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Railroad Space and Railroad Time

by Wolfgang Schivelbusch

Economiquement, les chemins de fer operent donc . . . comme un veritable rapprochement des distances . . . Lille se trouve tout a coup transporté a Louvres; Calais a Pontoise; le Havre a Poissy; rouen a Sevres ou a Asnleres; Reims a Pantin' Strasbourg a Meaux; Lyon entre Melun et Corbeil; Marseilles a Nemours; Perpignan a Pithiviers; Bordeaux a Chartres ou a Etampes; Nantes a Arpajon, etc.

(Economically, the railways' operation . . . causes distances to diminish . . . Lille suddenly finds itself next to Lourves; Calais to Pontoise; le Havre to Poissy; Rouen to Sevres or to Asnieres; Reims to Pantin; Strasbourg to Meaux; Lyon to a place halfway between Melun and Corbeil; Marseilles to Nemours; Perpignan to Pithiviers; Bordeaux to Chartres or to Etampes; Nantes to Arpajon, etc.)

—Constantin Pecqueur, 1839

“Annihilation of space and time”: this is how the early 19th century characterizes the effect of railroad travel. The concept is based on the speed that the new means of transport is able to achieve. A given spatial distance, to be covered, traditionally, in a fixed duration of travel or transport time, can suddenly be dealt with in a fraction of that time: to put it another way, the same duration now permits one to cover the old spatial distance many times over. In terms of transport economics, this means a shrinking of space: “Distances practically diminish in the exact ratio of the speed of personal locomotion,” Lardner says in his *Railway Economy*.¹

The average traveling speed of the early railways in England is 20 to 30 miles an hour, which is roughly three times the speed previously achieved by stagecoaches.² Thus, any given distance is covered in one-third of the customary time: *temporally* that distance shrinks to one-third of its former length. In early 19th century writings the temporal diminution is mostly

1. D. Lardner, *Railway Economy* (London 1850), p. 35.

2. According to H. G. Lewin, *The Railway Mania and its Aftermath 1845-52* (London, 1936), the average speed per hour was between 20 and 30 miles, up to the year 1845 (p. 95). The fastest English train, the Great Western Express, had a speed per hour of 46 miles. The average speed of stagecoaches, according to Lardner, was a little below eight miles (*Railway Economy*, p. 36); the fastest coaches made up to ten miles an hour, according to Lewin. The top speed that English trains achieved in the 1840s, according to Lardner, frequently was up to 60 or 70 miles (*Railway Economy*, p. 176).

expressed in terms of shrinking of space. An article published in the *Quarterly Review* in 1839 speaks of the “gradual annihilation, approaching almost to the final extinction, of that space and of those distances which have hitherto been supposed unalterably to separate the various nations of the globe,” and continues:

For instance, supposing that railroads, even at our present simmering rate of travelling, were to be suddenly established all over England, the whole population of the country would, speaking metaphorically, at once advance *en masse*, and place their chairs nearer to the fireside of their metropolis by two-thirds of the time which now separates them from it; they would also sit nearer to one another by two-thirds of the time which now respectively alienates them. If the rate were to be sufficiently accelerated, this process would be repeated; our harbours, our dock-yards, our towns, the whole of our rural population, would again not only draw nearer to each other by two-thirds, but all would proportionally approach the national hearth. As distances were thus annihilated, the surface of our country would, as it were, shrivel in size until it became not much bigger than one immense city.³

The temporal shrinkage seen as a spatial one appears in an even more extravagant guise in the work of Constantin Pecqueur, the economist and disciple of Saint-Simon, whose *Économie Sociale* received a prize from the Institut de France in 1838. Here, the temporally shrunk transport space appears as a new geography of France, a geography based on the new conditions of speed, a condensed geography, as it were. The cities of France approach each other while simultaneously advancing on Paris. These changes in location, enumerated in the epigraph to this chapter, Pecqueur summarizes by stating that it is now possible to see “the new France as fitting into the space of the *old* Ile-de-France, or its equivalent.”

The diminution of the transport distances seems to create a new, reduced, geography, yet it does not alter the size of the spaces connected by the new mode of transport. “Yet by a sort of miracle,” says the *Quarterly Review* author after describing the shrinking process, “every man’s field would be found not only *where* it was, but *as large* as ever it was!” Pecqueur expresses the same notion in literary hyperbole: the diminished transport geography of France contains the true geography of France, the one appearing within the other, in a condensed form: “Each bit of terrain, each field on this surface would still remain intact; so would every house in a village, the village itself, or the town; every territory with its village in the center would remain a province; on the map of the imagination, all of these would finally be reproduced and reduced down to the infinitely small! As for Louvres, or Pontoise, or Chartres, or Arpajon, etc., it is obvious that they will just get lost in some street of Paris or its suburbs.”⁴

The notion that a French provincial town will fit into a Paris street

3. *Quarterly Review*, 63 (1839), 22

4. Constantin Pecqueur, *Economie sociale* (Paris, 1839) 1 p. 26

demonstrates that the alteration of spatial relationships through the speed mustered by the railroad is not simply a process that diminishes space, but that it is a dual one: it both diminishes and expands space. The dialectic of this process states that the diminution, i.e. the temporal shrinking of transportation, causes the expansion of transport space. The nation's contraction into a metropolis, as described in the *Quarterly Review*, conversely appears as an expansion of the metropolis: by establishing transport lines to ever more outlying areas, it tends to incorporate the entire nation. The epoch of suburbs, of the amoebic proliferation of the formerly contained cites into the surrounding countryside, begins with the railroads. This is Lardner, 1851:

It is not now unusual for persons whose place of business is in the centre of the capital, to reside with their families at a distance of from fifteen to twenty miles from that centre. Nevertheless, they are able to arrive at their respective shops, counting-houses, or offices, at an early hour of the morning, and to return without inconvenience to their residence at the usual time in the evening. Hence in all directions round the metropolis in which railways are extended, habitations are multiplied, and a considerable part of the former population of London has been diffused in these quarters.⁵

The notion that the railroad annihilates space and time is not related to that expansion of space that results from the incorporation of ever new spaces into the transport network. What is experienced as annihilated is the traditional space-time continuum which was characterized by the old transport technology. Organically embedded in nature as it was, that technology, in its mimetic relationship with the space traversed, permitted the traveler to perceive that space as a living entity. Bergson speaks of the "durée," duration, of the road from one place to another: this is not an objective mathematical unit. It is dependent on transport technology, the way, according to Durkheim, a society's space-time perception are a function of its social rhythm and its territory.⁶ "What is decisive," says Edwin Strauss, discussing the psychology of distances, "is not the objectively measured distance, but the relation of such distance to potentiality."⁷ The transport technology is the material substratum of potentiality, i.e., it is in equal measure the material substratum of the traveler's space-time perception. If an essential element of a given socio-cultural space-time structure undergoes change, this will affect the entire structure. Our perception of space-time loses its accustomed orientation. Sorokin, following Durkheim's lead, distinguishes between socio-cultural and mathematical physical motions of space-time and describes the hypothetical effects of a sudden replacement of customary socio-cultural time measures with purely mathematical ones:

5. Lardner, p. 36.

6. E. Durkheim, *Les formes élémentaires de la vie religieuse* (Paris, 1912), pp. 14-15, 628-29.

7. Erwin Strauss, *Von Sinn der Sinne* (Berlin, 1956), p. 409.

If we try to replace socio-cultural time by a purely quantitative time, time becomes devitalized. *It loses its reality, and we find ourselves in an exceeding difficult position in our efforts to orient ourselves in the time process, to find out 'where we are' and where are the other social phenomena on 'the bridge of time'.* (Italics original.)⁸

Thus, the idea that the railroad annihilates space and time has to be seen as that kind of reaction of the perceptive powers, which, formed by a certain transport technology, suddenly find it replaced by an entirely new one. Compared to the eotechnical, the space-time relationship created by the railroad appears abstract and disorienting, because the railroad in realizing Newton's mechanics negates precisely all that characterized eotechnical traffic: it does not appear embedded in the space of the landscape the way coach and highway are; it seems to strike its way through it.

Heinrich Heine captures one such moment of the irritation experienced by the traditional space-time consciousness. *A propos* of the opening of railway lines from Paris to Rouen and to Orleans in 1843 he speaks of the "tremendous foreboding such as we always feel when there comes an enormous, an unheard-of event whose consequences are imponderable and incalculable," and calls the railroad a "providential event," comparable to the inventions of gunpowder and printing, "which swings mankind in a new direction, and changes the color and shape of life." Further:

What changes must now occur, in our way of looking at things, in our notions! Even the elementary concepts of time and space 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 and connected up with their railways! 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.⁹

We have clearly stated the two contradictory moments of the same motion: on the one hand, the railroad opens up new spaces that were not accessible before it; on the other, it does so by destroying space, viz., the space in-between. That in-between space, or travel space, which it was possible to 'savour' while using the slow and work-intensive eotechnical form of transport, disappears on the railroads. The railroad knows only

8. Pitirim A. Sorokin, *Sociocultural Casuality, Space, and Time* (Durham/N.C., 1943), p. 197.

9. "Welche Veränderungen müssen jetzt eintreten in unserer Anschauungsweise und in unseren Vorstellungen! Sogar die Elementar-begriffe von Zeit und Raum getötet, und es bleibt uns nur noch die Zeit übrig . . . In vierthalb Stunden reist man jetzt nach Orleans, in ebensoviel Stunden nach Rouen. Was wird das erst geben, wenn die Linien nach Belgien und Deutschland ausgeführt und mit den dortigen Bahnen verbunden sein werden! Mir ist, als kämen die Berge und Wälder aller Länder auf Paris angerückt. Ich rieche schon den Duft der deutschen Linden; vor meiner Tür brandet die Nordsee." Heinrich Heine, *Lutetia*, pt. 2, LVII (Ed. Elster, 6, p. 360)

points of departure and destination. “They (the railways — W.S.) only serve the points of departure, way stations, and terminal, which are mostly at great distances from each other,” says a French author in 1840; “they are of no use whatsoever to the intervening spaces, which they traverse with disdain, providing them only with a useless spectacle.”¹⁰

As the space between the points that are served, the traditional travelling space, is destroyed, those points move into each other’s immediate vicinity: one might say that they collide. They lose their old “here and now,” which used to be determined by the spaces between. The isolation that spatial distance created between localities was the very essence of their here-and-now, their self-assured and complacent individuality. Heine’s vision of the North Sea breaking on his doorstep in Paris is tinged with “tremendous foreboding” because both localities — Paris and the North Sea — are still presented in their mutually isolate, “worlds apart” here-and-now: thus their collision appears unfathomable. Thirty years later, as a fine-mesh network of railroad lines connects all the essential landscapes of France and the rest of Europe with each other, that kind of consciousness is no longer real. The landscapes appear, regardless of their geographical remoteness, as close and as easily accessible as the railroads have made them. One generation after Heine, the more privileged inhabitants of Paris have the option to let themselves be transported in a matter of hours to a region that is as distant from their city as Heine’s North Sea. The Mediterranean does not extend its shores right up to Parisian thresholds, but it can be reached so much more quickly than before, that the journey there is no longer experienced as such. The Parisians who migrate south in the winter see nothing but blue skies and sea. As Mallarmé writes in the journal he edits, *La dernière mode*, in the winter of 1874/5, they are “calm, self-absorbed people, paying no attention to the invisible landscapes of the journey. To leave Paris and to get to where the sky is clear, that is their desire.”¹¹ These are no longer travelers — rather, as Ruskin puts it, these are human parcels who dispatch themselves to their destination by means of the railroad, arriving as they left Paris, untouched by the space traversed.

Even though the railroad cannot bring the remote landscapes physically to Paris, the speedy and comfortable accessibility of those regions creates a consciousness of distance that approximates Heine’s vision of space. The landscape that can be reached by train from Paris, *realizes itself* for the Parisians by means of the train. It then appears as the product or appendage of the railroad, as in a phrase in Mallarmé’s journal: “Normandy, which,

10. “Ils ne servent qu’aux points de depart, de station et d’arrivee, ordinairement fort distants les uns des autres; ils sont perdus pour les espaces intermediaires, qu’ils traversent avec dedain, et a qui ils n’offrent qu’un vain spectacle.” Charles Dunoyer, *Esprit et methodes comparés de l’Angleterre et de la France dans les entreprises de travaux publics et en particulier des chemins de fer* (Paris, 1840), p. 104.

11. S. Mallarmé, *Oeuvres complètes* Ed. Pleiade (Paris, 1970), p. 843.

like Brittany, is part of the Western Railway.”¹²

But if Normandy and Brittany are part of the Western Railway, being its destinations, then the point of departure of that same railway, the station in Paris, becomes the entrance hall to those regions. This is a common enough notion in the 19th century: it can be found in every one of Baedeker's travel guides that recommends a certain railroad station for each journey. In his journal, Mallarmé emphasizes it by printing, under the heading “Gazette et programme de la quinzaine,” the following sub-headings representing equally important institutions for entertainment: *Les librairies*, *Les theatres*, *Les gares* (though there are several issues listing *Les voyages* instead of *Les gares*). Thus a trip to some region served by the railroad appears no more or less important than a visit to the theater or the library: the purchase of a train ticket is equivalent to that of one to the theater. The landscape thus purchased becomes imaginary, being to the railroad as the stage is to the theater. The distance from the entrance hall of a Paris train station to the target landscape becomes more or less commensurate with the distance from the theater lobby to the box seat.

A generation after Mallarmé, Marcel Proust's protagonist-narrator discusses the difference between a journey by train and one in a “motor-car”:

The journey was one that would now be made, probably, in a motor-car, which would be supposed to render it more interesting. We shall see too that, accomplished in such a way, it would even be in a sense more genuine, since one would be following more clearly, in a closer intimacy, the various contours by which the surface of the earth is wrinkled. But after all, the special attraction of the journey lies not in our being able to alight at places on the way and to stop altogether as soon as we grow tired, but in its making the difference between departure and arrival not as imperceptible but as intense as possible, so that we are conscious of it in its totality, intact, as it existed in our mind when imagination bore us from the place in which we were living right to the very heart of a place we longed to see, in a single sweep which seemed miraculous to us not so much because it covered a certain distance as because it united two distinct individualities of the world, took us from one name to another name; and this difference is accentuated (more than in a form of locomotion in which, since one can stop and alight where one chooses, there can scarcely be said to be any point of arrival) by the mysterious operation that is performed in those peculiar places, railway stations, which do not constitute, so to speak, a part of the surrounding town but contain the essence of its personality just as upon their sign-boards they bear its painted name.¹³

The fate wrought upon the landscapes by their conquest by the railroads affects *goods* even sooner: as long as production and consumption are

12. *Ibid.*, p. 774.

13. M. Proust, *Remembrance of Things Past*, 2, *Within a Budding Grove*, I, translated by C. K. Scott Moncrieff (New York, 1934), pp. 489-90.

strictly regional — which they were until the beginning of modern transportation —, the goods remain part of the local here-and-now of their place of production. Their route of circulation can be perceived at a glance. Only when modern transportation creates a definite spatial distance between place of production and place of consumption do the commodities become homeless. In the *Grundrisse* Marx makes an observation about the relation between spatial distance and the nature of commodities; it tells us a good deal about how modern transportation has affected our perception of the world of goods: “This locational movement — the bringing of the product to market, which is a necessary condition of its circulation, except when the point of production is itself a market — could more precisely be regarded as the transformation of the product *into a commodity*.”¹⁴ (Italics original.)

With the spatial distance that the product covers on its way from its place of production to the market it also loses its local identity, its here-and-now. Its concretely sensual properties which are experienced at the place of production as a result of the labor process (or, in the case of the fruits of the land, as a result of natural growth) appear quite different in the distant marketplace. There, the product, now commodity, realizes its economic value, and simultaneously gains new qualities as an object of consumption. No longer is it seen in the original context of the original here-and-now of its place of production but in the new here-and-now of the marketplace: cherries offered for sale in the Paris market seem to be products of that market, just as Normandy seems to be a product of the railroad that takes you there. Pecqueur touches on the notion of the unity of economic realization of value and the biological ripening process of fruit:

For instance, economically speaking, and for the sake of freshness and their price, the cherries of Montmorency really ripen on the uncultivated summits of the Quartier Lafayette; the roses of Fontenay burst into bloom and fragrance in the flowerbeds of the Jardin du Luxembourg; the peaches of Montreuil in the Parc de Monceaux, and the grapes of Fontainebleau, too, ripen in some place closer to Paris than the one where the Surènes is still greening.¹⁵

The landscapes, joined to each other and to the metropolis by the railways, and the goods that are torn out of their local relation by modern transportation, share the fate of losing their hereditary place, their traditional here-and-now, or, as Walter Benjamin sums it up in one word, their aura.

The detaching of the landscape from its original isolation, its opening-up by the railroad, can well be defined as a loss of its aura, considering how Benjamin characterizes the aura and its loss in his essay “The Work of Art in

14. Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy (Rough Draft)*, trans. Martin Nicololaus (London, 1973), p. 534.

15. Pecqueur, *Economie sociale*, pp. 34-35.

the Age of Mechanical Reproduction.” The notions of here-and-now and distance are integral parts of Benjamin’s concept of aura. He defines the “aura of natural objects” as the unique phenomenon of a distance, however close it may be.”¹⁶ The aura of a work of art is “its unique existence at the place where it happens to be.”¹⁷ This spatial-temporal singularity, its “happening-but-once-ness,” the *genuineness* of the object, according to Benjamin, is destroyed by reproduction. “The situations into which the product of mechanical reproduction can be brought may not touch the actual work of art, yet the quality of its presence is always depreciated.”¹⁸ It is tempting to apply this statement to the landscapes that have been made accessible by the railroad: while being opened up to tourism they remain, initially at least, untouched in their physicality — but their easy, comfortable, and inexpensive accessibility robs them of their previous value as remote and hard-to-get-to places. “The staple of the district is, in fact, its beauty and its character of seclusion and retirement,”¹⁹ Wordsworth writes in 1844, defending the Lake District against the intrusion of the railways. The *devaluation* of landscapes by their exploitation for mass tourism by means of the railroad in the 19th and air traffic in the 20th century is a familiar occurrence. As soon as the railroad reaches the seaside towns of southern England that had been strongholds of the aristocracy long into the 19th century, the middle classes take them over. Then the upper crust retires to remote localities such as Scotland, Ireland, and the Lake District.²⁰ Contemporary airplane charter tourism is continuously engaged in further devaluation of formerly exclusive, very remote tourist regions.

The de-auralization of means of reproduction of which Benjamin speaks is an expression of the same trend that brought the masses “closer to” the landscapes in the 19th century: “The desire of contemporary masses to bring things ‘closer’ spatially and humanly, which is just as ardent as their bent toward overcoming the uniqueness of every reality by accepting its reproduction.”²¹ The landscapes are made available to the masses by means of tourism: this is merely a prelude, a preparation for making *any* singular thing available by means of reproduction. When spatial distance is no longer experienced, the differences between original and reproduction diminish. In the filmic perception, i.e. the perception of *montage*, the juxtaposition of images of the most disparate nature into one unit, the new reality of annihilated spaces-between finds its clearest expression: the film brings things closer to the viewer as well as to each other.

16. Walter Benjamin, *Illuminations*, trans. Harry Zohn and ed. Hannah Arendt (New York, 1968), p. 224.

17. *Ibid.*, p. 222.

18. *Ibid.*, p. 223.

19. William Wordsworth, *The Prose Works*, ed. A. B. Grosart (London, 1876), Vol. 2, p. 326.

20. J. A. R. Pimlott, *The Englishman’s Holiday*. (London, 1947), p. 118.

21. Benjamin, p. 225.

The landscapes lose their Now in an entirely concrete sense: the railroads deprive them of their local time. As long as they remained isolated from each other, they had their individual times: London ran four minutes ahead of time in Reading, seven minutes and thirty seconds ahead of Cirencester time, fourteen minutes ahead of Bridgewater time.²² This patchwork of time zones was no problem as long as traffic between the places was so slow that the temporal differences really did not matter; but the temporal foreshortening of the distances, effected by the trains, now confronts not only the places but also their differing local times with each other. Under traditional circumstances, a supraregional schedule would be impossible: times of departure and arrival are valid only for the place whose local time is being used. For the next station, with its own time, that previous time is no longer valid. Regular traffic needs standardized time, and this is quite analogous to the way in which the technical collective of rail and carriage undermined individual traffic and brought about the transportation monopoly.

In the 1840's, the individual English railway companies proceed to standardize time, while not coordinating their efforts with each other. Each company institutes a new time on its own line. The process is so novel that it is repeated daily, in the most cumbersome manner, as Bagwell describes, a propos of the Grand Junction Company's procedure:

Each morning an Admiralty messenger carried a watch bearing the correct time to the guard on the down Irish Mail leaving Euston for Holyhead. On arrival at Holyhead the time was passed on to officials on the Kingston boat who carried it over to Dublin. On the return mail to Euston the watch was carried back to the Admiralty messenger at Euston once more.²³

When, after the establishment of the Railway Clearing House, the companies decide to cooperate and form a national railroad network, Greenwich Time is introduced as the standard time valid on all the lines.²⁴ Yet railroad time is not accepted as anything but schedule time until late in the century. As the rail network grows denser, incorporating even more regions into traffic, the retention of local times becomes untenable: in 1880, railroad time becomes general standard time in England. In Germany, official recognition comes in 1893; as early as 1884, an international conference on time standards, held in Washington, D.C., divided the world into time zones.

In the United States, the process is more complicated, as there is no cooperation whatsoever between the private railroad companies. Each

22. P. S. Bagwell, *The Transport Revolution from 1770* (London, 1974), p. 124.

23. *Ibid.*, p. 125.

24. "The precise standardization of time measurement dates from the founding of the Royal Observatory in Greenwich in 1675." See G. J. Whitow, *The Nature of Time* (London, 1972). As was the case with the later standard-time, the original Greenwich time emerged from the needs of an expanding traffic, the ship traffic of the seventeenth century.

company has its own time, in most cases, the local time of the company's headquarters. In stations used by several different lines there are clocks showing different times: three of these in Buffalo, six in Pittsburgh.²⁵ In 1889, the U.S. is divided into four time zones, essentially unchanged to this day, officially, at first, only in terms of railroad time; in practice, these become regional standard times, although they are given legal recognition only in 1918.

The notion that communication, exchange, motion bring humanity enlightenment and progress, and that isolation and disconnection are the obstacles to be overcome on this course, is as old as the bourgeois modern age. The bourgeois cultural development of the last three centuries can be seen as closely connected with the actual development of traffic. In retrospect, it is easy to see what significance the experience of space and time had in bourgeois education when one considers the Grand Tour — which was an essential part of that education, before the industrialization of travel. The world was experiencing in its original here and now. The traveling subject experienced localities in their spatial individuality. One's *education* consisted in the assimilation of this spatial individuality of the places visited by means of an effort that was both physical and intellectual. The 18th century's travel novel becomes the *Bildungsroman* (novel of education) of the early 19th. The motion of travel, that physical and intellectual effort in space and time, dominates both.

The railroad, that destroyer of experiential space and time, thus also destroys the Grand Tour's educational experience. Henceforth, the localities are no longer spatially individual or autonomous: they are moments in the traffic that makes them possible. As we have seen, that traffic is the physical manifestation of the circulation of goods. From now on, the places visited by the traveler become ever more similar to the commodities that are part of the same circulatory system. For twentieth century tourism, the world has become one big department store of landscapes and cities.

25. John Stover, *American Railroads*, (Chicago, 1961), p. 157.