Two Images from the Infinity - of the Mandelbrot set.
Journey to Work flows of over 10 people between wards from the 10% sample
The Changing Distribution of Housing by Price, Attributes and Sales, 1983-1987

The area of the branches is in proportion to 5x the total housing inflation by each set of attributes, in each constituency.
Migration Flows Between all Regions in 1976

Black circle for inflow, grey for outflow,
Circle size and line width in proportion to absolute numbers of migrants.

Flows sorted by contiguity order.

32% of all migrants included - 1,352,520 people.

Flows of more than 0.2% of the geometric mean for the resident populations of the areas of origin and destination are drawn as thin lines.
The Changing Distribution of Age & Gender in Britain 1971-1981
Quartile Rates by Enumeration District of:

Female
Old
All Three
Young

The constituencies are coloured in proportion to the votes cast for the three major parties.

The constituencies are coloured in proportion to the votes cast for the three major parties.
The Distribution of Employment by Industry, Status & Gender, 1987.

The area of the blocks is in proportion to the number of jobs in each sector, in each constituency.
Stills from an Animation of the Computer

Surfaces lit using conventional polygon shading
Stills from an Animation of the Computer

Surfaces lit by ray-tracing techniques.
Ray-Traced Surfaces of the Mandelbrot and Julia Sets.
Grey shades of shadow and light.
Visualizing Fourier Transforms
The art in the science.
A Maze of Colour

The detail a low resolution image can show.
Visualization of the
Mandelbrot Set
One dimensional chaos
Travel Time from the Tyneside Road Network
Buffering of the main routes to show areas of accessibility.
Alternative Three Colour Schemes and Keys.
Cubes, Circles & Triangles

Circle showing all 64 colours from the red-yellow-blue (orange-green-purple) space.

Cubes each showing 37 of 64 colours from the red-green-blue (yellow-cyan-magenta) space.

Triangles showing all 36 colours from an alternative red-yellow-blue space.
The Concentration of Place of Birth in Britain 1981

Quartile Levels by Enumeration District of:

England, Scotland, Wales

By Ward
The Distributions of Population, Age, Gender & Children in London 1981
Quartile Levels by Enumeration District
The Distributions of Place of Birth in London 1981
Quartile Levels by Enumeration District
The Distributions of Employment, Occupation & Graduates in London 1981
Quartile Levels by Enumeration District

Group of Greatest Increase in Ward by Employees:

- Agriculture
- Energy & Water
- Manufacturing
- Construction
- Distribution
- Transport & Banking
- Communication
- Other Services

Group of Greatest Decrease in Ward by Employees:

- Agriculture
- Energy & Water
- Manufacturing
- Construction
- Distribution
- Transport / Banking
- Accommodation
- Other Services

The area of the blocks is in proportion to the number of jobs gained or lost in each sector, in each constituency.

The arrows show the direction, magnitude and background to the changes.
The arrows show the direction, magnitude and background to the changes.
The Distribution of Voting Composition in the 1987, 1988 and 1990 British Local Elections

Proportion of the Vote by Ward of:

Liberal / Alliance

Labour

Conservative
Land Use in Britain by 1km$^2$ grid

- Urban
- Agriculture
- Open Land
- Woodland
- Moorland
- Upland
- Inland Water
Scotland

Level II European Regions

Annotated base map, shaded by the 1981 unemployment rate.
Counties and Scottish Regions

Annotated base map, shaded by the 1981 unemployment rate.
Scotland

Family Practitioner Committee Areas

Annotated base map, shaded by the 1981 unemployment rate.
Local Education Authorities
Annotated base map, shaded by the 1981 unemployment rate.
"Functional" Cities
Annotated base map, shaded by the 1981 unemployment rate.
Local Labour Market Areas

Annotated base map, shaded by the 1981 unemployment rate.
"Travel To Work" Areas
Annotated base map, shaded by the 1981 unemployment rate.
Local Government Districts
Annotated base map, shaded by the 1981 unemployment rate.

Created 1991 For very high resolution and vector format files of these scans
Published 2012 Please see http://www.dannydorling.org/books/visualisation/
Parliamentary Constituencies

Annotated base map, shaded by the 1981 unemployment rate.
Amalgamated Office Areas

Annotated base map, shaded by the 1981 unemployment rate.
Postcode Areas
Coloured at random.
Postcode Districts
Coloured at random.
Postcode Sectors

Coloured at random.
British Mainline Rail Network

Equal Area Projection
British Mainline Rail Network

Equal Population Projection
British Primary
Road Network
Equal Population
Projection
Experiments with Area Cartograms
Initial results using simple techniques and machines.

Population Cartogram for the Counties and Regions of Great Britain

C.A.M + Panic
Lorenz curve above
Gini coeff. below

1981 General Election Results on the Embryonic Constituency Cartogram

Cartogram grown by cellular automata.
Continuous Area Cartograms of the British Population. Illustrations of the results of applying different constraints.
County Boundaries

Showing bridges which maintain ward contiguity.
The Evolution of a Cartogram of Population by County
County Cartogram

1981 Resident Population, arrows represent topology.
Local Authority District Cartogram
1981 resident population, arrows represent topology.
Parliamentary Constituency Cartogram

1981 resident population.
Census Wards

(1981 Resident Population)
The Concentration of Unemployment by Ward (1981)
The Distribution of Unemployment by Ward (1981)
Counties and Scottish Regions
On the Enumeration District 1981 resident population cartogram.
Enumeration District Population Cartogram

Showing County and Inner London Boundaries, with District centres labelled.
1981 Equal Population Grid Squares

From Smoothed Enumeration District Cartogram 30,000 people squares
1981 Population
Enumeration District
Cartogram

Showing
Smoothed 100km²
National Grid Squares
The Changing Distribution of Total Population in Britain 1971-1981

Rates by Enumeration District

- Below Median
- Above Median
The Distribution of Age & Gender in Britain 1981

Quartile Levels by Enumeration District of:

- Female
- Old
- All
- Three
- Young
The Concentration of Age & Gender in Britain 1981
Quartile Levels by Enumeration District of:

By Ward
The Distribution of Children by Age in Britain 1981

Quartile Levels by Enumeration District of:

0 to 4
5 to 9
10 to 14

All Three
The Distribution of Place of Birth in Britain 1981
Quartile Levels by Enumeration District of:

England
Scotland
Wales
All Three
The Distribution of Place of Birth in Britain 1981

Quartile Levels by Enumeration District of:

Africa
Ireland
All Three

Asia
The Concentration of Place of Birth in Britain 1981
Quartile Levels by Enumeration District of:

By Ward
The Distribution of Employment in Britain 1981
Quartile Levels by Enumeration District of:

Unemployed

Working

All

Truce

Inactive
The Concentration of Employment in Britain 1981
Quartile Levels by Enumeration District of:

By Ward
The Distribution of Occupation in Britain 1981

Quartile Levels by Enumeration District of:

Supervised
Professional
All Three
Intermediate
The Concentration of Occupation in Britain 1981
Quartile Levels by Enumeration District of:

By Ward
The Distribution of Graduates in Britain 1981
Quartile Levels by Enumeration District of:

Female aged < 60 and not Employed

All Degrees

Employed

All Three
The Distribution of Housing Price in Britain 1983.

Continuous Mean Price by Ward of:

£ 83,300
£ 43,353
£ 38,417
£ 35,045
£ 32,481
£ 30,303
£ 28,575
£ 27,176
£ 26,012
£ 24,824
£ 23,686
£ 22,528
£ 21,413
£ 20,160
£ 18,518
£ 15,797
The Distribution of Voting in the 1987 British General Election

Quartile Levels by Constituency of:

- Alliance
- Labour
- Conservative
The Map of Voting in the 1987 British General Election
Quartile Levels by Constituency of:
Alliance
Labour
Conservative
The Distribution of First Placed Parties in the 1987 British General Election

Constituency Winners:

Conservative
Labour
Alliance
Nationalist
Other
The Distribution of Second Placed Party in the 1987 British General Election

Constituency Loosers:

Conservative

Labour

Alliance

Nationalist

Other
The Distribution of Non-Voting in the 1987 British General Election

Continuous Scale by Constituency of:

Low to High
The Distribution of Voting Composition in the 1987 British Local Elections

Proportion of the Vote by Ward of:

- Liberal / Alliance
- Labour
- Conservative
The Changing Distribution of Place of Birth in Britain 1971-1981
Quartile Rates by Enumeration District of:

England
Scotland
Wales

All Three
The Changing Distribution of Place of Birth in Britain 1971-1981
Quartile Rates by Enumeration District of:
The Changing Distribution of Employment in Britain 1971-1981

Quartile Rates by Enumeration District of:

Unemployed
Working
All Three
Inactive

(on 1981 Amalgamated Office Area population cartograms, scale indicating deviation from space/time independence.)

(on 1981 County population cartograms, scale indicating deviation from space/time independence.)

- 50% under
- 10% under
- 0%
- 10% over
- 50% over
The Changing Distribution of Occupation in Britain 1971-1981

Quartile Rates by Enumeration District of:

- Supervisor
- Professional
- Intermediate
- All Three

Continuous Mean Price Inflation by Ward of:

-16.4%  -7.8%  -2.8%  1.0%  4.0%  7.0%  9.6%  12.4%  15.3%  18.3%  21.7%  25.8%  30.6%  37.3%  49.9%

Continuous Mean Price Inflation by Ward of:

Continuous Mean Price Inflation by Ward of:

-16.4 %
-7.8 %
-2.8 %
1.0 %
4.0 %
7.0 %
9.6 %
12.4 %
15.3 %
18.3 %
21.7 %
25.8 %
30.6 %
37.3 %
49.9 %

Continuous Mean Price Inflation by Ward of:

- 49.9%
- 37.3%
- 30.6%
- 25.8%
- 21.7%
- 18.3%
- 15.3%
- 12.4%
- 9.6%
- 7.0%
- 4.0%
- 1.0%
- -2.8%
- -7.8%
- -16.4%

Continuous Mean Price Inflation by Ward of:

Continuous Mean Price Inflation by Ward of:

49.9 %
37.3 %
30.6 %
25.8 %
21.7 %
18.3 %
15.3 %
12.4 %
9.6 %
7.0 %
4.0 %
1.0 %
-2.8 %
-7.8 %
-16.4 %
The Distribution of Housing Price in Britain 1989.

Continuous Mean Price by Ward of:

€ 203,938
€ 94,402
€ 84,069
€ 77,410
€ 72,108
€ 67,485
€ 63,710
€ 59,825
€ 56,377
€ 52,184
€ 48,084
€ 43,863
€ 39,480
€ 35,032
€ 30,175
€ 24,528
Ten British General Elections 1955-1987
The Distribution of Second Placed Party
Conservative
Labour
Liberal
Alliance
Nationalist
Other
Migration Flows Between all Regions in 1976

Black circle for inflow, grey for outflow. Circle size and line width in proportion to absolute numbers of migrants.

Flows sorted by contiguity order and outlined.
Migration Flows
Between Metropolitan Counties and Other Areas
Between 1975 and 1976

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.

Showing all flows involving more than one in one hundred of the respective areas' population - 44% of all recorded moves.

Showing all flows involving more than one in two hundred of the respective areas' population - 54% of all recorded moves.

Showing all flows involving more than one in five hundred of the respective areas' population - 68% of all recorded moves.

Showing all flows involving more than one in one thousand of the respective areas' population - 86% of all recorded moves.

Flows of more than 2% of the employed population at the area of residence are drawn as thin lines to their workplace.

50% of all commuters included - 10,319,230 people.

50% of all commuters included 10,319,230 people.

Flows of more than 2% of the employed population at the area of residence are drawn as thin lines to their workplace.
Daily Commuting Flows Between
English and Welsh Wards in 1981.

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

$$\frac{m_{ijst}}{p_{is} p_{jt}} > \frac{1}{50000}$$

Flows of over 1000 people
drawn as thick lines.

Where-

- $m_{ijst}$: 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 $t$.

$i$: Place of residence.

$j$: Place of work.

$s$: Nighttime.

$t$: Daytime.

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.

Where-

\( m_{ijst} \): 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 \( t \).

\( i \): Place of residence.

\( j \): Place of work.

\( s \): Nighttime.

\( t \): Daytime.

10,319,230 commuter flows shown.
The width of line is in proportion to the number of people moving, direction is indicated by arrows.

Colours show the distribution of occupation by place of residence.

Quartile levels by ward of:

- Supervised
- Professional
- All Three
- Intermediate

10,319,230 commuter flows shown. The width of line is in proportion to the number of people moving, direction is indicated by arrows.

Colours show the distribution of occupation by place of residence.

Quartile levels by ward of:

- Supervised
- Professional
- All
- Three
- Intermediate
Migration Flows Between Family Practitioner Areas Between 1975 and 1976

Showing all flows involving more than one in two hundred of the respective areas' population - 12% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas Between 1975 and 1976

Showing all flows involving more than one in three hundred of the respective areas' population - 21% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas Between 1975 and 1976

Showing all flows involving more than one in five hundred of the respective areas' population - 36% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas Between 1975 and 1976

Showing all flows involving more than one in one thousand of the respective areas' population - 48% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas Between 1975 and 1976

Showing all flows involving more than one in two thousand of the respective areas' population - 65% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas From 1975 to 1976

Showing all flows involving more than the average of one in 2777 people between any two places - 74% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Cartogram area is in proportion to each region's total population.
Migration Flows Between Family Practitioner Areas From 1975 to 1976

Showing all flows involving more than the average of one in 2777 people between any two places - 74% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Euclidean area not proportional to each region's total population.
Migration Flows
Between English & Welsh Counties
From 1975 to 1976

Showing all flows involving more than the average of one in 1456 people between any two places - 70% of all recorded moves.

Black is inflow, grey is outflow. Arrow head shows net migration. Circle and line size proportional to absolute numbers of migrants. Euclidean area not in proportion to each region's total population.

1,352,520 migration flows shown
The width of line is in proportion to the number of people moving, direction is indicated by arrows.

Colours show the distribution of occupation by place of origin.

Quartile levels by ward of:

- Supervised
- Professional
- All Three
- Intermediate

Colours show the distribution of occupation by place of origin.

1,352,520 migration flows shown
The width of line is in proportion to the number of people moving, direction is indicated by arrows.

Quartile levels by ward of:
The use of Contours and Colour to Depict Surface Height
The use of Contours (without colour) to Depict Surface Height
British Population Surface Showing the 1987 General Election Results.
Constituencies are coloured by the proportion of the vote won by the three major parties. The volumes of all constituencies are equal.
British Population Surface Showing the 1987 General Election Results.

The volumes of all constituencies are equal. Conservative seats are projected downwards.

Constituencies are coloured by the proportion of the vote won by the three major parties.
The Distribution of Voting Composition in the 1987 British General Election

Quartile Levels by Constituency of:

Alliance

Labour

Conservative

None
1981 County Council Elections: English Voting Composition

Every electoral division won by one of the three major parties is shown by a circle on the diagram. The position of the circle indicates the composition of votes in that division.

The area of the circle is in proportion to the total vote. Distance from each apex measures the support for a party from total to none.

Independent candidates are counted as Conservative where no Conservative opposed Labour or Liberal nominees. Divisions falling on the sides of the triangle are projected as a histogram of two party support.
1985 County Council Elections: English Voting Composition

Every electoral division won by one of the three major parties is shown by a circle on the diagram.

The area of the circle is in proportion to the total vote.

Independent candidates are counted as Conservative where no Conservative opposed Labour or Liberal nominees.

The position of the circle indicates the composition of votes in that division.

Distance from each apex measures the support for a party from total to none.

Divisions falling on the sides of the triangle are projected as a histogram of two party support.
1989 County Council Elections: English Voting Composition

Every electoral division won by one of the three major parties is shown by a circle on the diagram.

The area of the circle is in proportion to the total vote.

Independent candidates are counted as Conservative where no Conservative opposed Labour or Liberal nominees.

Democrat
100%

The position of the circle indicates the composition of votes in that division.

Distance from each apex measures the support for a party from total to none.

Divisions falling on the sides of the triangle are projected as a histogram of two party support.

Labour
100%

Conservative
100%

Surface based on the three party triangle, height proportional to numbers of votes.

Contour values shown in thousands of votes, total number 8,276,000.

Surface based on the three party triangle, height proportional to numbers of votes.

- Labour
- Conservative
- Alliance

Contour values are shown in thousands of votes, total number 8,688,000.

Surface based on the three party triangle, height proportional to change in number of votes.

Labour

Conservative

Liberal - Alliance

Contour values are shown in thousands of votes, total change +412,000.

Surface based on the three party triangle, height proportional to numbers of votes.

Labour

Conservative

Democrat

Contour values are shown in thousands of votes, total number 1,950,000.

Surface based on the three party triangle, height proportional to change in number of votes.

Contour values are shown in thousands of votes, total change 193,000.

Surface based on the three party triangle, height proportional to change in number of votes.

Contour values are shown in thousands of votes, total change in change -605,000.
The Distribution of Unemployment in Britain 1981.

Rate shown as surface height, volume in proportion to the number of unemployed upon the population cartogram.
Resolution 300 by 450, based on ward figures.
The Changing Distribution of First Placed Party Between the 1983 and 1987 British General Elections

Constituency Changes:

Conservative
Labour
Alliance
Nationalist
Other

Then
Now

(On a 1981 County population cartogram, outer rings being most recent years - scale indicating deviation from space/time independence.)
The Detailed National Composition of Industry in Britain by Employee Status and Gender, 1981.

The chart shows the distribution of jobs between specific industries, full time and part time, male and female.

Total Area = 21,309,409 jobs.

...... 25% ...... 50% ...... 75% ...... 100%

Proportion of residents in type of employment.

The area of the blocks forming the chart is in proportion to the number of employees each block represents.

The width of the bars shows the overall share of jobs between the industries, the length of the bars indicates each industry's specific gender/status.

The chart shows the change in number of jobs between specific industries, full time and part time, male and female.

Total Area = 425,154 jobs

Male Full Time

Female Full Time

...... 25% ...... 50% ...... 75% ...... 100%
Proportion of jobs lost to the industry.

Male Part Time

Female Part Time

The area of the blocks forming the chart is in proportion to the number employees gained or lost in the industry.
The width of the bars shows the overall share of jobs between the industries, the length of the bars indicates each industry's specific gender/status.
The Distribution of Employment by Industry, Status & Gender, 1987.

The area of the blocks is in proportion to the number of jobs in each sector, in each constituency.

Full Time

Part Time

The National Distribution

The area of the blocks is in proportion to the number of jobs gained or lost in each sector in each constituency.
The Changing Distribution of Voting Composition Between the 1983 and 1987 British General Elections

Constituency Swings:

- Alliance
- None
- Labour
- Conservative
Ten British General Elections 1955-1987
Voting Change by Constituency

Liberal / Alliance
Conservative
Labour

'55
'59

'64
'66
'70

February '74
October '74

'79

adjusted '79

'83
'87

For very high resolution and vector format files of these scans please see http://www.dannydorling.org/books/visualisation/
The Distribution of Housing by Price, Attributes and Sales, 1987

The area of the branches is in proportion to the total sales for houses with each set of attributes, in each constituency.
The Distribution of Housing by Price, Attributes and Sales, 1987

The area of the branches is in proportion to the total sales for houses with each set of attributes, in each constituency.
The Changing Distribution of Housing by Price, Attributes and Sales, 1983-1987

The area of the branches is in proportion to 5x the total housing inflation by each set of attributes, in each constituency.
625 Chernoff Faces Showing All Permutations of 5 levels of four features - cheeks, eyes, nose and mouth.

Lowest Levels

Average Levels

Highest Levels
The Distribution of Voting, Housing, Employment and Industrial Compositions in the 1983 General Election.

Facial features indicate the social & economic characteristics of the constituencies, colour shows the proportions of the vote for the parties.

Low Social Indicators
- % Services Employees
- % Electorate Voting
- % Adult Employment
- £ Mean Housing Price

High

Voting Composition

Other Parties

Labour

Conservative
The Distribution of Voting, Housing, Employment and Industrial Compositions in the 1987 General Election.

Facial features indicate the social & economic characteristics of the constituencies, colour shows the proportions of the vote for the parties.

Relative Social Indicators

Decreasing

% Services Employees
% Electorate Voting
% Adult Employment
% Mean Housing Price

Increasing

Direction of Voting Swing

Facial features indicate the social & economic changes in the constituencies, colour shows the shift in the vote between the parties

Other Parties

Labour
Conservative
The Distribution of Population by County in 1981.

The volume of the spheres is in proportion to the resident population, but distorted by perspective.

The area of each circle represents the total population of a district. The circle's colour shows how that has changed:

Each colour shows the population change trajectory of a group of districts. Low 61/71 growth is coloured blue, 71/81 - yellow and 81/91 - red. Mixing to make many different shades.

Colour shows when and where the lowest relative rates of population growth occurred:

1961/1971
1971/1983
1981/1991

WHITE: Continuous Growth
BLACK: No Growth or Decline

The colour is mixed to show the extent of these changes. Where there is little deviation from the average change the circle appears as grey.

1989/90

Time

...Good Times and Bad...

1978/79

(on 1981 County population cartograms, scale indicating deviation from space/time independence.)

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

Tyne & Wear

Space

(on 1981 County population cartograms, higher levels being most recent years - scale indicating deviation from space/time independence.)
The Distribution of Years of Highest Housing Price Inflation in Britain, 1983 to 1989.

Years of highest local inflation by ward:

- 1983/84
- 1984/85
- 1985/86
- 1986/87
- 1987/88
- 1988/89
The Distribution of Childhood Leukaemia in Britain, 1966-1983.
Smoothed Surface of Cases in Population Space with District Centroids Labelled.

Wireframe images of the sides of the cuboid.
Key to Cancer Types Shown by Spheres in the Spacetime Diagrams.
From the Northern Region Children's Malignant Disease Registry.

Other Cancers:
- Histocytosis, Yolk sac tumour
- Hepatoblastoma, Retinoblastoma
- Rhabdomyosarcoma, Soft tissue sarcoma, Epithelial carcinomas

Hodgkin's disease

Non-Hodgkin's disease

Bone Tumours:
- Ewing's Sarcoma, Osteosarcoma, Osteoclastoma, Other bone tumours

Neuroblastoma & Ganglioneuroblastoma

Wilms' Tumour & Other kidney tumours

Brain Tumours:
- Craniopharyngioma, Cerebellar
- Astrocytoma, Brain Stem glioma
- Optic nerve glioma, Ependymoma, Medulloblastoma, Other brain tumours

Other Leukaemia:
- Acute Myeloid Leukaemia, Chronic Myeloid Leukaemia, Other Leukaemias

Acute Lymphoblastic Leukaemia
The Distribution of Childhood Leukaemias in the North East English Spacetime Cartogram

1968 - 1973

1974 - 1979

For very high resolution and vector format files of these scans please see http://www.dannydorling.org/books/visualisation/
The Distribution of Childhood Leukaemias in the North East English Spacetime Cartogram

1980 - 1985
Viewed from 2020

1986 - 1991
Viewed from 2020
The Distribution of Childhood Leukaemias on Teesside in the Spacetime Cartogram

1968 - 1991
Viewed from 2020
(Lens x 2.5)

Viewed from the East, 2014

Viewed from the East, 2001

Wire-frame representations of a regular tetrahedron containing the contests of 920 wards won by one of the four major parties.
Schematic Representation of Four Party Voting Compositions.

The diagram below is a projection of the tetrahedron which contains all possible four party arrangements. The standing of the Conservative party is shown as an example in shades of grey. Position on the diagram shows party order as well as proportions of the vote.
1988 District Elections: Scottish Voting Composition

The triangles show the projection of a regular tetrahedron encompassing electoral ward competitions involving as many as four separate candidates. Every ward won by one of the major parties is shown as a circle on the diagram, its area in proportion to the total vote. The position of the circle indicates the composition of votes in that ward. Circles are shown on the side of the tetrahedron they lie closest to. Wards falling on the edges of the tetrahedron are projected as histograms of two party support on the sides of the triangles. Distance from each apex measures the support for a party from total to none.
Four Perspective Views of the 1988 District Elections Scottish Voting Composition.

Each small tetrahedron represents the four party position of a ward, its size is in proportion to the electorate, facets coloured by the party of the apex opposite.

The tetrahedron is always lit from the front - towards the SLD apex.

The four party tetrahedron viewed from just above the Conservative apex.
The Ward Cartogram

Drawn using Thiessen polygons, 1981 population.
The Transformed Map of Voting in the 1987 British General Election

Quartile Levels by Constituency of:

Alliance

Labour

Conservative
Transformation of the Political Map of Northern Britain to Population Space

Constituencies coloured by the proportions of the vote cast in 1987, resized in proportion to the electorate.
Transformation of the Political Map of Southern Britain to Population Space

Constituencies coloured by the proportions of the vote cast in 1987, resized in proportion to the electorate.
The Distribution of Non-Voting by Voting Composition in the 1987 British General Election

Continuous Scale by Constituency of:

Alliance

Low to High

Northern Ireland

Labour

Conservative
The Distribution of Occupation in Britain 1981

Quartile Levels by Enumeration District of:

After 10 Passes of Binomial Smoothing
The Distribution of Voting Composition in the 1987, 1988 and 1990 British Local Elections

Proportion of the Vote by Ward of:

Liberal / Alliance

Labour

Conservative