

Reviews

Mapping cyberspace by M Dodge, R Kitchin; Routledge, London, 2001, 260 pages, £60.00 cloth, £19.99 paper (US \$100.00, \$32.99) ISBN 0 415 19883 6, 0 415 19884 4

In the system diagrams drawn by computer technologists, the Internet is often depicted as a cloud. The packets go in, the packets come out, but for many practical purposes it is not interesting or necessary to worry about what happens to them inside that amorphous fuzz. Indeed, it is one of the brilliantly successful features of the Internet that users, software designers, and even hardware engineers can mostly insulate themselves from the details of its internal logical, physical, and spatial structure.

But, if you care about the social, economic, and cultural implications of the Internet, the Web, and digital telecommunications networks in general, the internal structure of the cloud—the geography of cyberspace—*does* matter a great deal. Where does network service currently reach? What are the evolving patterns of deployment? What sorts of activities are supported, and where? Where are the hotspots of activity, and where are the backwaters? How do the spatial and temporal patterns of cyberspace intersect with other important spatial and temporal patterns? Dodge and Kitchin's *Mapping Cyberspace* is a pioneering attempt to open up and explore these sorts of questions.

At the most basic level, there is a geography of physical infrastructure—of the links and nodes of the network. This is remarkably heterogeneous. There is a very large-scale, terrestrial, wired network structure of telecom hotels, server farms, fiber-optic backbones, 'last-kilometer' linkages to dispersed user sites, and IP-addressable devices at the ends of the wires. There is a terrestrial wireless infrastructure of transmission and reception points, creating a cellular pattern in urbanized areas, along highways, and within buildings. There is infrastructure out there in space, consisting currently of high-altitude geosynchronous satellites that produce very specific service footprints, plus low-altitude satellite systems that provide blanket coverage across the globe. In the near future, it will extend to outer space, as spacecraft acquire IP capability.

All this adds up to a very large-scale civil engineering enterprise and a huge location-specific investment, but unlike many earlier enterprises of this sort (such as construction of railroad systems), it is not highly visible. Much of it is buried and disguised. The major nodes are not architecturally celebrated monuments, like the great railway stations of the 19th century, but are mostly anonymous boxes in obscure locations. And the network builders and operators mostly *want* it that way; for competitive and security reasons, they want to be as unobtrusive as possible.

It happens that the World Trade Center towers and the surrounding area of New York were a major concentration of digital telecommunications infrastructure. When the tragic events of 11 September 2001 unfolded, the effects on the street map, the skyline, and the transportation systems of New York were instantly obvious. But the effects on telecommunications infrastructure were far less clear. For a start, very few people knew what was actually there. (In fact there were major telecom hotels and telephone switching centers within the damage zone, a significant concentration of fiber-optic cabling and transport equipment, lots of cellular infrastructure, and a great many corporate Internet and Web facilities.) And in addition, capacity to switch to backup sites and to route around the damage made the effects ambiguous; partly they were distributed and thereby mitigated; partly they were propagated rapidly to other sites that faced sudden new demands.

These obscurities make it surprisingly difficult to collect accurate data on physical infrastructure and to map it in the most basic way. *Mapping Cyberspace* provides an excellent introduction to the methodological issues, plus a useful collection of some of the more interesting and useful available maps.

A second set of difficult issues arises if you try to map the patterns of social, economic, and cultural activity supported by the Internet and the Web. Where are all those servers

concentrated, and what sorts of services do they provide? And where are the users? How is Internet and Web usage related to other spatial variables? The available datasets, which might be used to construct maps, are frustratingly imperfect. Since Internet domain names are associated with street addresses, for example, you can map the spatial distribution of domain names. But there are many spurious effects. Because I happen to own the inactive domain name WayStupid.com, for example, I create a blip on the maps in the middle of a Cambridge, Massachusetts, residential area.

Then there is the issue of dynamics. Just as with freeway systems, it is important to know where and when the telecommunications traffic flows. Where are the concentrations? When are the peaks and lulls? What cycles can be identified? This is a fascinating issue, of great practical importance. And it is made even more complex by the emergence of services (like that provided by Akamai) that use sophisticated algorithms to analyze load conditions and dynamically choose servers and channels to provide optimum responses to current requests.

At these levels, too, *Mapping Cyberspace* provides an excellent introduction to the available data and the associated methodological issues. It provides some insight into the difficult graphic design issues that arise in translating the data into clear and compelling maps. And it reproduces some interesting map examples—many of which are difficult to locate and obtain from other sources.

Finally, there is a virtual geography of online environments. This manifests itself, for example, as the network established by the hyperlinks of the Web—a network that, though often very complex, can be diagrammed graphically. Indeed, graphically presented 'site maps' are becoming an increasingly crucial element of Web sites. It also manifests itself in the structure of online virtual communities and online, persistent, multiuser videogames such as Sony's Everquest. *Mapping Cyberspace* also introduces this topic, and documents some early examples, but this area is developing so fast that discussions in print are inevitably rather outdated by the time they reach the bookstores.

Today, there is an interesting and important convergence between these virtual geographies and the actual, spatial arrangements of cities. As portable, wireless, location-sensitive devices proliferate, navigating a city becomes more like navigating a videogame. And as videogames take advantage of these devices to ground themselves partially or wholly in physical space, they converge increasingly with established spatial practices such as exploration, pilgrimage, hide-and-seek, treasure hunts, *flânerie*, and Situationist 'drift'. *Mapping Cyberspace* does not get into this emerging topic, but it will be an increasingly crucial one for the future.

Overall, *Mapping Cyberspace* is an important pioneering work. It conveniently collects a great deal of useful material, and it provides sensible and frequently insightful introductions to the associated issues. It is not always as felicitously organized and written as one might wish, but these are venial flaws. The authors have performed a valuable scholarly service, and have produced an essential reference for anyone seriously interested in the spatial, social, economic, and cultural implications of telecommunications infrastructure and cyberspace.

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Americans and their weather by W B Meyer; Oxford University Press, New York, 2000, 278 pages, \$35.00 (£25.99) ISBN 0 19 513182 7

One picks up a book written by the George Perkins Marsh professor at Clark University with great anticipation. The historic resonance of the named chair and the location of the author create an atmosphere of hope. I am quite disappointed with the results, however, and have spent much of the last month in trying to determine what went wrong, with me or with Meyer.

A great many years ago I was taught that the difference between climate and weather was in the length of time involved. Meyer mixes these concepts and so the reader is constantly surprised by his judgments. Weather experts predict the immediate future or provide a guide for the next few days, based on what the maps show is coming, along with past performances