THE RAILWAY: The Industrialization of Time and Space in the 19th Century

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The railroad brought modern technology into everyday life in a radically new way and gave birth to new perceptions, new hopes, and new fears. It created, in the words of Wolfgang Schivelbusch, “a revolutionary rupture with [all] past forms of experience.” Nothing in the nineteenth century provided such a dramatic confirmation of change and technical progress as the coming of the railway. The railway with its powerful steam locomotives fascinated and impressed our ancestors in much the same way that a Space Shuttle flight impresses us today. For the first time in human history, the railway freed travel from the constraints of human and animal muscle power and even the constraints of geography. In economic terms, the railway was the great product of the first phase of the industrial revolution. Railway construction was an enormous economic incentive for the iron industry. In other words, an army of coal miners and another army of ironworkers (not to mention the masses of men swinging sledge-hammers laying the rails) was necessary to produce the raw material of the world's rail system.

The railway was a concrete symbol of the unlimited potential of science to improve everyone’s lives. Beyond that, the construction of the European railway system, largely complete in Great Britain by 1850, seemed to demonstrate that human labor could reshape the earth to fit human necessity. The net of railroad tracks did not follow the contours of nature the way that roads did. The railway went through nature in a straight, level line. Because the locomotive’s iron wheels placed limitations on traction—or so many engineers believed—the rail system had to eliminate steep grades as much as possible. Therefore the railway encouraged level roadbeds as well as straight rights of way. The railway required an enormous expenditure of labor to blast, dig, and tunnel its way through the physical landscape.

This was necessary in Europe because land was scarce while labor was plentiful. Cuttings, embankments, and bridges were necessary to allow the railway to move through the landscape in its straight and level course. The old natural irregularities that road builders had respected for millennia now disappeared; replaced by the sharp linearity of the railroad. As one traveler described a journey from London to Birmingham in 1839: “As far as the eye can range, one immense chasm through the earth appears before the observer, and at intervals are bridges carrying roads across the railway at a frightful height. The echoes in this place are very distinct, and while traversing its extent you seem shut out from all communication with the world.” (Schivelbusch, p. 24)

Psychological Perspectives

Like the factory system itself—the other great symbol of industrial society—rail travel introduced a number of new sensory and psychological experiences unique in human history. A railway journey differed from a stagecoach journey in many significant ways. Throughout history, people perceived spatial relationships in terms of animal exhaustion. A horse or a man can only walk or run so far in a given period of time. For stagecoach
passengers, going a certain distance meant stopping to rest or change the horses that drew the coach. As the British essayist Thomas de Quincey put it in 1839:

When we are traveling by stagecoach at the rate of eight or ten miles an hour, we can understand the nature of the force, which sets the vehicle in motion: we understand the nature of animal power: we see how soon it is exhausted; every successive hour do we watch the panting and reeking animals. In the course of a day's journey, we can appreciate the enormous succession of efforts required to transport a loaded vehicle from London to a distant town. *(Schivelbusch, p. 12)*

It was not so with the railroad. The average speed of the early railways in England was twenty to thirty miles per hour or roughly three times the speed of the stagecoach. In other words, even at a very early period of rail development, any given distance could be covered in one-third the time.

Many people experienced feelings of anxiety when they contemplated the implications of railway speed. Thomas Creevy, a liberal politician, rode along behind Stephenson's locomotive on its first trip in 1829 and commented that: “It is really flying, and it is impossible to divest yourself of the notion of instant death to all upon the least accident happening.” *(Schivelbusch, p. 15)* Some rail passengers, like modern people who fear air travel, dislike the feeling of helplessness, the knowledge that one has no power to control the powerful machine that encompasses everyone. Charles Dickens, for example, experienced acute anxiety for decades after surviving a deadly train crash in 1865. Slow trains bored him and fast trains frightened so much that he could not stand a rail journey without a bottle of brandy for his nerves. His son recalled, “I have seen him sometimes in a railway carriage when there was a slight jolt. When this happened he was almost in a state of panic and gripped the seat with both hands.” *(Hibbert, p. 267)*

Many passengers commented that they felt as if the train were a projectile. Thus all those rail cuttings, bridges and tunnels appeared like the barrel of a cannon through which the projectile of the train passed.

Other travelers were more impressed by the disorientation of the traditional time-space consciousness experienced by the railway traveler. Other travelers, like the German-Jewish poet Heinrich Heine were more impressed by the way in which the railway seemed to shrink space:

What changes must now occur, in our way of looking at things. Even the elementary concepts of space and time have begun to vacillate. *Space is killed by the railways,* and we are left with time alone. Now you can travel to Orleans in four and a half hours, and it takes no longer to get to Rouen. Just imagine what will happen when the lines to Belgium and Germany are completed! I feel as if the mountains and forests of all countries were advancing on Paris. Even now, I can smell the German linden trees; the North Sea’s breakers are rolling against my door. *(Schivelbusch, p. 37)*
“A Useless Spectacle”

Nineteenth century travelers were also struck by something we experience quite often today. If we fly to Las Vegas, we experience the desert only as a blur through the aircraft's windows. Even if we drive along I-15, the desert is merely a vista we experience outside the air-conditioned interior of our vehicle. Rail travel turned the landscape into a mere panorama. Some travelers regarded the experience as unpleasant. The Victorian essayist John Ruskin commented, “to any person who has all his senses about him, a quiet walk along a road is the most amusing of all traveling; and all traveling becomes dull in exact proportion to its rapidity.” The novelist Gustave Flaubert stayed up all night before rail trips because, as he put it to a friend in 1864, “I get so bored on the train that I am about to howl with tedium after five minutes of it.” (Schivelbusch, p. 58) Others enjoyed the experience. An American visitor to Great Britain wrote home: “The beauties of England, being those of a dream, should be as fleeting. They never appear so charming as when dashing on after a locomotive at forty miles an hours. Everything is so quiet, so fresh, so full of home, and destitute of prominent objects to detain the eye, or distract the attention from the charming whole, that I love to dream through these placid beauties whilst sailing in the air, quick, as if astride a tornado.” (Schivelbusch, p. 60)

Victor Hugo described the view from a train window in 1837: “The flowers by the side of the road are no longer flowers but flecks, or rather streaks, of red or white; there are no longer any points, everything becomes a streak; the grain fields are great shocks of yellow hair; fields of alfalfa, long green tresses; the towns, the steeples, and the trees perform a crazy, mingling dance.” (Schivelbusch, pp. 55-56) The result of this according to the British medical journal, Lancet, is nervous fatigue. According to the sociologist Georg Simmel, this multiplication of visual impressions—today we call it sensory overload—is a defining characteristic of modern times. Simmel called this process the development of urban perception. He characterized it as an “intensification of nervous stimulation which results from the swift and uninterrupted change of outer and inner stimuli.” (Schivelbusch, p. 57)

Industrial Time

If the railways "annihilated" space they sanctified time in a new way. The French social scientist Michelle Foucault theorized that a process of social discipline was necessary to develop the social and economic structures of industrial society. A new appreciation of the importance of time was among the changes of human consciousness associated with this process and with the industrial revolution—time is Money, etc. In the 1840s, as the British rail net neared completion, the British Railroad Clearing House decided to impose a standard time upon the entire British Isles. In other words, the needs of the railway industry required a standard time for everyone in the Great Britain. Initially, Greenwich Time was introduced as the standard time. In 1880, Railroad time became standard time in England. Sherlock Holmes was never without his handy pocket universal British railway timetable, he esteemed it a necessity for any criminologist. Germany followed suit in 1893. In 1889, the United States was divided into four time zones, which
remain unchanged to this day. At first, these time zones were regarded only as a convenience for the use of the railways; in practice they became regional standard time zones. (Schivelbusch, p. 44)

The Compartment

A railway journey also served as an index to social divisions. Railway passenger cars in Europe still are divided into first and second-class. Unlike the more democratic American railcars, which were modeled upon the steamship, European rail coaches were similar to the old horse-drawn carriage. While Americans traveled in mixed social groups in their large passenger cars, no European would dream of traveling outside his or her social class. This hyper class-consciousness led to some unique problems. From an American perspective, the whole idea of private compartments reserved for First Class was more a reflection of European class snobbery than any natural approach to travel. European first class passengers on European trains encountered one another in the ambiguous, sometimes embarrassing, sometimes dangerous space of the compartment. In their earliest form, the European passenger coach had no corridor and no access to a common space. The passenger entered his or her carriage, often to be joined by strangers, and exited the compartment only upon arrival at the destination point. At best, rail travel for middle class travelers was an isolating experience; at worst, the traveler found himself placed in an unpleasant, or even dangerous social situation.

The seating in the first class railway compartment forced travelers into an uncomfortable encounter that could lead to embarrassment. As the sociologist Georg Simmel put it:

Generally speaking, what we see of a person is interpreted by what we hear of him. Therefore one who sees without hearing is far more confused, undecided, upset than one who hears without seeing. Before the development of buses, trains and streetcars in the nineteenth century, people were quite unable to look at each other for minutes or hours at a time, or to be forced to do so, without talking to each other. Modern traffic increasingly reduces the majority of sensory relations between human beings to mere sight and this must create entirely new premises for their general sociological feelings. (Schivelbusch, p. 75)

Often people simply responded to the boredom and social discomfort of sharing a confined space with strangers by concentrating on their newspaper or railway novel in an attempt to avoid the eyes of their fellow travelers. For the middle class, by 1850 reading while traveling became an established custom. The working class had neither the desire nor the money for such a luxury as a “Railway novel.” By the 1840s, bookseller's stalls began to appear in almost every rail station. As one advertisement put it:

The traveler finds himself condemned to idleness as soon as he enters the carriage. The monotony of the trip soon takes effect: boredom arrives, and what is worse, impatience engulfs the unfortunate traveler pulled along like a piece of baggage. L. Hachette and Company have come up with an idea for turning the enforced leisure and the boredom of a long trip to the enjoyment and instruction of all.
They [provide] a railway library that will provide interesting volumes in a handy format and at a moderate price.  (Schivelbusch, pp. 65-66)

In other words, the railway was directly responsible for one distinct feature of modern life: the cheap, mass-market paperback book.

**Crime**

The railroad disrupted the travelers' relationships to each other as it disrupted their relationship to the traversed landscape. Several spectacular crimes associated with railway travel, galvanized the popular imagination, transforming embarrassment into fear. In Great Britain in the mid-1850s, robbers managed to steal a shipment of gold from a sealed baggage car on a train moving at 55 mph—a feat that shocked and impressed everyone. (The Great Train Robbery) In December of 1860, a train arrived in Paris and the conductor discovered the dead body of Chief Justice Poinsot alone in his compartment. No passenger was booked with him and no one in the neighboring compartments heard anything suspicious. “The painful interest excited in Paris by the dreadful death of Monsieur Poinsot has been extraordinarily great,” reported one Parisian newspaper. (Schivelbusch, p. 80) A similar unsolved murder in Great Britain caused a Parliamentary commission to look into railway security and inspired hundreds of detective stories.

Sometimes the fear of social embarrassment shaded over into the fear of being victimized. One railway official reported to Parliament that:

> There has been, indeed, a panic amongst railway passengers. Ladies, unable, of course, to discriminate at the moment between those whom they should avoid and those who should be their protectors, shun all alike; and gentlemen passengers constantly refuse to travel singly with a stranger of the weaker sex, under the belief that it is only common prudence to avoid in this manner all risk of being accused, for purposes of extortion, of insult, or assault.  (Schivelbusch, p. 82)

**Working Class Travel**

Travel only became accessible to working class people with the advent of the railroad, and working class people tended to travel in much the same way they lived and worked—crowded together in third or fourth class carriages. Lower class carriages were more like boxcars with roofs and benches. Why after all, should commoners expect luxuries reserved for their social betters? They may have been Spartan, but they allowed for sociability and movement. The French novelist Alphonse Daudet recalled a train journey in third class:

> I'll never forget my trip to Paris in a third class carriage in the midst of drunken sailors singing, big, fat peasants sleeping with their mouths open like those of dead fish, little old ladies with their baskets, children, fleas, wet-nurses, the whole paraphernalia of the carriage of the poor with its odor of pipe smoke, brandy, garlic sausage and wet straw.  (Schivelbusch, p. 77)
In England, until the 1840s, lower class riders were not regarded as recipients of passenger service, but rather as freight goods. The Gladstone Act of 1844 required the third and fourth-class carriages to be covered so that passengers would not be showered with hot coals and soot from the locomotive.

**The Railway as Political Symbol**

Above all, the coming of the railway symbolized that progress—or at least, change—was on the march. Could the railway usher in a period of political and economic modernization in the more backward areas of Europe? In 1846, the Italian journalist and politician the Conte di Cavour predicted, “the locomotive is destined to diminish the humiliating inferiority to which many branches of the great Christian family are reduced.” Cavour went on to predict that railroads would bring Italians together and hasten national unification and a new progressive society. In Germany, another nation lagging behind Western Europe in political and economic terms, the liberal economist Friedrich List predicted that the locomotive would be the hearse of the aristocracy and the railway would hasten social and political liberalization.

This potential for change did not please everyone. Europe had no shortage of social conservatives who doubted the value of any sort of innovation at all—including railway travel. The seventy-six year old poet Goethe wrote:

> Wealth and speed are the things the world admires and for which all men strive. Railways, express mails, steamboats, and all possible means of communication are what the educated world seeks. This is the century of clever minds, of practical men who grasp things easily, who are endowed with a certain facility, and who feel their superiority to the multitude, but who lack a talent for the most exalted tasks.

Many aristocrats were offended at the very idea of democratic travel—it could easily lead to all sorts of other outrages. William III, King of Prussia, saw no point in arriving home in Berlin an hour or two earlier. The Grand Duke of Hanover was appalled by the idea that, “any cobbler or tailor could travel as fast as I.” In Russia, the Imperial Academy of Sciences was asked to produce a study on the question of whether or not the human body could endure speeds of 25 miles per hours.

**The Urban Landscape Transformed**

The railway changed the face of the urban landscape. Just as twentieth century cities are constructed to cater to the automobile, the nineteenth century city reflected the needs of the rail system. The railway transformed the medieval face of London and Paris and changed Berlin from a quiet garrison town to an industrial giant. In general, the railway was responsible for the creation of specialized districts (residential, business, and industrial). As we shall see, it revolutionized retail business by making large retail outlets feasible. In the words of the J.R. Kellett, “The plans of British towns, no matter how individual and diverse before 1830, are uniformly super-inscribed within a generation by the gigantic geometrical brush-strokes of the engineers’ curving approach lines and cut-
offs, and [decorated] with the same bulky and intrusive [Stations], sidings, and marshaling yards." (Schivelbusch, p. 179)

Beginning with Paris in the 1850s, almost all major European cities undertook great reconstruction projects to accommodate needs of the railways as well as the great growth in the urban population. In 1800 urban areas accounted for 40% of the population of Britain and 25% of the French and German population. By 1914, urban centers accounted for 80% of the population of Britain, 60% in Germany, and 45% in France. The railway played a vital role in this social migration from the countryside to the city. But the story is more complex than that. The reconstruction of Paris by Napoleon III was the most famous urban renewal project of the century and set the model for London, Berlin, and Vienna. Under the direction of Baron Haussmann, the old residential areas in the city center of Paris, many of them working class slums, were demolished and replaced with government office buildings, retail stores including new department stores, public plazas and broad boulevards. It has been common to attribute some of the French government’s fondness for broad Parisian boulevards to purely military logic to make it easier to suppress revolts. As Karl Marx put it, the new streets were beautifully accessible to light, air, and infantry.

But the new streets were also necessary simply to accommodate the masses of people deposited at the railway stations and to direct people to the city center for shopping and lodging. Most of the great European rail stations were built on the outskirts of the city center—not in the best parts of town. This had the effect of increasing the number of horse carriages and cabs to transfer the passengers to the city center where the best hotels were. In London the new railway lines were built exclusively through working class neighborhoods because property values were considerably lower there. Government and the railways evicted Almost 120,000 people from their homes to make way for the new construction. In 1855, the city of London estimated the daily carriage traffic on the main arteries leading to the city center to be 75,000 horse-drawn vehicles.

All other European cities told a similar tale. The railway deposited an endless stream of goods and people at the railway stations and to direct people to the city center for shopping and lodging. The most of the great European rail stations were built on the outskirts of the city center—not in the best parts of town. This had the effect of increasing the number of horse carriages and cabs to transfer the passengers to the city center where the best hotels were. In London the new railway lines were built exclusively through working class neighborhoods because property values were considerably lower there. Government and the railways evicted Almost 120,000 people from their homes to make way for the new construction. In 1855, the city of London estimated the daily carriage traffic on the main arteries leading to the city center to be 75,000 horse-drawn vehicles.

One obvious benefit of increased traffic was the growth of retail business. The first modern department store—the Bon Marché—opened its doors in Paris in 1852. Such large retail outlets were only possible in a railway age. The railway brought both the goods and the customers to the city; the horse-drawn cabs and buses deposited them both in the central shopping areas. In fact, the railway changed everything. In the new department stores, the customer shopped in a new way. Everything had a price and that price was not subject to negotiation. In the traditional retail shop, buyer and seller still confronted one another in person. The department store put an end to thousands of years of European haggling. "The department store put an end to this sales conversation, as travel by rail put an end to verbal exchanges among travelers. The latter were replaced by railway novels; the former, by a mute price tag." (Schivelbusch, p. 189)
Not every city-dweller welcomed these changes. One Berlin newspaper groused as early as 1838 upon the volume of traffic along the formerly quiet Leipzigerstrasse:

Walking along the Leipziger Strasse that leads to the railroad there is a constant stream, in both directions, of pedestrians, coaches, cabs, and other vehicles; the solid, massive buildings reverberate from the continuous shocks, and inhabitants who formerly thought to find here a quiet, beautiful street, with its advantages of proximity to the countryside, green trees and fields, are now moving back into the city to regain their lost serenity. In the future the great Leipziger Strasse will probably be a thoroughfare of factories. (Schivelbusch, p. 180)