Urban Code

CODE OF THE CITY

Fueled by the collision of military-industrial methods of enumerating and coordinating actions and space, and the expansion of internet-born standards of surveillance and counting into our physical lives, our built environment is defined, as never before, by data. From Google goggles to enterprise GIS, the phantom datascapes that defined our first encounters with the digital realm have given way to new media of spatial information; like the glass that shaped a 20th-century avant-garde, the medium has become ubiquitous, yet remains—apparently—transparent.

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One relevant truism of historic computation borne by much of this contemporary practice goes back to the very first days of programmable devices. In his *Passages from the Life of a Philosopher* of 1864, Charles Babbage recounts with incredulity, "On two occasions I have been asked,—'Pray, Mr. Babbage, if you put into the machine wrong figures, will the right answers come out?'"[1] While the seeming certitude of data will lead even the finest minds to assume the infallibility of computing (Babbage's questioners were members of Parliament), the fact remains that the output of a data-driven process, in design as elsewhere, is only as good as its input. (The acronymic efficiency of 20th-century computing has reduced the principle to a single mnemonic; "GIGO;" or, "garbage in, garbage out.")

At the precisely the same time as Babbage was perfecting his differential engine, the physician and epidemiologist John Snow was seeking to alter the practice of medicine with the publication of his essay "On the Mode of Communication of Cholera."[2] Supplementing an earlier edition of the essay—which advocated the germ theory for the communication of the disease over the competing thesis of causation by unclean 'miasma,'—was a revolutionary map of the Soho district of London.

As well as showing the physical disposition of the neighborhood, the map was the first to spatially superimpose non-spatial data; in particular, cases of the water-borne disease. The clusters of cholera infection so revealed showed a clear correlation to a single, contaminated water source, the Broad Street pump.[3]

Even as it was for Snow and Babbage, the purpose of an informational practice is to manipulate, process, and superimpose data. And, when we give up the fidelity of vellum (or vinyl) for digital bits, we do so not for the cramped values that sampling brings, but rather for the myriad and newly fluid ways in which the resulting bits of data can be inter-related and transformed.

The main tool for such work in today's mapping landscape is Geographic Information Systems, or GIS.[4] This is the generic name for software that allows users to locate data spatially. Any line on a spreadsheet, item on a list, or field in a database that records a physical address has the potential, once linked to its geographic coordinates, to become a point on a digital map. Once that point is recorded, it can be linked to or labeled with any other sort of data: the address can be connected to the name of a road, a dollar amount, a color or a shade, something a person said, a crime committed or thwarted, an encounter with an animal or a deity, or almost anything else that can be stored in a database—and that includes non-quantitative data.

The most popular textbook on GIS, Geographic Information Systems and Science, describes the "field of GIS as concerned with the description, explanation, and of Geographic Information Systems and Science begins in the mid-1960s in Canada, where the first "real GIS" was a "computerized map measuring system."[5] It was produced to create the Canada Land Inventory System, a project—classically cartographic—to identify resources and their potential uses.[6] A second phase of rapid development, they write, came from the U.S. Census Bureau, which, planning for the 1970 census, created the DIME (Dual Independent Map Encoding) program, allowing the creation of digital records of every street in the United States such that the population could be referred and aggregated to specific geographies. From the perspective of emerging GIS software development, these two programs responded to the "same basic needs in many different application areas, from resource management to the census."[7]

These narratives and genealogies are important as examples (and this is not the full scope of genealogical narratives of GIS) because neither data collection nor software are neutral in the uses of GIS. Sociologists, urban planners, advocacy groups, and other users of GIS software often tend to downplay the art of mapping and can unknowingly, or knowingly, as Mark Monmonier has argued, "lie with maps."[8] GIS software, which hides from the viewer or user of the map the statistical operations that the maker of the map utilizes, can make this traditional possibility a great deal easier. A more polite term for this, which acknowledges the explicitly aesthetic operations of some GIS users and recognizes the deployment of maps for persuasive purposes, as well as for the management of people and things, would be that of Dennis Wood, "the power of maps."[9]

Obviously, the design of the data and the reasons for its collection have an effect on the biases of the map. Now that many specialists other than cartographers can make maps, it is especially important to understand the

sources of data they rely on, the products of which are maps and images that are having an effect on policy, cities, landscapes, privacy, and beyond.

Remote sensing had an enormous influence on the data and imagery in GIS. Aerial exploration of the Earth's surface not only generated the image bases for all sorts of maps, but also allowed interpreters to discover new things about everything from land use to population density to changes in landscapes and landforms. The Corona program was already using satellite imagery to map large parts of the United States and elsewhere by coordinating its measurable images with mapping reference grids (longitude and latitude). And as the 1990s dawned, GPS emerged as an unprecedented and inexhaustible source of new data points.

However, no one, really, would be using GIS were it not for the emergence of desktop and then portable computers and the World Wide Web, which dramatically democratized the availability of data-processing power in the late 1980s and early 1990s and effectively put GIS-like data and software into mass circulation. With the ubiquity of personal computers and the increased availability of GIS software and geospatial data—whether from GPS, remote-sensing satellites, or public and private libraries and archives—the ability to access, interpret, and put to use digital images of events occurring anywhere in the world, on any scale, from the local to the global, is no longer the sole property of governments, militaries, and large corporations.

For all this, however—and even as the provision of Web-based geospatial data creates fundamental changes in our relationship to place and proximity—a range of forces, (including the rift between architecture and planning that is the legacy of the first, midcentury encounter between systems, mapping, and design[10]), continue to militate against the systematic use of GIS by architects. Recent data-driven architecture, has focused almost exclusively on a virtuosity of output, and not on a critical examination of the data it ingests. And even as some designers employ the power of digital cartography as a creative and political device, our current ability to interrogate places using geospatial data remains broadly absent from the toolbox of digital design media.

Seen against this background, the work we seek to highlight here integrates the contemporary profusion of spatial data to imagine new—and necessary—practices of digital design; not the conclusive framework for how such a new discipline may develop, but rather the seeds of its—likely essential—ability to subvert and subsume the shifting landscape of our new, uncertain century. ◆

ENDNOTES

1. Babbage, C. (1864) Passages from the Life of a Philosopher. London: Longman and Co. p. 67
2. Snow, J. M.D. (1855) *On The Mode of Communication of Cholera "Second Edition, Much Enlarged."* London: John Churchill.
3. See Johnson, S. (2006) *The Ghost Map: The Story of London's Most Terrifying Epidemic and How it Changed Science, Cities, and the Modern World.* New York: Penguin.
4. See Kurgan, Laura (2013) Close Up at a Distance: Mapping Technology Politics, Lexicon, GIS, pg. 51—53: Zone Books
5. Longley et al., *Geographic Information Systems and Science*, p. 16.
6. Ibid
7. Ibid, p. 17
8. Mark Monmonier, *How to Lie with Maps* (Chicago: University of Chicago Press, 1991).
9. Denis Wood, *The Power of Maps* (New York: Guilford Press, 1992).
10. See de Monchaux, *Spacesuit* and Jennifer Light *Warfare to Welfare*, amongst others.