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City of Bits

Space, Place, and the Infobahn

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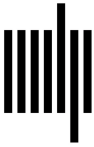

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The infobahn goes in: telephone workers install fiber-optic cabling.

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As the *fin-de-K* countdown cranked into the nineties, I became increasingly curious about the technicians I saw poking about in manholes. They were not sewer or gas workers; evidently they were up to something quite different. So I began to ask them what they were doing. "Pulling glass," was the usual reply.

They were stringing together some local, fiber-optic fragments of what was fast becoming a worldwide, broadband, digital telecommunications network.[1] Just as Baron Haussmann had imposed a bold spider's web of broad, straight boulevards on the ancient tangle of Paris, and as nineteenth-century railroad workers had laid sleepers and steel to shrink the windy distances of the North American

frontier, these post-whatever construction crews were putting in place an infobahn — and thus reconfiguring space and time relationships in ways that promised to change our lives forever.[2] Yet their revolutionary intervention was swift, silent, and (to most eyes) invisible.[3]

At about the same time, I discovered — as did many others — that I no longer had to go to work. Not that I suddenly became idle; it's just that the work now came to me. I did not have to set out every morning for the mine (as generations of my forebears had done), the fields, the factory, or the office; I simply carried a lightweight laptop computer that gave me access to the materials on which I was working, the tools that I required, and the necessary processing power. When I wanted to connect to the network, I

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could just plug it in to the nearest telephone socket or to the RJ-11 connections that were beginning to appear on airplane seats. Increasingly, I found that I did not even need to be near an outlet; my pocket-sized cellular telephone could do the job. Nor, in the age of the Walkman, did I have to go to the theater to be entertained. More and more of the instruments of human interaction, and of production and consumption, were being miniaturized, dematerialized, and cut loose from fixed locations.

How was the laptop on which I am writing these words (in an airport lounge) designed and built? Neither by an old-fashioned craftsman, lovingly contriving it like a Stradivarius violin, nor in some sprawling, smokestacked, Fordist factory. Its components and subassemblies were engineered and manufactured concurrently at locations scattered throughout the world — from Silicon Valley to Singapore. Computer-aided design (CAD) systems, computer-controlled processes, and industrial robots were used at every step. Component fabrication and product assembly operations were geographically separated, and component deliveries were carefully paced and orchestrated to avoid both shortages and unnecessary stockpiling. The various design, component manufacture, and product assembly tasks were performed not within a single industrial corporation, but by different members of an intricate international alliance. The finished product's software — which I chose and installed myself — is as crucial as the hardware. Now that this complex artifact is in my hands it is intensively used, but its useful life is short; soon it will be obsolete. When it can no longer connect me to the electronic information environment as effectively as some competing product (even though it still works perfectly well), I shall simply transfer my software and data and throw the superseded carcass away; the information ecosystem is a ferociously Darwinian place that produces endless mutations and quickly weeds out those no longer able to adapt and compete. Neither handicraft

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of the sort so passionately defended by Ruskin and Morris, nor durable, standardized, mass-produced, industrial object of the kind that fascinated the early modernists, my laptop is an emblematic product of the electronic information age.

The texts that follow reimagine architecture and urbanism in the new context suggested by these observations — that of the digital telecommunications revolution, the ongoing miniaturization of electronics, the commodification of bits, and the growing domination of software over materialized form. They adumbrate the emergent but still invisible cities of the twenty-first century. And they argue that the most crucial task before us is not one of putting in place the digital plumbing of broadband communications links and associated electronic appliances (which we will certainly get anyway), nor even of producing electronically deliverable "content," but rather one of imagining and creating digitally mediated environments for the kinds of lives that we will want to lead and the sorts of communities that we will want to have.

What does it matter? Why should we care about this new kind of architectural and urban design issue? It matters because the emerging civic structures and spatial arrangements of the digital era will profoundly affect our access to economic opportunities and public services, the character and content of public discourse, the forms of cultural activity, the enaction of power, and the experiences that give shape and texture to our daily routines. Massive and unstoppable changes are under way, but we are not passive subjects powerless to shape our fates. If we understand what is happening, and if we can conceive and explore alternative futures, we can find opportunities to intervene, sometimes to resist, to organize, to legislate, to plan, and to design.

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