How to visualise social structure

What would happen if you applied data visualisation techniques of 2012 to data from the 1980s? **Danny Dorling** has found out
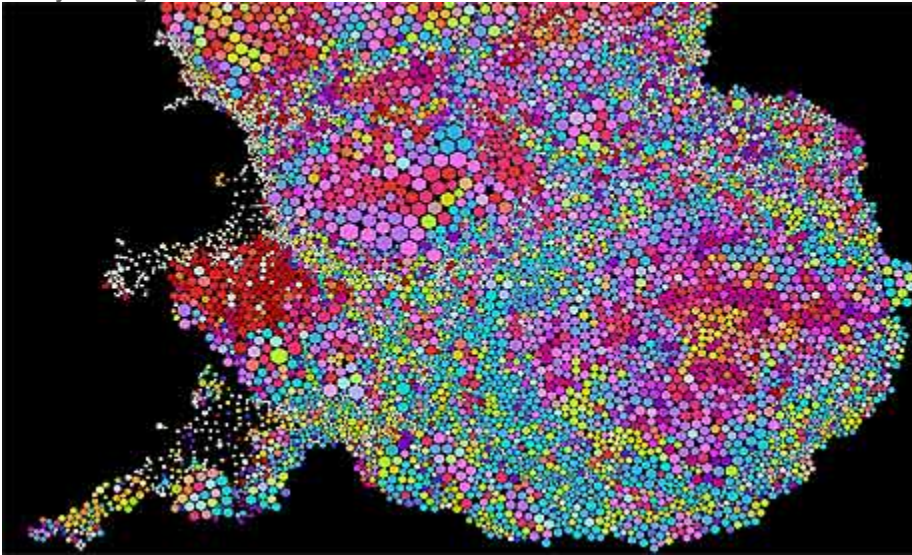
Danny Dorling mapped British local voting patterns over time. **Click image for big version**

Visualization is often about stories. Good stories are about seeing things differently. In my new book, I have tried to write a story as a way of introducing new ways of visualizing people in places.
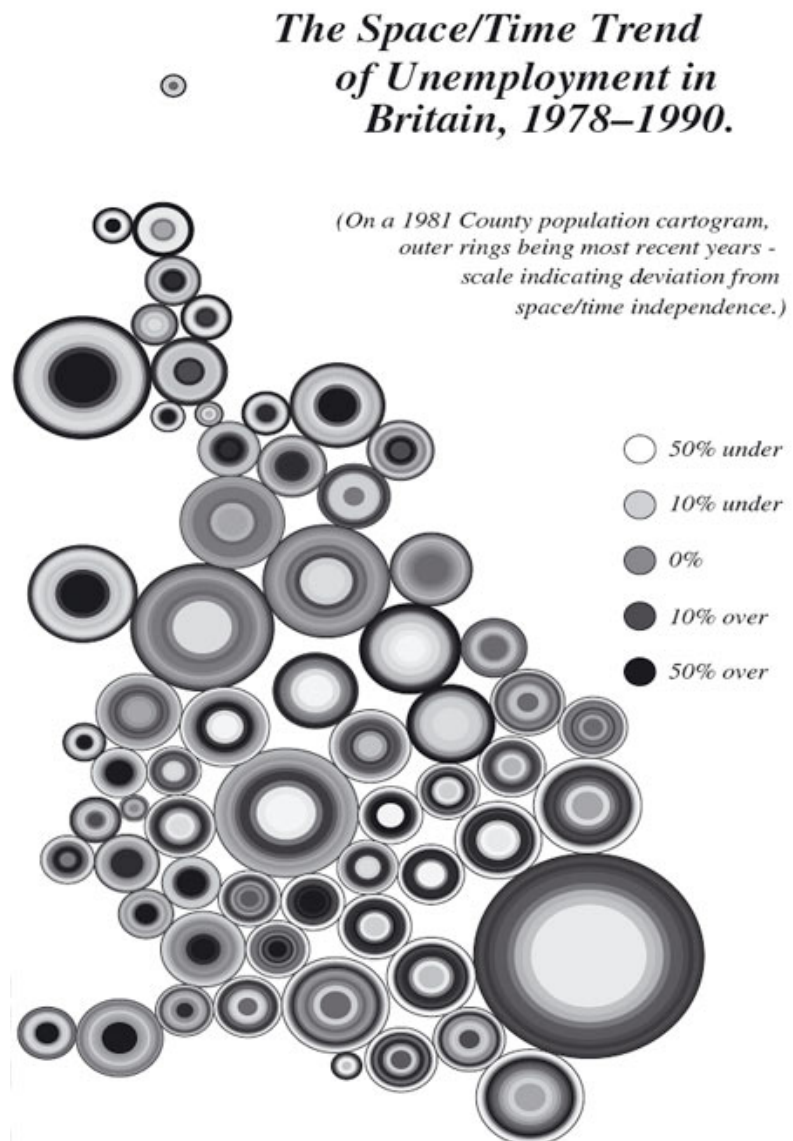
The visualization of spatial social structure means, literally, trying to make visible the geographical patterns to the way our lives have come to be socially organized. It is about seeing the geography in society. Visualization often implies using data. More widely defined it implies freeing our imaginations.

The story centres on a particular place and time, 1980s Britain, and a particular set of records, routine social statistics. During the 1980s

computer graphics developed and, to comprehend the information they held, a few social scientists thought it needed to be effectively visualized with graphics.

It shows how modern computer graphics can be used to look back on the 1971 and 1981 censuses, and the polarization of the UK which was underway in the 1980s and which explains so much of life in Britain today.

Deviations from expected levels of unemployment are shown here, superimposed as rings around the 64 counties on the equal population cartogram. This method does not work too well. Although some sort of pattern can be discerned, the use of these symbols breaks up the picture and fails to produce an overall impression. The success or failure of an image often depends on these two factors

The Space/Time Trend of Unemployment in Britain, 1978–1990.

(On a 1981 County population cartogram, outer rings being most recent years - scale indicating deviation from space/time independence.)

- 50% under
- 10% under
- 0%
- 10% over
- 50% over

In the United States a small but significant number of Geographers in the 1960s argued that conventional maps contained a massive and unwanted distortion, but a growing number in the social sciences back in the 1970s then thought that anything numerical was in some way suspicious and could de-humanise inquiry.

Mapping, by the late 1980s, had been rejected by many social analysts as an unsuitable means of showing spatial social structure. The usual alternative was, and remains, to write in the abstract on social structure and rarely to employ graphics or maps or to rely on numbers. However, that wastes a huge amount of information and the skills of many more numerically minded people who might also be interested in uncovering the social organisation of the world they live in.

Rather than just rely on verbal description a more human cartography can be useful, one that reveals, through amalgamating and subdividing the events of people's lives, the shape of society. The aim here is to see the whole, in as much detail as possible, at a glance.

Daily Commuting Flows Between English and Welsh Wards in 1981.

Where-

All flows which satisfy the following inequality are drawn as thin lines-

$$\frac{m_{ijst}}{p_{is}p_{js}} > \frac{1}{25000}$$

Flows of over 1000 people drawn as thick lines.

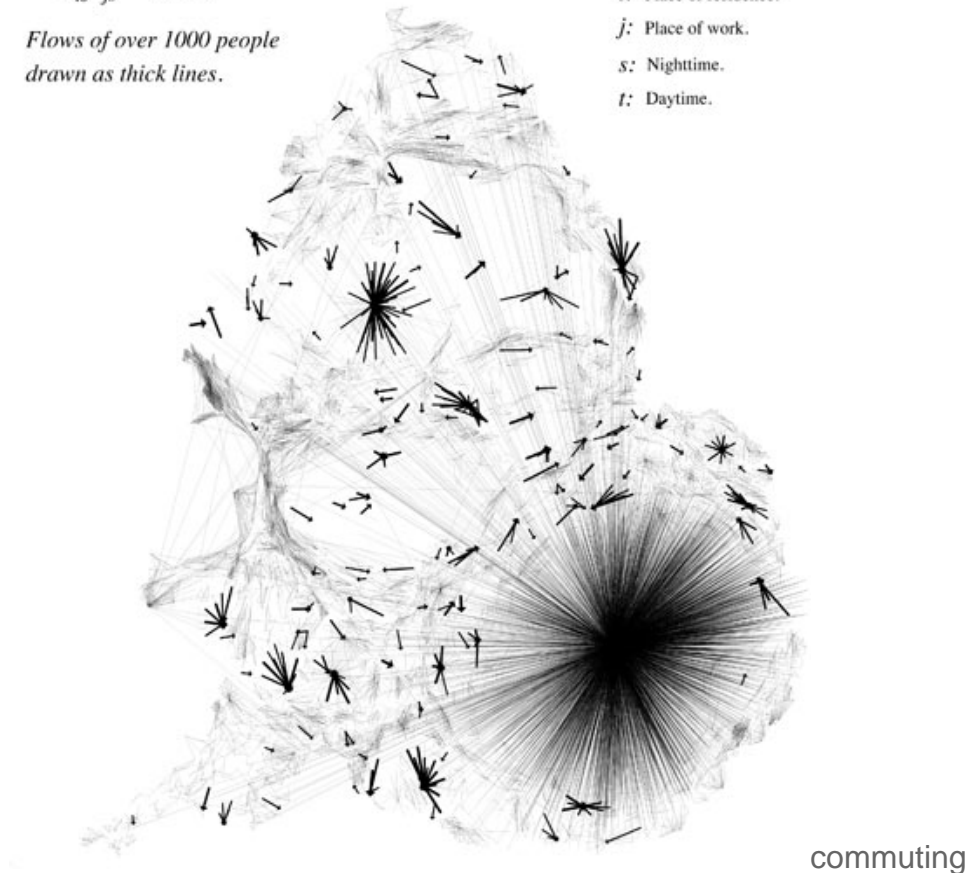m_{ijst} : The number of people moving from place i to j between times s and t.

p_{is} : The number of people at place i time s.

i: Place of residence.

j: Place of work.

s: Nighttime.

t: Daytime.

commuting

While the case study is 1980s Britain, the geography of Thatcherism, the applicability of these techniques is hopefully far wider. The areas studied could be far smaller than an island like Britain, or larger. Revealed by many of the 189 full page illustration in this book is the society inherited by Margaret Thatcher's government in 1979 and how that society had been changed by 1990, the year of her forced resignation.

4

Almost all of the text is new, but the images in the book where first drawn on computer in the late 1980s and very early 1990s. At the time they were drawn it was far too expensive to be able to print them, and printing technology was mostly too limited to faithfully reproduce the detail shown in maps of over 100,000 places or which show more than a million human flows.

Even on the computer screen, 21 years ago the resolution was too low to be able to see all the detail revealed by the visualization in a single image. That is still true of modern computer screens; their resolution is still too low. With the maps in this book, only by looking at the printed page can you really get an idea of how pattern is replicated within pattern, and how Edward Tufte was correct when he suggested back in 1990 that a maxim for those wishing to understand with pictures was "to clarify, add detail".

*Danny Dorling's **The visualization of Social Spatial Structure** is published by Wiley on August 14th 2012. Many of the graphics and part of the content is available to browse here*