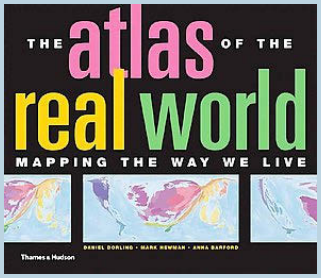
The beginning section of each chapter is also linked to an appendix called *ArcMap Tips*. For each of the maps redesigned by Brewer, references are made to specific tips that will explain how one can implement the same design using ArcGIS software. For users of ESRI products, particularly those that have been more involved in spatial analysis than data presentation, this section may prove invaluable. Even as an experienced user of ArcGIS, I learned a new trick or two from the *ArcMap Tips* section.

All in all, I was pleasantly surprised by this book. From the rather unassuming title, I had feared that *Designed Maps* may be a glorified coffee table piece. *I could not have been more wrong*. It is easily readable and full of inspiring maps and yet still very much of practical use. To some extent, the book may suffer from being too encompassing. A separate book for each of the three main map types Brewer lays out at the beginning would have done the topic more justice. However, this was pioneering work and Brewer needs to be commended for what she achieves–collecting a compendium of well-designed maps, securing permission to reproduce and bind them together, and analyzing how each map was created. In this light, it was likely prudent of Brewer to cover a variety of maps appealing to cartographers as a whole.

Cartophiles aside, determining the appropriate audience for this book presents a bit of a conundrum. *Is this book worth having GIS students buy it for a class?* Probably not. Novices are likely better off with a true cartographic design book. Is *Designed Maps* worth owning as a GIS instructor? Absolutely. It is full of design ideas that can be shared with students. In fact, I have already shown several maps to students to help them explore new design ideas. Is *Designed Maps* worth owning as a practicing cartographer? It depends. If you do not have a large collection of maps to inspire your creativity and if you use ArcGIS regularly, then it is indubitably a wise investment. If you have a large collection of well-designed maps to look at already, you are probably safe to skip this. Regardless, I believe it can only benefit our discipline if similarly themed books of this caliber and quality come out in the future.



THE ATLAS OF THE REAL WORLD. MAPPING THE WAY WE LIVE

by Daniel Dorling, Mark Newman, and Anna Barford

New York: Thames & Hudson, 2008. 400 pages, 366 maps, figures, graphs.
Price US$ 50.00, hardcover
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Review by: Jörn Seemann Department of Geography & Anthropology, Louisiana State University

A few weeks before Christmas, *The Atlas of the Real World* was in the top three of Amazon book sales in the following categories: Maps, Atlas, and Human Geography. Only Jared Diamond's controversial *Guns, Germs and Steel* and Alan Weisman's *The World Without Us* received more online orders. On December 16, 2008, the bulky 5.2 pound book was even temporarily out of stock. What is the secret of this success, taking into account that books on geography are rarely blockbusters or bestsellers?

The Atlas of the Real World is a "joint venture" between the British geographers Danny Dorling and Anna Barford and the American physicist and specialist in complex systems Mark Newman. It contains "366 maps showing all sorts of geographical and social statistics, ranging from basic data on population, health, wealth and occupation to how many toys we import and who's eating their vegetables" (8). The maps, however, are not conventional thematic world maps, but area cartograms inspired by such previous attempts to produce value-area maps as Erwin Raisz's diagrammatic maps, Waldo Tobler's pioneering computer-aided cartograms, and the *State of the World Atlas* (Kidron and Segal 1981). In each map, the areas of the countries are resized according to the statistical value attributed to them. For example, a world map showing absolute numbers for each territory's population exaggerates the size of countries such as China and India that together make up for more than one third of all the human beings on our planet.

Dorling, Barford, and Newman divide their atlas into six different "Worlds" or sections that are dedicated to broader thematic categories. In the "Resourceful World," we can find cartograms on population, travel, transport, natural resources, and energy. The "Trading World" entails issues of globalization and internationalism, food and consumables, and the flows of natural resources and petrochemical products. Closely related to this are the cartograms that (re)present aspects of the "Economic World." These maps do not only touch on export/import statistics of manufactured goods and services, but also display indicators of wealth and poverty (including the (in)famous human development index), employment, and productivity. The "Social World" discusses housing,

education, communication, media, and health topics while death, disaster, war, and crime are contemplated in the "Perilous World." The last section deals with environmental issues such as pollution, resource depletion, and the endangerment and extinction of the global fauna and flora.

Behind these overarching categories, we can find a considerable number of cartograms ranging from run-of-the-mill topics, such as absolute population and precipitation, to highly unconventional and cartographically neglected themes. Have you thought about cartograms showing condom use by men, the number of mopeds and motorcycles, the number of protest events against the 2003 Iraq War or of McDonald's restaurants, faults with landline telephones, or people killed by earthquakes, volcanoes, floods and avalanches? What about prison populations (the United States has the highest rate of all: 0.75 percent of its population is incarcerated, p. 346), or animal and plant species at risk of extinction? The published atlas is only a small sample of possible thematic maps: the online database of the Worldmapper project (www.worldmapper.org) permits access to almost 600 different cartograms and is updated frequently.

Each map is accompanied by a brief text that provides the reader with additional information, a table with the ranking of the highest and lowest rates for each topic, complementary graphic representations (pie, line, or bar charts) with relative figures, and/or a catchy quotation from a newspaper article, report, or book that refers to the theme. For example, on the map sheet on the exportation of toys (map 129), we can read that toys are not only made *for* children but also *by* children: "At City Toy Ltd., …,Shenzen, youngsters worked 16-hour days, seven days a week" (148). All the source citations for statistics, primarily "seven key data sources" (392) which includes data from the World Bank and the United Nations, are referenced at the end of the book.

The layout and the content of the pages render the atlas extremely user-friendly, especially for school children and the general public. Different tones of colors, carefully avoiding any color bias, are attributed to the twelve regions that the authors have defined. The cartograms do not contain overly saturated colors and no red at all. South American countries are represented in light blue colors, North America in dark blue and Western Europe in purple tones, African countries appear in green hues and Asia in yellows.

The authors of *The Atlas of the Real World* present an innovative technique to visualize geographically relevant world affairs. The elaboration of the cartograms is based on a linear diffusion method derived from elementary physics (Gastner and Newman 2004). According to these proceedings, it is possible to predict the motion of a fluid at any time by the use of differential equations. How does this work in cartography? The process of the map production can be compared to a bottle of ink spilt into a swimming pool (it could also be a terrified octopus releasing ink from his ink sac): Initially, the ink does not mix immediately with the water. The highest concentration can be found at the point where it has been dropped into the pool. Due to currents and movements in the water, the ink diffuses over time until it is dispersed throughout the water body. In a density-equalizing process, the ink spreads from high density areas to areas with a lower concentration, and this diffusing movement can be modeled using the standard linear diffusion equation of elementary physics. Of course, in this case we are not dealing with liquids, but with world maps that are first cast on the rectangular grid of an equidistant cylindrical projection and then distorted according to the transformation algorithm ("fast Fourier transform, multiplied by a Gaussian kernel," 12).

For the production of the cartograms, the definition of boundaries is essential. The authors defined a set of 204 resizable territories: 200 countries and, "for cosmetic reasons" (12), four non-contiguous areas with data considerably different from their motherland (Alaska, Falkland Islands, New Caledonia, and French Guiana). The complete set of territories corresponds to 99.95 percent of the world population (12).

The transformation technique does not permit non-values, so missing data in the statistics has to be estimated. In most cases, average values for neighboring countries in the same region were computed in order to give a "roughly correct" and "reasonable picture" (12). This leaves us with the same problem mapmakers faced hundreds of years ago: what to do with the blank spaces? On the one hand, the measures taken by the authors are necessary to produce the maps, but, on the other hand, fictitious data are not "real" values. It is doubtful, for example, if the cultural, political, and economic uniqueness of Brazil in South America could be expressed through average figures or "guesstimates" from the adjacent countries. All the cartograms are based on absolute values (such as total population, number of exported cars, etc.), but some of these values are computed figures that some readers may find far from orthodox. For example, the cartogram on International Justice (map 074) defines the values for the areas as total population multiplied by the number of years since the date at which a country signed the Geneva Conventions.

Flipping through the 366 maps, I can agree with the authors when they write that *The Atlas of the Real World* is a "thought-provoking way to learn about the world around us and understand our place within it" (8). The atlas is a good exercise for map reading. It can be opened on any page, although some readers might get tired quickly after looking at too many of these maps in one sitting. The authors are eager to stress the educational value of their product: "Open this book at almost any page and you will learn something you never knew about the world" (118).

Unlike conventional thematic maps, area cartograms emphasize values visually. This is one of the few moments in cartography when cartographers are allowed to *consciously* distort the size and shape of a territory. Country sizes are not "taken-for-granted" fixed structures, but amoeba-like territories. We do not have to worry about scale and coordinates. The transmission of the geographic message is more important than conventional notions of geographic accuracy. The central idea of the atlas is to "challenge views by distorting a familiar image prompting [readers] to ask why is something the wrong size" (Dorling, Barford, and Newman 2006, 757).

Although the authors attempt to maintain the shapes of the countries, some of the maps suffer severe deformations due to the centrifugal effects of the area-equalizing technique. For example, in map 129 (Exports of Toys), the area of China almost annihilates the rest of the world, and many of the health cartograms (HIV Prevalence, Cases of Malaria, Cholera, and Yellow Fever) emphasize a grotesquely distorted and swollen shape for the African continent. On the other hand, map 042 (total carrying capacity of cargo ships) is one of the rare moments to see Malta as big as the United States. In this map, we can easily understand why the authors compare their cartographic method to an "ink-in-the-pool" diffusion. The world seen like this seems to be a whirlpool or (more negatively) a maelstrom, with the landmasses and the oceans literally streaming around the principal centers of cargo shipping and "flags of convenience" such as Liberia, Bahamas, Malta, Cyprus, and Panama. However, the emphasis here on small countries can only be considered an exception to the rule. Since most of the maps are related to absolute population figures, small countries do not become more visible. Should size always dominate the message in the map? In the cartogram on international immigrants (map 016), Andorra is rendered imperceptible, while the country's statistics show that in relative terms Andorra has the highest rate of immigrant population in the world (80 percent).

The problem with projections is that they are always centered on a reference point or line. Based, as they are, on a cylindrical projection type rectangular format, the cartograms in the atlas do not offer a solution to the problem of severe distortions at higher latitudes. Since Russia is rarely the center of the density-equalizing process, the Russian territory appears unrecognizably twisted and turned in most of the maps. Could transformation cartograms rooted in a polar projection provide better results?

Some of the maps, especially those with Third World topics such as health issues and food security, would be more explicit as regional representations. Although the authors are aware of the generalizing nature of world maps, they do not tackle this problem and "will leave this to another day" (12). It is also notable that most of the maps describe present conditions and not processes and changes. There could be more combinations between the different maps, allowing "overlays" of temporal sequences or the comparison of key issues. The atlas would be even more interesting as an interactive CD application than as a coffee-table book.

Dorling, Barford, and Newman use their cartograms as weapons to unmask a "worrying picture of the world" (10) and to show that "worldwide inequality is on the increase, with the rich getting richer and the poor poorer" (10). Their aim is to make readers think about the social and economic injustice on our planet. Janos Szegö's (1987) reflections about "human cartography" represent a red thread for the authors in their attempt to represent the human experience of space. Szegö writes that human cartography aims "to create maps *about* people *for* people" (Szegö 1987, 10, emphasis by author). In other words, "how can actual events and processes in the world of man (sic) be translated into maps and how can this translation be made comprehensible for the human brain?" (Szegö 1987, 10).

The initiative of *The Atlas of the Real World* should be saluted, with a caveat. Although the authors reach a broad audience (as we can prove by the sale numbers), they do not diminish the gap between mapmakers and society. On the one hand, the cartograms are a fantastic exercise for map reading, but, on the other hand, the understanding of the mapmaking process employed (for example, the "fourth-order Runge-Kutta integrator" 12) remains restricted to the insiders. Even if one rejects a Harleian or postmodern critique of the ideological and persuasive nature of maps and atlases, as Dorling has made clear in his other writings, it is important to establish a dialogue between cartography and people, and to reduce the distance between mapmakers and society. It sounds strange when the authors refer to the "real world" and how they map "the way *we* live," "showing *us* where *we* are now, allowing *us* to navigate *our* way through the world" (11 emphasis added). The more the map reader understands the mapping process, the better he/she will be able to recognize the map as a powerful tool to express and communicate ideas. Of course, due to their scale and high level of abstraction, world maps will always have a limitation with regards to the messages they convey.

All in all, *The Atlas of the Real World* represents refreshing views and substantial food for thought, not only for cartographers and mapmakers, but also for anyone interested in visual culture. For me, there is yet another aspect: one that shows the enormous potential of the atlas. Maps are projections and distortions of reality, and we cannot deny the artistic value in their production. Behind the technical facade of the cartograms (Fourier transforms, algorithms, Runge-Kutta integrator, etc.) is looming an artistic creativity. In fact, Dorling, Barford, and Newman unconsciously revive a counter-tradition from the Renaissance defined as anamorphic

art: Cartograms are examples of the "subjectification" of the viewing process, similar to seventeenth-century anamorphoses such as the drawing of Saint Francis de Paul from Jean-François Niceron's *Perspective Curieuse* (see Figure 1) that was transmogrified by the use of a "cylindrical mirror" (Niceron 1638). The viewer is first deceived by the strange appearance of the image and then introduced to the formal construction of it. This means that "the spectator must play part and re-form the picture himself [herself]" (Leeman 1975, 9). With these observations in mind, we will be able to come closer to the "real world." Let's jump into the pool!

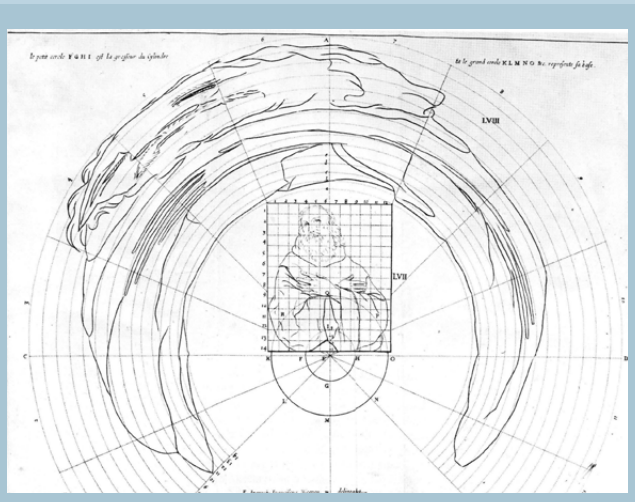

Figure 1.

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AN ATLAS OF RADICAL CARTOGRAPHY

Lize Mogel and Alexis Bhagat, eds.

Journal of Aesthetics and Protest Press, Los Angeles, CA, 2007. 160 pp., 10 poster maps, 17 figures, endnotes, contributors' biographies, publisher's note. Price: $30.00, Softbound.

ISBN 978-0-9791377-2-3

Review by: Daniel G. Cole, Smithsonian Institution

This atlas of ten loose folded poster maps and an accompanying text of ten essays provide the reader with plenty of food for thought. As the editors mention in the Introduction, "While all maps have an inherent politics that often lies hidden beneath an 'objective' surface, the contributions to *An Atlas of Radical Cartography* wear their politics on their sleeve" (6). Indeed, as the editors continue, "Our criteria for selecting these ten maps emphasized radical inquiry and activist engagement" (7). The ten texts and maps, typically with different authors and cartographers, respectively, are intended to be read together, although any good map reader may draw his or her own conclusions from the maps.

The first chapter, "Other Worlds, Other Maps: Mapping the Unintended City," by Jai Sen, is matched with a map titled *Chetla Lock Gate: Marginal Land Settlement in Calcutta* by the Unnayan in Kolkata organization. The author admits that this map was serendipitously sparked by a map on a peanut bag that showed a planned road project adjacent to an unrecognized settlement. Sen points out that "official" maps blank out unauthorized neighborhoods of unintended settlers, thus blatantly labeling such locations as "vacant land." The Unnayan NGO wanted to help settlers better locate common services and spatial relationships through the use of maps. Unnayan also mapped marginal land settlements along drainage canals, major roads, and railroads. As a critique, Sen states that "What I think we failed to sufficiently do was to engage the people of the settlements either in mapping themselves or in studying the maps we were producing" (15-16). The sample map provided for the book is of the Chetla Lock Gate area of southwest Calcutta. It is a pen and ink drawing with very clean linework and typography. Humbly, Sen finishes by refusing to assert that their mapping efforts empowered all of the communities that were mapped.

The Institute for Applied Autonomy (IAA) wrote and illustrated Chapter 2, "Tactical Cartographies" and produced its accompanying map, *Routes of Least Surveillance: Manhattan, USA circa 2001*. The authors wanted to present an alternative view of the urban landscape as dominated by surveillance. They identify