

Graphs before graphics

## Visualisation and Presentation in Victorian Statistics

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*Visualisation and Presentation in Statistics* Open University  
Conference May 2011

### Why the Victorian period?

- For the first time there was a statistical scene
- This period has been more researched than later periods
- And time is limited...



## Branches of statistics

- **Vital statistics**—the best developed with more government money, more imaginative civil servants and links to an established discipline, actuarial mathematics
- **Economic statistics**—less official support but could be linked to a recognised discipline, political economy
- **Social statistics**—less of everything
- **Agricultural statistics?** Treated prices and volumes and a branch of economic statistics. What Rothamsted was doing from 1847 was **not** stats.

## Who did statistics

### Specialists—official statisticians

Statistical Dept of the Board of Trade (1834)

General Register Office (1836)

### Occasionals

Free lance writers

Journalists—outlets include *Lancet* (1823),  
*Economist* (1843), *Nature* (1869)

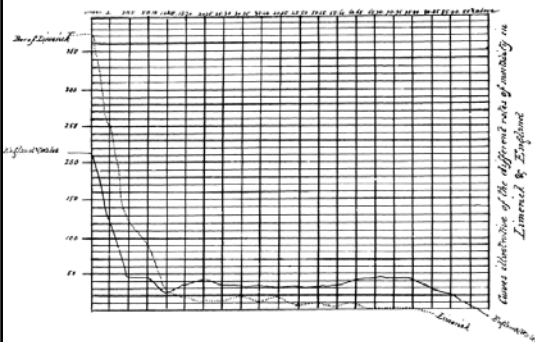
A few academics

Came together in the Statistical Society of London

## And for whom

- Fellow enthusiasts—statisticians
- The educated reader
- Civil servants
- Politicians
- Voters

## The first diagram in the *Statistical Journal* 1841: amateur and professional cooperate



Deaths at different ages: the poor in Limerick and everybody in England and Wales

- Dr Daniel Griffin of the Limerick Literary and Scientific Society
- Collected data
- Compared his results with the GRO
- Contributed this one paper

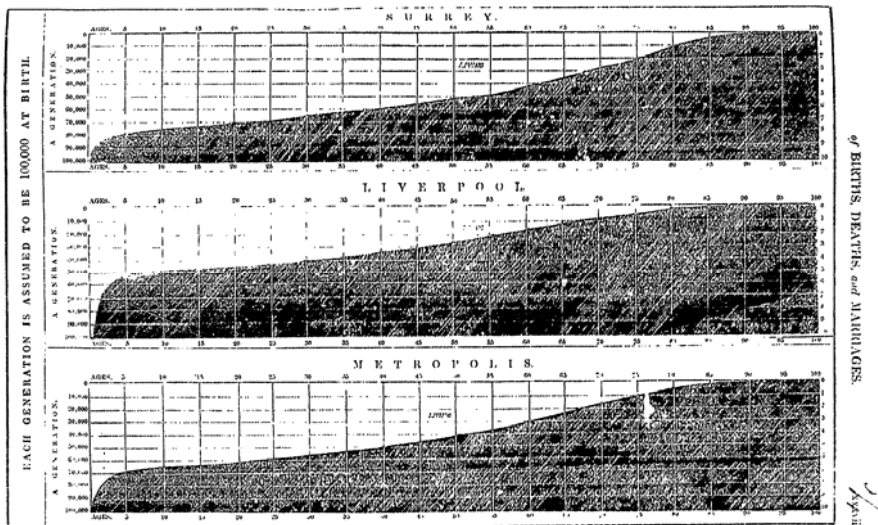
# Statistical man and machine: Farr and the GRO



William Farr (1807-83)  
GRO from 1837-80

- The common fare mainly came from the GRO— information on births, deaths, and marriages
- But Farr was a visualiser on occasion

## Depicting death in the 1843 Report



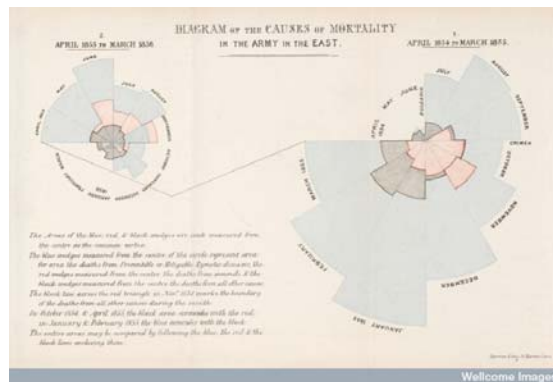
# Specials



Temperature and mortality of London (1830-40)

- Farr used graphics in special reports
- Reports on cholera epidemics in 1848 and 66
- Report on the Crimean war 58/9

# Campaign and aesthetics: Florence Nightingale and the Crimean war



Army sanitation was not the only campaign--Nightingale to Farr "statistical aesthetics lagged behind the progress of numerical statistics and languished in a state like that of the fine arts before Cimabue."

## “few people read Blue Books”

3 versions for 3 audiences

- Nightingale’s evidence to government inquiry
- Publication of the text as a book
- *England and her Soldiers* written by journalist Harriet Martineau to “extend the knowledge of the case” among the public”

Diagrams in all three—but the effect is unclear.  
Like Farr’s diagrams they disappeared.

## Economic statistics

- **Great past**

Political arithmetic of C17 and C18

Graphics of William Playfair’s (1759-1823)

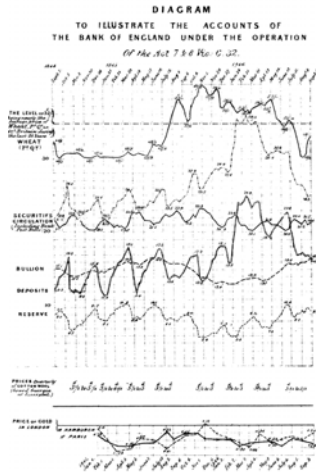
*Commercial and Political Atlas* (1786)

- **Not to so great present**

The Board of Trade operation did not compare with GRO and George Porter did not compare with Farr

Private ventures more important

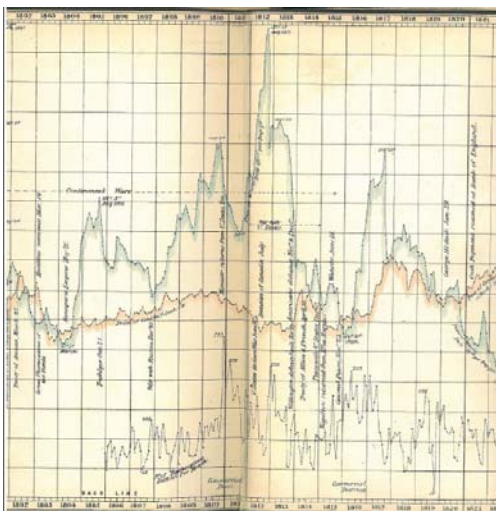
## The first economic diagram in the *Statistical Journal* 1847



- Financial journalist John Towne Danson traces developments since the 1844 Bank Act
- Pretty much **the diagram** of economic statistics
- In fact **the diagram** of Victorian statistics



## Jevons's statistical atlas 1860

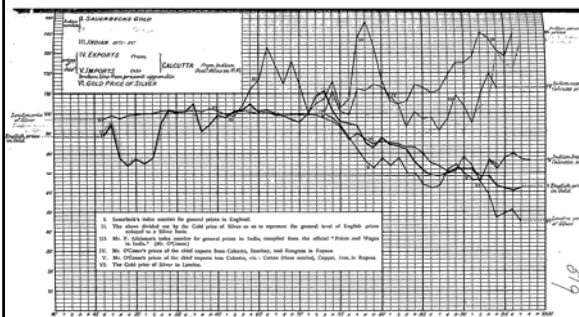


- W. Stanley Jevons, would-be free lance writer, constructed an atlas of 30 diagrams
- The atlas made visible patterns in individual series and relations between series
- Jevons published only two plates

# Reactions

- William Newmarch a businessman and the leading economic statistician looked “without interest & almost without a word”
- There were more favourable reactions and Jevons projected a volume for merchants but did not carry it out
- He became a professor of political economy though he used diagrams in his publications

## The committee on Indian currency takes evidence



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Marshall's evidence to the committee on Indian currency  
1889

- Alfred Marshall was the leading late-Victorian economist
- His evidence to the committee on Indian currency 1889 included this diagram
- Similar diagrams were presented by other witnesses and by the India Office

## Abroad—a golden age of graphics?



Fig. 10. TRAFIC DES CHEMINS DE FER ET MOUVEMENT DE LA NAVIGATION DES PORTS EN FRANCE



Emile Levasseur

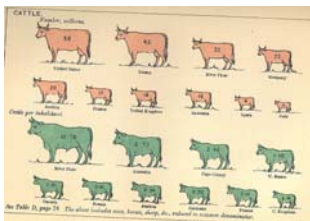
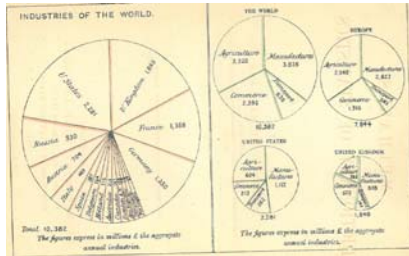
- Levasseur described “La Statistique graphique” in the SSL Jubilee Volume in 1885
- Graphical methods are “très profitable aux études statistiques et surtout à la vulgarisation de leurs résultats.”

## International differences

- “The English statistical mind seems to have turned to the graphic method more for purposes of analysis and discovery than for the purpose of popularizing official statistics in the manner of the graphic atlases of France, Germany and the United States” Funkhouser
- But there was private enterprise popularisation in England

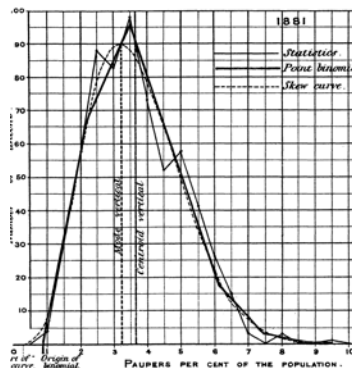


## Vulgarisation in England: Mulhall's *Dictionary* 1884-1894



- Michael Mulhall 1836-1900 statistical journalist.
- Used pie charts and pictograms
- His pictograms were ridiculed by professionals: de Foville  
“the births might be represented by cradles, the marriages by bouquets and wreaths of orange blossom, and the deaths by coffins.”

## New real statisticians—new diagrams



Yule: History of Pauperism treated by the Method of Frequency-Curves  
JRSS 1896

- Usual English reaction to statistical pictures--“Real statisticians” do not need them!
- But the idea of a real statistician was changing
- Karl Pearson gave his students a scientific training which included making diagrams
- The students took the diagrams into statistics

## Victoria beginning to end: statisticians begin to become professionals

- Farr was a doctor and medical journalist, Porter a merchant. Later Robert Giffen worked as a journalist and a civil servant
- At the very end university training for statisticians was beginning
- **Though** the Royal Economic Society was arguing **in 1944** that statistician is not a very “definite” term

## Changing presentations?

- The *Elements of Statistics* (1901) by a new specialist Bowley has 50 pages on the “graphic method”—mostly about time series plots
- The visual invention of the mid-century special did not become routine
- The South African War had its own statistical debacle—the unfitness of the recruits—but it generated no new diagrams.

## Literature and history links

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- Maas, H. (2005) *William Stanley Jevons and the Making of Modern Economics*, Cambridge University Press
- [Materials for the History of Statistics](#)
- [Figures from the History of Probability and Statistics](#)