

# Transcontinental Railroads: Compressing Time and Space

By Richard White

*This essay is provided courtesy of the Gilder Lehrman Institute of American History.*

*This text has been adapted for use by ReadWorks.*

Many of our modern clichés about the impact of technology, particularly about the consequences of the Internet and telecommunications, first appeared as clichés about nineteenth-century railroads, particularly the transcontinental railroads in North America. People remarked on the annihilation of time and space with an enduring sense of wonder whenever a railroad penetrated a new region. When passengers found that they could get to

distant places more quickly, they translated reduced time into contracting space and spoke as if distant places had grown closer. The human experience of space depended on the speed of conveyance. With the Atlantic cable and the transcontinentals, Margaret Irvein Carrington wrote in 1869 [that] “with only a single wire to underlie the Pacific, the whole earth will become as a whispering gallery, wherein all nations, by one electric pulsation, may throb in unison, and the continent shall tremble with the rumbling of wheels that swiftly and without interruption or delay transport its gospel and commerce.” By 1869, the Pacific Coast was only four days from Omaha, and Carrington reported that “an officer of the army recently returned in forty hours over a distance which required a march of sixty-four days in 1866.”

It was only after the Civil War that the railroads really began to create technologically coherent systems. In 1860 there were 31,286 miles of American railroads, but they could hardly be thought of as a system or even a collection of systems. The main reason was that



Railroad officials witness the completion of the transcontinental railroad, May 10, 1869, photographed by Andrew Russell.

there was no single standard gauge—the distance between the rails—for tracks. The standard gauge in North America today is 4 feet 8½ inches, and by 1860 that was the dominant gauge in much of the eastern United States. It was used in roughly one-half of the total mileage, but it was only one of the more than twenty gauges in use. Five feet was the standard gauge in the South. It was as if hobbyists were trying to connect Lionel tracks with HO tracks, and to make matters worse, lines coming into a city often did not connect. Workers would have to load goods on wagons and transport them across town to another railroad. Trains stopped at rivers where passengers and goods had to be ferried across.

The Civil War was not the primary impetus for standardizing gauges, but it quickened the pace of change. The need to transport men and supplies rapidly without unnecessary breaks gave urgency to the complaints of merchants, who had long resented the increased costs of transshipments. Abraham Lincoln’s decision to make the Pacific Railway, the first transcontinental, using a standard gauge (4 feet, 8½ inches) ratified a consensus that had already emerged, but the ratification was nonetheless important. It compelled Pacific Coast railways, where the early gauge was 5 feet, to change, and provided an incentive to all lines connecting with the Pacific Railway to adopt the standard gauge. It was a major step toward continental uniformity. Although the South would continue to fight the standard gauge even after the Civil War, it lost that fight as thoroughly as it lost the war.

In the years after the Civil War, railroad technology underwent, as Steven Usselman has put it, “virtually perpetual refinement.” Except for the gauge, virtually everything about railroad lines grew larger: the locomotives, the weight of the rails, the bridges, the cars. Iron rails gave way to steel rails that could carry heavier loads, and wooden bridges increasingly yielded to iron. Increases in size and weight brought changes to braking systems and suspension systems, and improvements in these allowed further increases in size of the machinery.

This “bulking up” was not so much a necessity for the movement of people as for the movement of things. The ability to move heavy things long distances at relatively cheap rates was the real economic significance of the railroads. In 1869, the year that the first transcontinental railroad was completed, Dan Castello’s Circus and Menagerie stopped in

Cheyenne, Wyoming, then a raw railroad town on the Union Pacific. The elephants that disembarked were unlikely beasts in an unlikely place, but elephants in Cheyenne were as apt a symbol as any of the reorganization of the world through steam technology. If a railroad could cross hundreds of miles to deliver elephants and Moroccan acrobats into frontier towns, what couldn't they deliver across vast and forbidding distances? The presence of elephants signaled the vast reach of American popular culture and the way the railroads could pull once isolated regions into new orbits. The arrival of railroads signaled the creation of a new set of spatial relations and a new set of material connections.

Elephants disembarking from a railroad train also symbolized the increased speed with which the flora and fauna of continents could mix and mingle. Railroad technology influenced Americans' ideas of nature and shaped the ways Americans changed the natural world. We tend to think of technology as antithetical to nature, but this was not a nineteenth-century attitude. The locomotive was, after all, the iron horse. Western railroads were the most modern of industrial products set in midst of what North Americans regarded as primeval nature. This is one reason that they so fascinated Americans. In the United States intellectuals and popular writers had already accepted "the machine in the garden" as a defining symbol of the republic, marking Americans as both a people of progress and a people of nature. Western railroads promoted travel on their western lines as a journey into nature. The 1879 edition of *The Pacific Tourist* made the transcontinental trip seem both an inspirational immersion in nature and a journey utterly devoid of physical effort or discomfort. Upon seeing the mountains, "[w]ithout scarcely asking the cause the tourist is full of glow and enthusiasm."

To bring passengers into nature, the railroads consumed the raw stuff of nature. Railroads were by the late nineteenth century the largest consumers of wood and coal in the United States. To make the iron and steel that went into the trains, men mined iron ore and coal. Once in operation, these trains caused forests to fall and the earth to be ripped open. In the West, buffalo yielded to cattle, and cattle overgrazed the ranges which allowed invading plants to follow in their footsteps. Farmers transformed vast grasslands into corn and wheat. Industrial towns grew up around mines and consumed vast swaths of timber. None of this

could have happened in the way it did or with the speed it did without the railroads carrying buffalo hides, cattle, corn, and wheat to market.

Although railroads improved the lives of many Americans, they took a toll on those who operated them. Even though railroad companies moved reasonably quickly to improve safety for passengers with the Westinghouse automatic brake, platforms between cars, and other improvements, they moved much more slowly to protect their workers. Commentators often compared working on the railroads to wars, and the number of deaths and injuries was astonishing. In 1889, 2,000 men were killed working on the railroads, and 20,000 were injured. The vast majority did not die in spectacular accidents but rather in the everyday work of coupling cars, laboring in crowded yards full of moving machinery, and balancing on the top of moving railroad cars to tighten hand brakes. Most railroad companies did not put automatic brakes on freights until the early twentieth century. In a very real sense in the late nineteenth century, railroad companies found it cheaper to kill and maim workers than to install available, safer technologies. President Benjamin Harrison called these deaths and injuries “a reproach to our civilization.” Dead bodies, severed hands and fingers, and legs lost as trains ran over them formed the final grim connection between technology and nature.

Such preventable deaths were another reason Americans loved this new technology but did not love the men who owned the railroads. Anthony Trollope declared that among Americans “the railway is everything. It is the first necessity of life, and gives the only hope of wealth.” The locomotive had “been taken to the bosoms of them all as a domestic animal.” But railroad corporations in the late nineteenth century were reviled as monopolies whose control over movement and thus over space were undemocratic and unsuited to the lives of free people. Nineteenth-century Americans made a distinction somewhat akin to our distinction between hardware and software. The tracks, locomotives, cars, and bridges were the hardware, and the rate tables and schedules were the software. How the trains and the technology affected people’s lives depended on the rates and schedules. Critics of the railroads maintained that the railroads routinely discriminated against some people, places, and things in favor of others.

Charges of discrimination had resonance because they touched both the material interests of millions and basic notions of republican equity. Because railroads were chartered by the state, because the government used its powers of eminent domain to aid the railroads, because governments granted land to railroads and loaned some railroads credit, and because the railroads were public highways under common law, they had greater obligations to the public than normal businesses. It was unjust, critics argued, for railroad corporations to set rates that discriminated against the citizens of the government which gave them life. The railroads should not be allowed to use their control over technology to choose winners and losers by controlling rates. In fact, the railroads often did choose winners and losers. In the western United States, it was as if all towns were on wheels. When rates changed, space changed. When railroad rates made it more expensive to ship goods from Chicago to Spokane than from Chicago to Seattle, which was farther away, it was as if all the merchants in Seattle moved closer to Chicago and all the merchants in Spokane moved farther away.

In the nineteenth century, like today, new technologies changed the way that Americans lived. Then, as now, some people had far more control over technological changes than others. Railroads spurred a long contest over technology—its public purposes and consequences and its private ownership—that is with us still.

---

Richard White is the Margaret Byrne Professor of American History at Stanford University and a past president of the Organization of American Historians. His books include *It's Your Misfortune and None of My Own: A New History of the American West* (1991), *The Middle Ground: Indians, Empires, and Republics in the Great Lakes Region 1650–1815* (1991), which won the Parkman Prize, and most recently *Railroaded: The Transcontinentals and the Making of Modern America* (2011).