Introduction

The railroad was the premier technology of nineteenth-century America, and the U.S. Army played a key role in its development. Army officers surveyed the first American rail lines, Civil War generals relied on railroads to transport and supply their troops, and heads of the frontier army allied with railroad companies to impose their vision of civilization across the plains. Yet the army's attitude toward railroads was not simply one of blind enthusiasm. Members of the Corps of Engineers resisted efforts to promote railroads as substitutes for fortifications, the Quartermaster's Department bickered with Southern railroads for nearly two decades after the Civil War, and army leaders rejected the creation of an organization to plan and coordinate the military use of railroads. The complex and changing relationship between the U.S. Army and American railroads thus provides a valuable prism through which to study the response of a military establishment to technological change, the development of American military thought, the origins of military-industrial cooperation, and the political evolution of the United States.

Several decades of army involvement in and influence on internal improvements preceded the establishment of the first railroads in the United States. Transportation had long been a problem for the U.S. Army. The lack of adequate roads produced hardships during the American Revolution, the campaigns against Native Americans in the 1790s, and the War of 1812. In response to these problems, the army surveyed and constructed numerous internal improvements and transformed the United States Military Academy from a moribund school for training military engineers and artillerists into a vital institution for educating civil engineers.

Early railroad advocates capitalized on the precedent and institutional support for military assistance to internal improvements to obtain aid for their projects. They claimed that railroads' rapid all-weather transport ca-

pabilities enabled them to repel foreign invasions, quell Native Americans, suppress slave rebellions, lower the cost of transporting men and supplies, and maintain internal trade during a conflict. Although the army paid more attention to a railroad's political backing than its military utility, it nevertheless assigned engineers to survey routes and prepare construction specifications for more than twenty railroads between 1827 and 1838.

Support for direct military technical assistance to railroads was weak, however, and the army's aid program ended in the late 1830s. Railroad promoters and army surveyors focused more on their projects' local commercial benefits than their national military advantages. Many officers left the service for higher-paying positions in more attractive locations working for railroad companies. Politicians adopted the rhetoric of railroads to disparage the standing army, the most prominent symbol of centralized power, and to attack the national government. Citizens protested the provision of government aid to improvements that did not operate as public highways. In the army, fortification engineers voiced growing opposition to railroads, while the atmosphere and curriculum at West Point increasingly concentrated on producing skilled military professionals rather than talented civil engineers.

As the acquisition of territory after the Mexican-American War and the completion of the outlines of the eastern rail network shifted the geographic focus of railroad development westward, the government and the army entered a period of indirect subsidy for railroads. The federal government provided land grants, and army topographical engineers surveyed routes for a Pacific railroad. To avoid charges of infringing on states' rights or aiding monopolies, the government awarded the land grants to states, who then transferred the land to railroad companies that agreed to transport troops and military stores free of charge or at reduced rates. For similar reasons, the army topographers surveyed several different routes in advance of the formation of any railroad company.

Indirect subsidy proved inadequate to the demands of internal conflict, and the government and the army adopted new approaches to railroad policy during the Civil War. The government threatened Northern railroads with seizure to induce agreement on favorable rates. Meanwhile, the Union military leaders who emerged during the war relied on civilian railroad experts to reconstruct and operate captured Southern railroads.

Based on these past experiences, the army synthesized a novel approach to railroad development after the Civil War. The army provided protection, supplies, and police services to the railroads in the West. In exchange, the railroads concentrated the army's forces, lowered its transportation

costs, and helped it pacify the Native Americans. Despite this new relationship, the army and the railroads were unprepared for the mobilization of the Spanish-American War.

Prominent railroad historian Maury Klein has noted that the books written on American railroads could fill entire warehouses. The volume of material on American military history is perhaps even greater. Historians have described the rhetoric of railroad promoters concerning the military value of railroads and the railroad surveys of army engineers during the antebellum era, the critical role of railroads during the Civil War, and the cooperation between the army and the railroads in the West after the war. Yet no previous study has provided a critical examination of the interaction between the army and the railroads in the United States throughout the nineteenth century. Works on the relationship between armies and railroads either limit themselves to the European experience or begin their discussion of the United States with the Civil War. Moreover, the existing literature conveys the general impression that the military value of railroads was widely accepted and that the army pursued an organized and effective program to assist railroads.[1]

This book offers a more complete and more critical history of the relationship between the U.S. Army and the railroads throughout the nineteenth century. It suggests that, in the years preceding the Civil War, political and commercial considerations rather than military ones guided the army's aid to railroads, important factions within the army resisted a closer relationship to railroads, and the army's assistance efforts did not increase its appreciation of railroads' military value or its ability to incorporate them into practice. Not until the Civil War expanded the government's role in the economy and changed the military's leadership, ethos, and organizational structure did the army recognize railroads' military utility and employ them effectively. The symbiotic exchange of cheap transportation for military protection after the war enabled the railroads to build their lines across the continent and the army to police the Plains, but left the army critically dependent on private enterprise and unprepared to use railroads to move troops and supplies for a foreign war at century's end.

By examining the development of the army's relationship with railroads, this study also highlights the forces that determine a military establishment's attitude toward technological change. The most important of these factors are the political context in which the military organization functions, the culture and structure of the institution, and the characteristics of the technology in question. The politics of nineteenth-century America shaped

the army's relationship with railroads. During much of the antebellum era, citizens viewed national governmental institutions as instruments to serve local political and commercial interests yet they distrusted centralized power. They pleaded for federal aid but opposed the imposition of uniform standards or the creation of a national network. As Jacksonians opposed to privilege attacked standing armies, the military academy, and government assistance to internal improvements, the army's aid to railroads declined. The demands for greater federal control of railroads resulting from the railroad expansion of the 1850s and the Civil War paved the way for the close cooperation between the army and the railroads on the frontier.

The army's institutional culture and structure also influenced its connection to railroads. The leadership of well-known figures such as Ulysses Grant, William Sherman, and Philip Sheridan, and of lesser-known figures such as Montgomery Meigs and Joseph Totten, the training they received at West Point, and their openness to the civilian world decided how closely the army worked with railroads. The existence of organizations to conduct surveys, plan the use of railroads, construct and repair rail lines, and transact business with railroad companies, as well as the pay and status of officers working in those organizations, also affected the army's interaction with railroads.

Additionally, the development of railroad technology guided the army's association with railroads. When railroads were in their infancy and engineers debated all aspects of their design, army surveyors proposed a variety of technological styles drawn from diverse sources. As railroads matured, many of those surveyors left the army to devote all of their energies to railroading. The army therefore relied increasingly on civilian experts, many with military backgrounds, to build and operate railroads.

This book also sheds light on the history of American military organization and strategy. It examines the debates concerning the military organization best adapted to a republican form of government, the missions such an organization should perform, and the professionalism of the organization's members. All three issues shaped the army's relationship with railroads. The conflict between militia advocates and regular army supporters influenced the army's interaction with railroads before the Civil War, while the tension between the line and the staff of the regular army affected it after the war. The army's changing missions, from repelling invasions, suppressing slave insurrections, and pacifying Native Americans during the antebellum period, to fighting an internal conflict over a vast area during the Civil War, to protecting settlers, "civilizing" the frontier,

and preparing for foreign wars after the Civil War, also changed its thinking regarding railroads. Lastly, the transformation of army officers from civil engineers to military professionals altered the army's involvement in railroad development.[2]

Closely related to the development of American military thought is the origin of military-industrial cooperation in the United States. Although the term "military-industrial complex" dates only to Dwight D. Eisenhower's farewell address in 1961, historians have looked increasingly far back in history for the beginnings of such collaboration. They have portrayed the antebellum military as an important agent for federal government intervention in the economy that, like the French military engineers of the Enlightenment, introduced science, precision, and planning to private industry in the service of the rational, centralized state. The army's experience with railroads confirms the nineteenth-century roots of military-industrial collaboration but suggests that military bureaucracies are complex institutions that do not always impose system and uniformity on technological problems.[3]

Finally, the history of the army's participation in railroad development parallels the political evolution of the United States during the nineteenth century. The central question in American politics from the drafting of the Constitution in 1779 until the beginning of the Civil War in 1861 was what kind of nation the United States would be. At the extremes, the choice was between a group of loosely allied states and a single unified nation. Caught up in this larger debate were the issues of national defense, internal improvements, and private enterprise. For national defense, the choice was between reliance on state militias or on a standing army composed of a well-trained professional military class. For internal improvements, the alternatives were a scattered collection of small projects responsive to local needs or a centrally planned and integrated system of national public works. For private enterprise, the options were the free market or government subsidy. The inability to settle these issues as they affected the army and the railroads was indicative of the larger failure to resolve the differences at the national level. In the end, deciding the question required four bloody years of war. The army's relationship to railroads after the war, in which a small professional army cooperated with private companies to improve transportation in the West and "civilize" Native Americans but left itself dependent on private industry, reflects the benefits and the costs of the answer.[4]