

# Editorial

In these normally friendly pages we have the unusual occurrence of a dispute between authors. Roy Carr-Hill sent in his article signed as being sent from "Blunt Speaking Land, North of the Gap". Personally I would have liked to have seen some of his Yorkshire frankness replaced with weasal words from the mealie-mouthed Midlands. (Perhaps it is safe now for me to confess to having been born in Grantham, although not everyone from that normally sleepy East Midlands town is known for their pursuit of consensus). However George Davey Smith, Mel Bartley, and David Blane have produced a spirited response. I wonder whether George Graham who, around 1700, designed the original orrery, a mechanical device for illustrating the motions of the planets, would be surprised to see it used as an analogy for a modern manner of argument.

In a controversy of more cosmic proportions Andrew Philpott Morgan asks "Does chaos reign?". This may be a useful counter to the inappropriate subheading, "Chaos reigns", that has appeared with a series of articles in the *New Scientist* recently. From Darwin to Dawkins theories used by one discipline have been transferred with little justification to another discipline such as sociology, economics, history, and politics which have not yet reached any consensus on theories or laws of their own.

Steve Simpson challenges us to identify (and perhaps even produce) good graphics. Yes, it's easy enough to find poor graphics. How simple it is with modern spreadsheets to produce all that 'non-data ink'. What effort has been made by computer programmers to allow the generation of those 3-D pie charts and 3-D bar diagrams where there is no third dimension in the data? Unfortunately this newsletter is also short on inspiring graphics. I am sure that the future editors would welcome more attention to this aspect of contributions from authors.

# The visual display of quantitative information

## by Edward R. Tufte

Review by Steve Simpson

Here's a book that some may know already - it was first published in 1983, but has only recently become available in the UK.

Having thoroughly enjoyed this book, I sought out earlier work by Edward Tufte and discovered that this is not the first time that he has taken a very simple idea and usefully wrung it for all it's worth.

In this case the simple idea is this; the ink that represents quantitative data should be maximised in relation to all other ink on the graphic. "Most of a graphic's ink should vary in response to data variation."

It leads him to principles that reject glaring shades and other 'chartjunk' - those unnecessarily heavy grids, or symbols that lead the eye away from the data rather than towards it. It leads to less cluttered graphs that show a lot of data in a small space - and therefore can often be usefully placed next to related graphics with the same scales.

The book gives some take-it-or-leave-it redesigns of scatterplots, boxplots and histograms, and I would leave as many as I would take. But they use one chapter out of nine. The inspiration of the book is the high quality display of hundreds of real good-practice graphics with Edward Tufte's commentary pointing to how they do well. I guarantee that any reader will get some ideas to put into practice straight away and others to store for the appropriate time. The graphics include William Playfair's 18th. century economic time series, Minard's 19th. century map-depictions including the reducing size of Napoleon's army into Russia and on its retreat, complete with temperature scale, and many modern graphics of varied sources<sup>1</sup>.

He deals with graphs as a serious means of investigating and communicating the real world: "Occasionally artful design makes a graphic worthy of the Museum of Modern Art, but essentially statistical graphics are instruments to help people reason about quantitative information." He feels that statistical graphics get a raw deal, used as a headline in the press and relegated to illustrative material rather than exploratory tools in themselves: as reasons he touches on scientific and statistical teaching, the influence of printing technology, professionalised art being the main influence on both mass media data graphics and computer graphics packages.

1. Editor's note: Minard's graphic was reproduced (with colour) in the *New Scientist*, 29th. September, 1990, page 57.

Tufte makes a good case - if you need one making - that graphics can show sophisticated relations between variables, displaying not only the researcher's model but also how well the raw data fit them. At one point, the book examines the graphical sophistication in current publications by measuring the proportion of graphics which are 'relational' - defined as those which have more than one variable but are not time series or maps. He finds that Japanese publications including daily papers do well, with over 5% relational graphics, compared with the Economist (2%) or The Washington Post (0%) on samples of 100-400 graphics.

I thought I'd have a look at *Radical Statistics'* graphical sophistication, only to discover that in 15 out of the 25 issues I have near me there are no graphics at all. In the 34 graphics that I found in the other ten issues, six were relational but I wouldn't say they were classics of clear graphical exposition! We seem to have a preference for time series as might befit a high respect for history; and we have some very low 'data densities': not much data displayed on a big page, or big page after big page. Prizes would go to Dave Drew & co. for the sheer number of graphics (RS22, 24, . . .), and to Cathie Marsh for using graphs to explore opinion poll time series data through fitting five related graphs on two adjacent pages (RS28).

Talking of prizes, I see from an issue of the US magazine on statistics, *Chance*, that they have a 'Graphic of the month' which seemed to be the worst graphic they could find - wrong labelling, distracting symbols, little data surrounded by complicated notes. I suggest that *Radical Statistics* starts a **Data Graphic Award** (republishing in this journal) not for bad graphics but for **best** graphics.

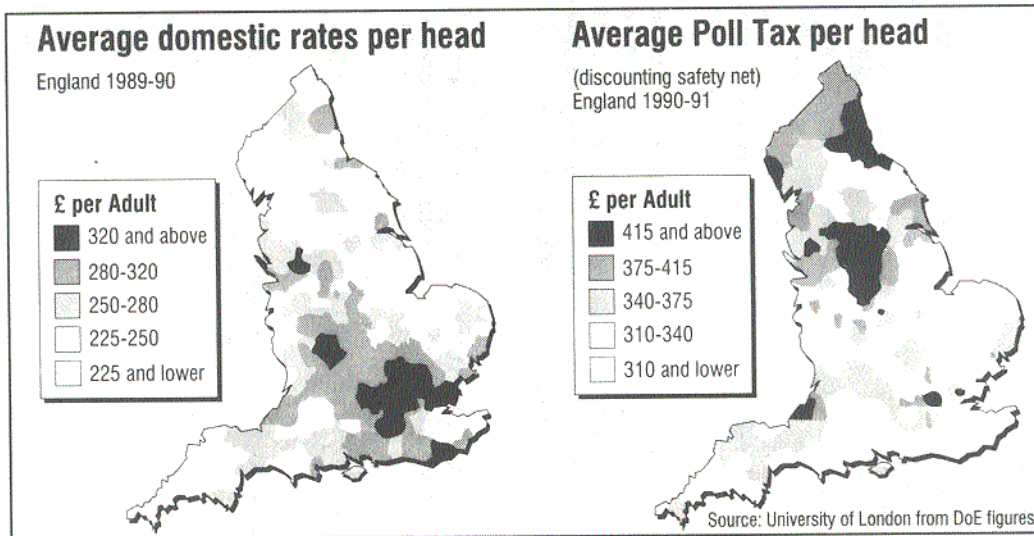
My choice for this issue is Charlie Owen's poll tax maps, reproduced by *The Independent* on 22nd. August, 1990. They get across an important message, namely, the shifted burden from the richer South to the poorer North, but they are also clearly presented and allow a variety of comparisons both across space and across tax systems. Perhaps maps are especially suitable to quantitative displays for exploration. Can you, dear reader, come up with a good-practice graphic, map or not, for the next issues of *Radical Statistics*?

Back to Edward Tufte's book. It has made me make resolutions: I **shall** add dates of relevant events to time axes; I **shall** simplify graphs and reduce them in size; I **shall** use scatterplots more often and label outliers. I **shall** take the time and effort to bend my graphics package to get it to do what I need it to do, and not put up with what it offers at first sight. But it is not a textbook. You will enjoy it as a good history, good relaxation, and it will provoke your own ideas.

It probably won't be in bookshops; its available for £22 direct from Graphics Press UK, PO Box 8, Godalming, Surrey, GU7 1HB. I'm not on commission - you could also get it through your library.

# Data Graphic Award

To Charlie Owen and *The Independent's* graphics editors



Send your entry for the Data Graphic Award to the next editors of Radical Statistics.