



**Designed visualisation: good design doing good?**

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## Aim

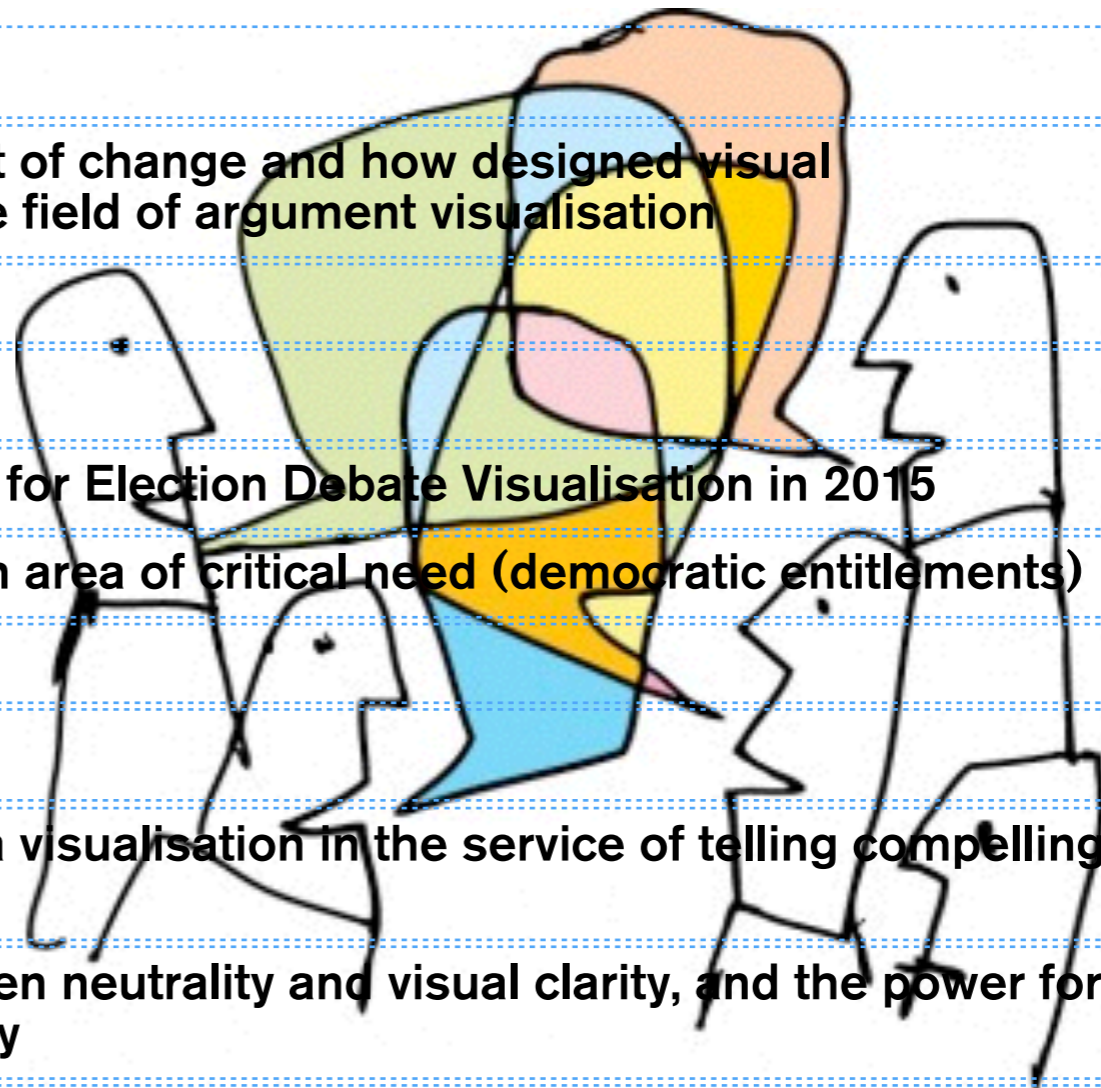
- to examine ideas of design as an agent of change and how designed visual communications can operate within the field of argument visualisation

## Context

- the three-year EPSRC-funded platform for Election Debate Visualisation in 2015
- allows for design to (re)invent within an area of critical need (democratic entitlements)

## This talk

- to situate the power of design and data visualisation in the service of telling compelling, engaging and illuminating stories
- to explore the inherent tensions between neutrality and visual clarity, and the power for beautiful design to allow of accessibility
- to outline some challenges in the creation of the project's research tools, interfaces and visualisations
- to touch upon some thoughts around methods for making and methods for testing the platform's design prototypes






Am I stating the obvious?



**‘Practically every decision we make as designers\* has an ethical dimension, requiring us to ‘balance the forces’ in our own small way as responsible individuals.’**

Ray Roberts, in Lucienne Roberts (2006)

\*here, design is used to describe visual communication in all its forms (Graphic Design?)

A red rectangular sign with white text that reads "WRONG WAY" is mounted on a metal post. The sign is tilted slightly to the right. The background is a clear blue sky with some light, wispy clouds. The sign is the central focus of the image.


**My research asserts that it's possible to outline a critical position where design is active in perception, construction and transformation (personal / social).**

**Gui Bonisepe - design as a shaper of / for self-determination: an emancipatory 'design humanism'**

**Alice Rawsthorn - redesigning design to reinvent areas of critical need: 'embrace the mundane aspects of noble endeavours'**

Design for common good





Design research as / and activism

- my research is attempting to counter the perception that design might most often viewed as a form of 'functional facilitation' (Michael Rock); as being largely instrumental with little agency
- it poses the question whether there's a place and role for ethics and understanding of the responsibilities (of design) linked to social and technological innovations? (a question repeatedly returned to by some designers)
- it asks to what extent might the form of visual communication help make sense of a particularly 'wicked' problem? (Rittel, Buchanan)
- it wonders where this takes place (within / outside institutions? elsewhere?)





Case study#1: Does design really matter?  
What's your choice?

| 1 OFFICIAL BALLOT, GENERAL ELECTION<br>PALM BEACH COUNTY, FLORIDA<br>NOVEMBER 7, 2000  |   | OFFICIAL BALLOT, GENERAL ELECTION<br>PALM BEACH COUNTY, FLORIDA<br>NOVEMBER 7, 2000 1-R |   |
|--|---|---|---|
| <b>ELECTORS<br/>FOR PRESIDENT<br/>AND<br/>VICE PRESIDENT</b><br><br>(A vote for the candidates will<br>actually be a vote for their electors.)<br><br>(Vote for Group) | <b>(REPUBLICAN)</b><br>GEORGE W. BUSH - PRESIDENT<br>DICK CHENEY - VICE PRESIDENT         | 3 →   |   |
|  | <b>(DEMOCRATIC)</b><br>AL GORE - PRESIDENT<br>JOE LIEBERMAN - VICE PRESIDENT              | 5 →   |   |
|  | <b>(LIBERTARIAN)</b><br>HARRY BROWNE - PRESIDENT<br>ART OLIVIER - VICE PRESIDENT          | 7 →   |   |
|  | <b>(GREEN)</b><br>RALPH NADER - PRESIDENT<br>WINONA LaDUKE - VICE PRESIDENT               | 9 →   |   |
|  | <b>(SOCIALIST WORKERS)</b><br>JAMES HARRIS - PRESIDENT<br>MARGARET TROWE - VICE PRESIDENT | 11 →  |   |
|  | <b>(NATURAL LAW)</b><br>JOHN HAGELIN - PRESIDENT<br>NAT GOLDKABER - VICE PRESIDENT        | 13 →  |   |
|  |   |   |   |
|  |   |   | <b>(SOCIALIST)</b><br>DAVID McREYNOLDS - PRESIDENT<br>MARY CAL HOLLIS - VICE PRESIDENT  |
|  |   |   | <b>(CONSTITUTION)</b><br>HOWARD PHILLIPS - PRESIDENT<br>J. CURTIS FRAZIER - VICE PRESIDENT                                    |
|  |   |   | <b>(WORKERS WORLD)</b><br>MONICA MOOREHEAD - PRESIDENT<br>GLORIA La RIVA - VICE PRESIDENT                                     |
|  |   |   | <b>WRITE-IN CANDIDATE</b><br>To vote for a write-in candidate, follow the<br>directions on the long stub of your ballot card. |
|  |   |   | <b>TURN PAGE TO CONTINUE VOTING</b> →   |

November 2000



## PALM BEACH COUNTY BALLOT

|  |    |   |  |
|--|----|---|--|
| <b>REPUBLICANS</b><br>GEORGE W. BUSH - President<br>DICK CHENEY - Vice President | 3→ | ● |  |
| <b>DEMOCRATS</b><br>AL GORE - President<br>JOE LEIBERMAN - Vice President        | 5→ | ● | ←4 <b>REFORM</b><br>PAT BUCHANNAN - President<br>EZOLA FOSTER - Vice President       |
| <b>LIBERTARIANS</b><br>HARRY BROWNE - President<br>ART OLIVER - Vice President   | 7→ | ● | ←6 <b>SOCIALIST</b><br>DAVID McREYNOLDS - President<br>MARY CALHOUS - Vice President |
|  |    | ● | ←7   |

### How design failed democracy

'The most influential piece of information design in my lifetime may very well be the butterfly ballot used in Palm Beach County for the November 2000 US presidential election. The number of votes mistakenly cast for independent Pat Buchanan instead of Al Gore, due to misleading layout, was well in excess of George W. Bush's certified margin of victory in Florida, and enough to result in Bush winning the presidency nationally.'

David Berman (2008)

| OFFICIAL PRESIDENTIAL BALLOT<br>GENERAL ELECTION - NOVEMBER 2, 2004<br>CUYAHOGA COUNTY   |  |
|--|--|
| <p><b>For President and Vice-President</b></p> <p>To Vote for President and Vice-President, punch the hole beside the number for the set of candidates of your choice. Your vote will be counted for each of the candidates for presidential elector whose names have been certified to the Secretary of State (Vote not more than ONCE)</p> | <p>For President: <b>JOHN F. KERRY</b> and For Vice-President: <b>JOHN EDWARDS</b> <b>6</b> →</p> <p>Democratic</p>                      |
|  | <p>For President: <b>CANDIDATE DISQUALIFIED</b> and For Vice-President: <b>CANDIDATE DISQUALIFIED</b></p>                                |
|  | <p>For President: <b>MICHAEL A. PEROUTKA</b> and For Vice-President: <b>CHUCK BALDWIN</b> <b>10</b> →</p> <p>Other-Party Candidate</p>   |
|  | <p>For President: <b>MICHAEL BADNARIK</b> and For Vice-President: <b>RICHARD V. CAMPAGNA</b> <b>2</b> →</p> <p>Other-Party Candidate</p> |
|  | <p>For President: <b>GEORGE W. BUSH</b> and For Vice-President: <b>DICK CHENEY</b> <b>4</b> →</p> <p>Republican</p>                      |

|    |    |    |    |    |     |     |     |     |
|----|----|----|----|----|-----|-----|-----|-----|
| 3  | 22 | 42 | 60 | 79 | 98  | 118 | 136 | 155 |
| 4  | 23 | 43 | 61 | 80 | 99  | 119 | 137 | 156 |
| 5  | 24 | 44 | 62 | 81 | 100 | 120 | 138 | 157 |
| 6  | 25 | 45 | 63 | 82 | 101 | 121 | 139 | 158 |
| 7  | 26 | 46 | 64 | 83 | 102 | 122 | 140 | 159 |
| 8  | 27 | 47 | 65 | 84 | 103 | 123 | 141 | 160 |
| 9  | 28 | 48 | 66 | 85 | 104 | 124 | 142 | 161 |
| 10 | 29 | 49 | 67 | 86 | 105 | 125 | 143 | 162 |
| 11 | 30 | 50 | 68 | 87 | 106 | 126 | 144 | 163 |
| 12 | 31 | 51 | 69 | 88 | 107 | 127 | 145 | 164 |
| 13 | 32 | 52 | 70 | 89 | 108 | 128 | 146 | 165 |
| 14 | 33 | 53 | 71 | 90 | 109 | 129 | 147 | 166 |

As a result, AIGA's Design for Democracy worked with the US government to address the ballot's design '...which has compromised the mechanics of democracy' (Berman);

2007: U.S. Election Assistance Commission issued voluntary guidelines for use in federal elections.

In 2008, these recommendations were only reflected in the ballot design in six states.



089 6 0 1

**Design makes things visible.**

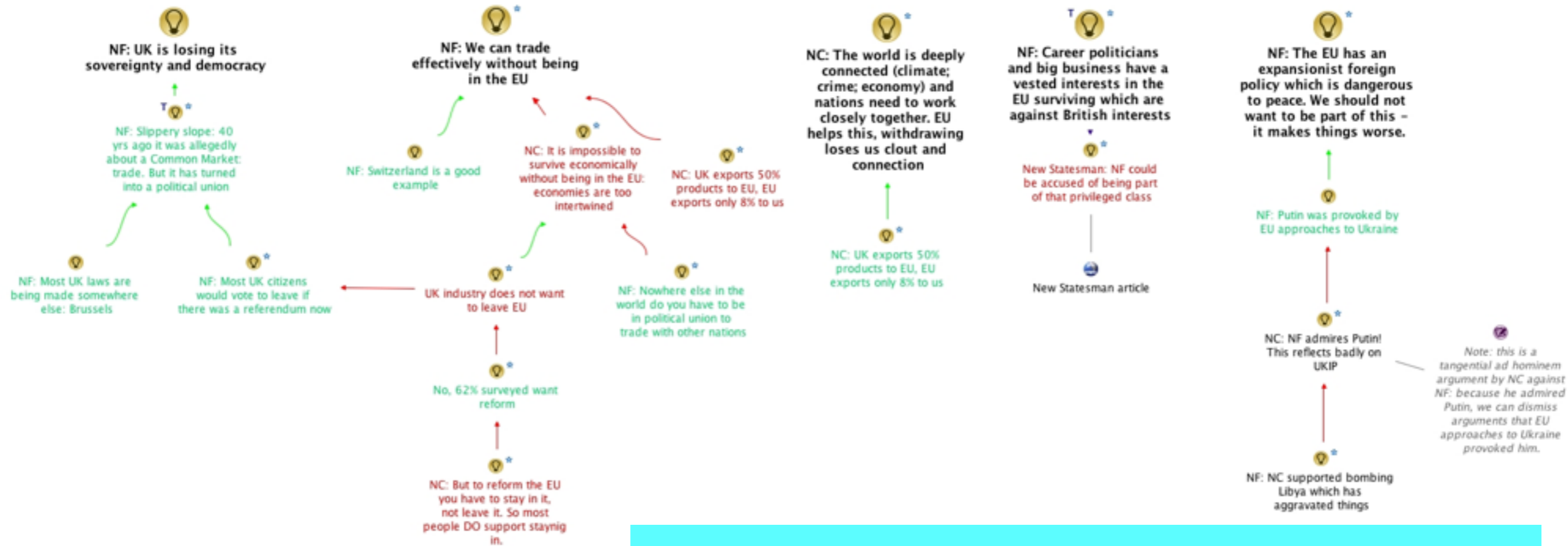
**But what does this actually mean?**

**Making something appear? Other things disappear? Things seeming more clear? More legible? More attractive?**

**In the context of argument visualisation, what can design do? What might 'good' mean, here?**

opping ev  
ry store





## Where to start? How to read? What do they each mean? What have I got to compare it with?

- how can design choices contribute to perception and cognition of the underlying information?
- most often, such principles exist as tacit knowledge (sets of qualitative guidelines) via best practice and creative visualisation (Agrawala, Li and Berthouzoz 2011)
- Bertin might be some help, here





**We are drawn to beauty**

- the realm of the beautiful and our notions of aesthetic judgement can't be ignored
- research shows that perceptions of good or 'quality' design are apparent within some online user interaction - the idea of good design adding some sense of value above and beyond



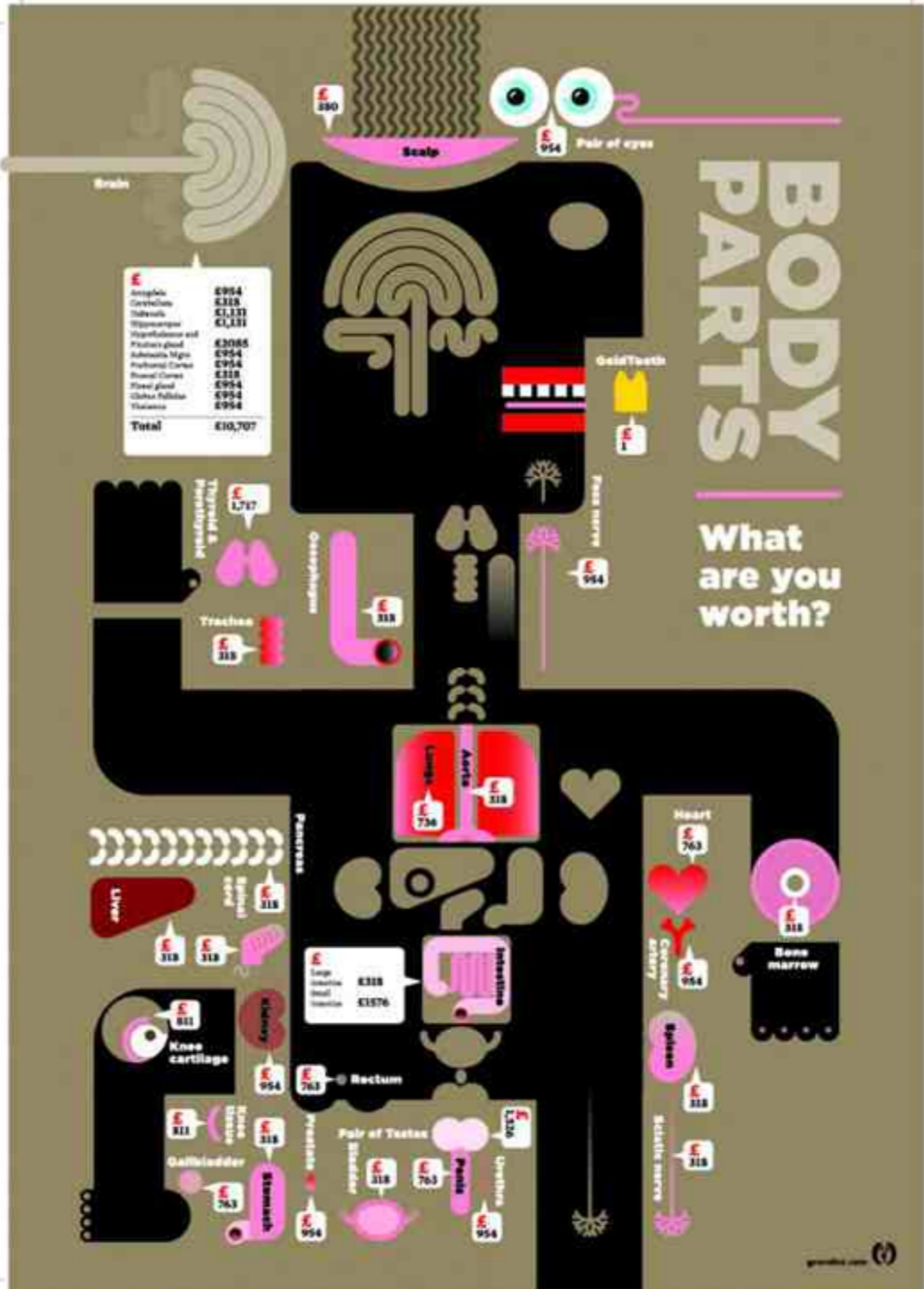
selections from the inaugural (2012)  
Information is Beautiful awards shortlist



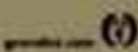


# BODY PARTS

What are you worth?



Follow crop marks for A2 trim. 200% for A0. Illustrator CS4 art. type as outlines. colour to CMYK.





# The Opportunity Gap

The opportunity gap disproportionately impacts students of color who come from low-income backgrounds. The demographic disparities Black and Hispanic students in the United States face is comparable to the White youth put from a disadvantage before they even enter school. When combined with the educational disparities based on the achievement gap, students of color often have to overcome more challenges to have an equal chance of their opportunities.

A collaboration between GOOD and University of Missouri, a research and advocacy organization.

## Executive Summary

### Health, Well-Being, & Social & Economic Mobility

Black and Hispanic children are more likely to live in poverty than Whites.

### Education

White children are twice as likely to graduate college as Black & Hispanic.

### Household Net Worth

The median net worth of White households with children is six times greater than Hispanic and 12 times greater than Black.

### Health

Hispanic children are twice as likely as Black & Whites to have no health insurance.

### Infant Mortality

Black infants are more likely to die before their first birthday than Hispanic or White.

### College Barriers

84% of Black students report not having enough money to pay for college.

### College Barriers

74% of Hispanic students report not having enough money to pay for college.

### College Barriers

83% of non-white young adults students report not having enough money to pay for college.

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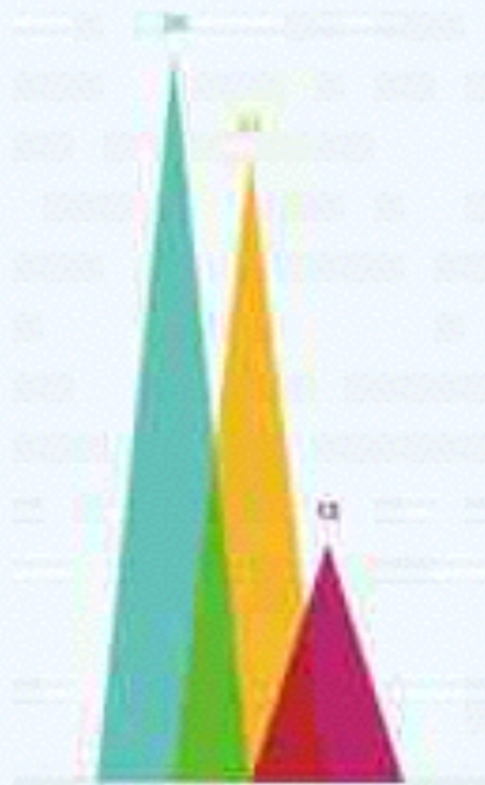
83% of non-white young adults students report not having enough money to pay for college.

### College Barriers

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Percentage of children living in poverty (2019)

## Poverty

Black & Hispanic children are three times more likely to live in poverty than Whites.

## Household Net Worth

The median net worth of White households with children is six times greater than Hispanic and 12 times greater than Black.



Percentage of children with no health insurance (2019)

## Health

Hispanic children are twice as likely as Black & Whites to have no health insurance.

## Infant Mortality

Black infants are more likely to die before their first birthday than Hispanic or White.



Percentage of white children who graduate college (2019)

## Education

White children are twice as likely to graduate college as Black & Hispanic.

## College Barriers

84% of Black students report not having enough money to pay for college.

74% of Hispanic students report not having enough money to pay for college.

83% of non-white young adults students report not having enough money to pay for college.

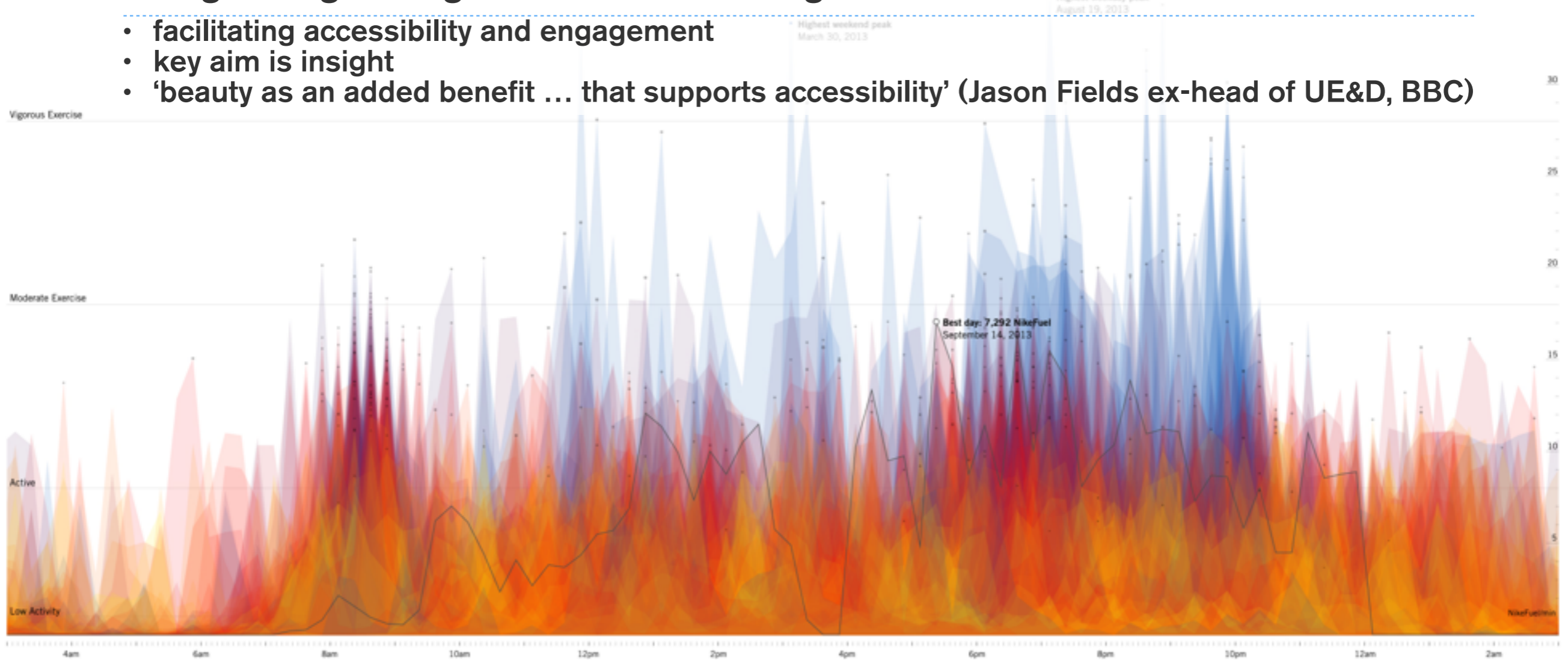






# The growing emergence of what we might call beautiful information.

- facilitating accessibility and engagement
- key aim is insight
- ‘beauty as an added benefit ... that supports accessibility’ (Jason Fields ex-head of UE&D, BBC)

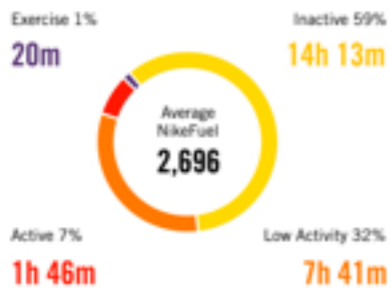


## 2013 YEAR IN NIKEFUEL

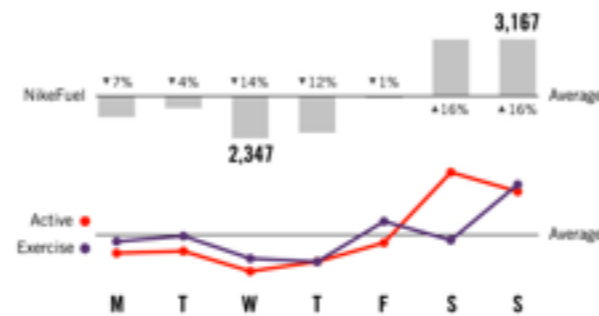
TJ

- Vigorous Exercise
- Moderate Exercise
- Active
- Low Activity
- Inactive

### DAILY MOVEMENT



### WEEKLY MOVEMENT



### WEEKLY EXERCISE



See the U.S. Department of Health and Human Services' Physical Activity Guidelines at [hhs.gov](http://hhs.gov) for recommended physical activity levels.

### WORKOUTS

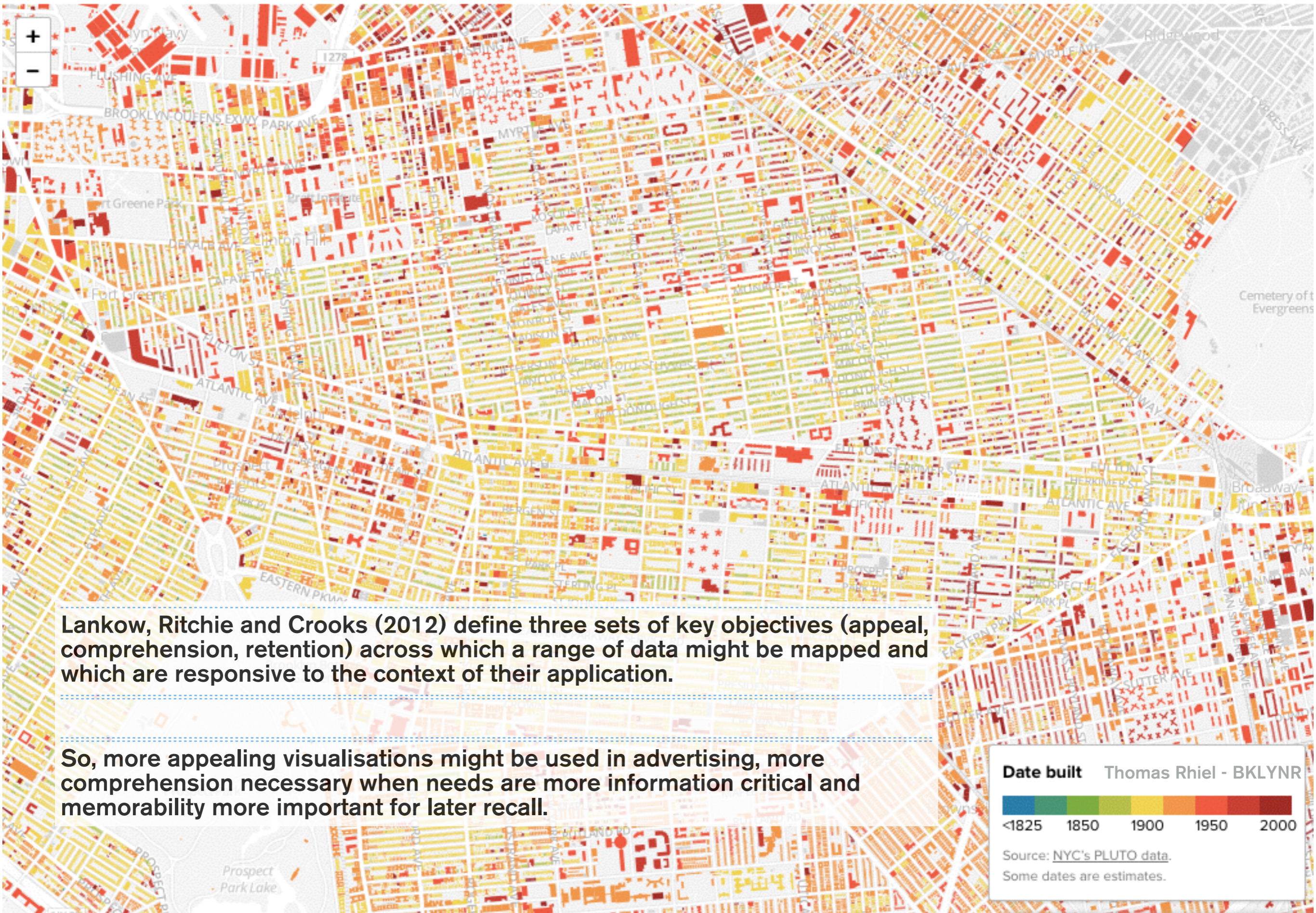


Workout: 18+ NikeFuel per minute for 30+ consecutive minutes

© 2014 Nike, Inc.

Ben Fry / Fathom  
2013 year in NikeFuel






Lankow, Ritchie and Crooks (2012) define three sets of key objectives (appeal, comprehension, retention) across which a range of data might be mapped and which are responsive to the context of their application.

So, more appealing visualisations might be used in advertising, more comprehension necessary when needs are more information critical and memorability more important for later recall.

**Date built** Thomas Rhiel - BKLYNR



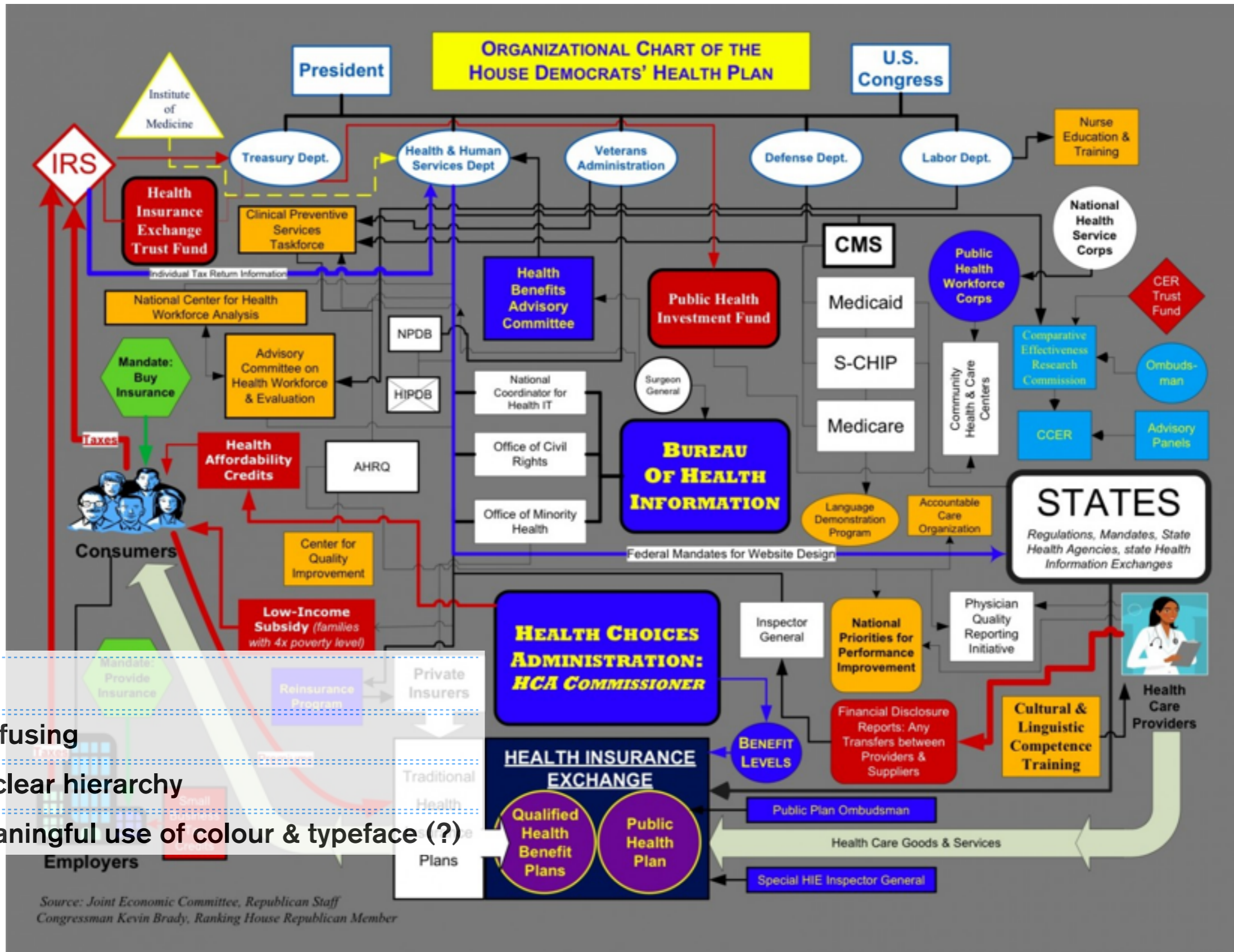
Source: NYC's PLUTO data.  
Some dates are estimates.



Is this activism?  
Is this doing good?



Angela Morelli. 'The Global Water Footprint of Humanity': 'a project that aims to visualize and make tangible the impact of human consumption on the natural water environment'; information design in the service of clearly communicating the consequences of non-sustainable practices



Bad

- confusing
- no clear hierarchy
- meaningful use of colour & typeface (?)





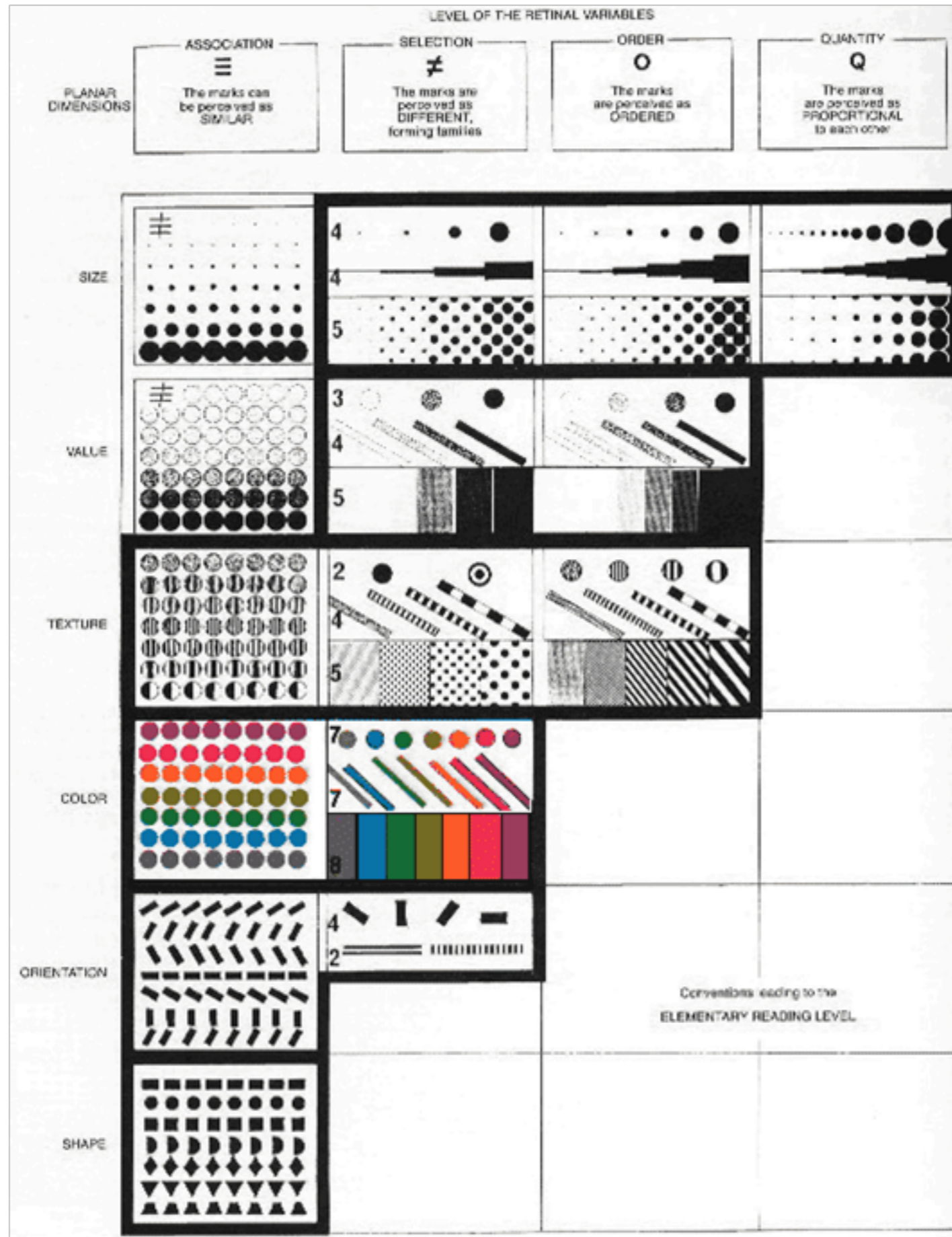
## A taxonomy for visualisation

### Bertin (1967) 'Semiologie Graphique'

#### Seven key variables

- size - communicates quantitative variation
- shape - expresses an identity and so, communicates similarity and difference
- value - of colour, communicates order or difference through 'tone'
- colour - again, difference but culturally and psychologically informed
- pattern - texture to differentiate or congregate
- position - signs in relation along an axis
- orientation - alteration around an object's centre





Bertin's Retinal Properties  
refined by William Cleveland





**What typography is / what typography does:**

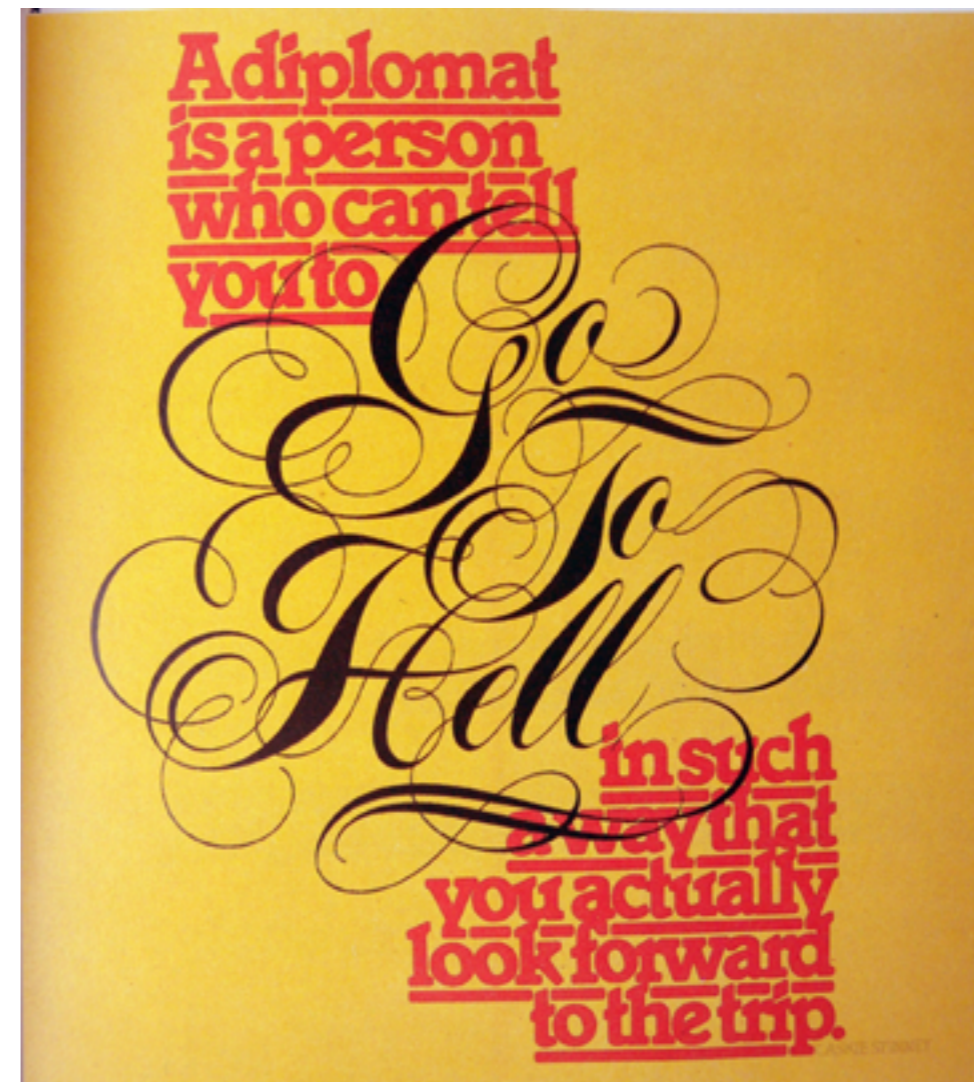
- affective [adding to the emotional impact of a message]
- informative [clarifying situations or experiences]
- decorative [in pattern, onto things]
- surprising [challenging our expectations]

**Makes meaning more meaningful**

Herb Lubalin



Anon

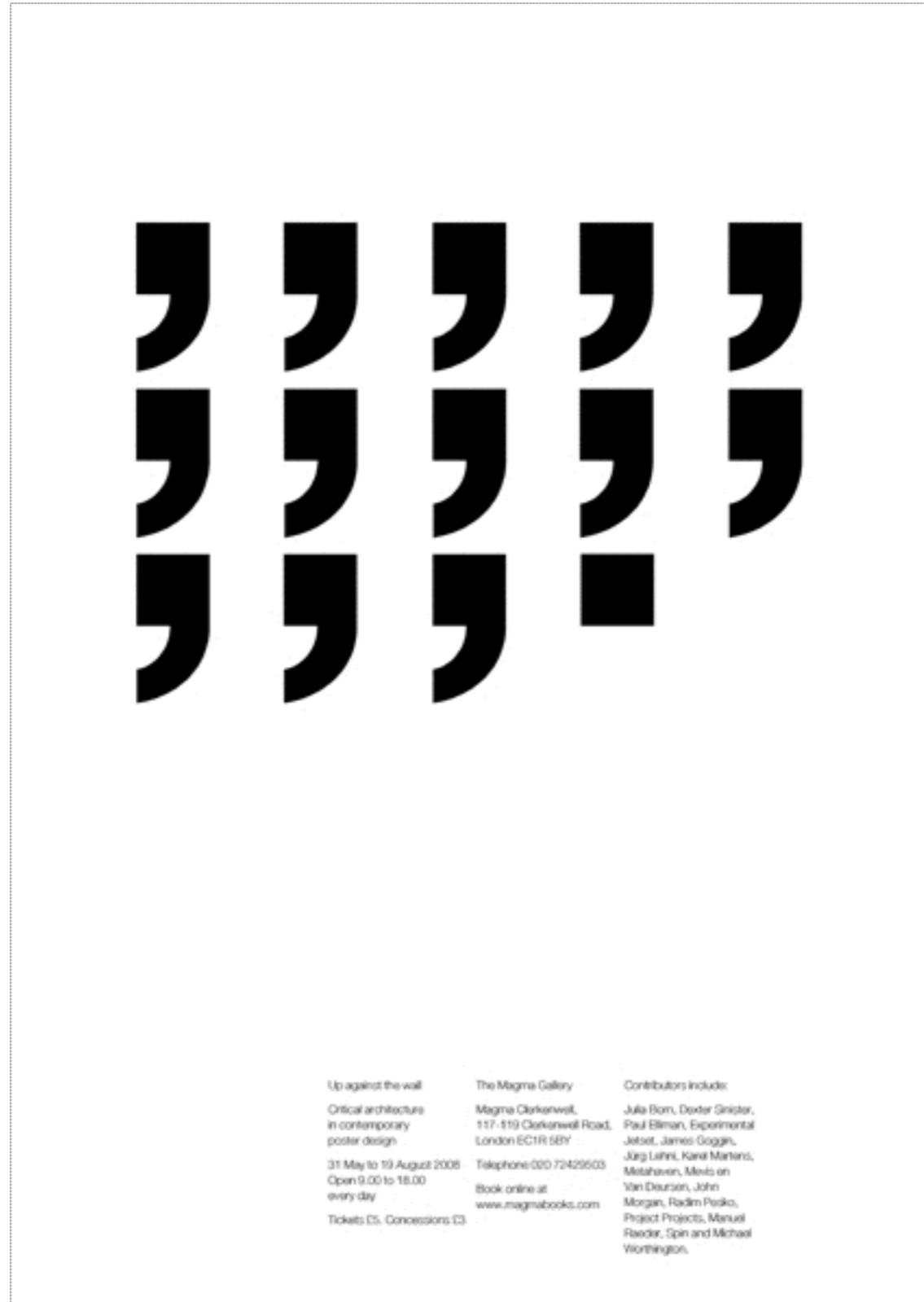


typeface selection





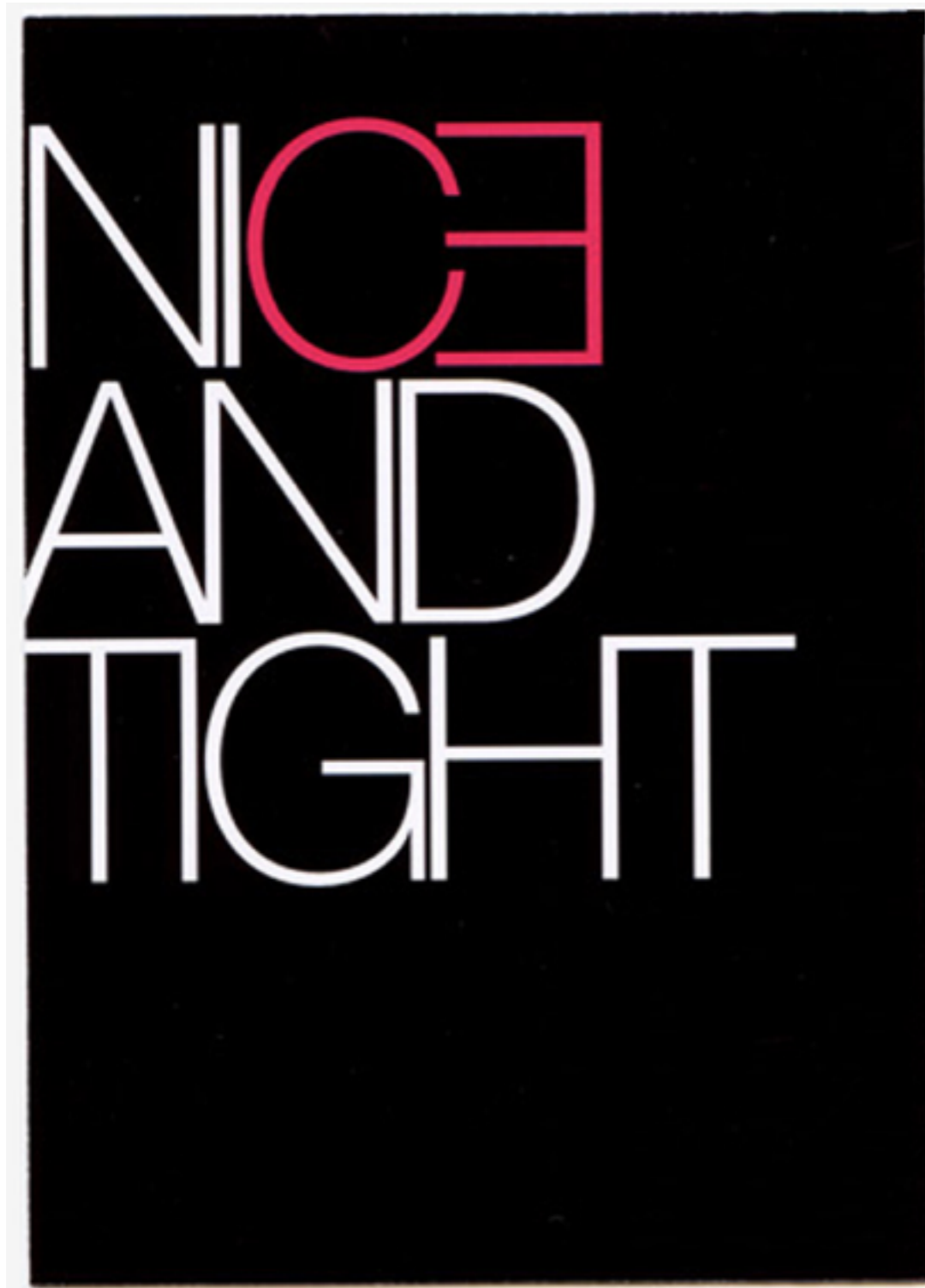
Scale and position of text



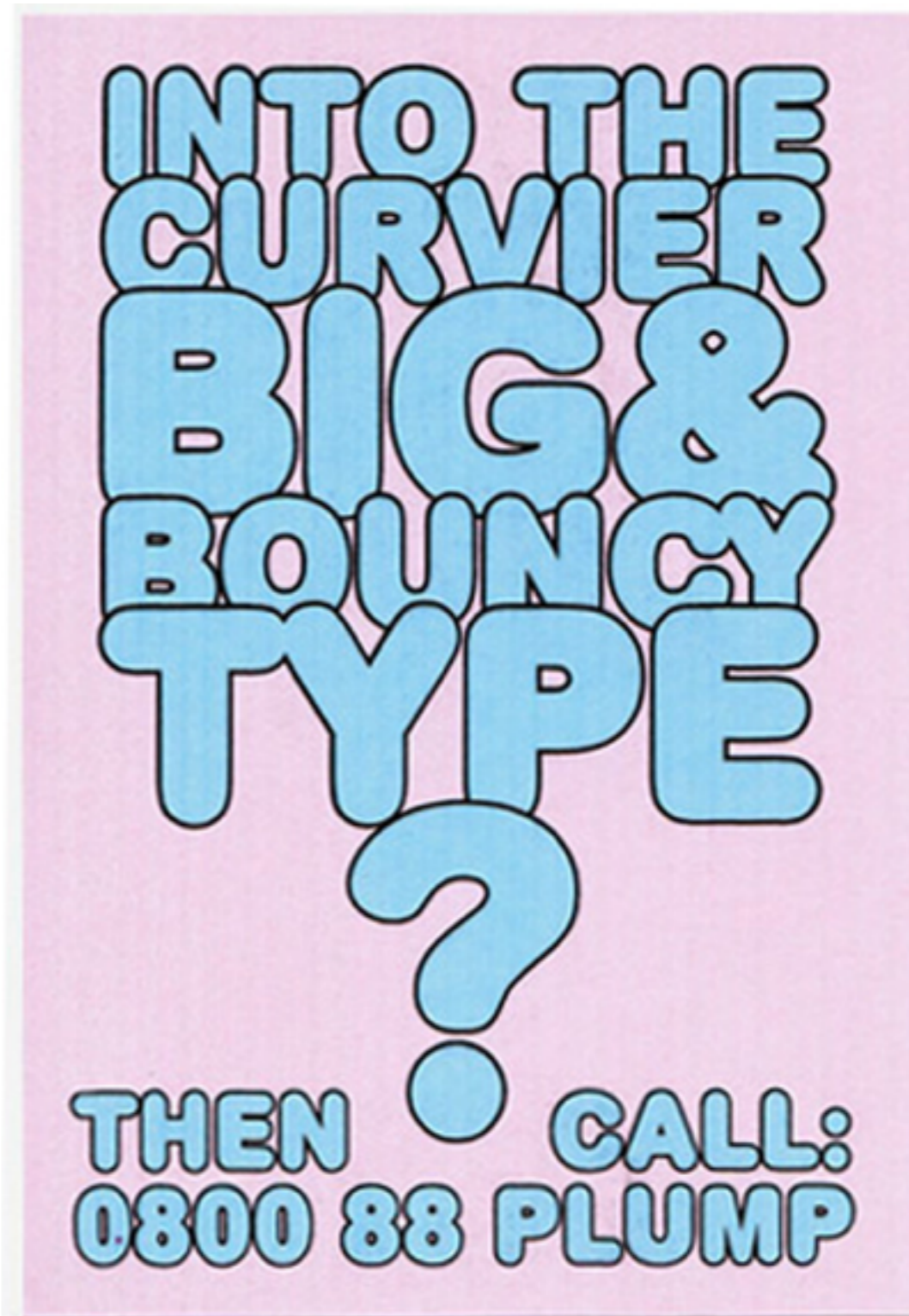
Anon



Duncan Bancroft



Peter Fletcher



Weight and colour of text



## **Typography as a tool for non-neutral graphic rhetoric -**

### **The Farage & Clegg flashcard experiment**

**'Double sided' responses: interrogating ideas of question, trust and emotion**

- **testing approaches - layout & composition - the semiotic gestalt**
- **relative emphasis and weight**
- **colour as categorisation and coding tool**
- **potential for graphic devices (marks, points etc.)**
- **as part of the process, alternate typographic strategies quickly passed over: being less 'designed' was deemed to work**



Is  
**this**  
**true**

How  
**does this**  
**affect**  
**me**

Can I  
**trust**  
**him**

Where can  
**I find**  
**more info**  
**on this**

Why  
**should**  
**I care**

What are  
**the pros**  
**and cons**  
of this  
**policy**



I believe in  
**this**

This is a  
**wrong**  
statement

He is  
**vague**  
&  
**avoiding**  
the question

I do not  
believe  
**this**

**Correct**

His response is  
**confident**  
&  
**precise**



I  
**love**  
it

This is  
**better**  
than I  
expected

I'm losing  
**interest**

This is  
**unnerving**

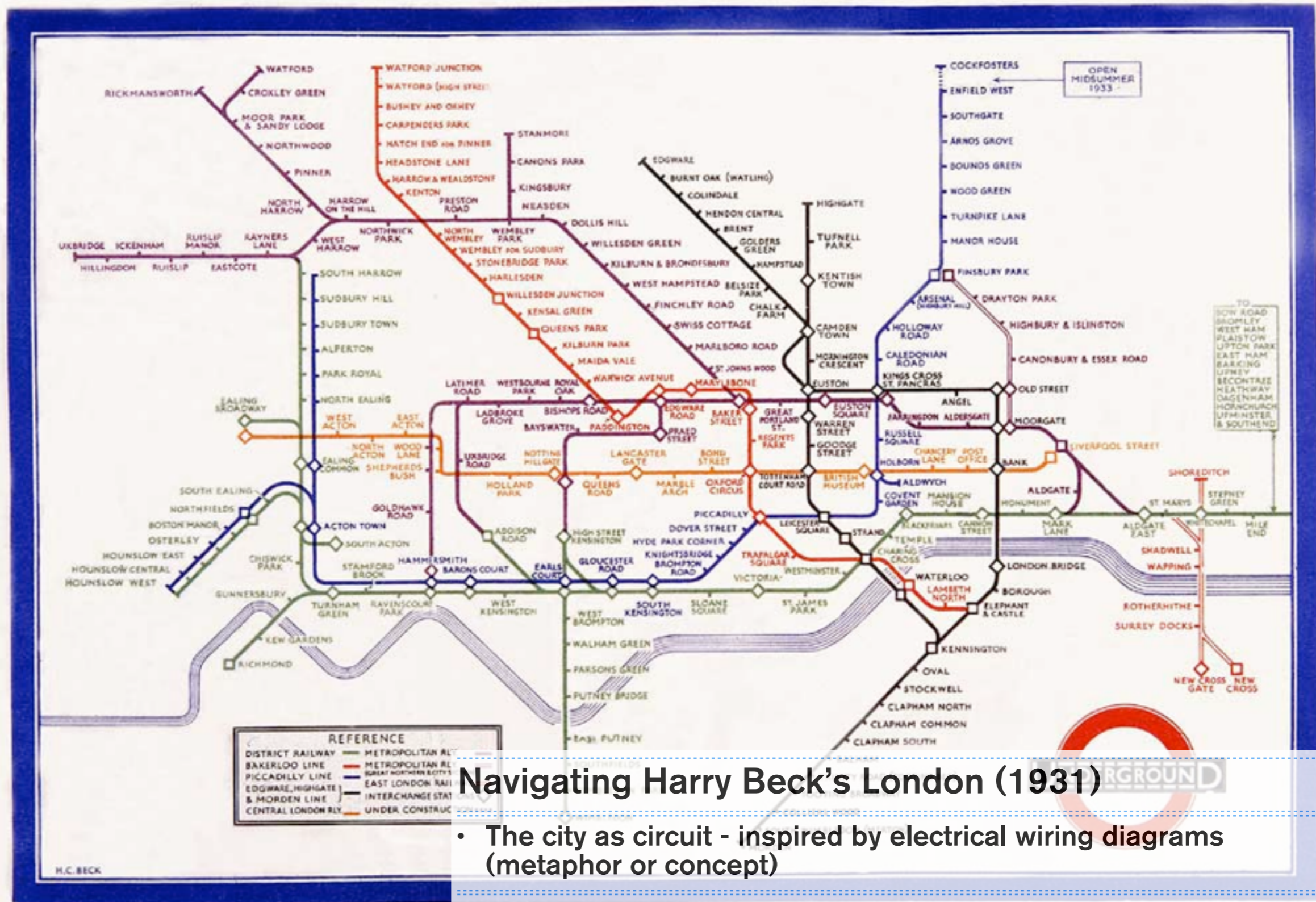
This is  
**so**  
**sad**

I would leave  
**the room**  
**now**  
if I could



Visualised stories - a place for space





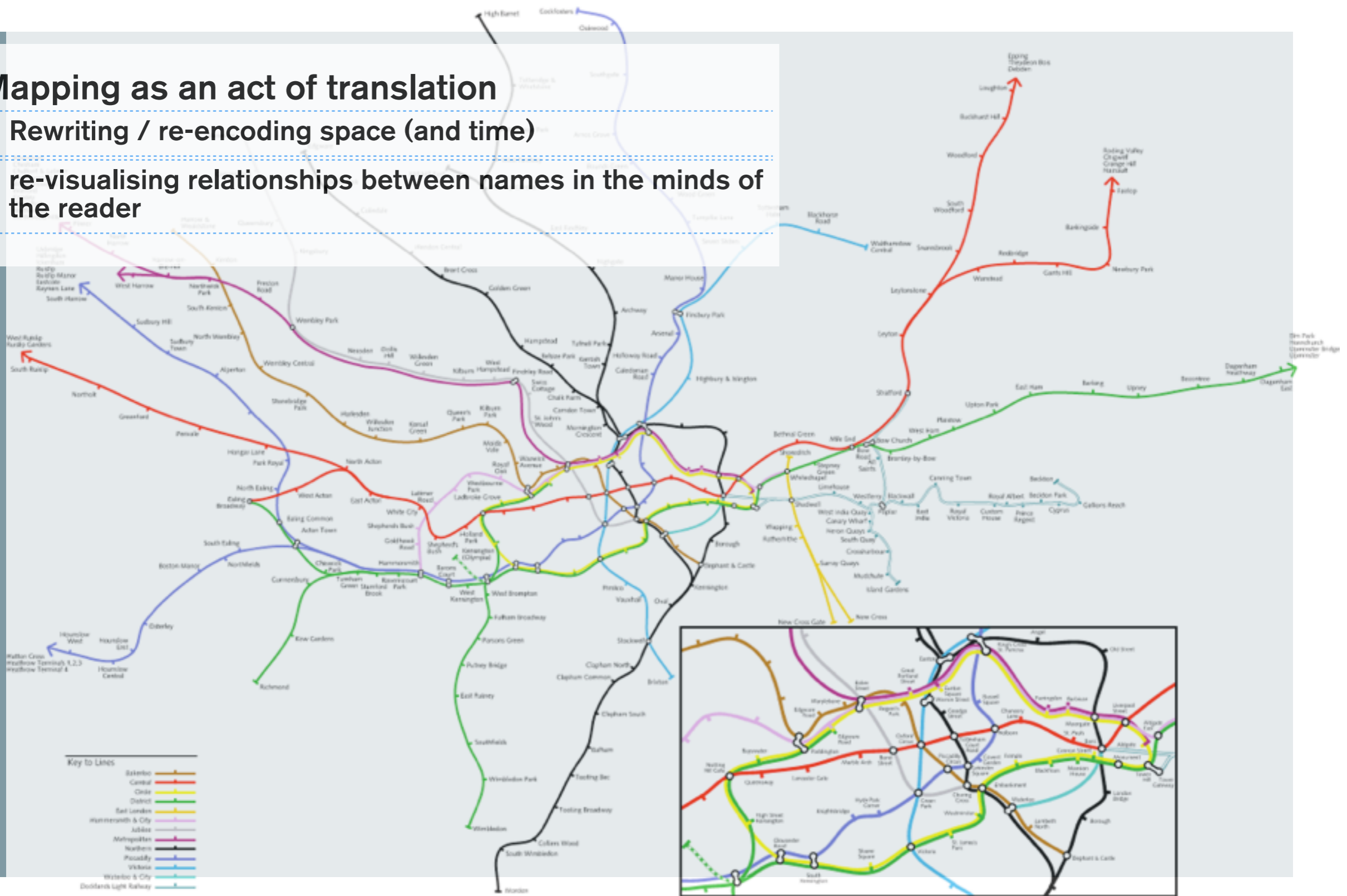
## Navigating Harry Beck's London (1931)

- The city as circuit - inspired by electrical wiring diagrams (metaphor or concept)
- no relationship to geography or overground landscape (abstraction)
- spatial relationships flattened out and equalised (simplification)



# Mapping as an act of translation

- Rewriting / re-encoding space (and time)
- re-visualising relationships between names in the minds of the reader





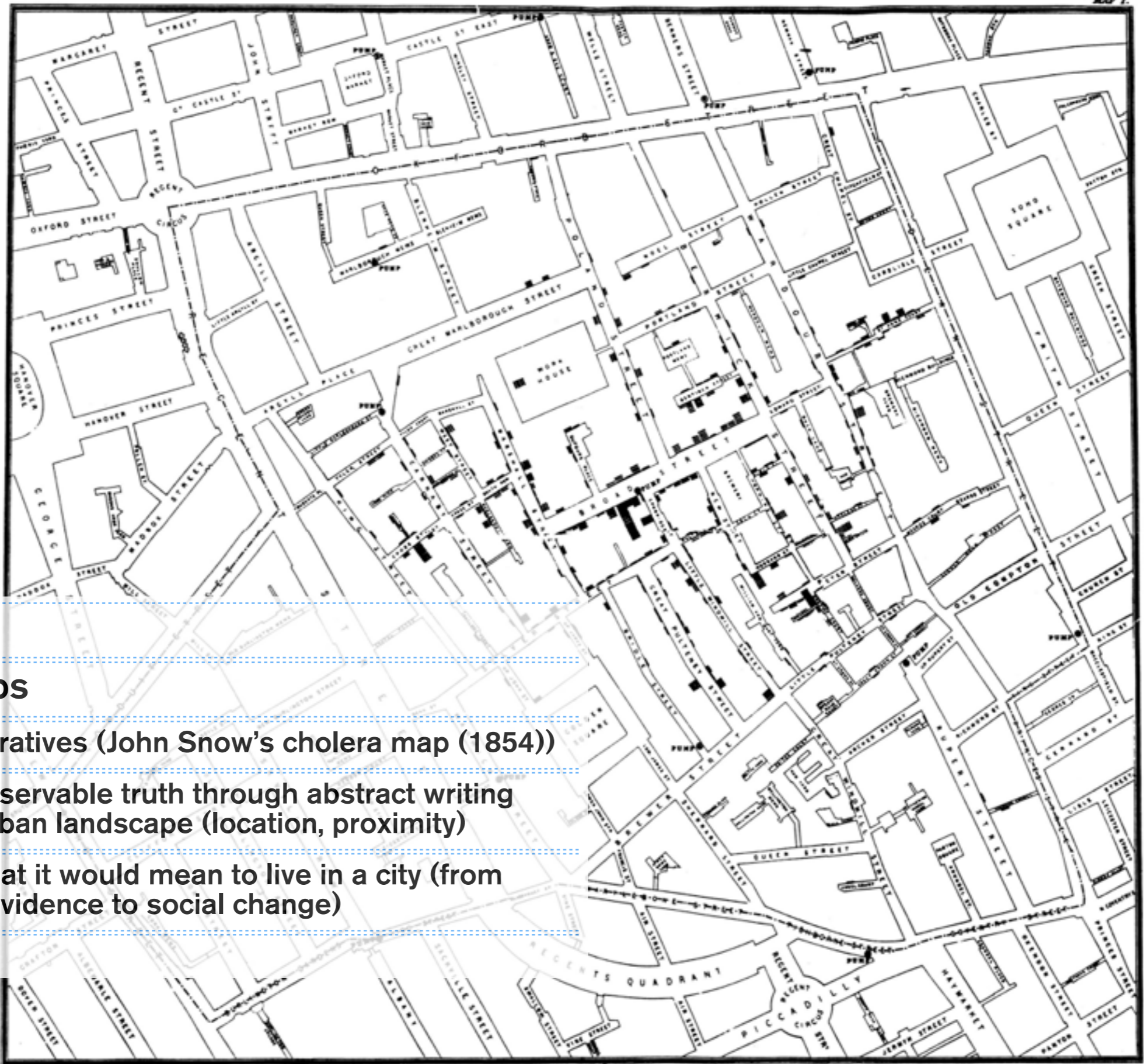


## Mapping an idea of wealth

- Writing histories and class onto new communities
- Charles Booth's poverty map (c.1889) responded to problems of urban deprivation
- the form of the map was used as a means to communicate stories, to geographically locate and visualise certain narratives via colour and geography
- part of a history that leads into the discipline of information visualisation - comparison, location etc.

The district of West Kensington; yellow signifies highest wealth, blue highest poverty





## Ghost maps

- Hidden narratives (John Snow's cholera map (1854))
- locating observable truth through abstract writing onto the urban landscape (location, proximity)
- rewrote what it would mean to live in a city (from insight to evidence to social change)



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## **Clarity vs agency - how clear is clear?**

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- **the rhetoric of neutrality (Kinross 1985) and designers' denial of 'visible persuasion'**
- **Kinross' argument studies the design of train timetables, the selection of typeface (one of many decisions in constructing design as a rhetorical device and significant in giving insight into context which has informed production - the dominance of Gill Sans (1920s to 1960s and Humanist typography - looking specifically at a commitment to the rational which can be traced to Modernism tied to the post-war technological boom:**
- **'ideological vacuums do not exist' within the cultures of material and visual production**
- **reflected in historical shifts and approaches to typography**



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## **Tufte's six principles of analytical design (2006) to 'assist thinking about evidence'**

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- **show comparisons, contests, differences**
  - **show causality, mechanism, systematic structure, explanation**
  - **multivariate analysis (show more than one or two variables)**
  - **integration of evidence (words, numbers, images, diagrams etc.)**
  - **documentation (all evidence must be thoroughly described)**
  - **content counts most of all (quality, relevance, integrity)**
- 

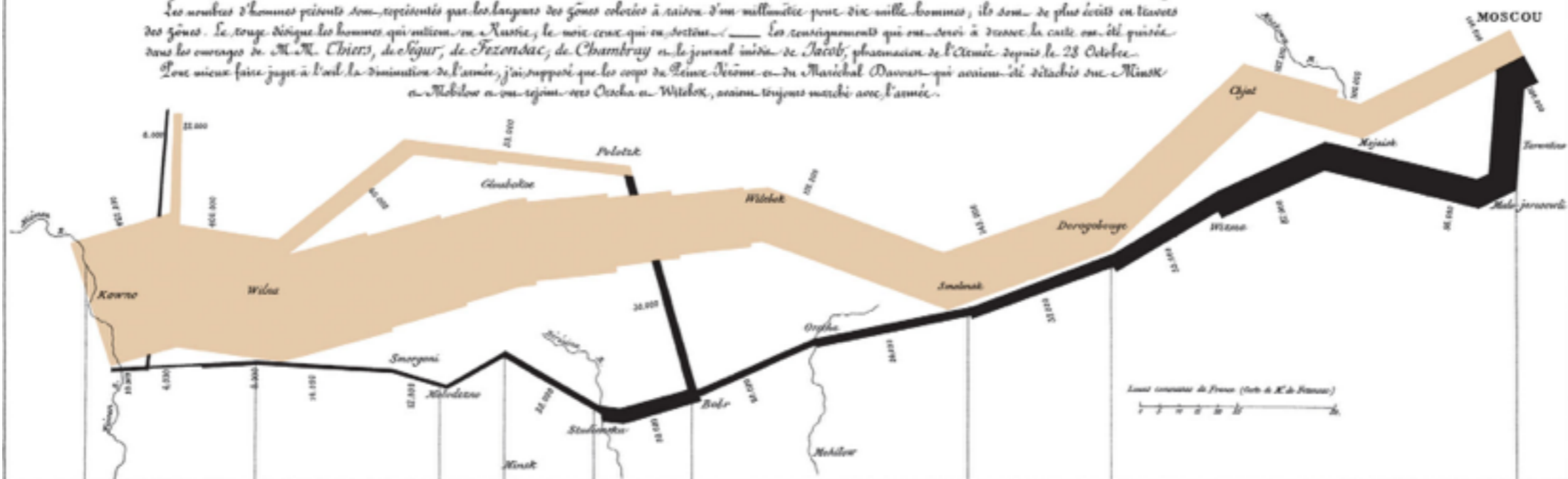
**A useful checklist for testing against future work?**

# Carte Figurative des pertes successives en hommes de l'Armée Française dans la Campagne de Russie 1812-1813.

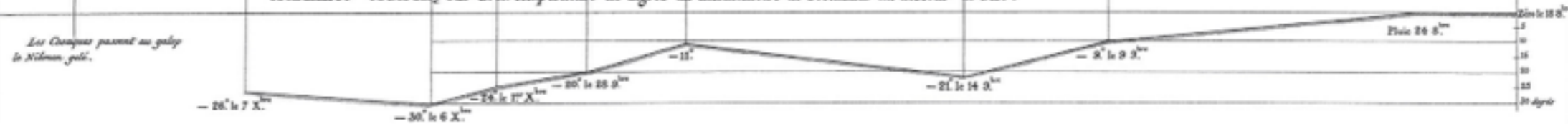
Recueillie par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les longueurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en traits des zones. Le rouge désigne les hommes qui militent en Russie, le noir ceux qui en sont retirés. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Chiers, de Légar, de Fozendac, de Chambray et le journal inédit de Jacob, pharaon de l'Armée depuis le 23 Octobre.

Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps de Prince Névou et du Maréchal Davout qui avaient été détachés sur Minsk et Mohilew n'en rejoignent pas Oucha et Witebsk, ainsi toujours marchés avec l'armée.



## TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



Imp. par Bachelier, à Paris, 17, rue de la Harpe.

Imp. par Bachelier et Borel.

Charles Minard's data map of Napoleon's invasion of Russia in 1812



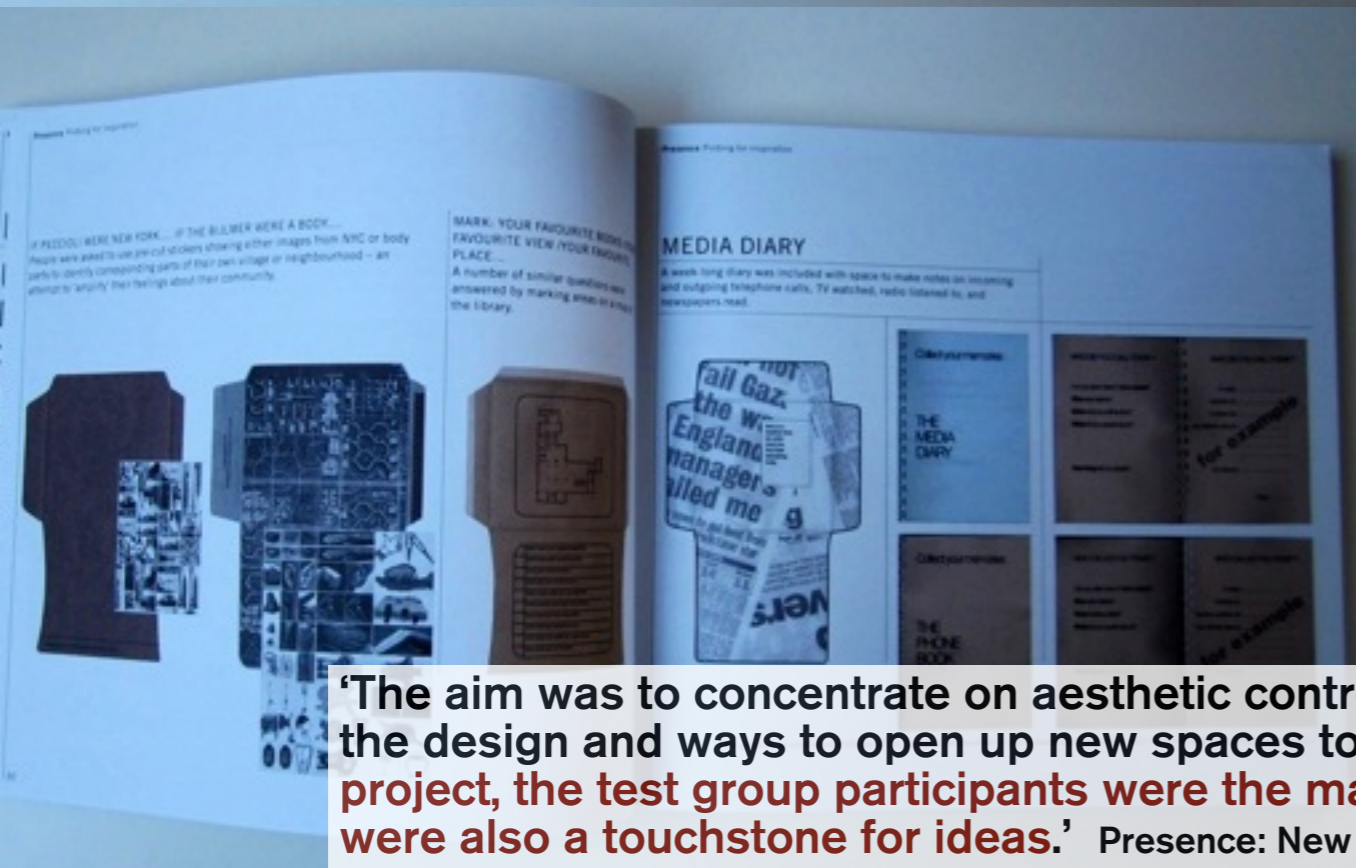
\*Eu-funded research project exploring social / demographic change (the growth of the 60+ population); to challenge stereotypes and to explore how new technologies can be used in homes and communities as lifestyles and social relations change



### Methods of engagement / 'data' collection: 'Probing for inspiration'

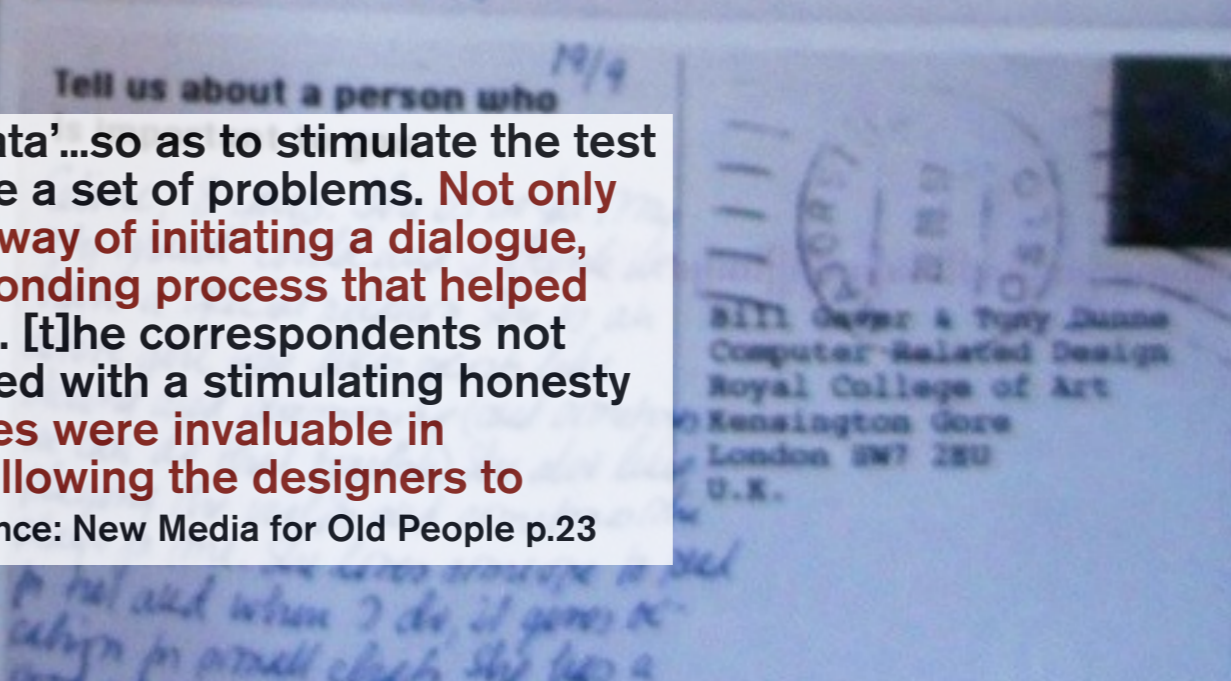
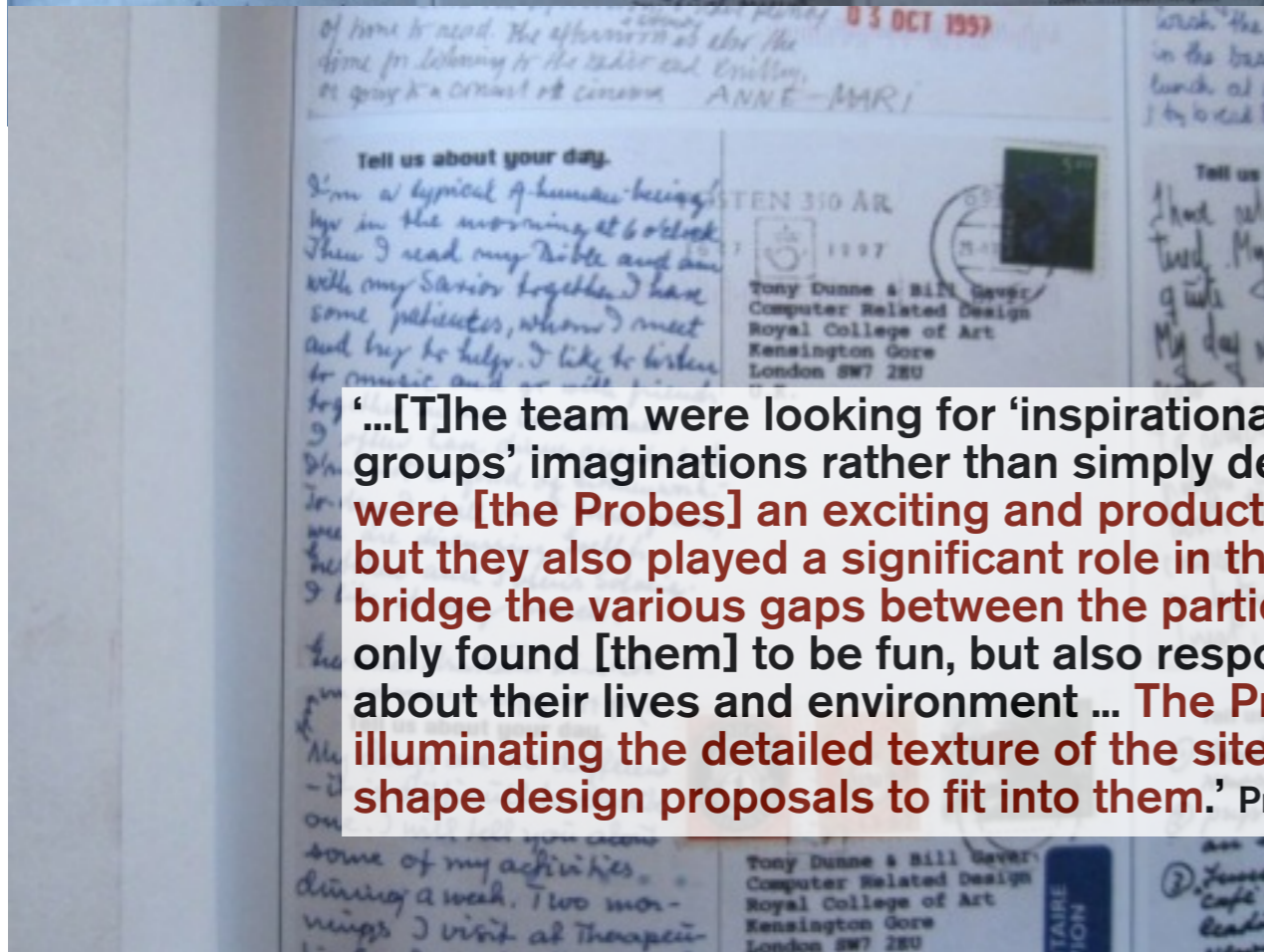
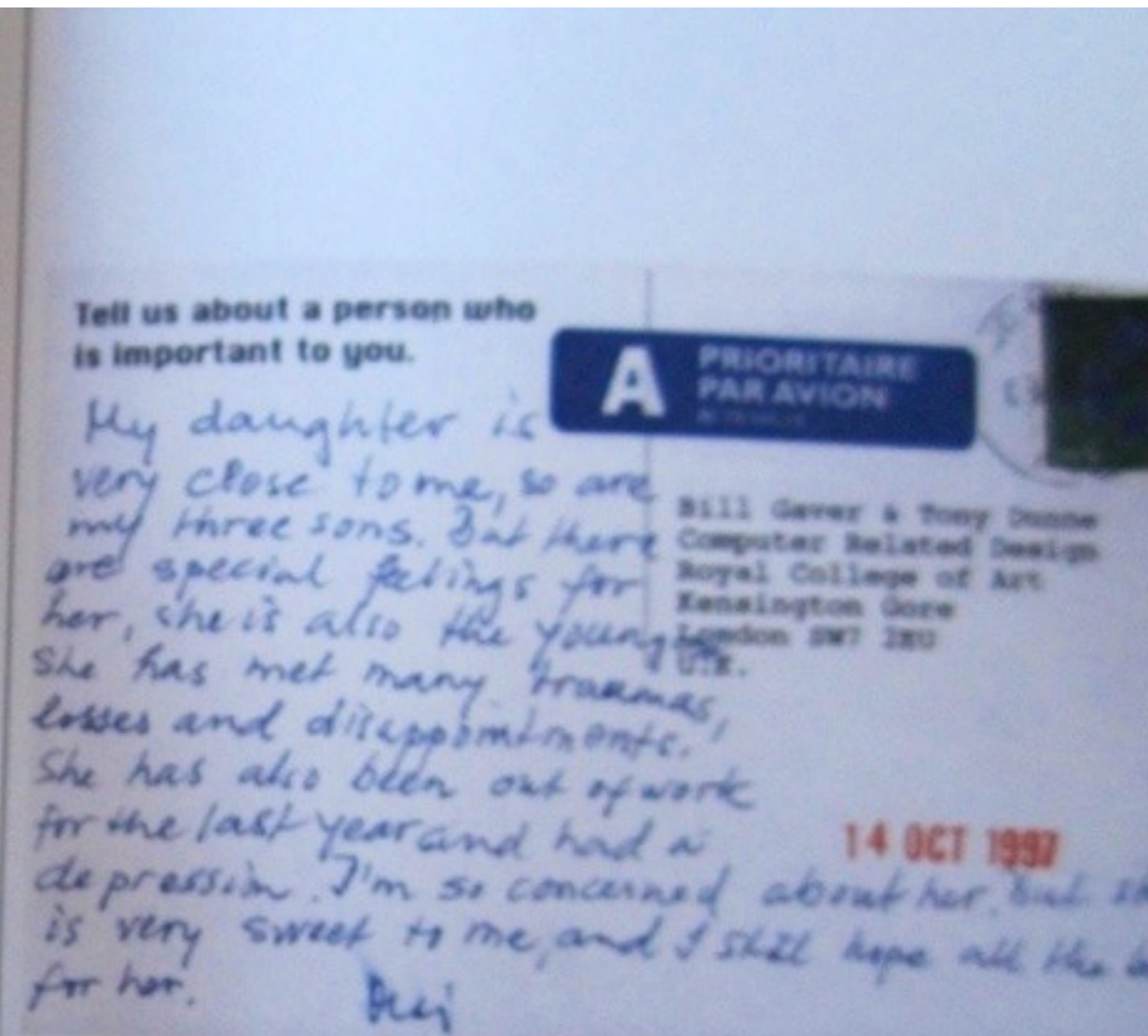
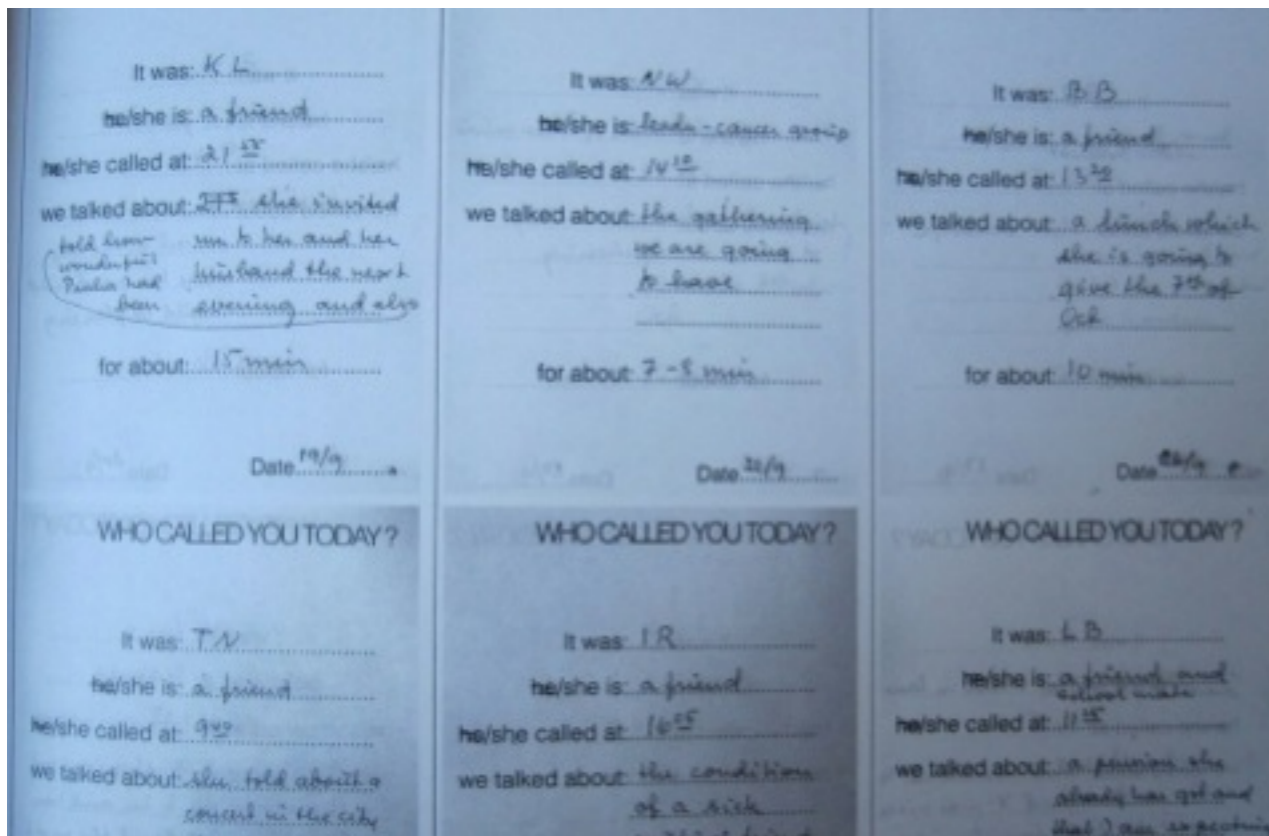
- the Presence project\* **utilised specific forms of user-centred research (the 'cultural probe') to elicit information regarding how new technology can be used;**
- three communities (Italy, Norway, Netherlands) were test sites, beginning initially with more traditional forms of ethnographic research methods;
- **design teams found that a more 'impressionistic' array of data would allow them to circumnavigate the two-dimensional stereotypes of the old;**
- a direct focus on the everyday was taken, where details of individual lives were surveyed using a set of 10 bespoke tools (120 maps, 200 postcards, 500 photographs, 25 albums plus media diaries)





**'The aim was to concentrate on aesthetic control, the cultural implications of the design and ways to open up new spaces to design ... [t]hroughout the project, the test group participants were the main source of inspiration and were also a touchstone for ideas.'** Presence: New Media for Old People p.23





‘...[T]he team were looking for ‘inspirational data’...so as to stimulate the test groups’ imaginations rather than simply define a set of problems. **Not only were [the Probes] an exciting and productive way of initiating a dialogue, but they also played a significant role in the bonding process that helped bridge the various gaps between the parties ... [t]he correspondents not only found [them] to be fun, but also responded with a stimulating honesty about their lives and environment ... The Probes were invaluable in illuminating the detailed texture of the sites, allowing the designers to shape design proposals to fit into them.** Presence: New Media for Old People p.23

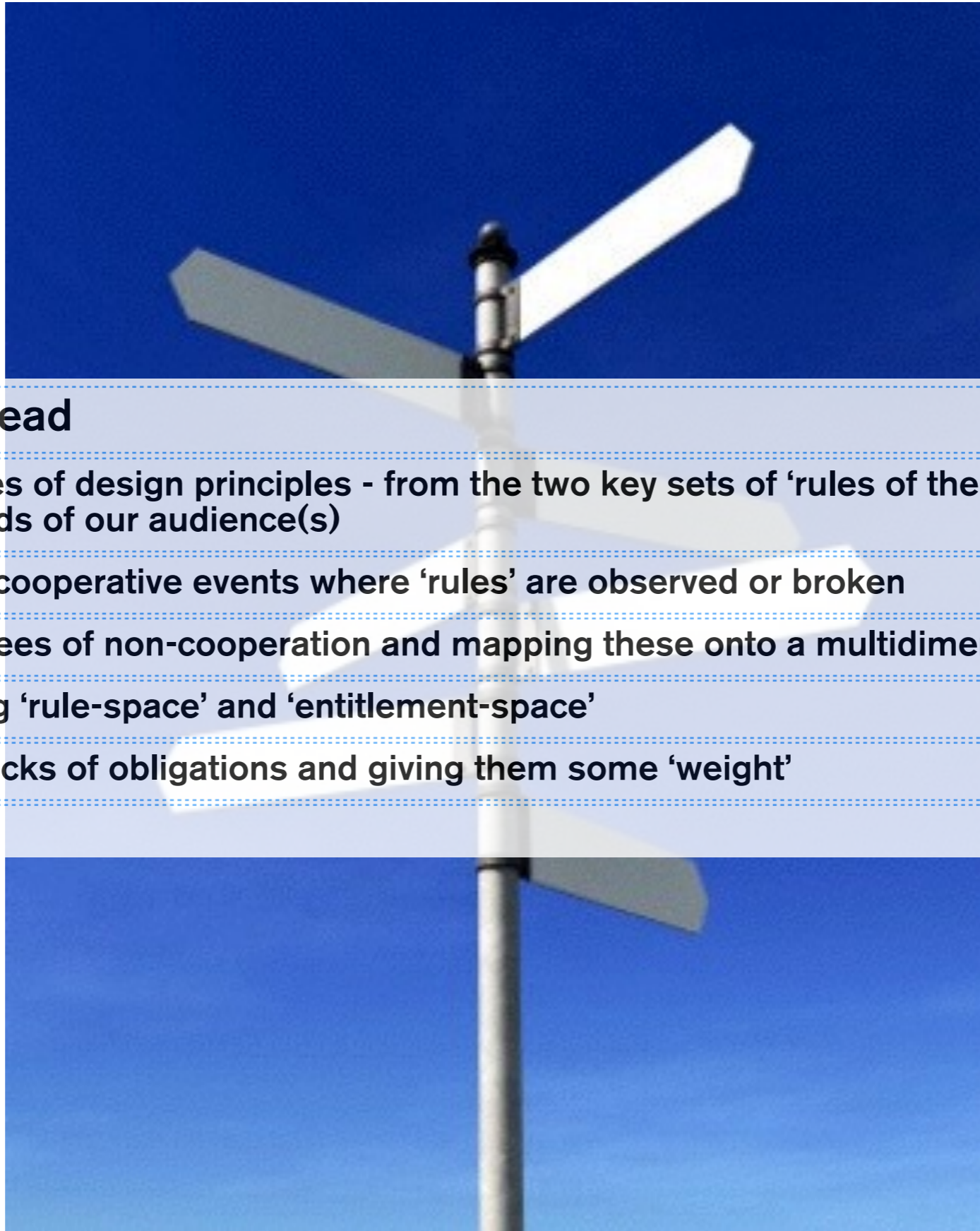


## Methods for making

what can design do for EDV project: adding value to the visualisation & doing good

- the design process is inherently iterative, so Grounded Theory might possess some relevant and useful approaches.
- Suchar (1997) and Konecki (2011) lay the foundations for a 'visual grounded theory' which can be developed (multislice imagining)
- visualising intangibles - a visible language which is affective and might be mapped against felt or experienced democratic entitlements reflecting degrees of engagement
- methods for analysis and testing - Verbal Protocol Analysis?
- Linked to a further refinement of the flashcards - where text and response may be enhanced and where sentiment and its communication can be readdressed - an app seems most likely
- some form of robust usability testing?





## Challenges ahead

- establish a series of design principles - from the two key sets of 'rules of the game' and the information needs of our audience(s)
- visualising non-cooperative events where 'rules' are observed or broken
- visualising degrees of non-cooperation and mapping these onto a multidimensional landscape
- cross-visualising 'rule-space' and 'entitlement-space'
- mapping the stacks of obligations and giving them some 'weight'





## To summarise

- design is vital in how we negotiate our engagement and relationships with the world
- design's power is often under-utilised or not acknowledged (embedded in one domain)
- visual communication aids understanding and has potential to help make sense of things
- Bertin and Tufte give insight into, and some control of, symbol systems for making meaning
- 'beauty as an added benefit' (Jason Fields)

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## Select Bibliography

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Berman, D. (2008) Do Good Design. New Riders

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Kinross, R. (1985) 'The Rhetoric of Neutrality' in Design Issues, Vol. 2:2 (Autumn) pp.18-30

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Maneesh, A. Wilmot, L. and Floraine, B (2011) Design principles for Visual Communication.  
Communications of the ACM

---

---

Johnson, S. (2008) The Ghost Map. Penguin Books

---

---

Rawsthorn, A. (2013) Hello World: Where Design Meets Life. Hamish Hamilton

---

---

Roberts, L. (2006) Good: an Introduction to Ethics in Graphic Design. AVA Publishing

---

---

Rock, M. (2004) 'Graphic Authorship'. Available at: [https://www.typotheque.com/articles/graphic\\_authorship](https://www.typotheque.com/articles/graphic_authorship). Accessed 24.07.2014

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Tufte, E. (2006) Beautiful Evidence. Graphics Press

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