the solidity of bodies in no instance depend upon atomic hardness and solidity; for in that case all bodies would of necessity be hard and solid.

"Of what are the substrata of the various powers and energies of nature we are totally ignorant, but that such powers and energies exist we plainly perceive by their operations. I further contend that if such a matter as Newton has described really did exist, it would be impossible for us to acquire any knowledge of it, from its very nature. It is now the universally received opinion that all our knowledge of things existing without us is derived from impressions made upon the senses. Now I would ask in what manner can the *internal* texture of an atom—which is hard, solid, and impenetrable—operate upon our sense.

It is manifest [that] its hardness, solidity, and impenetrability can never be open to us, as it would then be no longer hard, solid, and impenetrable. . . .

"The truth is, it is now clearly ascertained that hardness or softness, solidity or fluidity, depend altogether upon temperature; that, by an increase or diminution of heat, all bodies may be made to assume a solid, fluid, aeriform or gaseous form. Until, therefore, we have a better evidence of its existence than merely the resistance of what we vulgarly call hard bodies, we shall take the liberty of dismissing this solid, massy, impenetrable being as wholly unnecessary. Perpetually hanging as a dead weight upon us, it has so embarrassed philosophers that, in their speculations respecting Matter and Spirit, it has drawn them unavoidably into the greatest absurdities."

When he turned to a consideration of *space*, Stevens reminded his reader that "Des Cartes was so enamored of a *plenum* that he declared nature abhorred a vacuum," and yet Newton "was compelled to require empty space, void of any resisting medium, in order that heavenly bodies might not be impeded in their courses." Again, discussing "metaphysicians of the Cartesian School on their own ground," he said "they tell us matter is inert; incapable alike of motion, thought, or design. Now, we find in the works of nature the most incontestable evidences of motion, thought, and design. What then are we to infer? Evidently that the Power of the Great Architect pervades the whole system! This conclusion, however skeptics may cavil, will ever be held by sound minds as incontestable."

from the French government to the Continental Army. Williams had also worked with his great-uncle Franklin on experiments in “Thermometrical Navigation,” published as a paper by the American Philosophical Society, of which Williams was vice-president.

West Point’s officers and cadets were automatically members of the Military Philosophical Society, but civilians could also apply for election. The Society became the semi-official archives for the Corps of Engineers, and boasted a library containing the finest collection of technical works in the country. Within a few years, most of its members were civilians, including such leading scientific and political figures as John Quincy Adams, James Monroe, John Marshall, Robert Fulton, Eli Whitney, and Bushrod Washington—giving the Society an expanded influence for organizing projects to develop the nation’s economy. By 1807, it had become a center of scientific activity in America. With the Corps of Engineers scattered during the War of 1812, a skeleton meeting of the Society in New York in 1813 voted to disband. The only dissenting vote was cast by Sylvanus Thayer, who would soon turn West Point itself into a military agency for scientific progress.

Following the conclusion of the war with Britain in 1814, Superintendent Joseph Gardiner Swift dispatched Thayer to Paris in 1815, to gather all the knowledge he could from the Ecole Polytechnique, the most famous military-scientific academy in the world. Arriving after Napoleon’s defeat at Waterloo, Thayer found that the British had already ransacked the Ecole and shut it down; but he still managed to obtain some one thousand books, maps, and models for West Point. When he returned to America in May of 1816, Thayer was appointed superintendent of West Point, and proceeded to turn the Academy into a first-rate military and civil engineering school.

An important adjunct to West Point was established across the Hudson River in 1818. Joseph Swift resigned from the Army and joined Gouverneur Kemble in establishing the West Point Foundry at Cold Spring. Kemble’s home, overlooking the foundry, was frequented by Washington Irving and James K. Paulding (a future Secretary of the Navy), and became the headquarters for the informal continuation of the Military Philosophical Society. The foundry cast some of the most powerful cannons in the world, produced iron fittings for the locks on the Erie Canal, manufactured rails, and built America’s first locomotives.

The Erie Canal, connecting the Hudson River at Albany to Lake Erie at Buffalo, was America’s first Great Project, and one that astounded the world. Begun on Independence Day, July 4, 1817, the entire canal—363 miles long—was completed by October 1825. The waterway reduced average freight costs to *one-fortieth* of the prevailing overland rates. On July 4, 1826, Pennsylvania began the Delaware and Ohio Canal, a 395-mile-long system of canals and railroads completed in 1834. Steamboats revolutionized internal com-

merce; they dramatically reduced shipping times, and continued to do so as their designs improved. Before the introduction of steam-power, a trip up the Mississippi from New Orleans to St. Louis took 120 days. Steamboats made the trip in 25 days in 1815; by 1826, the time had been cut to nine-and-a-half days. Steamboats on the Hudson made the trip from New York to Albany in 27 hours in 1820; by 1825, that figure had been cut in half.

From 1821 to 1829, during the Presidencies of James Monroe and John Quincy Adams, the development strategy which Henry Clay described as the “American System” began rolling at full steam. Its momentum increased despite the continuing obstruction of Constitutional powers, by British agents and slaveholding interests in the U.S. Congress. Thayer’s West Point played a crucial role. With the passage of the Survey Act in 1824, the Corps’ trained engineers were able to be deployed to assist local governments and private companies, in building canals and railroads deemed important to the public interest. By 1837, of West Point’s total of 940 graduates, 231 had each worked on at least one project to develop the nation’s infrastructure. These included the Chesapeake & Ohio Canal (which originated as George Washington’s Potomac Canal) and the Baltimore & Ohio Railroad. The ground-breaking ceremonies for both projects were held on July 4, 1828.

The B&O laid 12 miles of track that year—a seemingly modest beginning. But the rate of U.S. railroad development was phenomenal. In November 1832, a railroad from Harrisburg to Pittsburgh, Pennsylvania, was completed—a distance of 250 miles. By 1840, nearly 2,400 miles of track had been laid, mostly in the Northeastern and Mid-Atlantic states. During the 1840s, the transportation revolution swept through the Midwest, with more than 1,000 miles laid during that decade, and 9,000 more during the following ten years. Between 1850 and 1857, Ohio alone increased its railroad-building *tenfold*, to 3,000 miles of operating lines.

The military and *philosophical* mobilization directed by Washington and Franklin produced an engine of development which powered the nation for generations to come. John Quincy Adams, personally tutored in his adolescent years by Benjamin Franklin in France, attained the Presidency in 1825 by reawakening America’s sense of purpose, with the vital assistance of a year-long tour throughout the country by General Lafayette. In his inaugural address, Adams firmly declared that, if the constitutional powers of the Federal government to promote the welfare of the nation “may be effectually brought into action by laws promoting the improvement of agriculture, commerce, and manufactures, the cultivation and encouragement of the mechanic and elegant arts, the advancement of literature, and progress of the sciences . . . , [then] to refrain from exercising them for the benefit of the people themselves, would be to hide in the earth the talent committed to our charge—would be *treachery to the most sacred of our trusts.*”