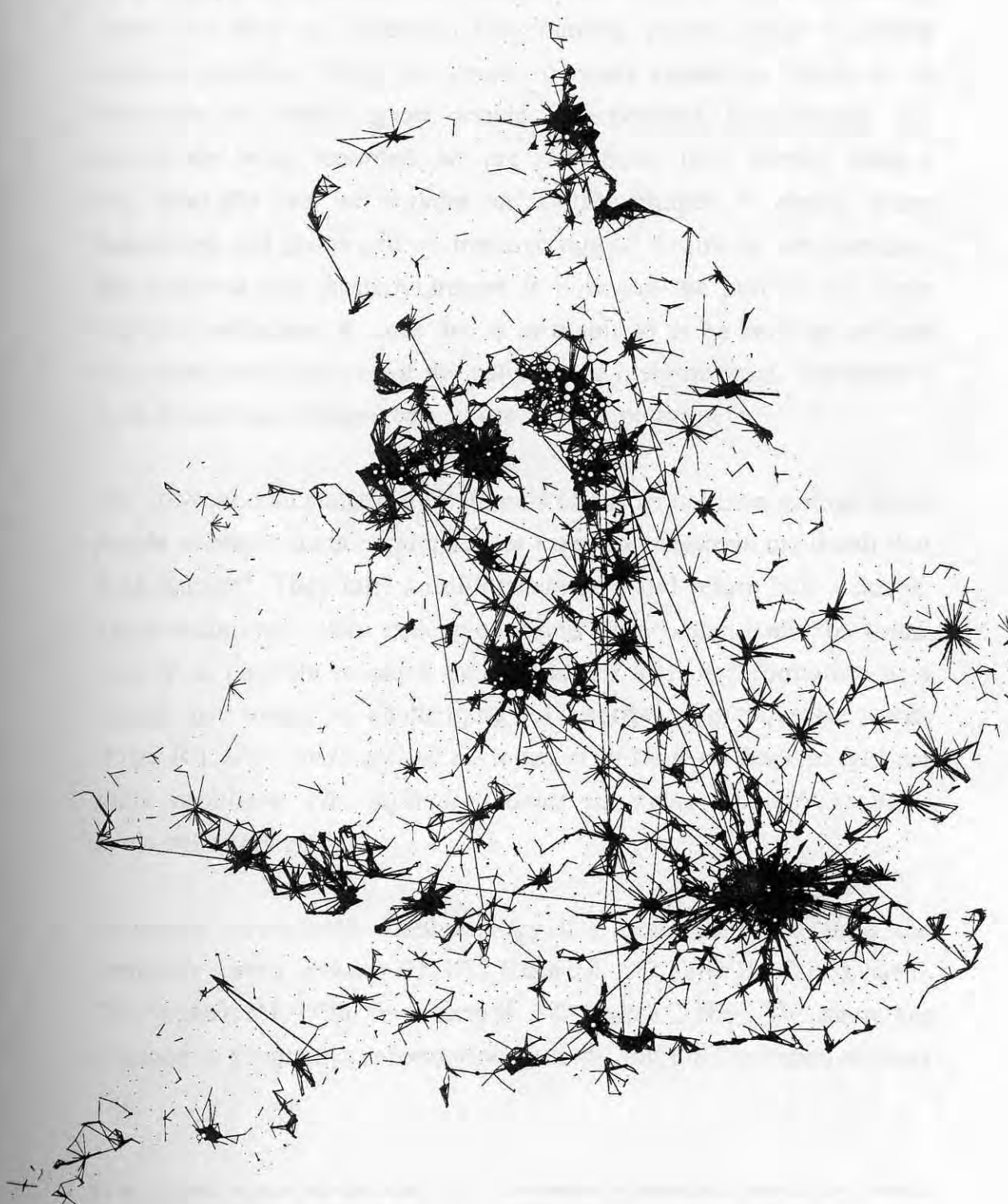
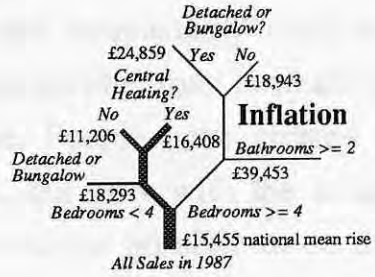
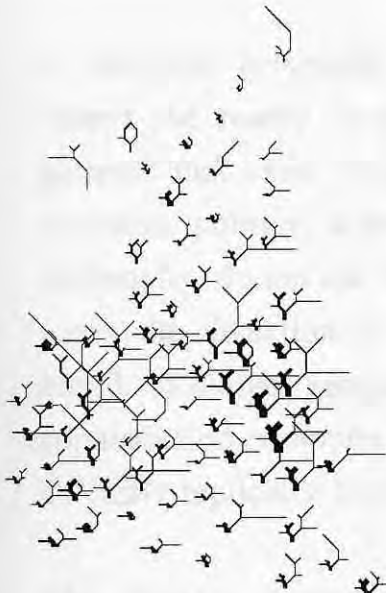


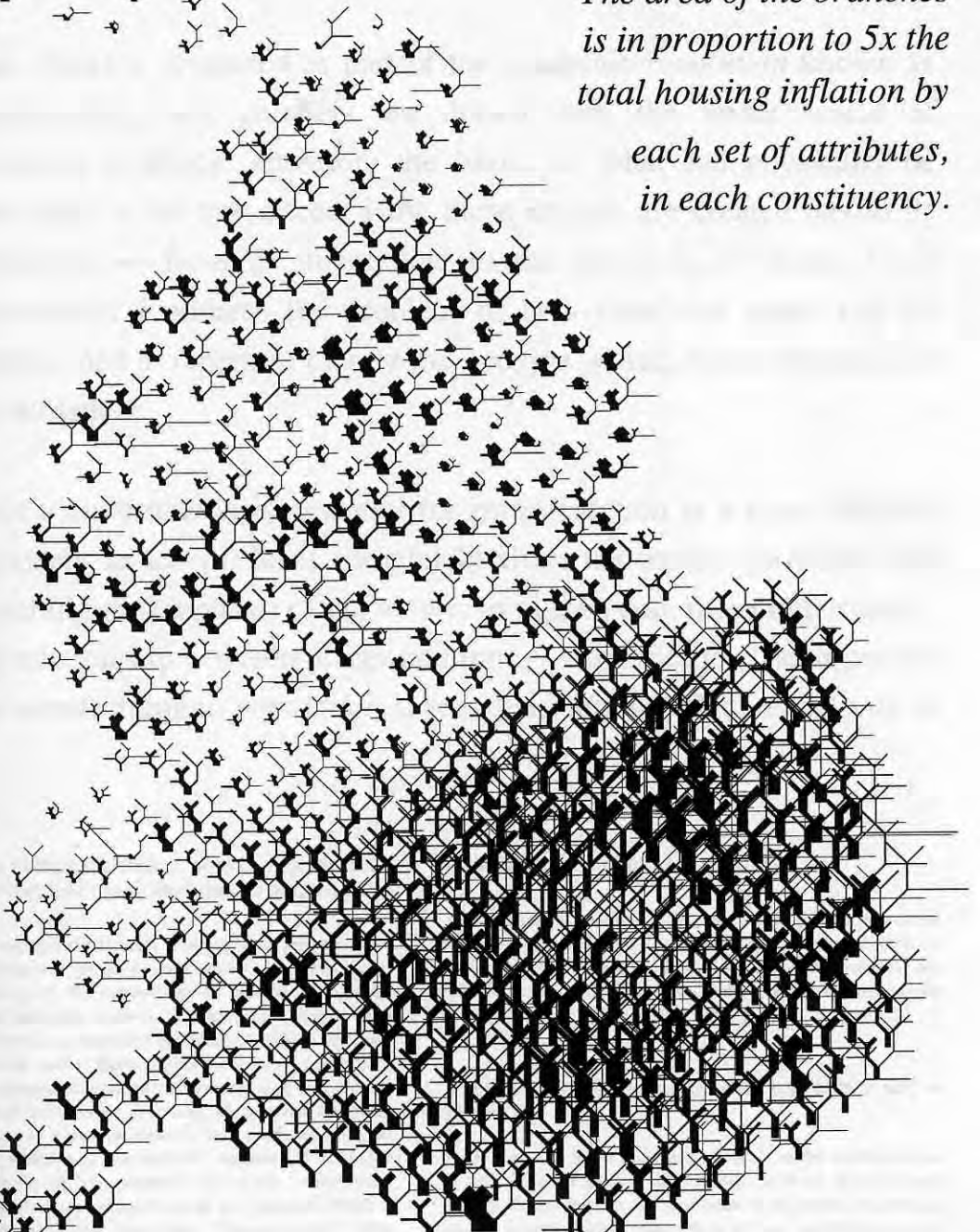
*Journey to Work flows of over 10
people between wards from the
10% sample*



The Changing Distribution of Housing by Price, Attributes and Sales, 1983-1987



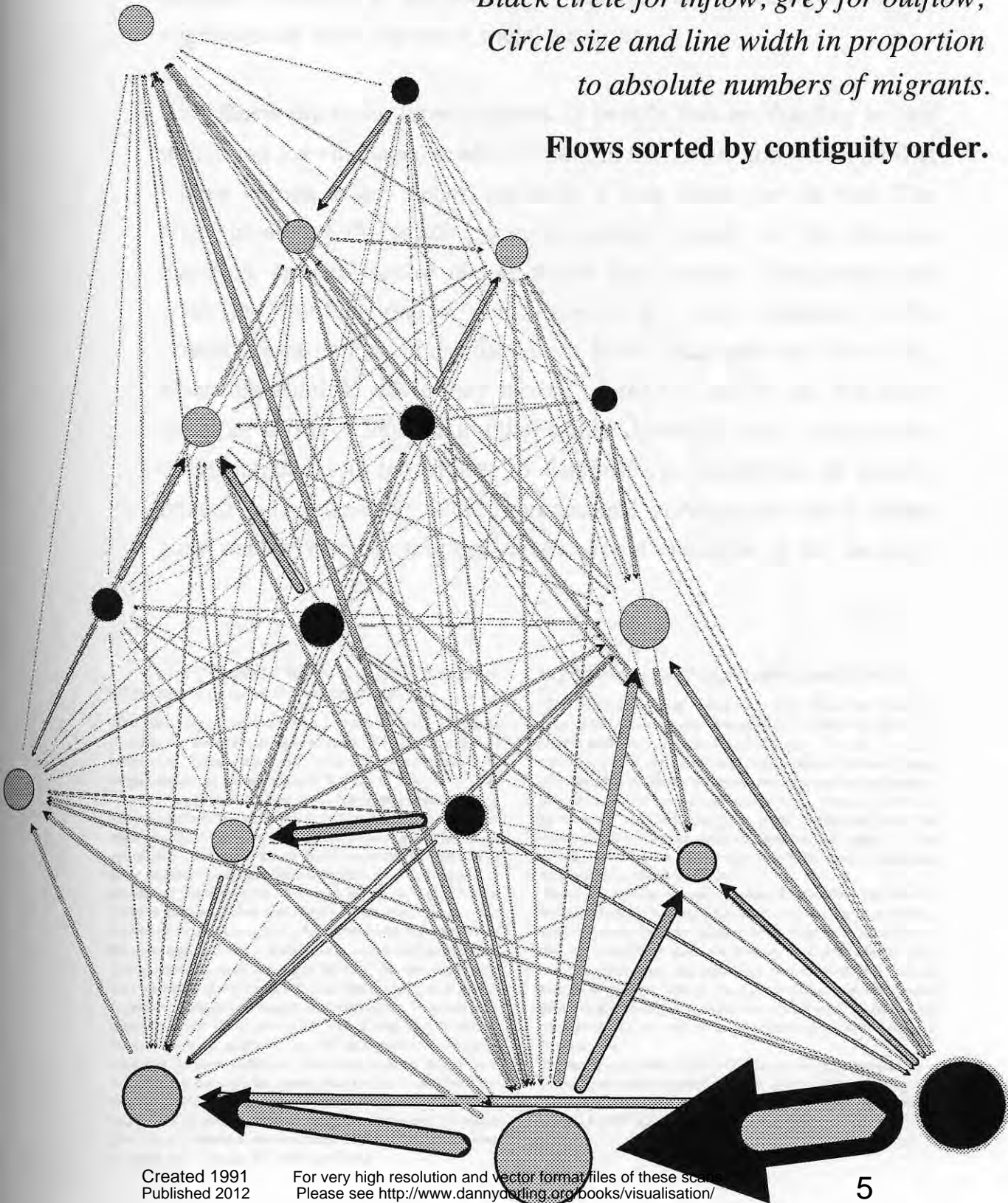
The area of the branches is in proportion to 5x the total housing inflation by each set of attributes, in each constituency.



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.



***Yearly Migration Flows
Between English and
Welsh Wards 1980/1981.***

*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.*

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



The Changing Distribution of Age & Gender in Britain 1971-1981

*Quartile Rates by
Enumeration District of:*



*Voting Composition
on the Electoral
Cartograms of
Northern Britain
1955 - 1987.*

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

1955



1959



1964



1966



1970



February
1974



October
1974



1979



1979



1983



1987

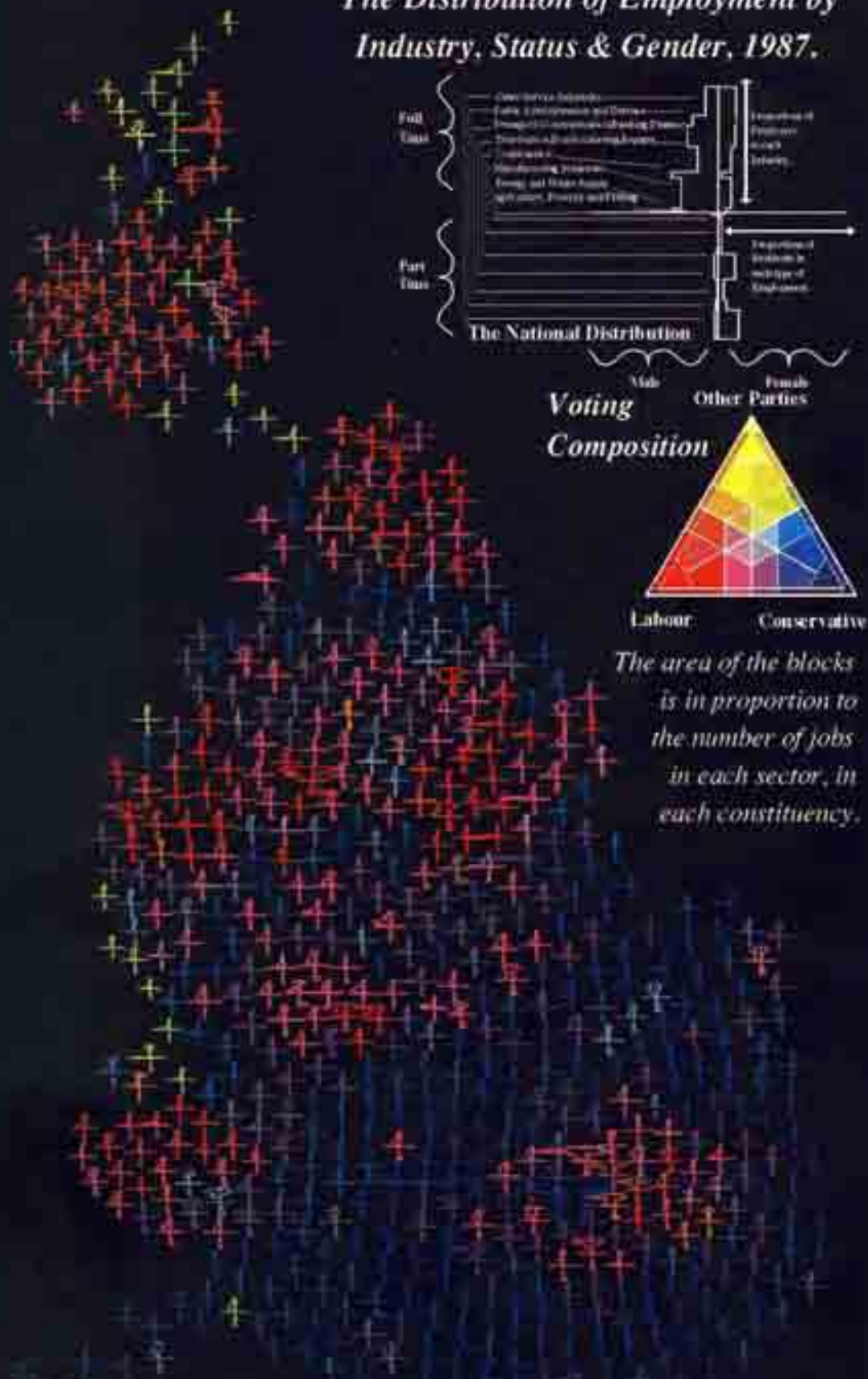


*Voting Composition
on the Electoral
Cartograms of
Southern Britain
1955 - 1987.*

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



The Distribution of Employment by Industry, Status & Gender, 1987.

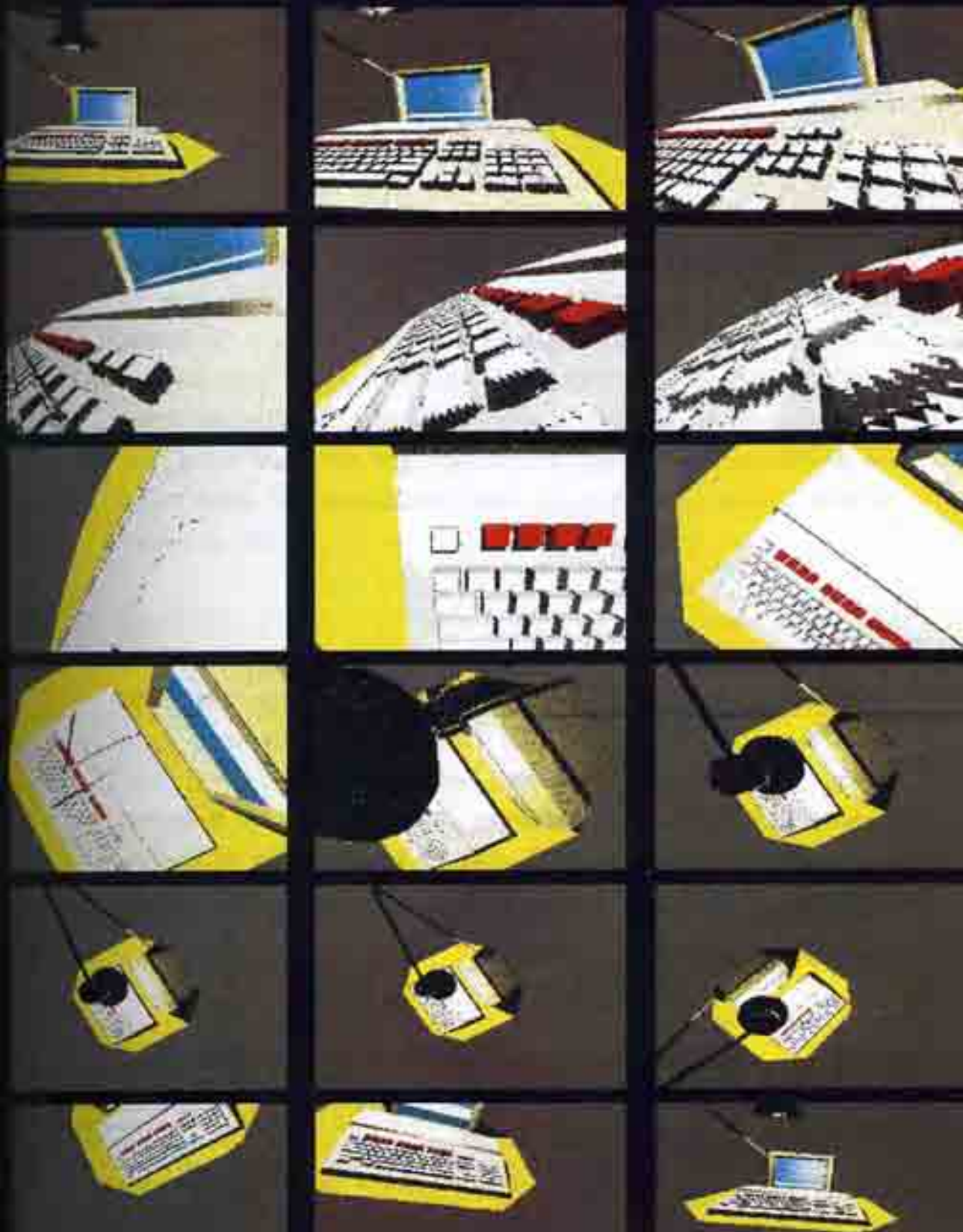


The area of the blocks is in proportion to the number of jobs in each sector, in each constituency.

Stills from an Animation of the Computer

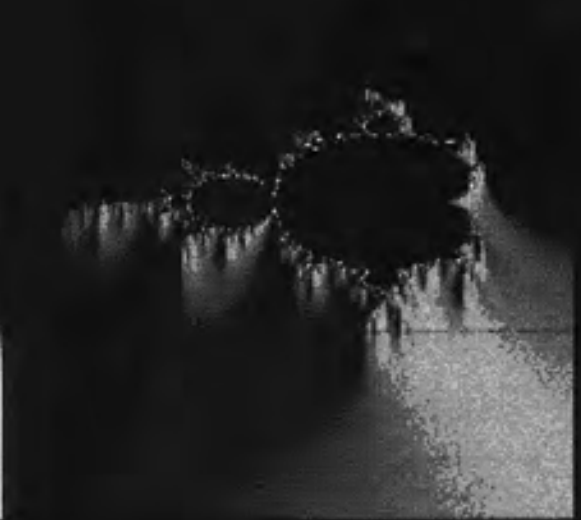
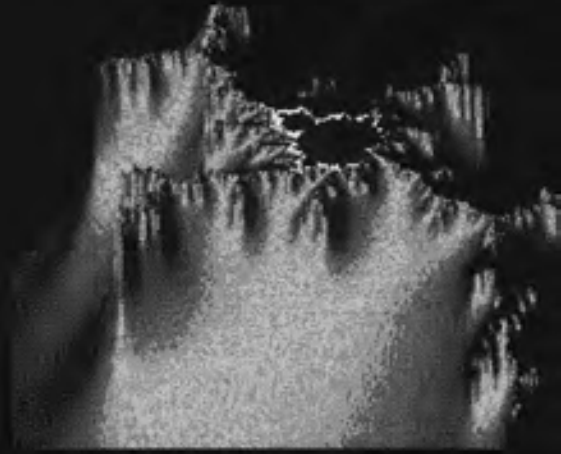
Surfaces lit using conventional polygon shading.





*Ray-Traced Surfaces of the
Mandelbrot and Julia Sets.*

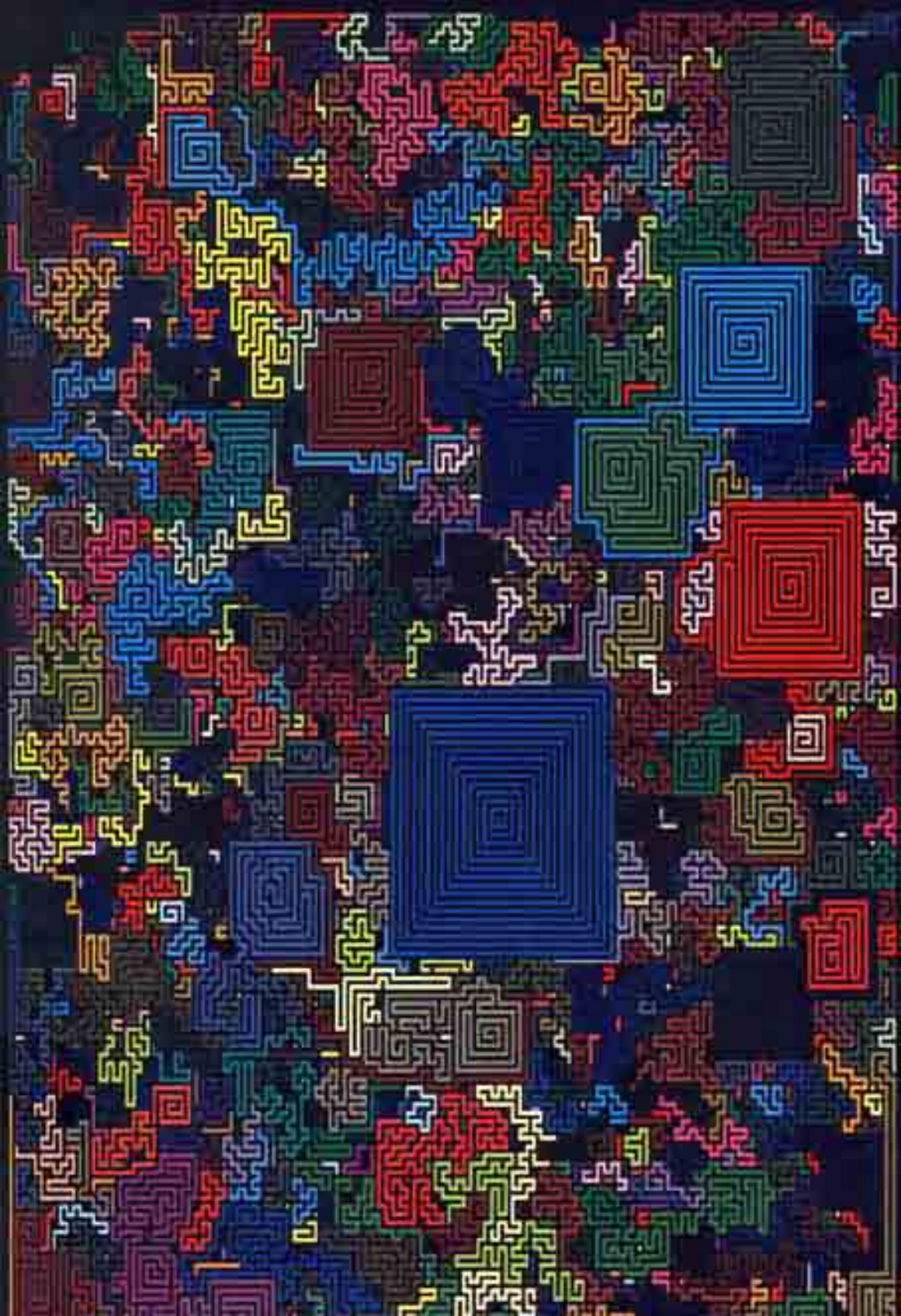
Grey shades of shadow and light.



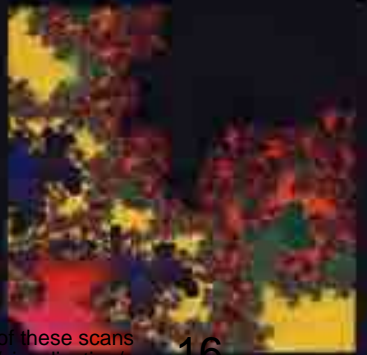
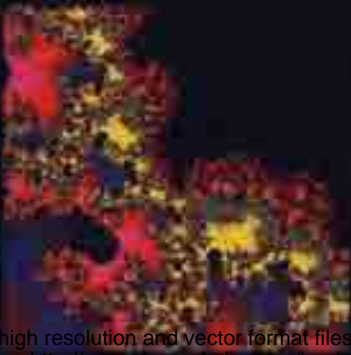
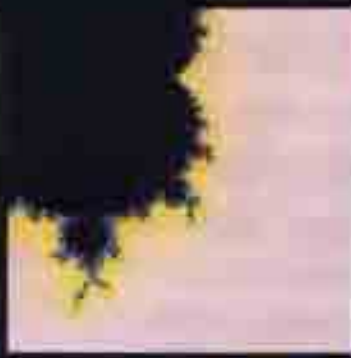
Visualizing Fourier Transforms

The art in the science.



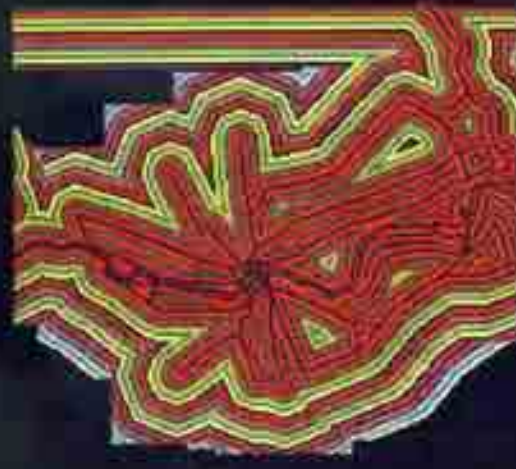
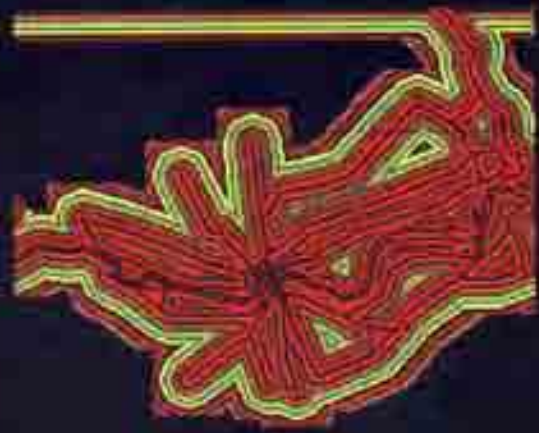
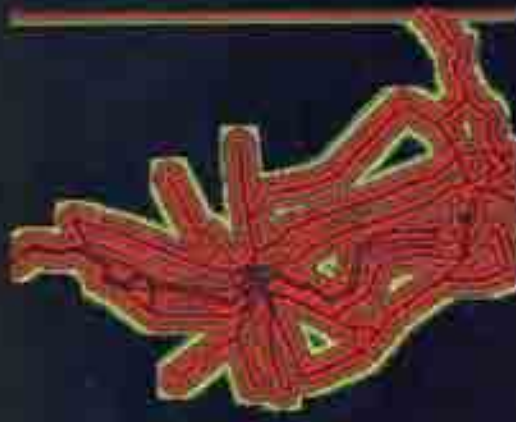
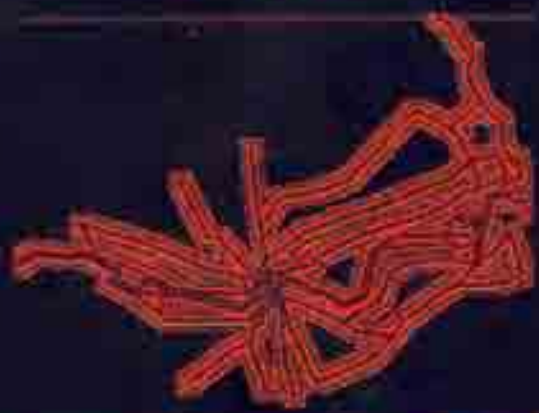
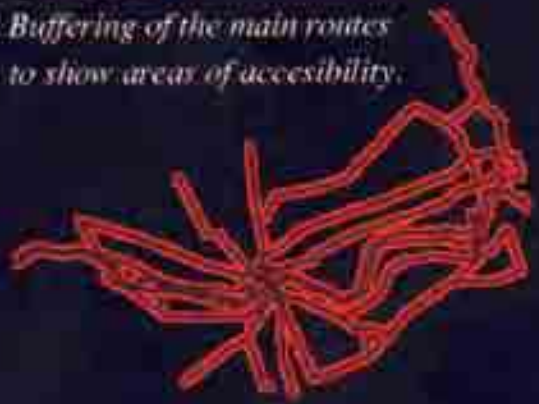


*Visualization of the
Mandelbrot Set
One dimensional chaos*



Travel Time from the Tyneside Road Network

*Buffering of the main routes
to show areas of accessibility.*



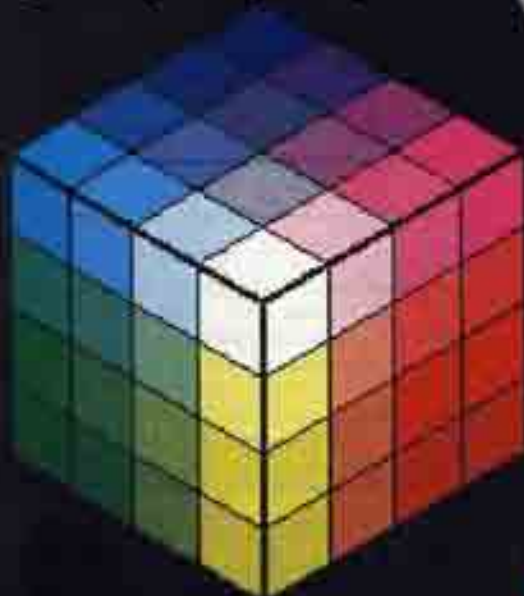
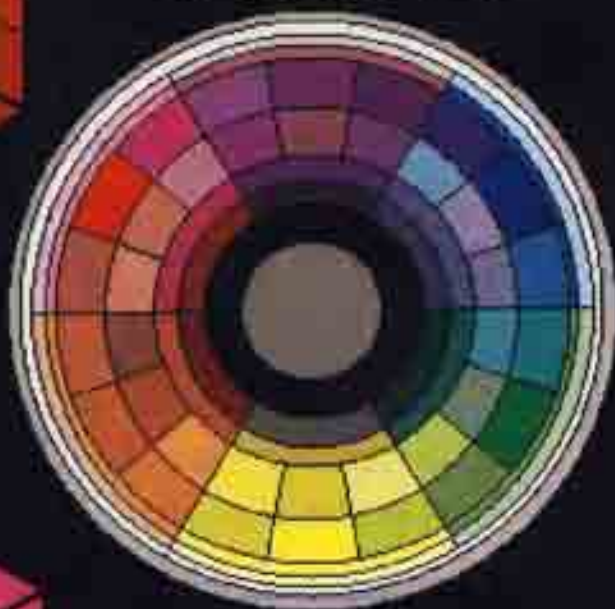
Alternative Three Colour Schemes and Keys.

Cubes, Circles & Triangles

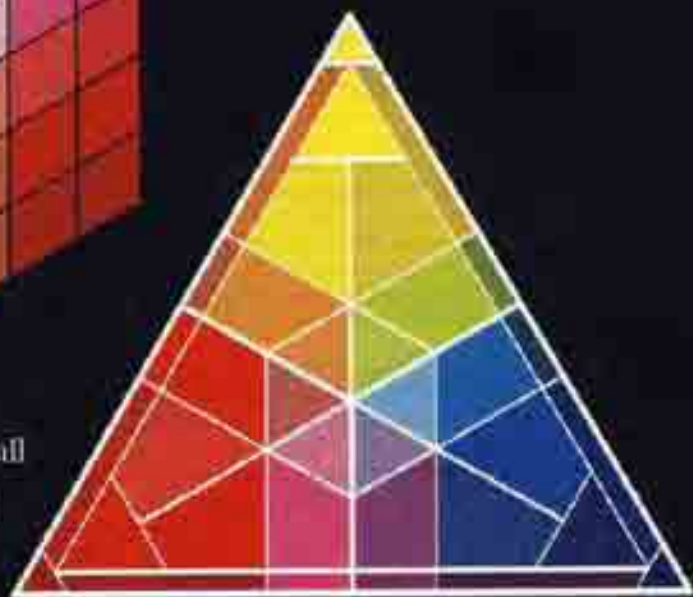


Cubes each showing
37 of 64 colours from
the red-green-blue
(yellow-cyan-magenta) space.

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



Triangles showing all
36 colours from an
alternative red-
yellow-blue

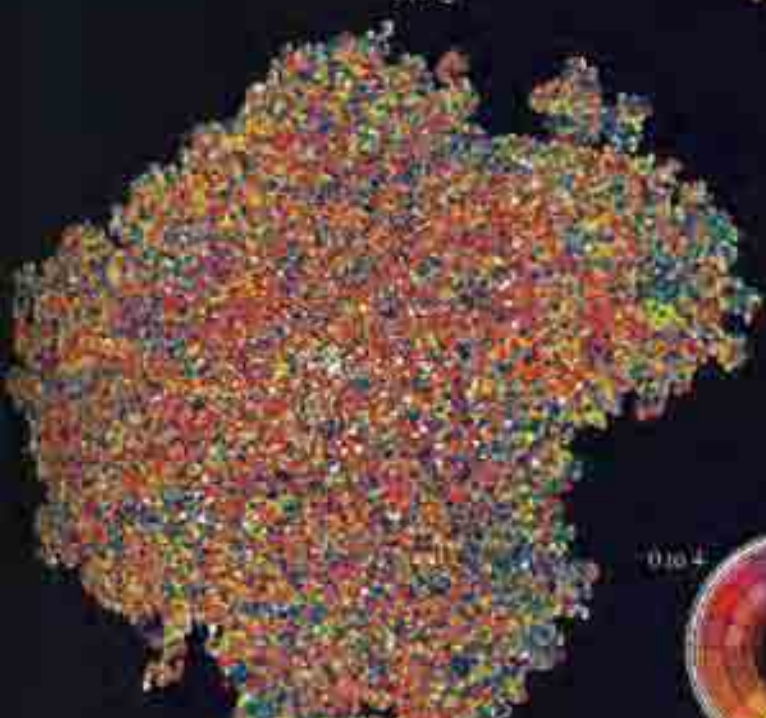
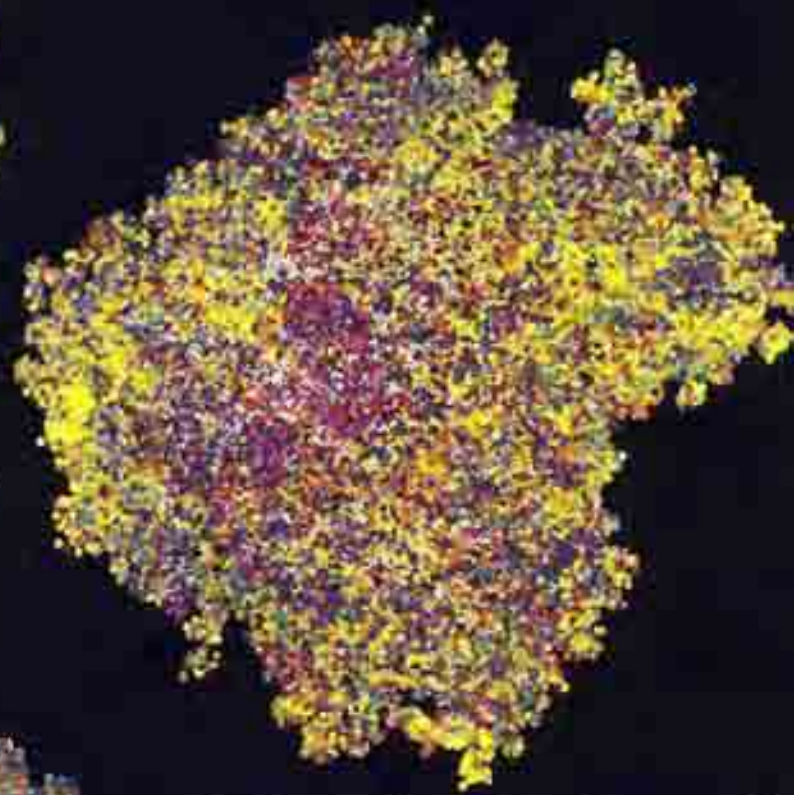
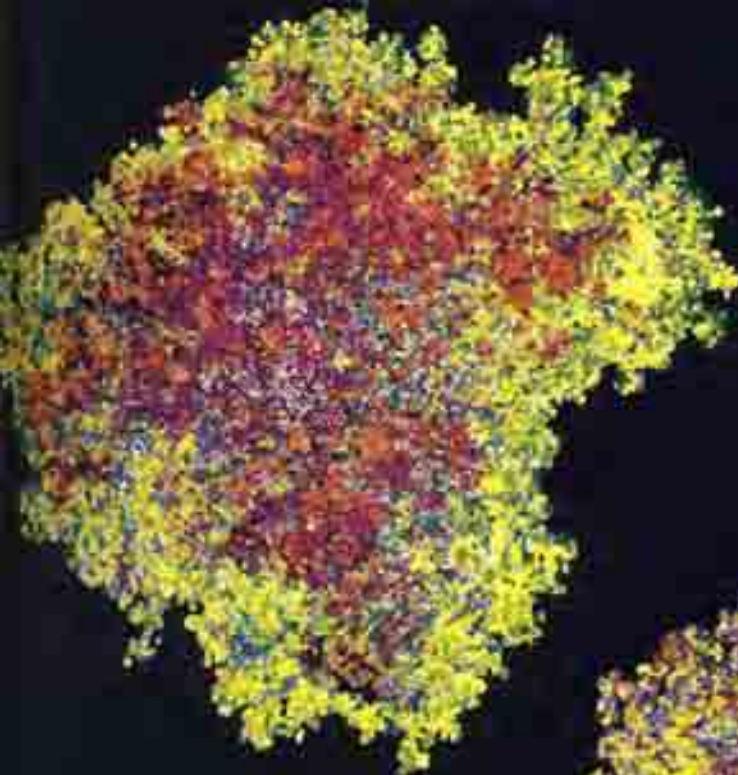


The Concentration of Place of Birth in Britain 1981

*Quartile Levels by
Enumeration District of:*

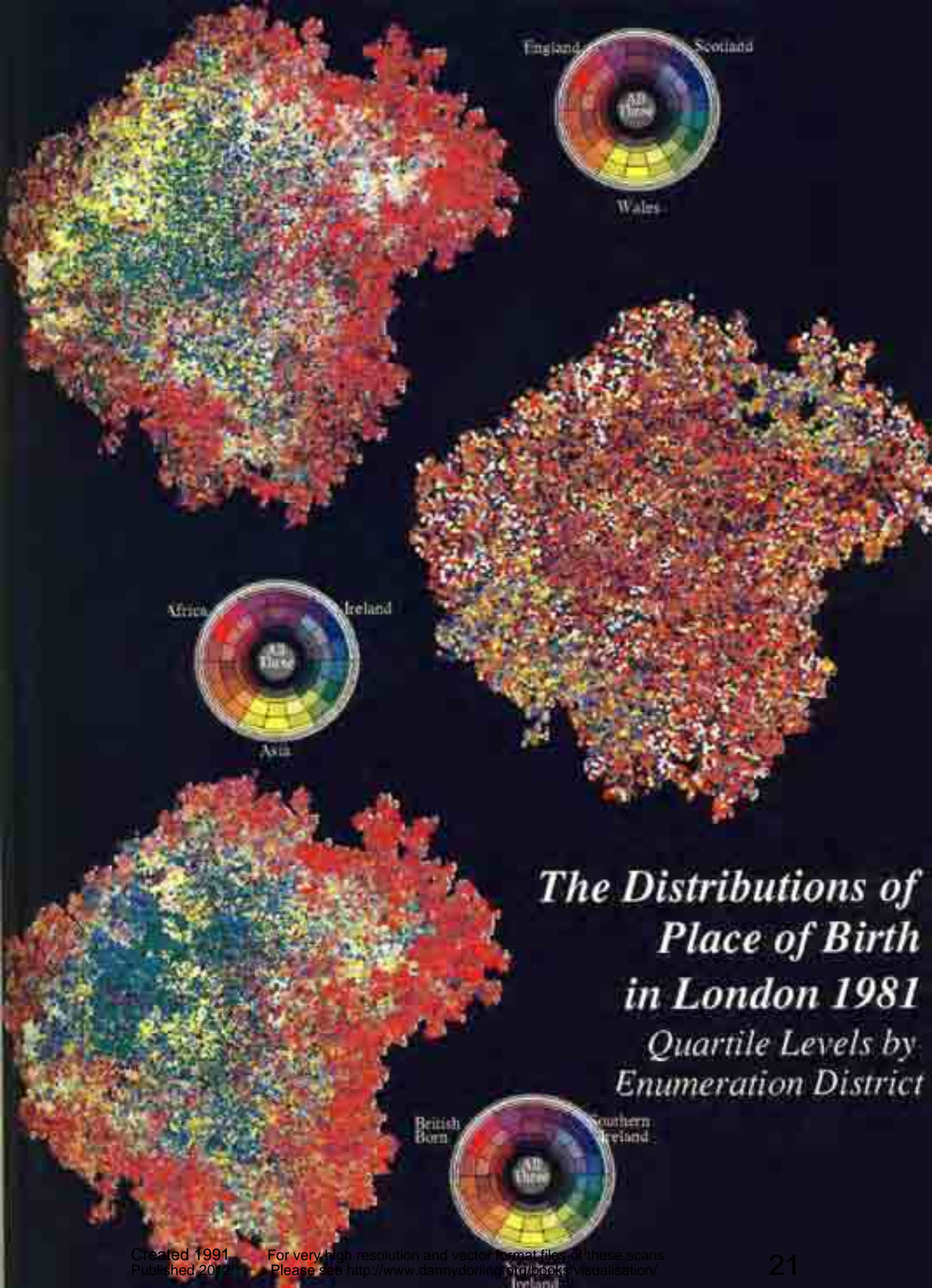


By Ward



*The Distributions of
Population, Age,
Gender & Children
in London 1981
Quartile Levels by
Enumeration District*



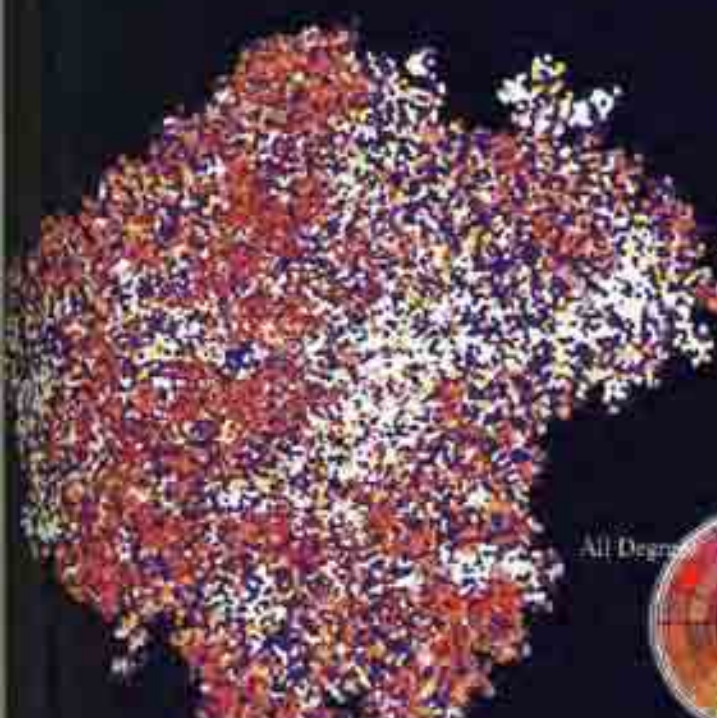
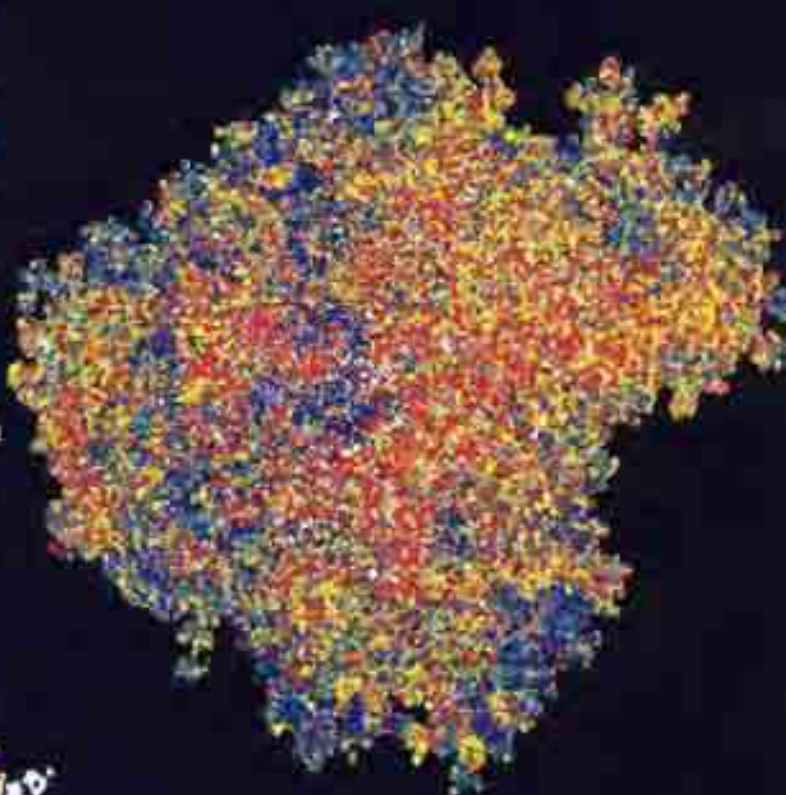
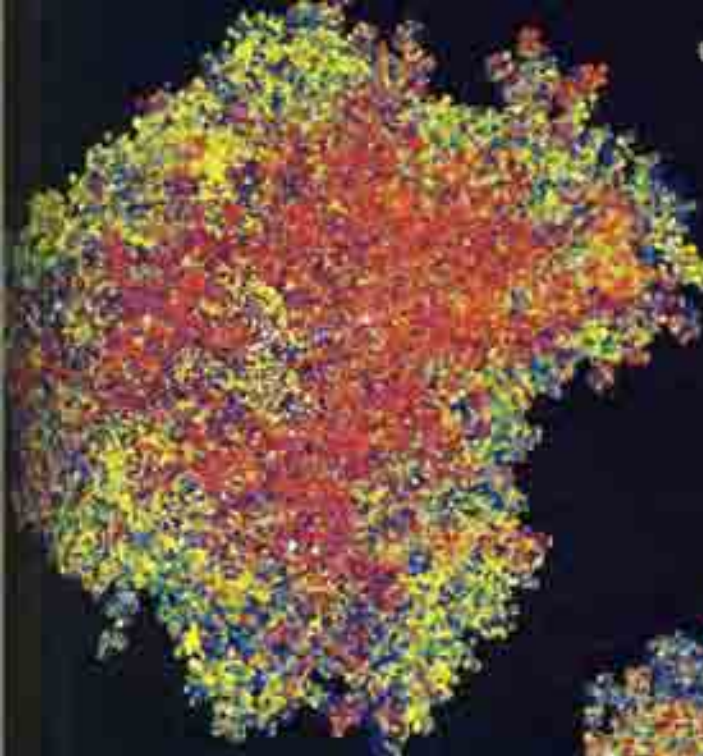


England, Scotland, Wales

Africa, Ireland, Asia

British Born, Southern Ireland

*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*

*The Distribution of
Broad Industrial Groups
in Britain, 1987.*

*Dominant Group in
Ward by Employees:*



*The Changing Distribution
of Broad Industrial
Groups in Britain,
1984 - 1987.*

*Group of Greatest Increase
in Ward by Employees:*

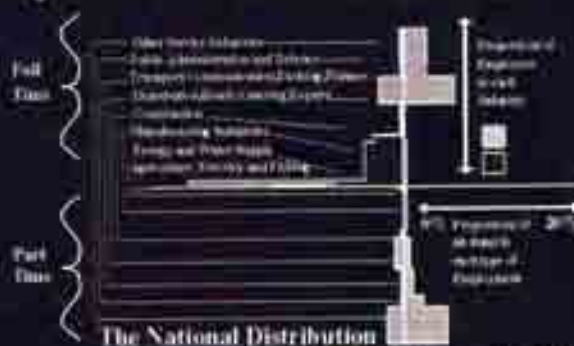


*The Changing Distribution
of Broad Industrial
Groups in Britain,
1984 - 1987.*

*Group of Greatest Decrease
in Ward by Employees:*



The Change in Employment by Industry, Status & Gender, 1984-1987.



Voting Composition Change



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

*Political Swing
on the Electoral
Cartograms of
Northern Britain
1955 - 1987.*

*The arrows show the
direction, magnitude
and background to
the changes.*

1955

1959

1964

1966

1970

February
1974

October
1974

1979

1979
March 1980

1983

1987

*Political Swing
on the Electoral
Cartograms of
Southern Britain
1955 - 1987.*

*The arrows show the
direction, magnitude
and background to
the changes.*

1955

1959

1964

1966

1970

February
1974

October
1974

1979

1979

1983

1987

*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

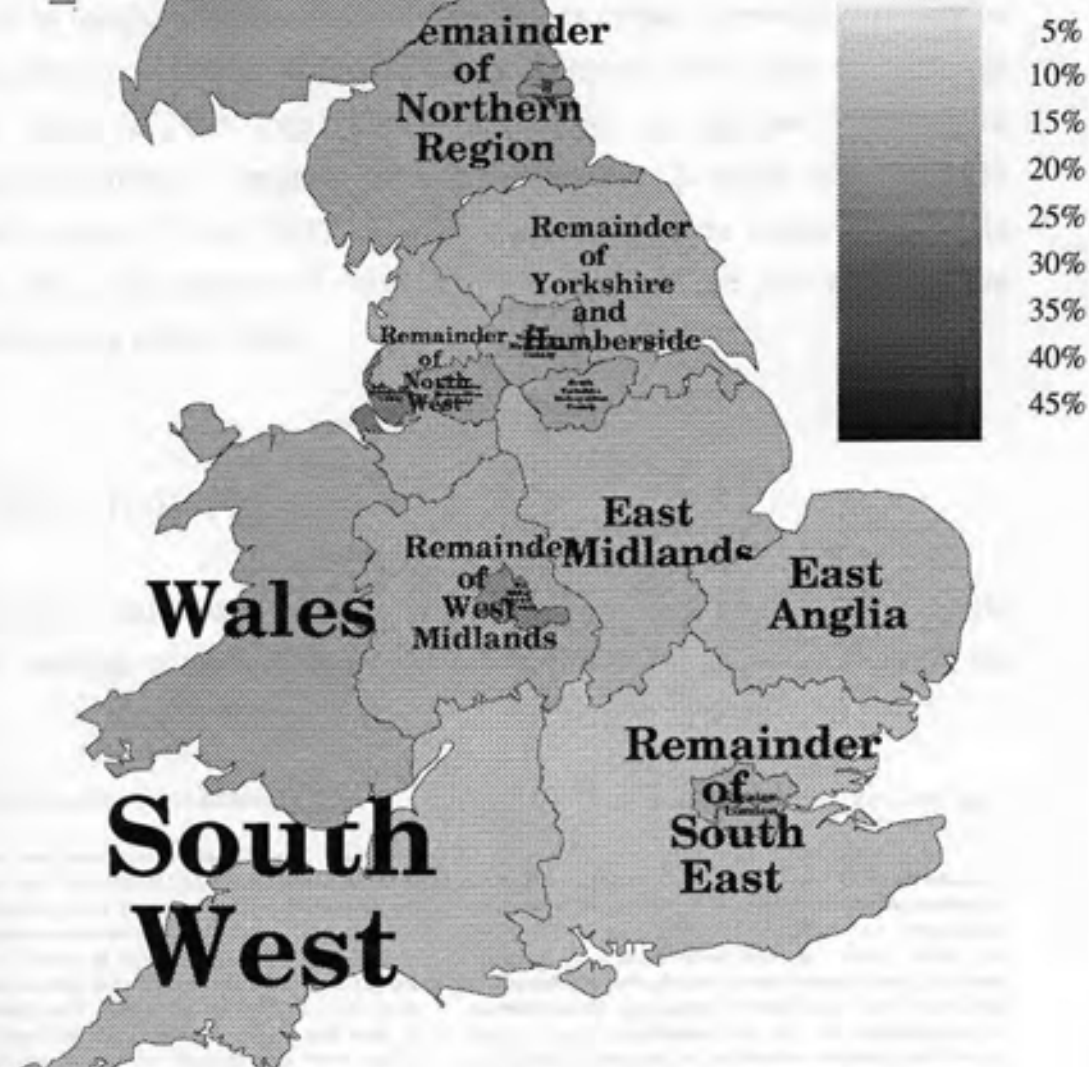
Land Use in Britain by 1km² grid



Scotland

Level II European Regions

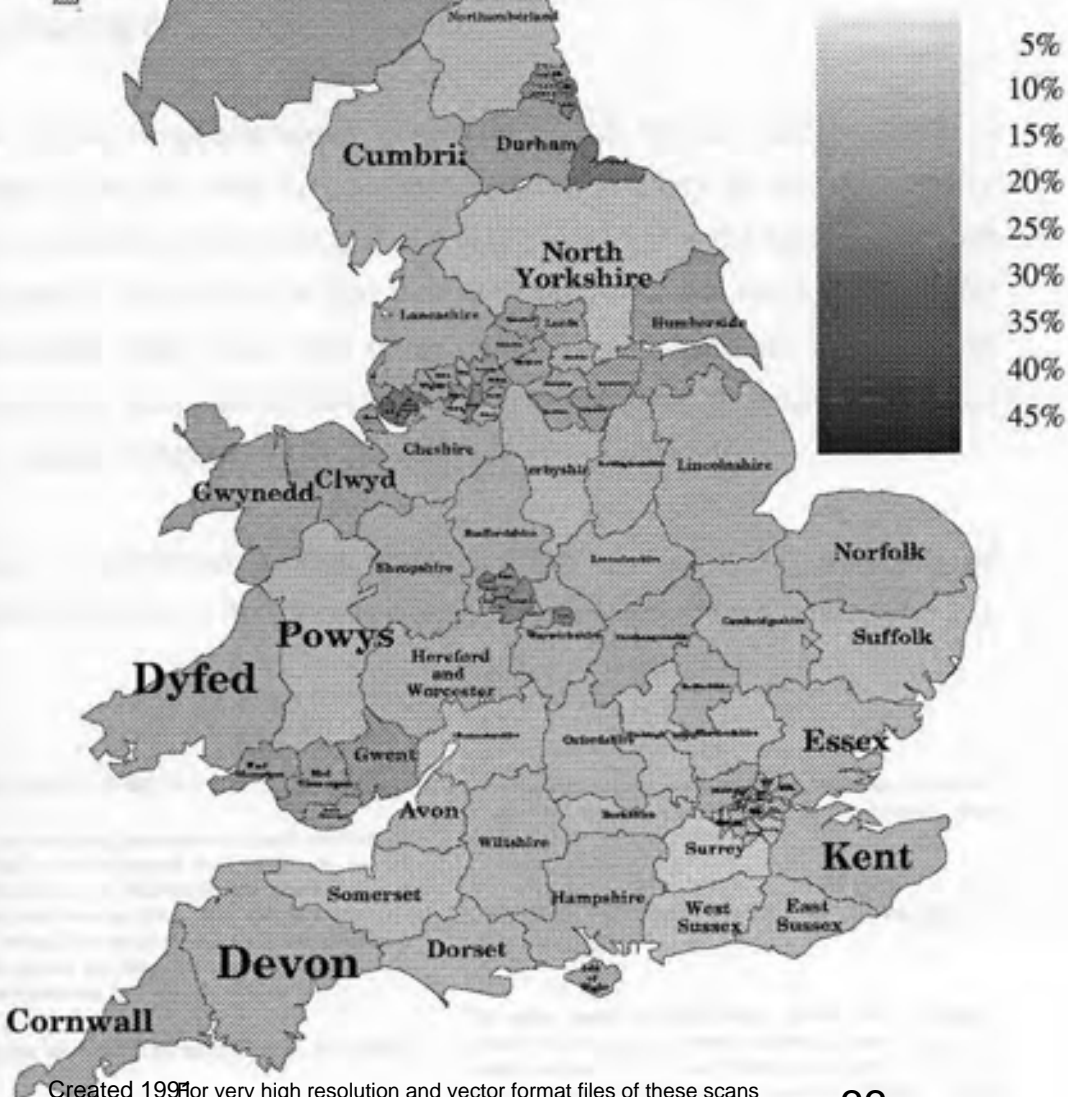
Annotated base map, shaded by the 1981 unemployment rate.

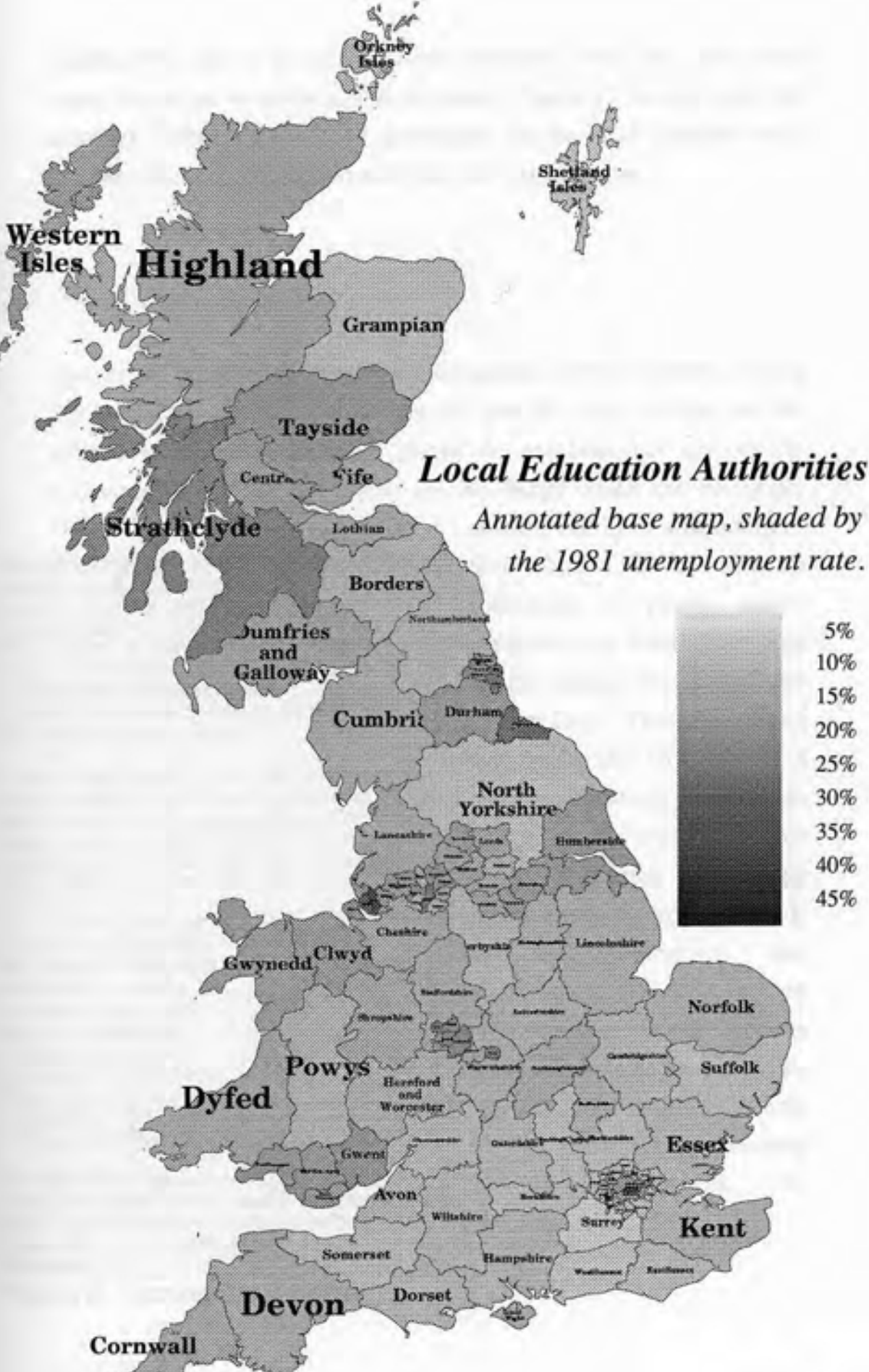


Scotland

Family Practitioner Committee Areas

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













Orkney and Shetland

Western Isles

Ross, Cromarty and Skye

Caithness and Sutherland

Inverclyde and Lochaber

North Tayside

Highland

Argyll and Bute

Parliamentary Constituencies

Annotated base map, shaded by the 1981 unemployment rate.

5%

10%

15%

20%

25%

30%

35%

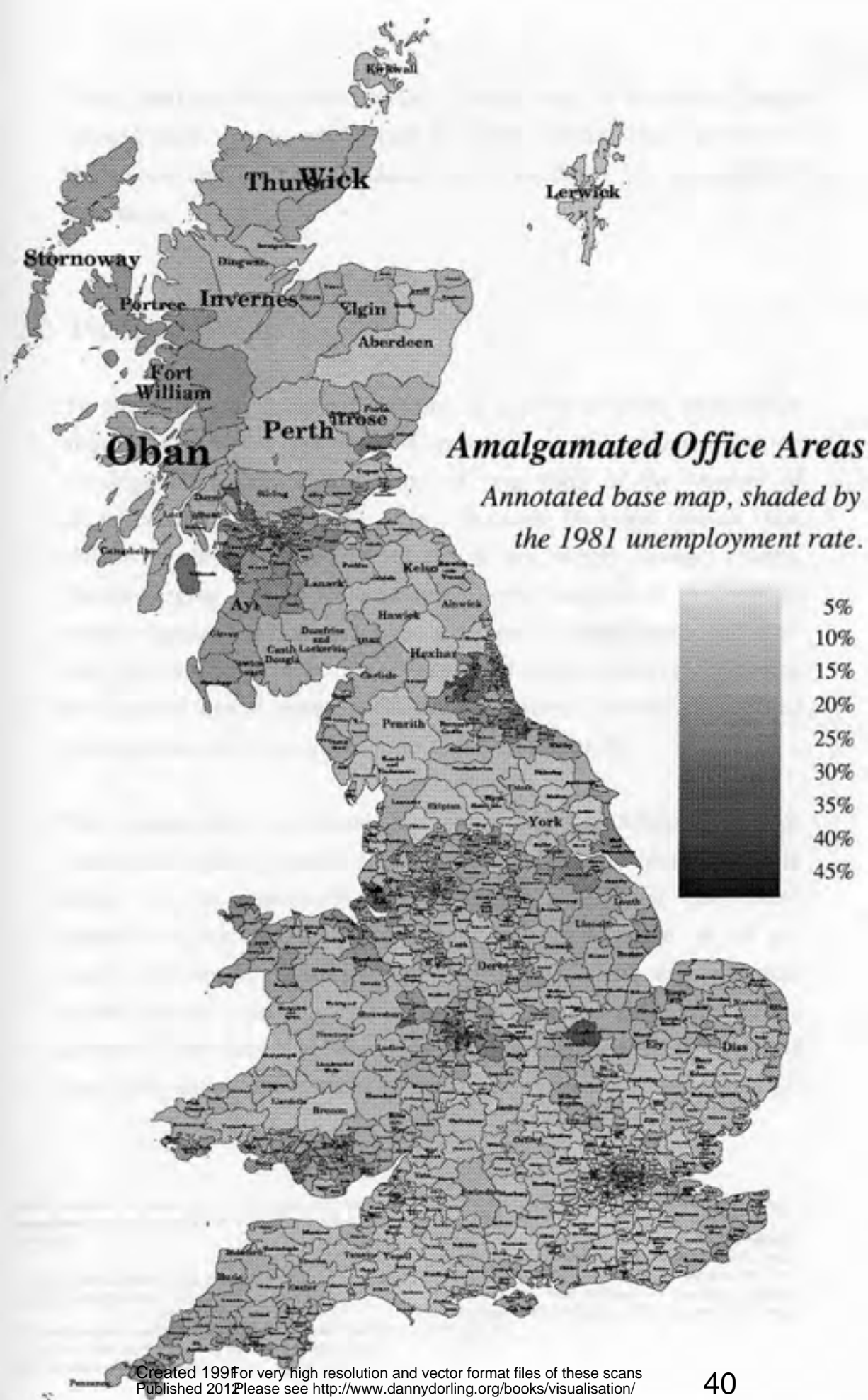
40%

45%

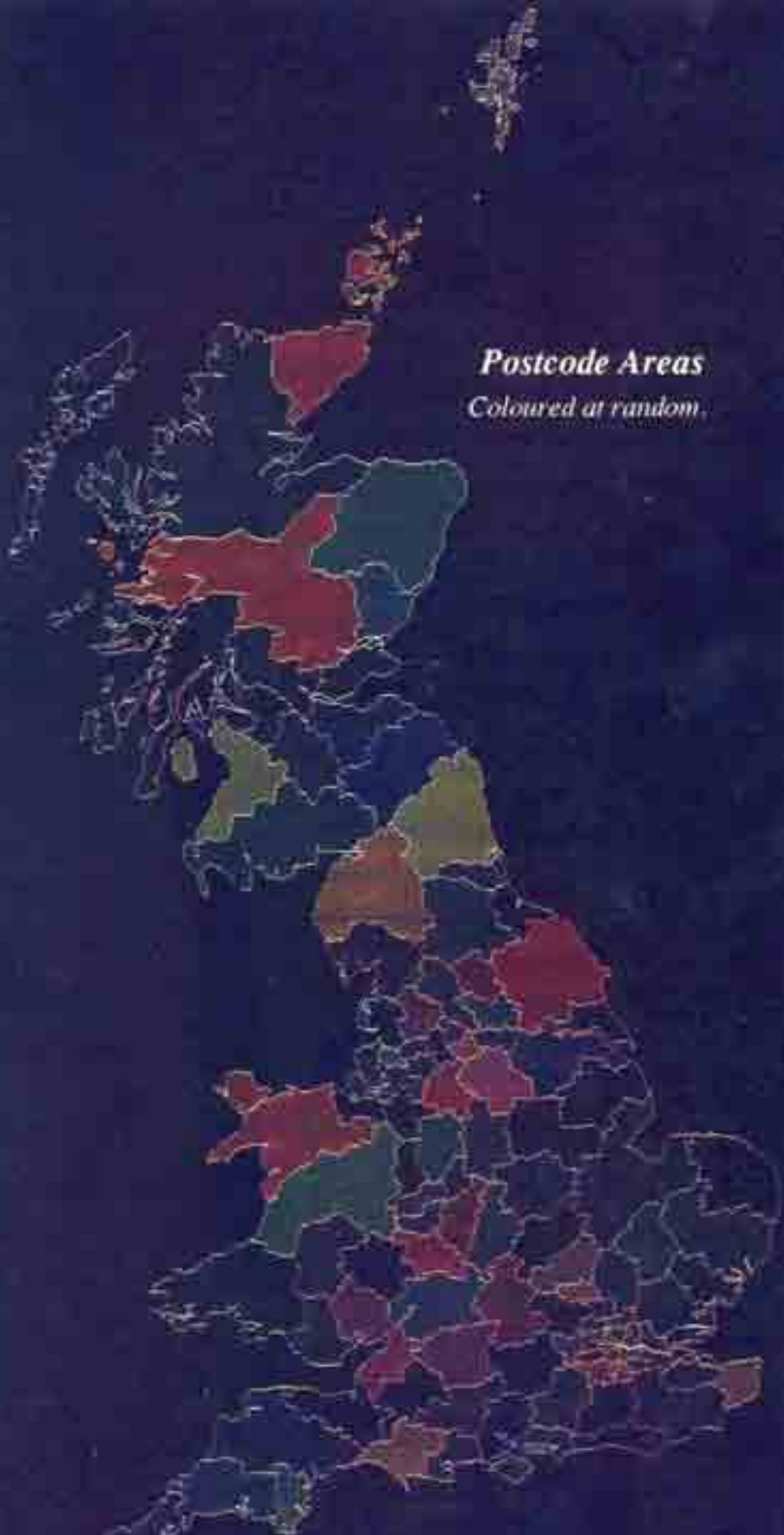
St Ives

Created 1991
Published 2012

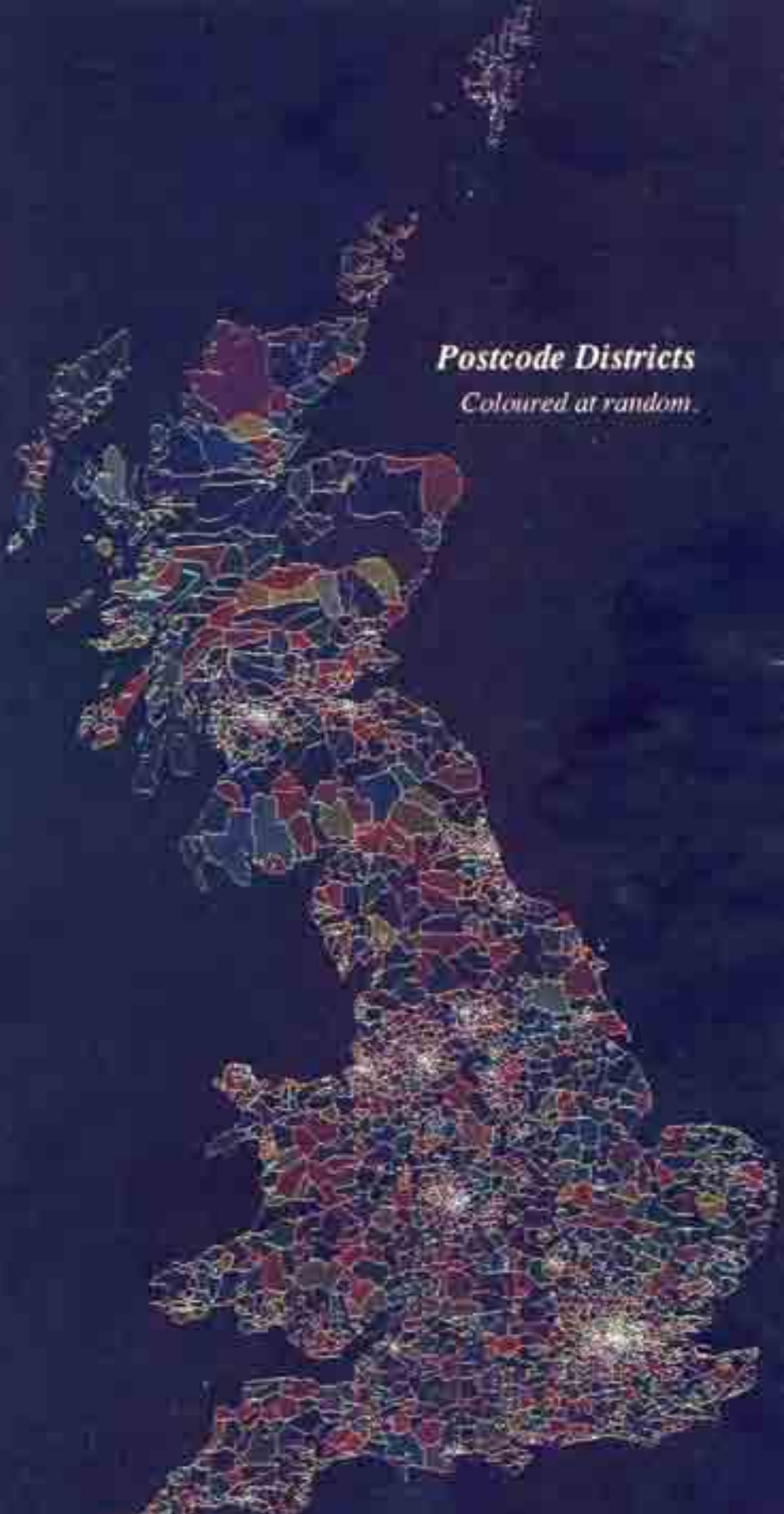
For very high resolution and vector format files of these scans
Please see <http://www.dannydorling.org/books/visualisation/>



*Postcode Areas
Coloured at random.*



Postcode Districts
Coloured at random.

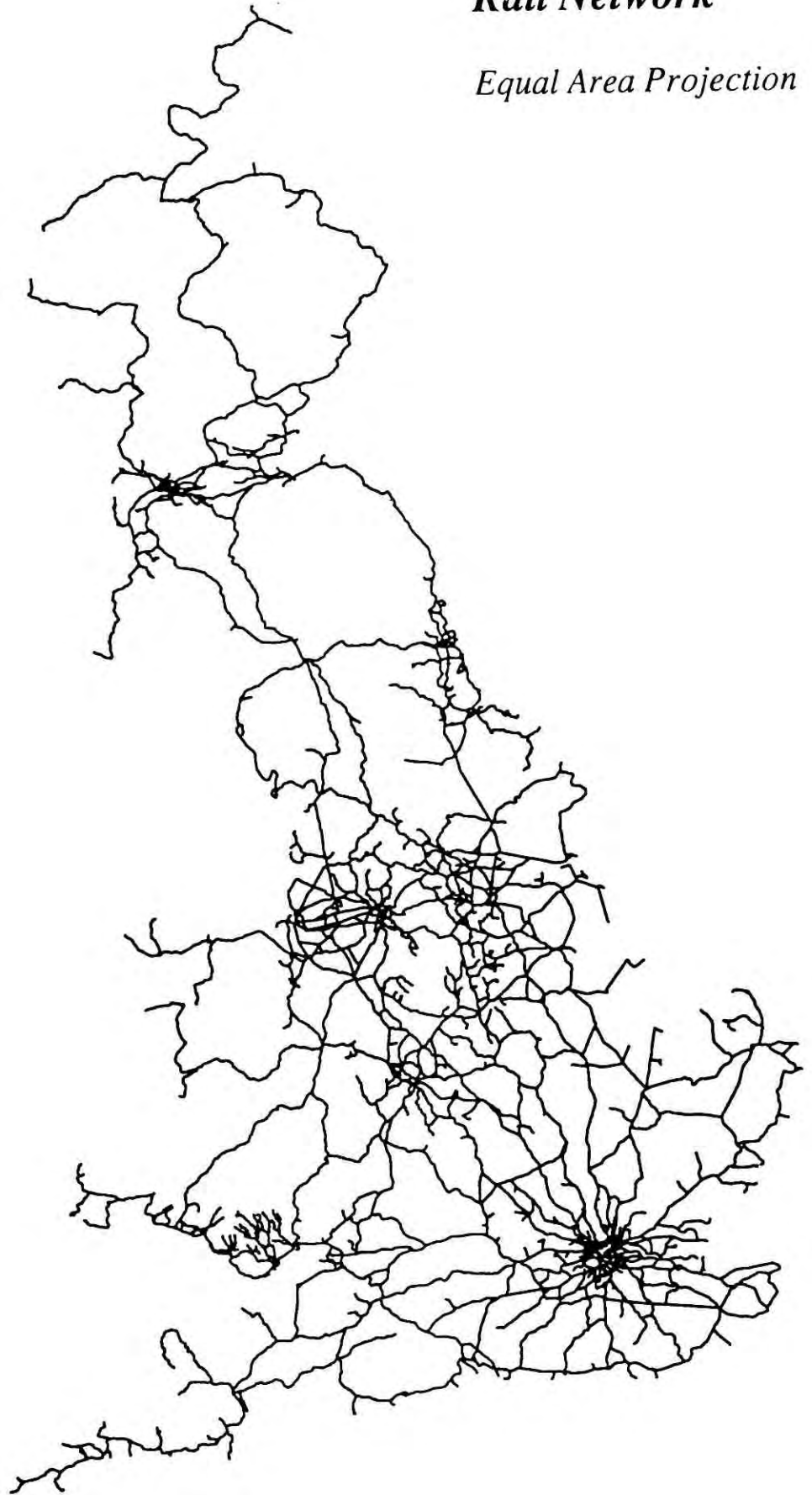


Postcode Sectors
Coloured at random.



British Mainline Rail Network

Equal Area Projection



*British Mainline
Rail Network
Equal Population
Projection*



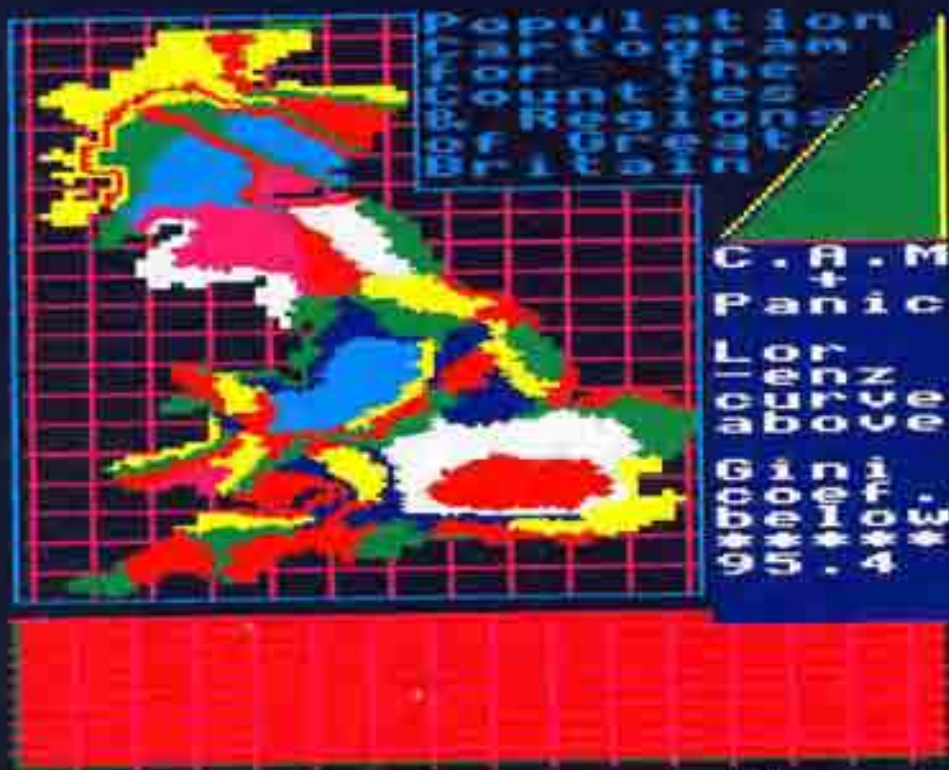
*British Primary
Road Network
Equal Area Projection*



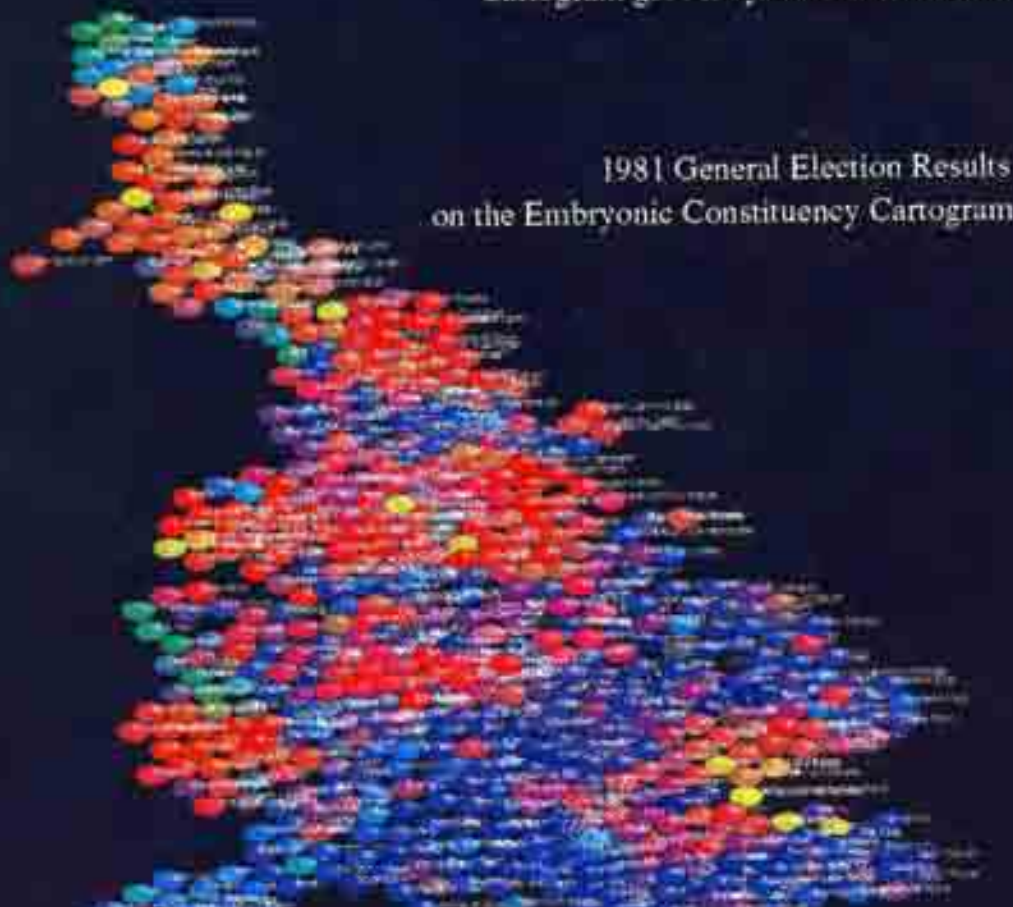
*British Primary
Road Network
Equal Population
Projection*



Experiments with Area Cartograms
Initial results using simple techniques and machines.



Cartogram grown by cellular automata.



*Continuous Area Cartograms of the British Population.
Illustrations of the results of applying different constraints.*

Basemap of
Counties and
Major Cities



Cartogram
Preserving
Coastline



Approximate
Pseudo-
Cartogram



Cartogram
Minimising
Internal
Boundaries

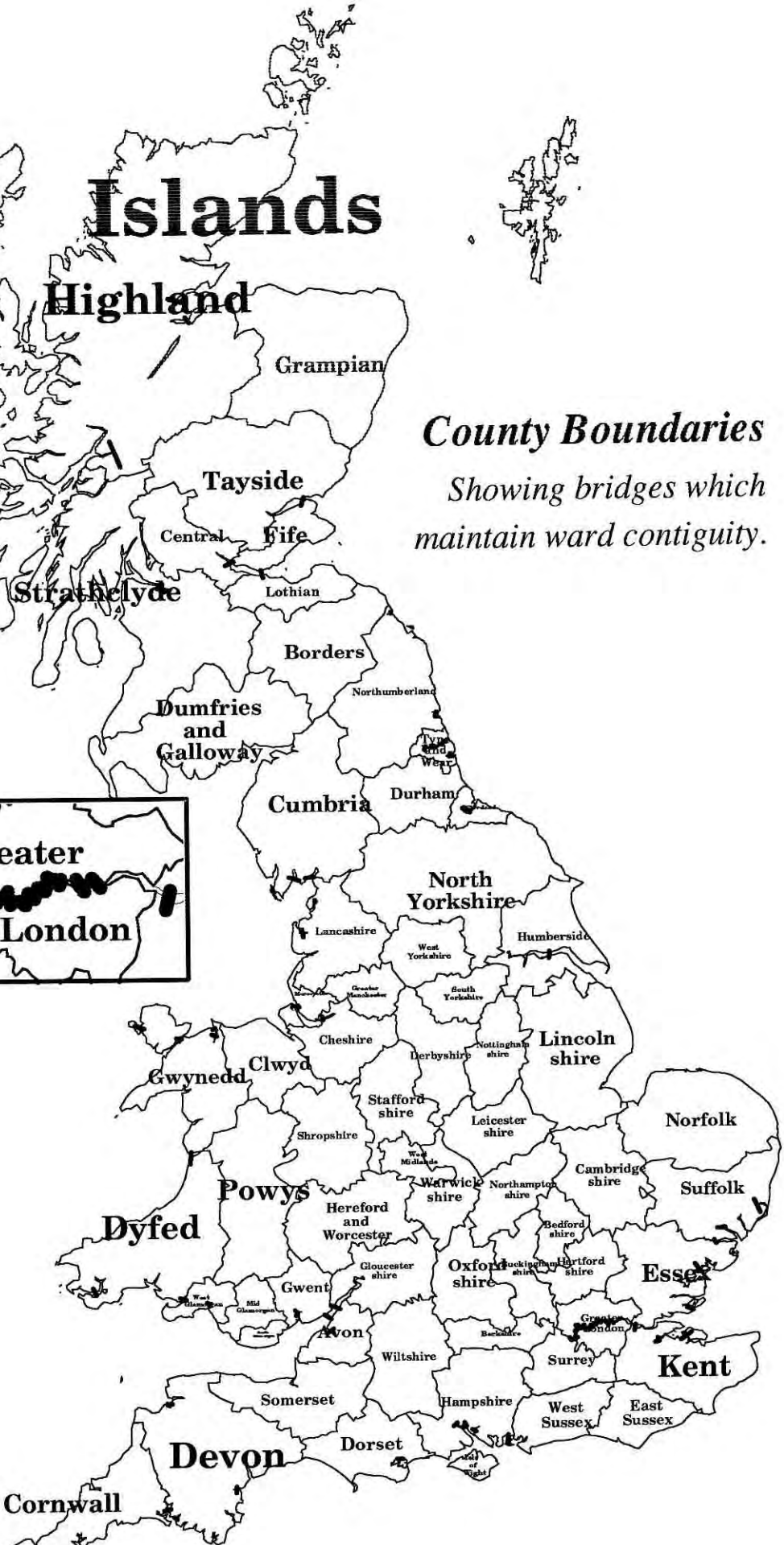
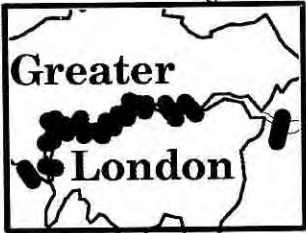


Islands

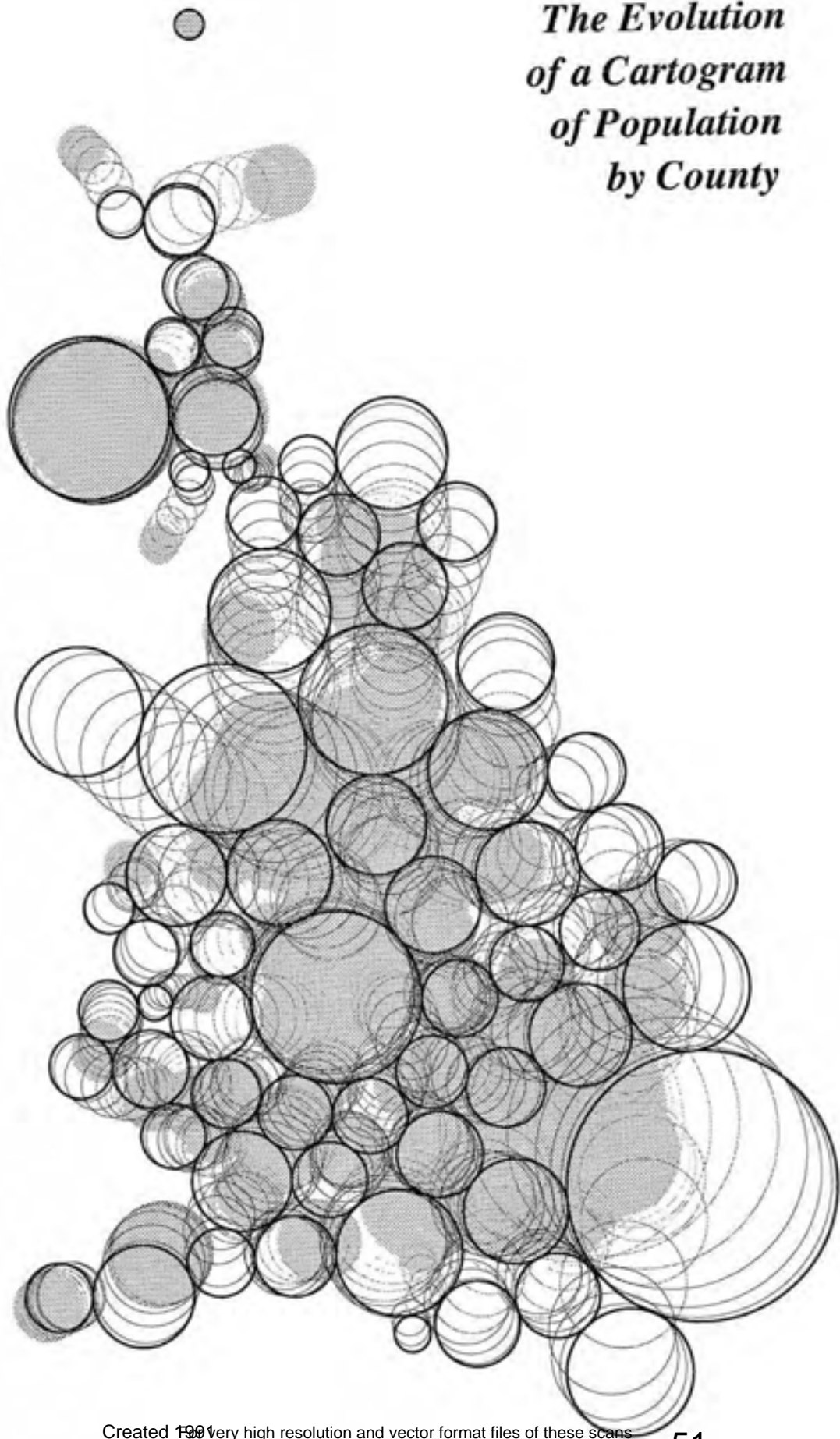
Highland

County Boundaries

Showing bridges which maintain ward contiguity.

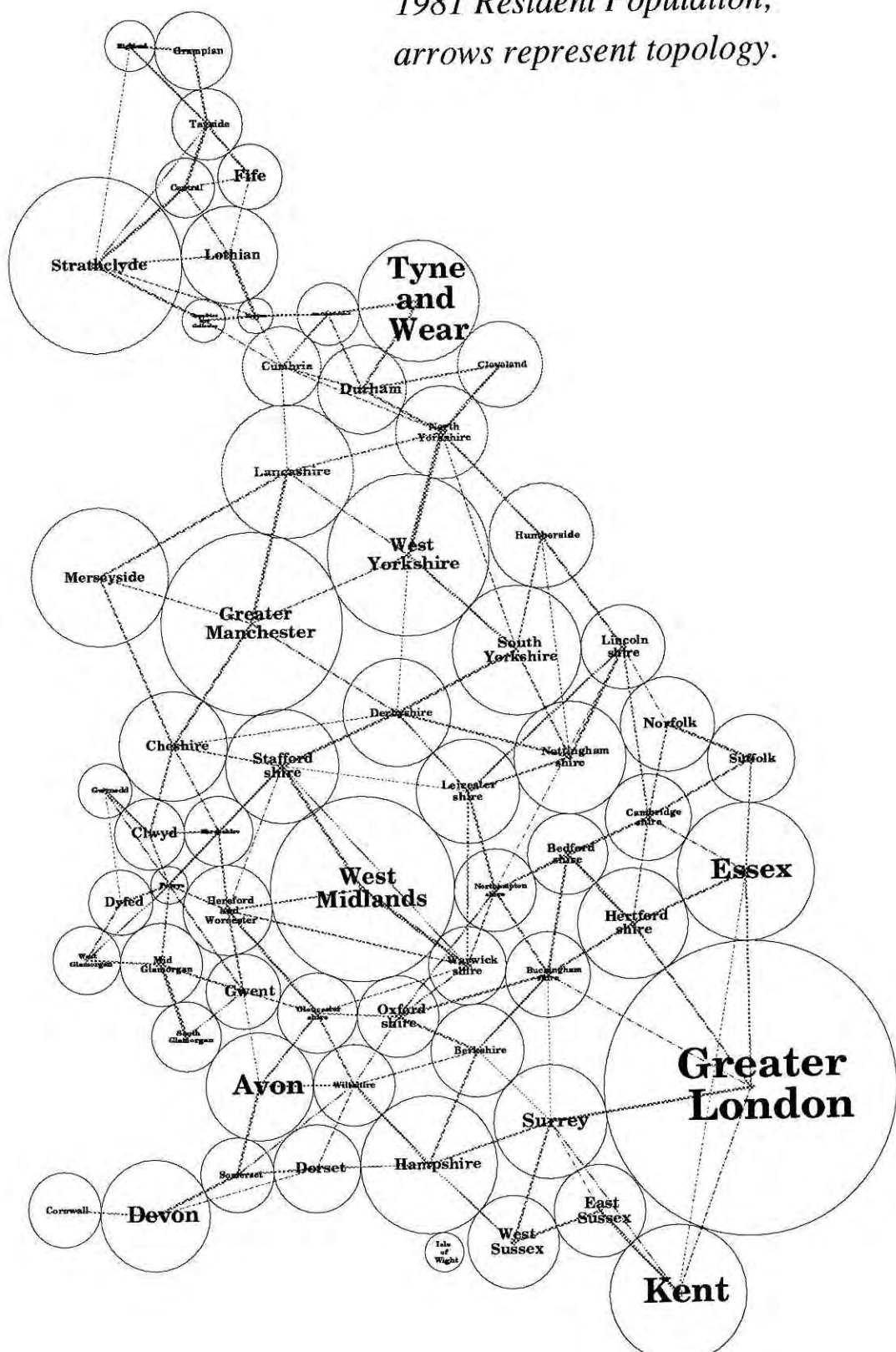


*The Evolution
of a Cartogram
of Population
by County*



County Cartogram

1981 Resident Population,
arrows represent topology.

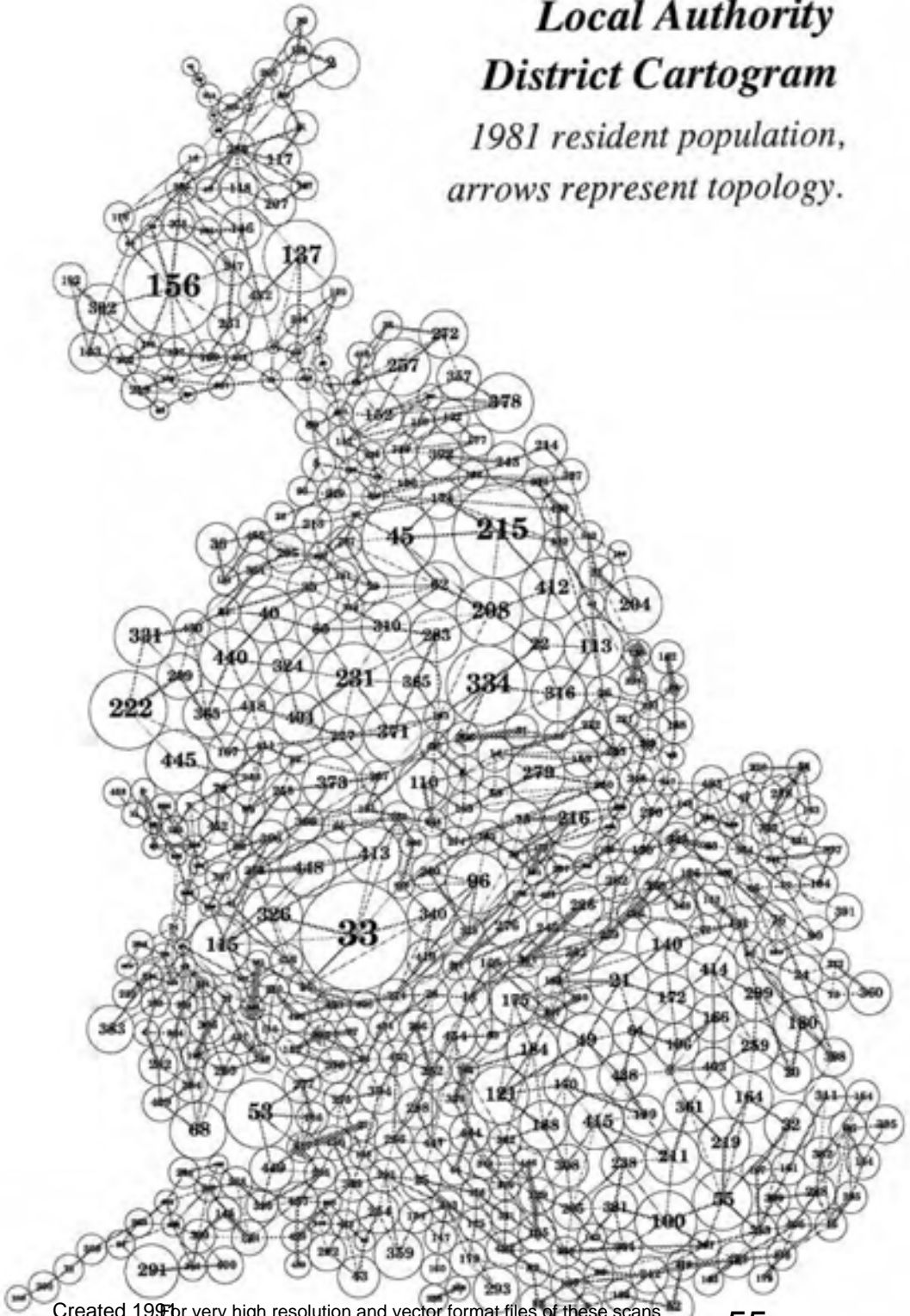


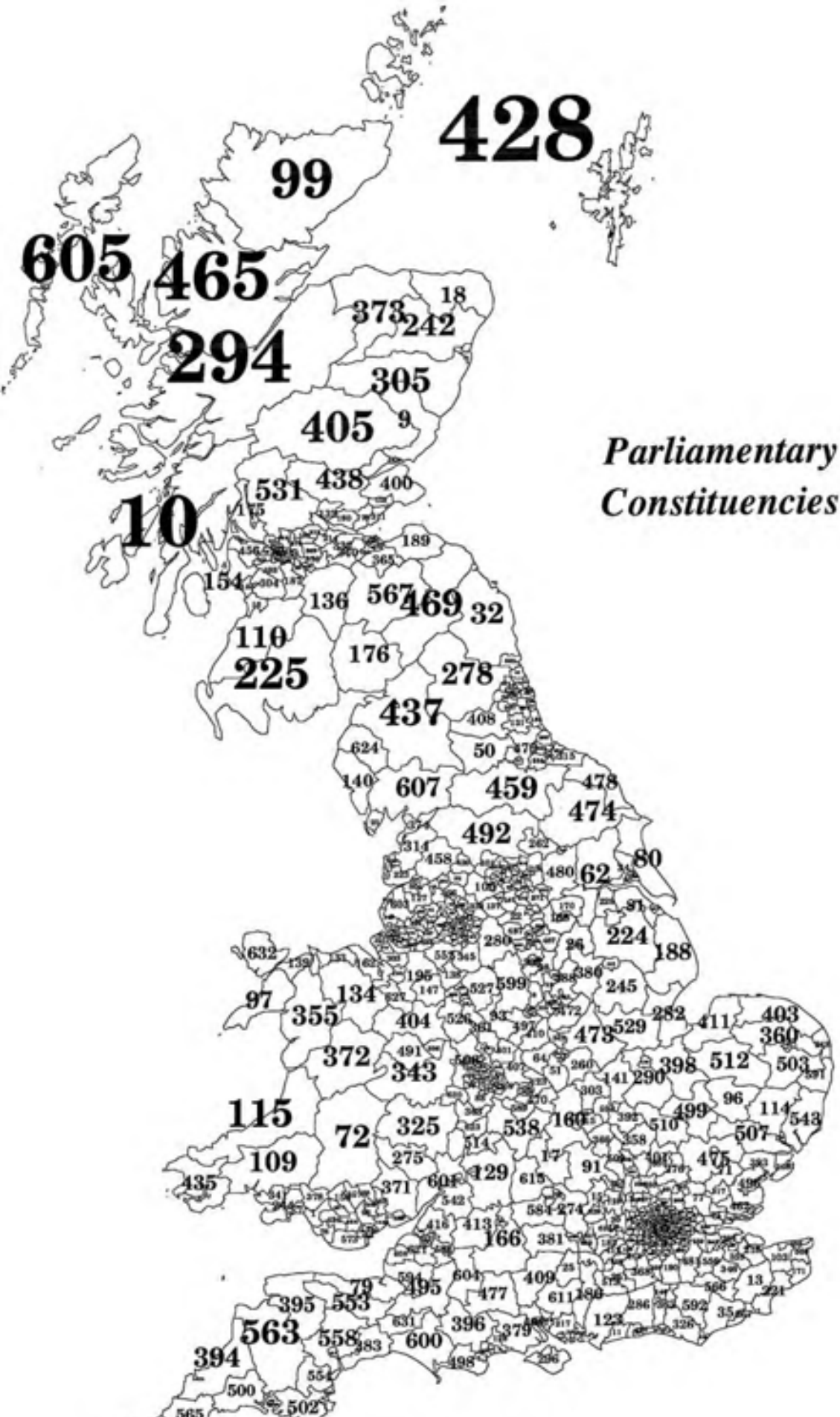


Local Authority Districts

1 Aberconwy	62 Calderdale	131 East Staffordshire	200 Kerrier	Derbyshire	331 Sefton	393 Tewkesbury
2 Aberdeen City	63 Cambridge	132 East Yorkshire	201 Kettering	267 North East Fife	332 Selby	394 Thamesdown
3 Adur	64 Camden	133 East Yorkshire	202 Kilmarnock and Loudoun	268 North Hertfordshire	333 Sevenoaks	395 Thanet
4 Alan	65 Canock Chase	134 Eastbourne	203 Kincardine and Deeside	269 North Kesteven	334 Sheffield	396 The Wrekin
5 Allerdale	66 Canterbury	135 Eastleigh	204 Kingston upon Hull	270 North Norfolk	335 Shepway	397 Three Rivers
6 Alwark	67 Caradon	136 Edon	205 Kingston upon Thames	271 North Shropshire	336 Shetland Islands	398 Thurrock
7 Alyn and Deeside	68 Cardiff	137 Edinburgh City	206 Kingswood	272 North Tyneside	337 Shrewsbury and Atcham	399 Tonbridge and Malling
8 Amber Valley	69 Carlisle	138 Ellesmere Port and Neston	207 Kirkcaldy	273 North Warwickshire	338 Skye and Lochalsh	400 Torbay
9 Angus	70 Carmarthen	139 Elmbridge	208 Kirkcaldy	274 North West Leicestershire	339 Slough	401 Torfaen
10 Annandale and Eskdale	71 Carrick	140 Enfield	209 Kirkcaldy	275 North Wiltshire	340 Solihull	402 Torridge
11 Ardn	72 Castle Morpeth	141 Epping Forest	210 Knowsley	276 Northampton	341 South Bedfordshire	403 Tower Hamlets
12 Argyll and Bute	73 Castle Point	142 Epsom and Ewell	211 Kyle and Carrick	277 Northavon	342 South Bucks	404 Trafford
13 Arun	74 Cheredigion	143 Erewash	212 Lambeth	278 Norwich	343 South Cambridgeshire	405 Tunbridge Wells
14 Ashfield	75 Charnwood	144 Etrick and Lauderdale	213 Lanark(now Clydesdale)	279 Nottingham	344 South Derbyshire	406 Tweeddale
15 Ashford	76 Chelmsford	145 Exeter	214 Lancaster	280 Nuneaton and Bedworth	345 South Hants	407 Tynedale
16 Aylesbury Vale	77 Cheltenham	146 Falkirk	215 Leeds	281 Oadby and Wigston	346 South Herefordshire	408 Uttlesford
17 Babergh	78 Cherwell	147 Fareham	216 Leicester	282 Oger	347 South Holland	409 Vale of Glamorgan
18 Badenoch and Strathspey	79 Chester	148 Farnham	217 Leominster	283 Oldham	348 South Hants	410 Vale of White Horse
19 Banff and Buchan	80 Chester-le-Street	149 Forest Heath	218 Lewes	284 Orkney Islands	349 South Lakeland	411 Vale Royal
20 Barking and Dagenham	81 Cheshire	150 Forest of Dean	219 Lewisham	285 Oswestry	350 South Norfolk	412 Wakefield
21 Barnet	82 Chichester	151 Fylde	220 Lichfield	286 Oxford	351 South Northamptonshire	413 Walsall
22 Barnsley	83 Chiltern	152 Gateshead	221 Lincoln	287 Pendle	352 South Oxfordshire	414 Waltham Forest
23 Barrow-in-Furness	84 Chorley	153 Gedling	222 Liverpool	288 Perth and Kinross	353 South Pembrokeshire	415 Wandsworth
24 Basildon	85 Christchurch	154 Gillingham	223 Llanelli	290 Peterborough	354 South Ribble	416 Wansbeck
25 Basingstoke and Deane	86 City of London	155 Gillingham	224 Llŷn Valley	291 Plymouth	355 South Shropshire	417 Wansdyke
26 Bassetlaw	87 Clackmannan	156 Glasgow City	225 Lochaber	292 Poole	356 South Staffordshire	418 Warrington
27 Bath	88 Cleethorpes	157 Gloucester	226 Luton	293 Portsmouth	357 South Tyneside	419 Warwick
28 Bearsden and Mingavie	89 Clydebank	158 Glyndwr	227 Macclesfield	294 Preseli	358 South Wight	420 Watford
29 Berwick-upon-Tweed	90 Colchester	159 Gordon	228 Maidstone	295 Preston	359 Southampton	421 Waverley
30 Berwickshire	91 Colwyn	160 Gosport	229 Maldon	296 Purbeck	360 Southend-on-Sea	422 Weaverley
31 Beverley	92 Congleton	161 Gravesham	230 Malvern Hills	297 Radnor	361 Southwark	423 Wealden
32 Bexley	93 Copeland	162 Great Grimsby	231 Manchester	298 Reading	362 Spelthorne	424 Wear Valley
33 Birmingham	94 Corby	163 Great Yarmouth	232 Mansfield	299 Redbridge	363 St Albans	425 Wellington
34 Biaby	95 Cotswold	164 Greenwich	233 Medina	300 Redditch	364 St Edmundsbury	426 Welwyn Hatfield
35 Blackburn	96 Coventry	165 Guildford	234 Meirionnydd	301 Reigate and Banstead	365 St Helens	427 West Derbyshire
36 Blackpool	97 Craven	166 Hackney	235 Melton	302 Renfrow	366 Stafford	428 West Devon
37 Blaenau Gwent	98 Crawley	167 Halton	236 Mendip	303 Restormel	367 Staffordshire Moorlands	429 West Dorset
38 Blyth Valley	99 Crewe and Nantwich	168 Hambleton	237 Merthyr Tydfil	304 Rhondda	368 Stenage	430 West Lancashire
39 Bolsover	100 Croydon	169 Hamilton	238 Merion	305 Rhuddlan	369 Stewartry	431 West Lindsey
40 Bolton	101 Cumbernauld and Kilsyth	170 Hammersmith and Fulham	239 Mid Bedfordshire	306 Rhymney Valley	370 Stirling	432 West Lothian
41 Boothferry	102 Cumnock and Doon Valley	171 Harborough	240 Mid Devon	307 Ribble Valley	371 Stockport	433 West Norfolk
42 Boston	103 Cuninghame	172 Haringey	241 Mid Suffolk	308 Richmond upon Thames	372 Stockton-on-Tees	434 West Oxfordshire
43 Bournemouth	104 Cynon Valley	173 Harlow	242 Mid Sussex	309 Richmondshire	373 Stoke-on-Trent	435 West Somerset
44 Bracknell	105 Dacorum	174 Harrogate	243 Middlesbrough	310 Rochdale	374 Stratford-on-Avon	436 West Wiltshire
45 Bradford	106 Darlington	175 Harrow	244 Midlothian	311 Rochester upon Medway	375 Strathkelvin	437 Western Isles
46 Braintree	107 Dartford	176 Hart	245 Milton Keynes	312 Rochford	376 Stroud	438 Westminster, City of
47 Breckland	108 Daventry	177 Hartepool	246 Mole Valley	313 Ross and Cromarty	377 Suffolk Coastal	439 Weymouth and Portland
48 Brecknock	109 DeLyn	178 Hastings	247 Monklands	314 Rossendale	378 Sutherland	440 Wigan
49 Brent	110 Derby	179 Havant	248 Monmouth	315 Rother	379 Surrey Heath	441 Wigton
50 Brentwood	111 Denwentside	180 Havering	249 Montgomery	316 Rotherham	380 Sutherland	442 Wimborne
51 Bridgnorth	112 Dinefwr	181 Hereford	250 Moray	317 Roxburgh	381 Sutton	443 Winchester
52 Brighton	113 Doncaster	182 Hertsmere	251 Motherwell	318 Rugby	382 Swale	444 Windsor and Maidenhead
53 Bristol	114 Dover	183 High Peak	252 Naim	319 Runnymede	383 Swansea	445 Wirral
54 Broadland	115 Dudley	184 Hillingdon	253 Neath	320 Rushcliffe	384 Taff-Ely	446 Woking
55 Bromley	116 Dumbarton	185 Hinckley and Bosworth	254 New Forest	321 Rushmoor	385 Tameside	447 Wokingham
56 Bromsgrove	117 Dundee City	186 Holderness	255 Newark	322 Rutland	386 Tamworth	448 Wolverhampton
57 Broxbourne	118 Dunfermline	187 Hounslow	256 Newbury	323 Ryedale	387 Telford	449 Woodspring
58 Broxtowe	119 Durham	188 Hove	257 Newcastle upon Tyne	324 Salford	388 Taunton Deane	450 Worcester
59 Burnley	120 Dwyfor	189 Hove	258 Newcastle-under-Lyme	325 Salisbury	389 Teesdale	451 Worthing
60 Bury	121 Ealing	190 Huntingdon	259 Nowham	326 Sandwell	390 Telford	452 Wrexham Maelor
61 Caithness	122 Easington	191 Hyndburn	260 Newport	327 Scarborough	391 Telford	453 Wychavon
	123 East Cambridgeshire	192 Inverclyde	261 Nithsdale	328 Scunthorpe	392 Telford	454 Wycombe
	124 East Devon	193 Inverness	262 North Bedfordshire	329 Sedgfield	393 Test Valley	455 Wyre
	125 East Hampshire	194 Ipswich	263 North Cornwall	330 Sefton		456 Wyre Forest
	126 East Hertfordshire	195 Isles of Scilly	264 North Devon			457 Yeovil
	127 East Kilbride	196 Islington	265 North Dorset			458 Ynys Mon-Isle of Anglesey
	128 East Lindsey	197 Islwyn	266 North East Fife			459 York
	129 East Lothian	198 Kennet	267 North East Fife			
	130 East Northamptonshire	199 Kensington and Chelsea	268 North			

*Local Authority
District Cartogram
1981 resident population,
arrows represent topology.*





428

99

605

465

294

373 242

305

405

9

10

531 438 400

110 225

136 567 469 32

437

607 459

492

62 80

97 355

134 404

372 343

115

72 325

538 160

109

275 371 608 429

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395 553

79 495 604 477

409 611 180

394 563

558 600

396 379

500 502

554 498

296

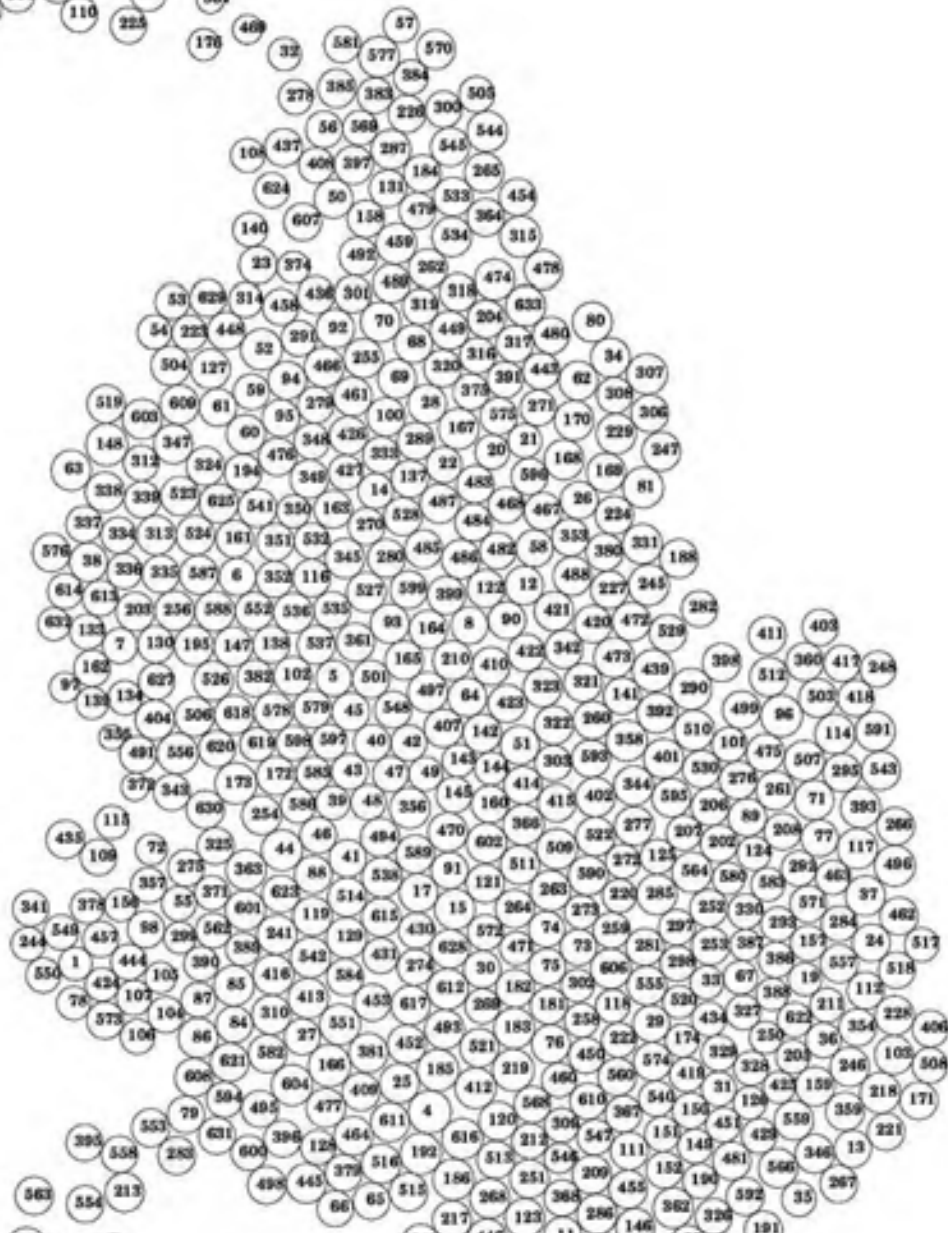
*Parliamentary
Constituencies*

Parliamentary Constituencies

1 Aberdeen	167 Cardiff West	315 Falkirk West	319 Leeds North West	424 Ogmore	528 Stalybridge and Hyde
2 Aberdeen North	168 Cardiff	316 Falkirk and Cambus	320 Leeds West	425 Old Bailey and St Giles	529 Stamford and Spalding
3 Aberdeen South	169 Carmarthen	217 Farnham	321 Leicester East	426 Oldham Central and Royton	530 Stevenage
4 Aldershot	110 Carmk, Cuswick and Doon Valley	218 Faversham	322 Leicester South	427 Oldham West	531 Striding
5 Alton - Brownhills	111 Carshalton and Wallington	219 Feltham and Heston	323 Leicester West	428 Orkney and Shetland	532 Stockport
6 Alyn and Deeside	112 Castle Point	220 Finchley	324 Leigh	429 Orington	533 Stockton North
7 Amble Valley	113 Central Fife	221 Folkestone and Hythe	325 Lewminster	430 Oxford East	534 Stockton South
8 Angus East	114 Central Suffolk	222 Fulham	326 Lewes	431 Oxford West and Abingdon	535 Stoke-on-Trent Central
9 Argyll and Bute	115 Ceredigion and Pembroke North	223 Fyfe	327 Lewisham Deptford	432 Paisley South	536 Stoke-on-Trent North
10 Arundel	116 Cheshire	224 Gallesborough and Hitcham	328 Lewisham East	433 Paisley North	537 Stoke-on-Trent South
11 Ashford	117 Chesham	225 Galloway and Upper Northcliffe	329 Lewisham West	434 Peckham	538 Stratford-on-Avon
12 Ashford	118 Chesham	226 Gateshead East	330 Leyton	435 Penitoke	539 Strathkivall and Beavain
13 Ashford	119 Chesham	227 Gedling	331 Lincoln	436 Penrith	540 Streatham
14 Ashton-under-Lyne	120 Chesham and Walton	228 Gillingham	332 Lichfield	437 Penrith and the Borders	541 Stratford
15 Aylesbury	121 Chesham and Amersham	229 Glasgow and Southside	333 Lilloborough and Bedford	438 Perth and Kinross	542 Stroud
16 Ay	122 Chesham	230 Glasgow Central	334 Liverpool Green	439 Peterborough	543 Suffolk Coastal
17 Barking	123 Chichester	231 Glasgow Central	335 Liverpool Garston	440 Plymouth Devonport	544 Sunderland North
18 Barking and Buckham	124 Chipping	232 Glasgow Garscadden	336 Liverpool Mossley Hill	441 Plymouth Drake	545 Sunderland South
19 Barking	125 Chipping Barnet	233 Glasgow Govan	337 Liverpool Riverside	442 Plymouth Sutton	546 Sutton
20 Barnsley Central	126 Chislehurst	234 Glasgow Hillhead	338 Liverpool Walton	443 Portlath and Castleford	547 Sutton and Cheam
21 Barnsley East	127 Chorley	235 Glasgow Maryhill	339 Liverpool West Derby	444 Pontypool	548 Sutton Coldfield
22 Barnsley West and Penistone	128 Chritchurch	236 Glasgow Pollok	340 Livingston	445 Poole	549 Swanssea East
23 Barrow and Furness	129 Cirencester and Tewkesbury	237 Glasgow Provan	341 Llanelli	446 Portsmouth North	550 Swanssea West
24 Basildon	130 City of Chester	238 Glasgow Rutherglen	342 Loughborough	447 Portsmouth South	551 Swindon
25 Basildon	131 City of Durham	239 Glasgow Shettleston	343 Luton	448 Preston	552 Taitton
26 Basildon	132 Gladsmann	240 Glasgow Springburn	344 Luton South	449 Putney	553 Taunton
27 Bath	133 Glyn North West	241 Gloucester	345 Macclesfield	450 Putney	554 Teignbridge
28 Bath and Spire	134 Glyn South West	242 Gordon	346 Maidstone	451 Ravensbourne	555 The City of London and Westminster
29 Battersea	135 Glynbank and Mingavie	243 Gosport	347 Mairfield	452 Reading East	556 The Wrekin
30 Beaconsfield	136 Glynedale	244 Gower	348 Manchester Blackley	453 Reading West	557 Thurrock
31 Beckenham	137 Glyn Valley	245 Grantham	349 Manchester Central	454 Reading	558 Thurston
32 Benack-upon-Tweed	138 Gwent	246 Gravesham	350 Manchester Gorton	455 Reigate	559 Tonbridge and Malling
33 Bethnal Green and Stepney	139 Gwent	247 Great Grimsby	351 Manchester Withington	456 Renfrew West and Inverclyde	560 Tooting
34 Beverley	140 Copeland	248 Great Yarmouth	352 Manchester Wythenshawe	457 Rhondda	561 Torbay
35 Bewick and Bettle	141 Corby	249 Greenock and Port Glasgow	353 Mansfield	458 Ribbles Valley	562 Torridge
36 Bewick Heath	142 Coventry North East	250 Greenwich	354 Melksham	459 Richmond	563 Torridge and West Devon
37 Billesley	143 Coventry North West	251 Guildford	355 Melton	460 Richmond-upon-Thames	564 Tottenham
38 Blithfield	144 Coventry South East	252 Hackney North and Stoke Newington	356 Meriden	461 Richmond-upon-Thames and Barnes	565 Tooting
39 Birmingham Edgbaston	145 Coventry South West	253 Hackney South and Shoreditch	357 Merthyr Tydfil and Rhymney	462 Rochdale	566 Tunbridge Wells
40 Birmingham Erdington	146 Crawley	254 Halesowen and Stourbridge	358 Mid Bedfordshire	463 Rochford	567 Tynemouth
41 Birmingham Hall Green	147 Crawe and Nantwich	255 Halifax	359 Mid Kent	464 Romford	568 Tynemouth
42 Birmingham Hodge Hill	148 Crosby	256 Halton	360 Mid Norfolk	465 Romsey and Waterside	569 Tyne Bridge
43 Birmingham Ladywood	149 Croydon Central	257 Hamilton	361 Mid Staffordshire	466 Ross, Cromarty and Skye	570 Tyne and Wear
44 Birmingham Northfield	150 Croydon North East	258 Hammer-smith	362 Mid Sussex	467 Rossett and Darwen	571 Uxbridge
45 Birmingham Perry Bar	151 Croydon North West	259 Harpendale and Highgate	363 Mid Wiltshire	468 Rother Valley	572 Uxbridge
46 Birmingham Selly Oak	152 Croydon South	260 Harrogate	364 Middlesbrough	469 Rotherham	573 Vale of Glamorgan
47 Birmingham Small Heath	153 Cumbria and Merseyside	261 Harlow	365 Milton Keynes	470 Rugby and Leicestershire	574 Vauchan
48 Birmingham Sparkbrook	154 Cumbernauld and Kilmory	262 Harrogate	366 Mitcham and Morden	471 Rugby and Leicestershire	575 Wakefield
49 Birmingham Yardley	155 Cuninghame North	263 Harrow East	367 Mole Valley	472 Rushcliffe	576 Wakefield
50 Bishop Auckland	156 Cynon Valley	264 Harrow West	368 Morildens East	473 Rutland and Melton	577 Walsall
51 Blaby	157 Dagenham	265 Hartlepool	369 Morildens West	474 Ryedale	578 Walsall North
52 Blackburn	158 Darlington	266 Havering	370 Morildens West	475 Salford Central	579 Walsall South
53 Blackburn North	159 Dartford	267 Hastings and Rye	371 Morildens West	476 Salford East	580 Walthamstow
54 Blackburn South	160 Daventry	268 Havant	372 Montgomery	477 Salisbury	581 Warrack
55 Blanaid Gaer	161 Davyhuime	269 Hayes and Harrington	373 Morley	478 Scarborough	582 Warrack
56 Blaydon	162 Delyn	270 Hazel Grove	374 Morwell North	479 Sedgfield	583 Warrack and Woodford
57 Blith Valley	163 Denton and Reddish	271 Hemsworth	375 Morwell South	480 Selby	584 Warrack
58 Bolsover	164 Derby North	272 Hendon North	376 Motherwell North	481 Sevenoaks	585 Warrack East
59 Bolton North East	165 Derby South	273 Hendon South	377 Motherwell South	482 Sheffield Attercliffe	586 Warrack West
60 Bolton South East	166 Devizes	274 Henley	378 New Forest	483 Sheffield Brightside	587 Warrack North
61 Bolton West	167 Dewbury	275 Hereford	379 Newark	484 Sheffield Central	588 Warrack and Leamington
62 Booth Ferry	168 Don Valley	276 Hertford and Stortford	380 Newark	485 Sheffield Hallam	589 Watford
63 Botic	169 Doncaster Central	277 Hertsmere	381 Newbury	486 Sheffield Healey	590 Watford
64 Bow and Poplar	170 Doncaster South	278 Hexham	382 Newcastle-under-Lyne	487 Sheffield Hillsborough	591 Waverley
65 Bow and Poplar	171 Dover	279 Heywood and Middleton	383 Newcastle-upon-Tyne Central	488 Sheffeld	592 Wavertree
66 Bradford North	172 Dudley East	280 High Peak	384 Newcastle-upon-Tyne East	489 Shipley	593 Wellingborough
67 Bradford South	173 Dudley West	281 Holborn and St. Pancras	385 Newcastle-upon-Tyne North	490 Siverham	594 Wells
68 Bradford West	174 Dulwich	282 Holland and Boston	386 Newham North East	491 Stretsbury and Altham	595 Wellingborough
69 Braine	175 Dumfries	283 Honiton	387 Newham North West	492 Sthampton and Ripon	596 Westbury
70 Brecon and Radnor	176 Dundee East	284 Hornchurch	388 Newham South	493 Suffolk	597 West Bromwich East
71 Brent East	177 Dundee West	285 Hornsey and Wood Green	389 Newport East	494 Southdown	598 West Bromwich West
72 Brent North	178 Dundee East	286 Hornham	390 Newport West	495 Somerset and Frome	599 West Derbyshire
73 Brent South	179 Dundee East	287 Houghton and Washington	391 Normanton	496 South Coldsheaf and Maldon	600 West Dorset
74 Brentford and Isleworth	180 Dundee West	288 Hove	392 North Bedfordshire	497 South Derbyshire	601 West Dorset
75 Brentford and Uxbridge	181 Ealing Acton	289 Huddersfield	393 North Colchester	498 South Dorset	602 West Dorset
76 Bridgend	182 Ealing North	290 Huntingdon	394 North Cornwall	499 South East	603 West Dorset
77 Bridgewater	183 Ealing Southall	291 Hylton	395 North Devon	500 South East Cornwall	604 West Dorset
78 Bristol East	184 Easington	292 Huddersfield	396 North Dorset	501 South East Staffordshire	605 West Dorset
79 Bristol North West	185 East Berkshire	293 Huddersfield	397 North Durham	502 South Hants	606 Westminster North
80 Bristol South	186 East Hampshire	294 Inverness, Nairn and Lovat	398 North East	503 South Norfolk	607 Westminster and London
81 Brigg and Cleethorpes	187 East Kilbride	295 Ipswich	399 North East Derbyshire	504 South Ribbles	608 Westminster-Super-Mare
82 Brighton and Hove	188 East Lindsey	296 Isle of Wight	400 North Devon	505 South Shields	609 Wig
83 Brighton Pavilion	189 East Lothian	297 Islington North	401 North Dorset	506 South Staffordshire	610 Wiltshire
84 Bristol East	190 East Sussex	298 Islington South and Finsbury	402 North Devon	507 South Suffolk	611 Winchester
85 Bristol North West	191 Eastbourne	299 Islay	403 North Devon	508 South Thanet	612 Windsor and Maidenhead
86 Bristol South	192 Eastleigh	300 Janow	404 North Shropshire	509 South West Bedfordshire	613 Windsor and Maidenhead
87 Bristol West	193 Eastleigh	301 Kettering	405 North Tyneside	510 South West	614 Windsor and Maidenhead
88 Bromsgrove	194 Epsom and Ewell	302 Kensington	406 North Tyneside	511 South West	615 Windsor and Maidenhead
89 Bromsgrove	195 Epsom and Ewell	303 Kensington	407 North Warwickshire	512 South West	616 Windsor and Maidenhead
90 Brixton	196 Epsom and Ewell	304 Kettering	408 North Warwickshire	513 South West	617 Windsor and Maidenhead
91 Buckingham	197 Epsom and Ewell	305 Kettering	409 North Warwickshire	514 South West	618 Windsor and Maidenhead
92 Burnley	198 Epsom and Ewell	306 Kettering	410 North Warwickshire	515 South West	619 Windsor and Maidenhead
93 Bury	199 Epsom and Ewell	307 Kettering	411 North Warwickshire	516 South West	620 Windsor and Maidenhead
94 Bury North	200 Epsom and Ewell	308 Kettering	412 North Warwickshire	517 South West	621 Windsor and Maidenhead
95 Bury South	201 Epsom and Ewell	309 Kettering	413 North Warwickshire	518 South West	622 Windsor and Maidenhead
96 Bury St. Edmunds	202 Epsom and Ewell	310 Kettering	414 North Warwickshire	519 South West	623 Windsor and Maidenhead
97 Caermarthen	203 Epsom and Ewell	311 Kettering	415 North Warwickshire	520 South West	624 Windsor and Maidenhead
98 Caerphilly	204 Epsom and Ewell	312 Kettering	416 North Warwickshire	521 South West	625 Windsor and Maidenhead
99 Caerphilly and Sutherland	205 Epsom and Ewell	313 Kettering	417 North Warwickshire	522 St. Albans	626 Windsor and Maidenhead
100 Calder Valley	206 Epsom and Ewell	314 Kettering	418 North Warwickshire	523 St. Helens North	627 Windsor and Maidenhead
101 Cambridge	207 Epsom and Ewell	315 Kettering	419 North Warwickshire	524 St. Helens South	628 Windsor and Maidenhead
102 Camock and Buntingford	208 Epsom and Ewell	316 Kettering	420 North Warwickshire	525 St. Helens	629 Windsor and Maidenhead
103 Canterbury	209 Epsom and Ewell	317 Kettering	421 North Warwickshire	526 St. Helens	630 Windsor and Maidenhead
104 Cardiff Central	210 Epsom and Ewell	318 Kettering	422 North Warwickshire	527 St. Helens	631 Windsor and Maidenhead
105 Cardiff North	211 Epsom and Ewell	319 Kettering	423 North Warwickshire	528 St. Helens	632 Windsor and Maidenhead
106 Cardiff South and Penarth	212 Epsom and Ewell	320 Kettering	424 North Warwickshire	529 St. Helens	633 Windsor and Maidenhead



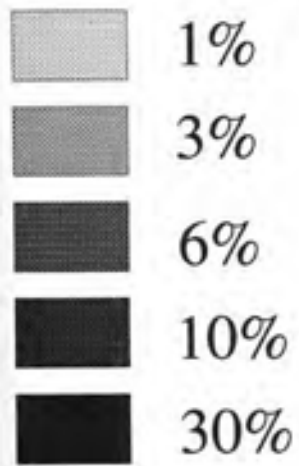
*Parliamentary
Constituency
Cartogram
1981 resident
population.*



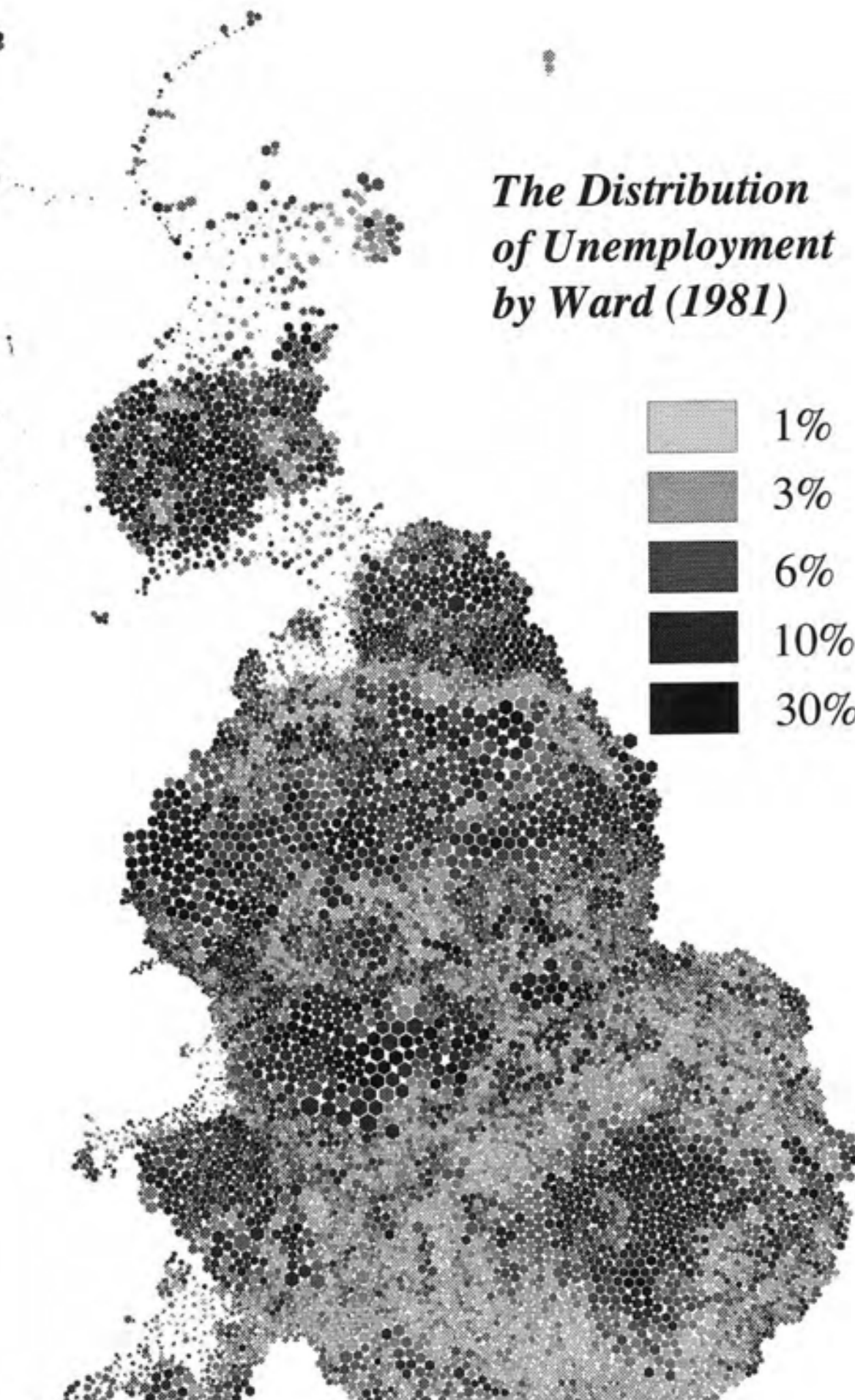
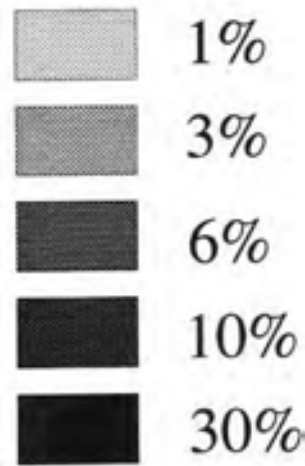
Census Wards

(1981 Resident Population)

*The Concentration
of Unemployment
by Ward (1981)*



*The Distribution
of Unemployment
by Ward (1981)*



Islands

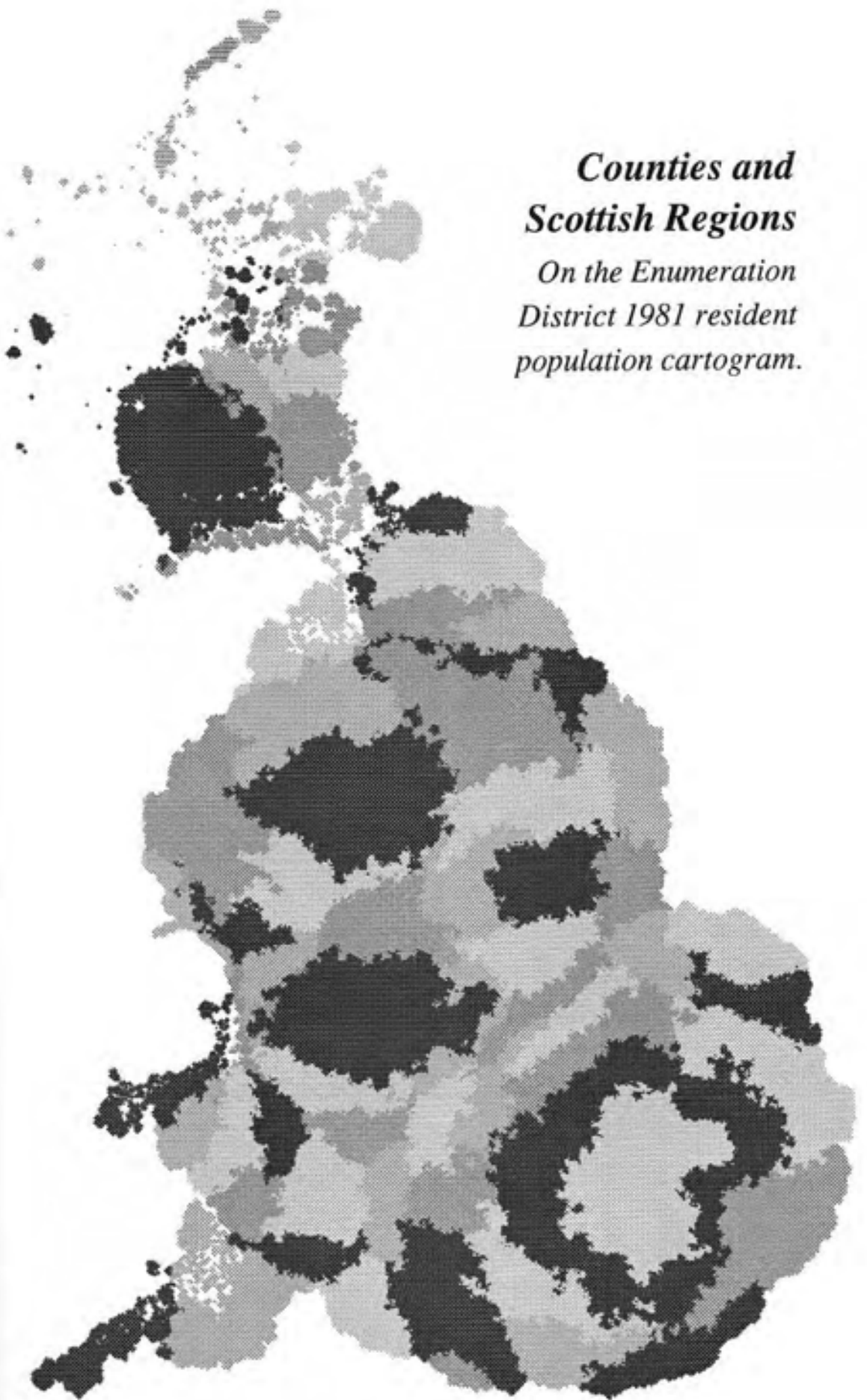
Highland

Counties and Scottish Regions



*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.*

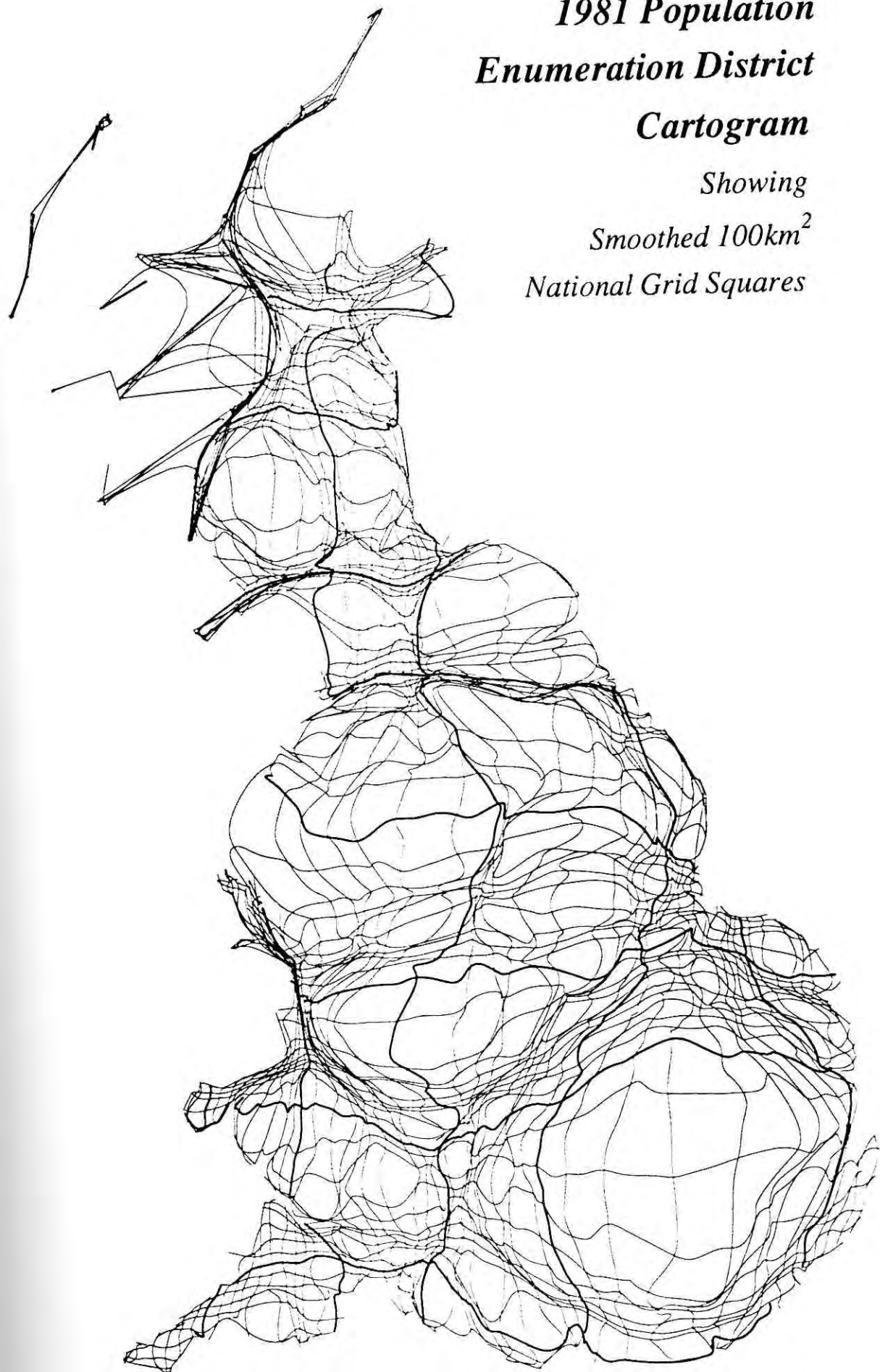
**1981 Equal
Population
Grid Squares**

*From Smoothed
Enumeration District
Cartogram 30,000
people squares*



*1981 Population
Enumeration District
Cartogram*

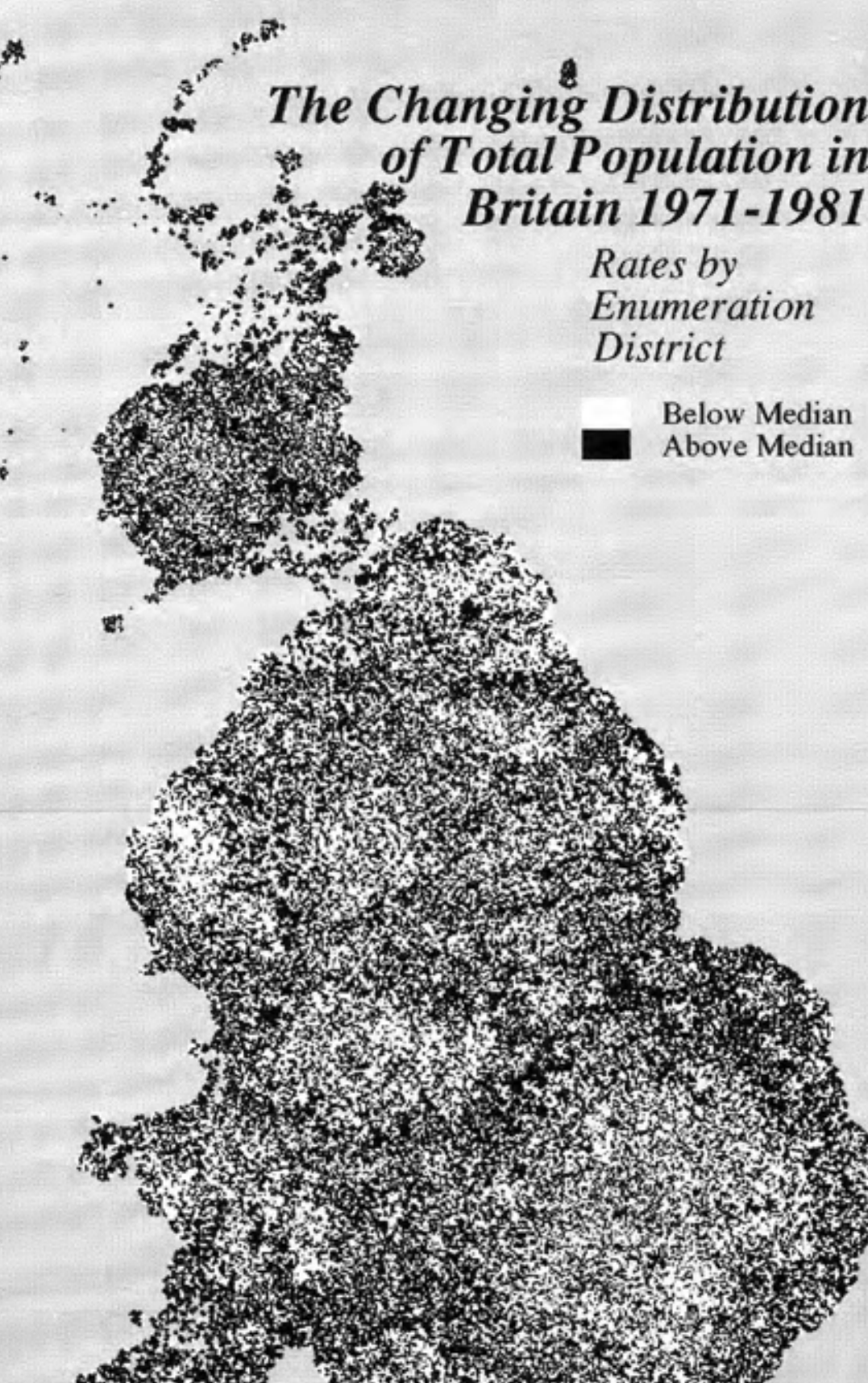
*Showing
Smoothed 100km²
National Grid Squares*



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



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

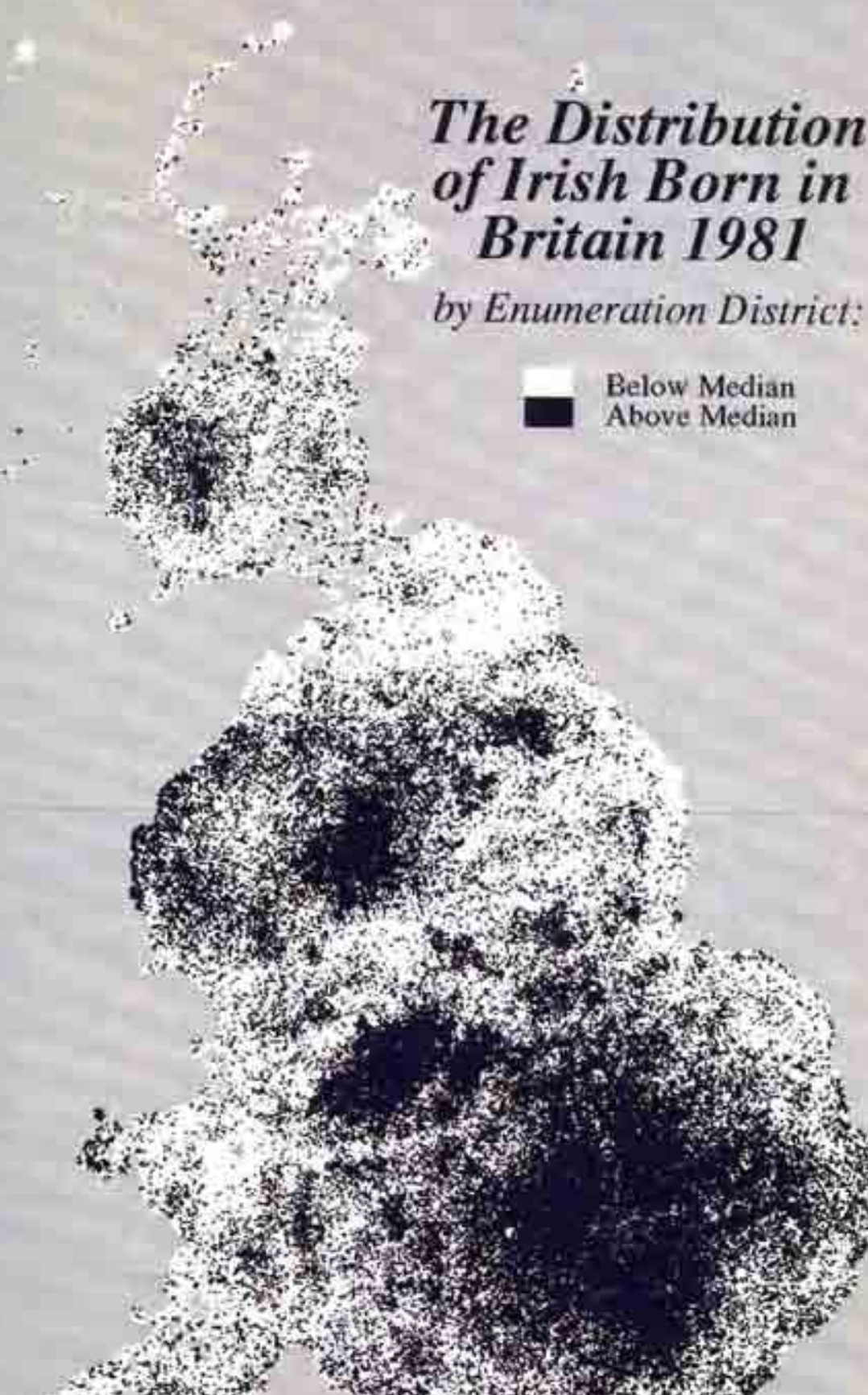
*Quartile Levels by
Enumeration District of:*



The Distribution of Irish Born in Britain 1981

by Enumeration District:

Below Median
Above Median



The Distribution of Place of Birth in Britain 1981

*Quartile Levels by
Enumeration District of:*

England

Scotland



Wales

The Distribution of Place of Birth in Britain 1981

*Quartile Levels by
Enumeration District of:*

Africa

Ireland



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:*



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:*



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:*

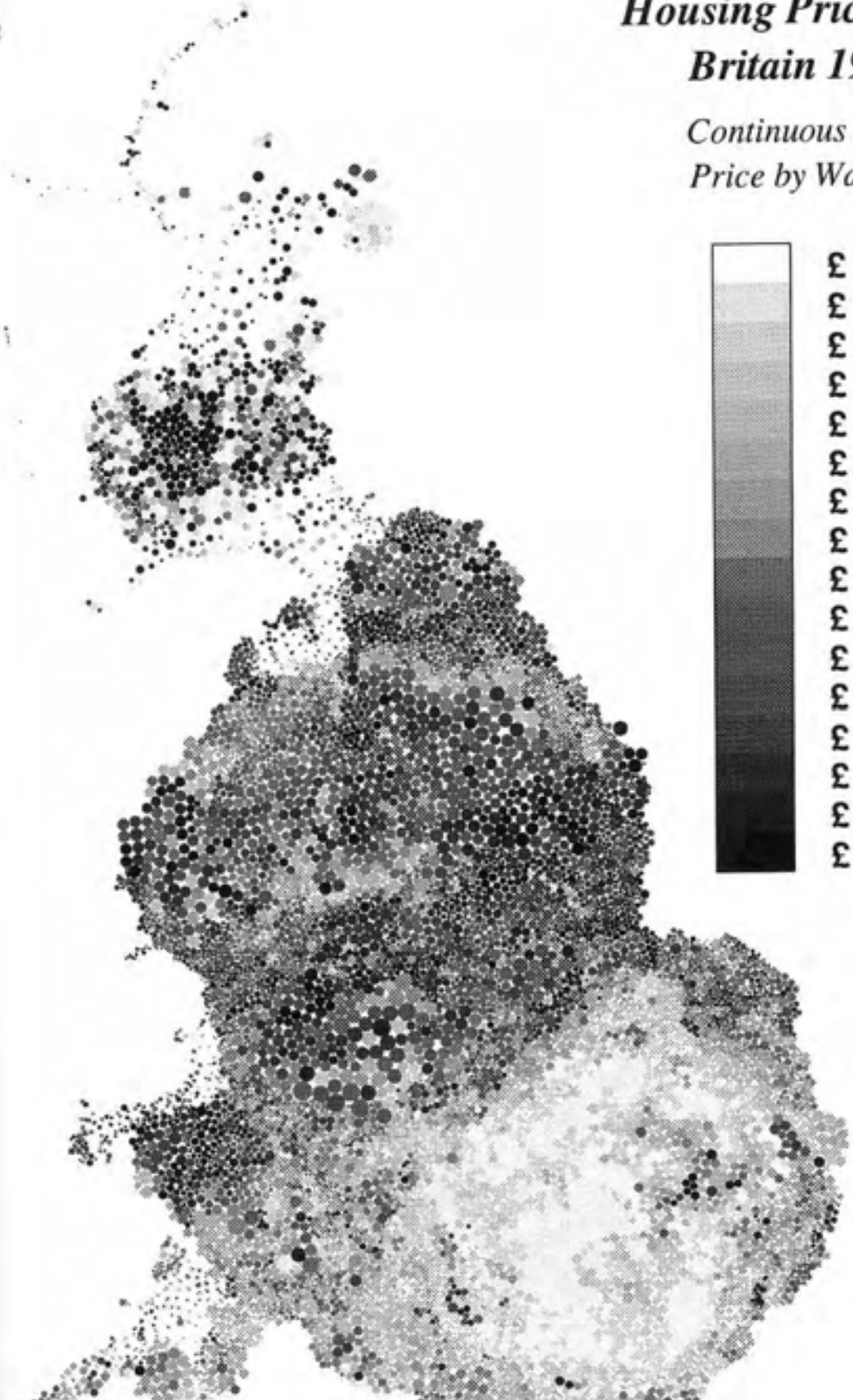
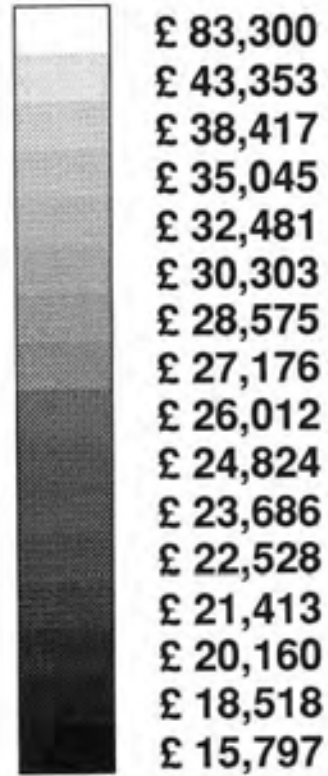
All Degree Employed



Female aged < 60
and not Employed

The Distribution of Housing Price in Britain 1983.

*Continuous Mean
Price by Ward of:*



The Distribution of Voting in the 1987 British General Election

*Quartile Levels by
Constituency of:*

Alliance



The Map of Voting in the 1987 British General Election

*Quartile Levels by
Constituency of:*

Alliance



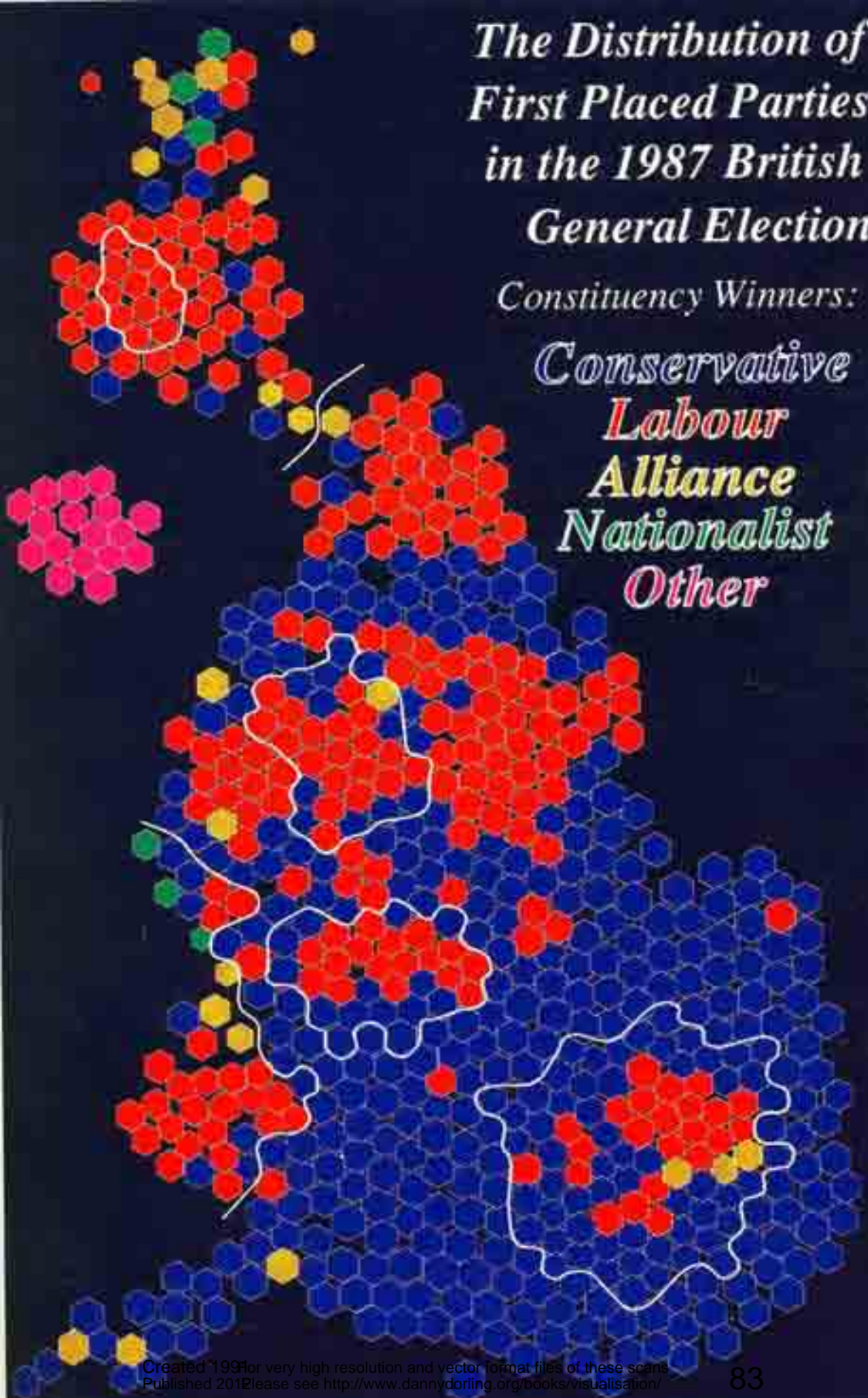
Labour

Conservative

*The Distribution of
First Placed Parties
in the 1987 British
General Election*

Constituency Winners:

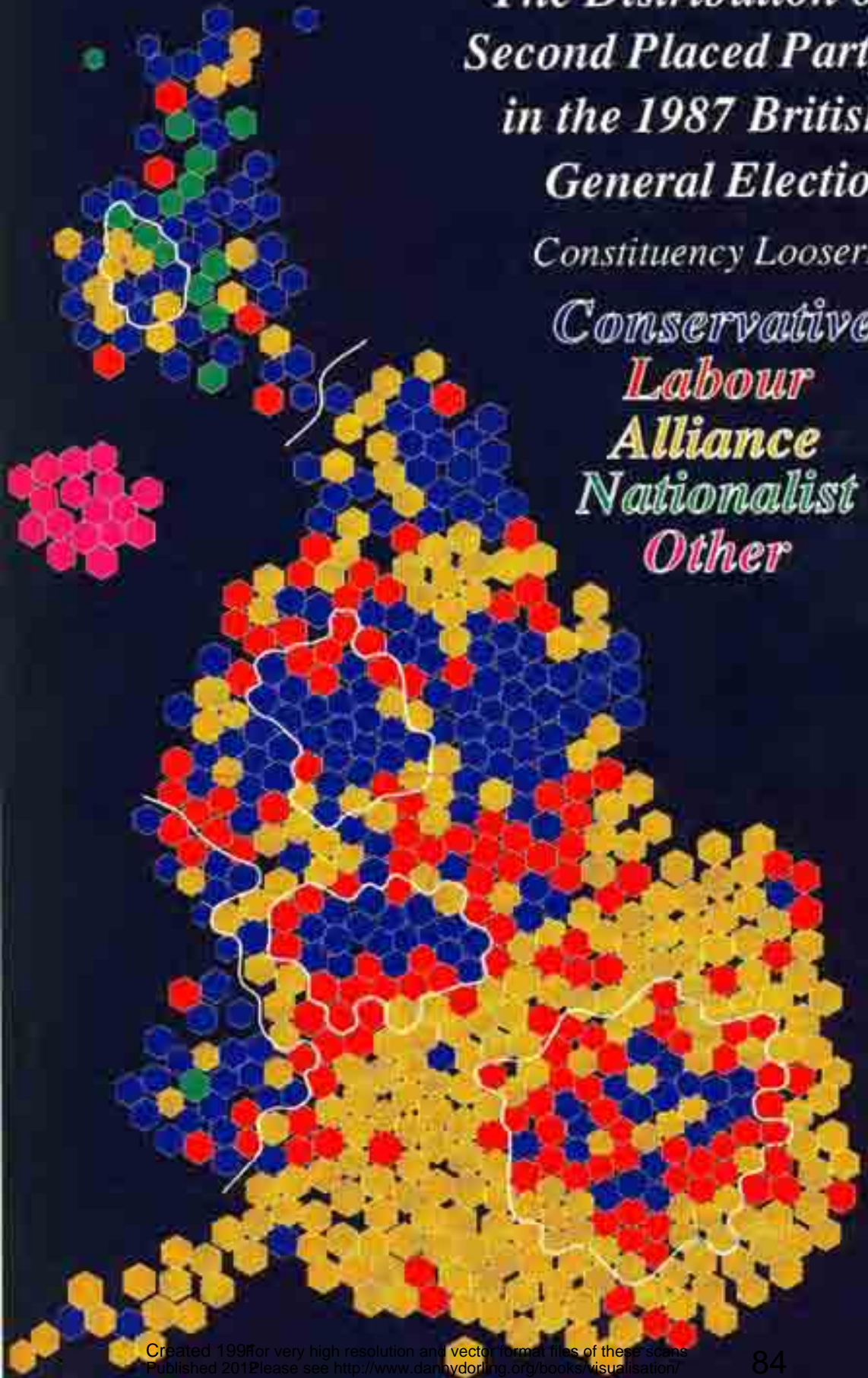
*Conservative
Labour
Alliance
Nationalist
Other*



*The Distribution of
Second Placed Party
in the 1987 British
General Election*

Constituency Losers:

*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:*



The Changing Distribution of Place of Birth in Britain 1971-1981

*Quartile Rates by
Enumeration District of:*



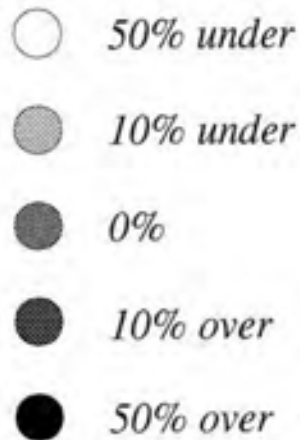
The Changing Distribution of Employment in Britain 1971-1981

*Quartile Rates by
Enumeration District of:*



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

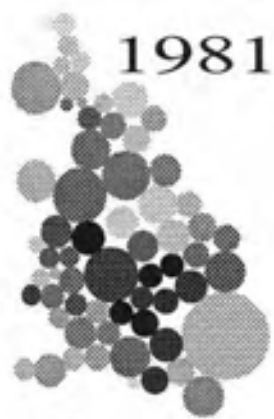
(on 1981
Amalgamated
Office Area
population
cartograms,
scale indicating
deviation from
space/time
independence.)



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



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



○ 50% under
● 10% under
● 0%
● 10% over
● 50% over



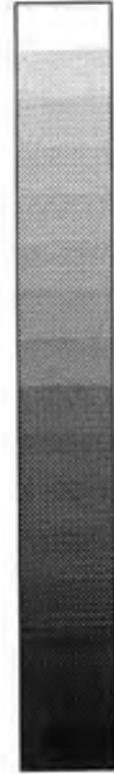
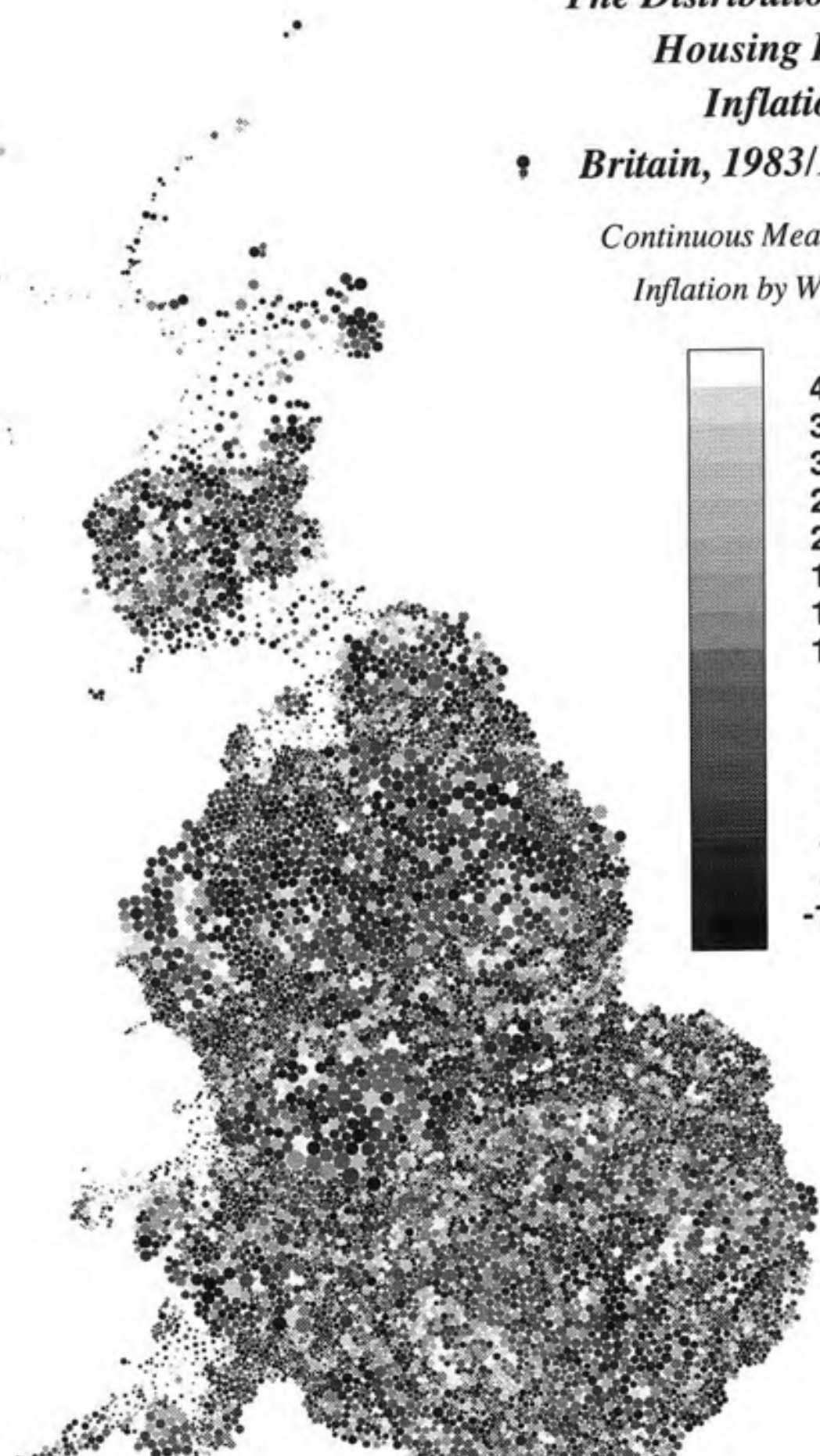
The Changing Distribution of Occupation in Britain 1971-1981

*Quartile Rates by
Enumeration District of:*



The Distribution of Housing Price Inflation in Britain, 1983/1984.

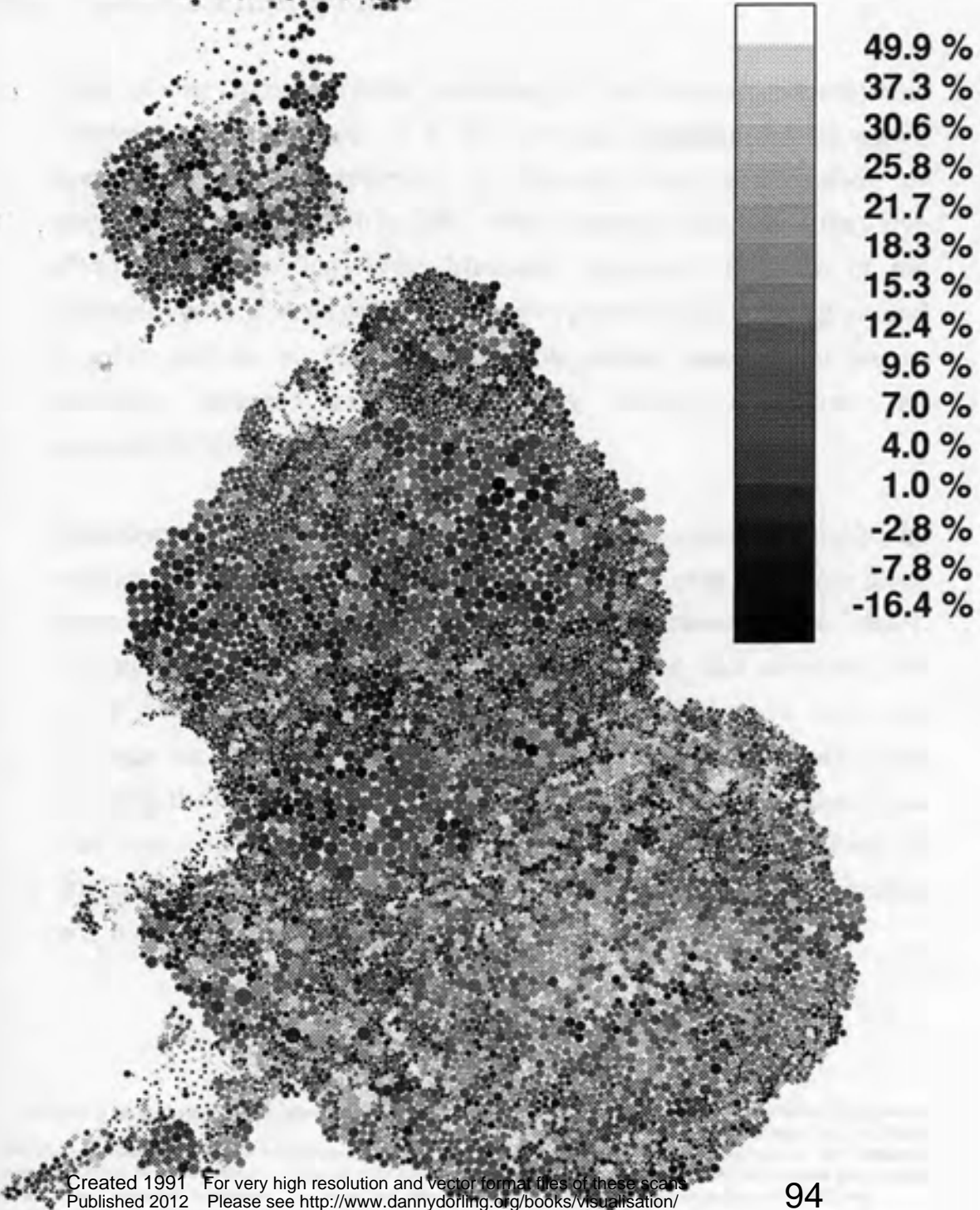
*Continuous Mean Price
Inflation by Ward of:*



- 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 %

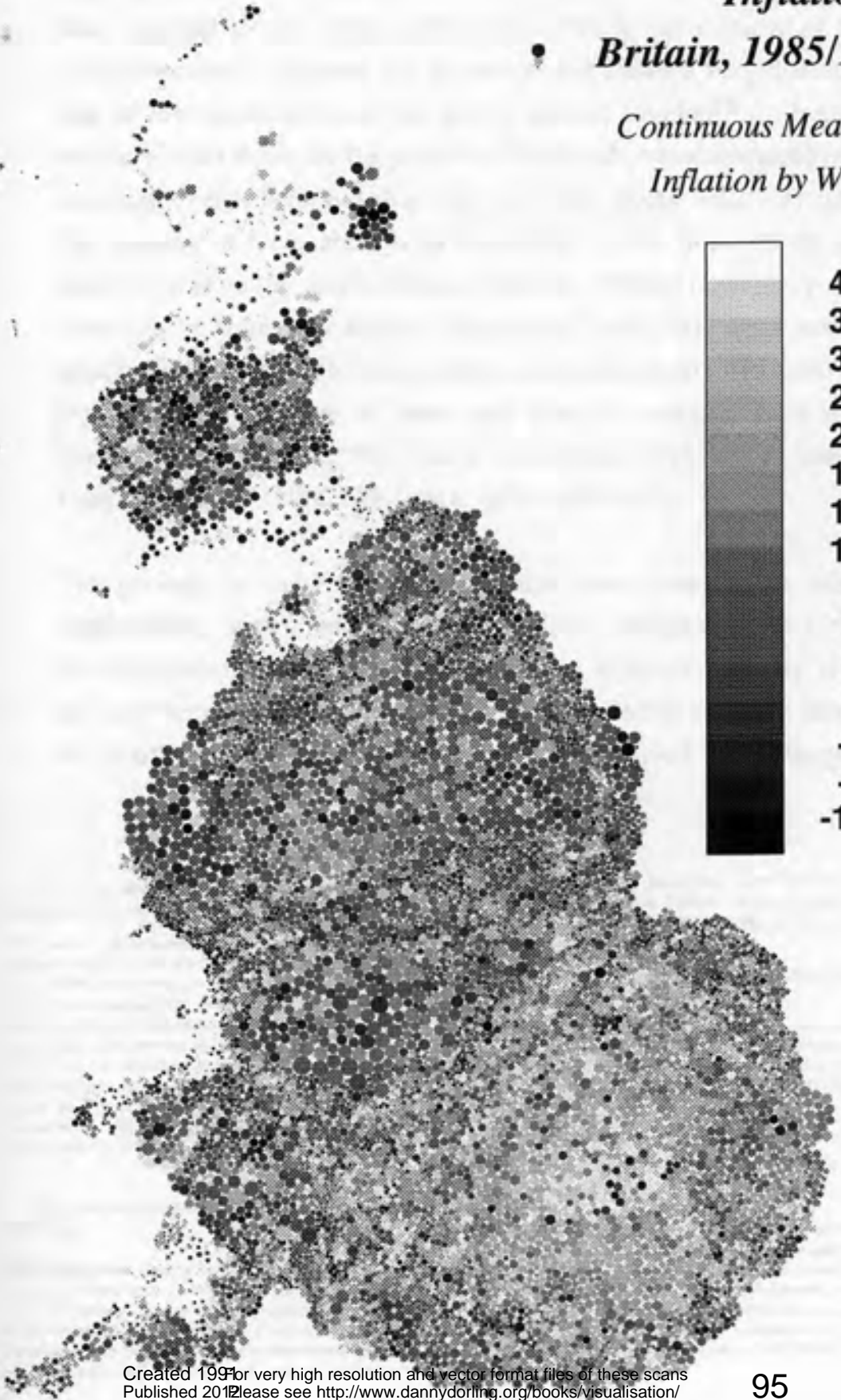
The Distribution of Housing Price Inflation in Britain, 1984/1985.

*Continuous Mean Price
Inflation by Ward of:*



*The Distribution of
Housing Price
Inflation in
Britain, 1985/1986.*

*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 Inflation in Britain, 1986/1987.

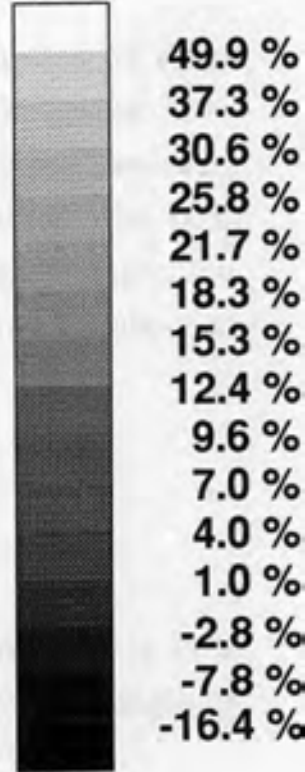
Continuous Mean Price
Inflation by Ward of:



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 %

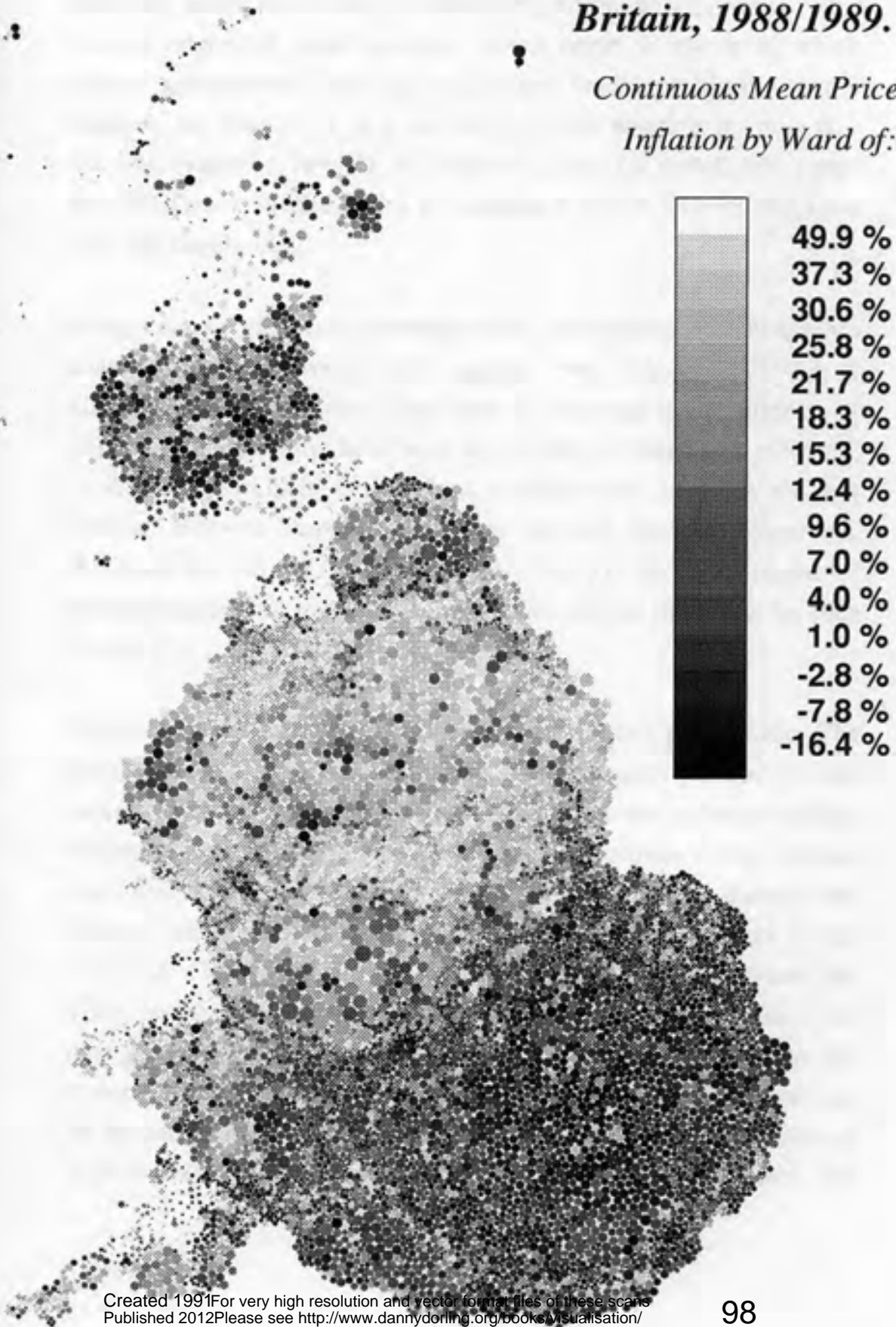
The Distribution of Housing Price Inflation in Britain, 1987/1988.

*Continuous Mean Price
Inflation by Ward of:*



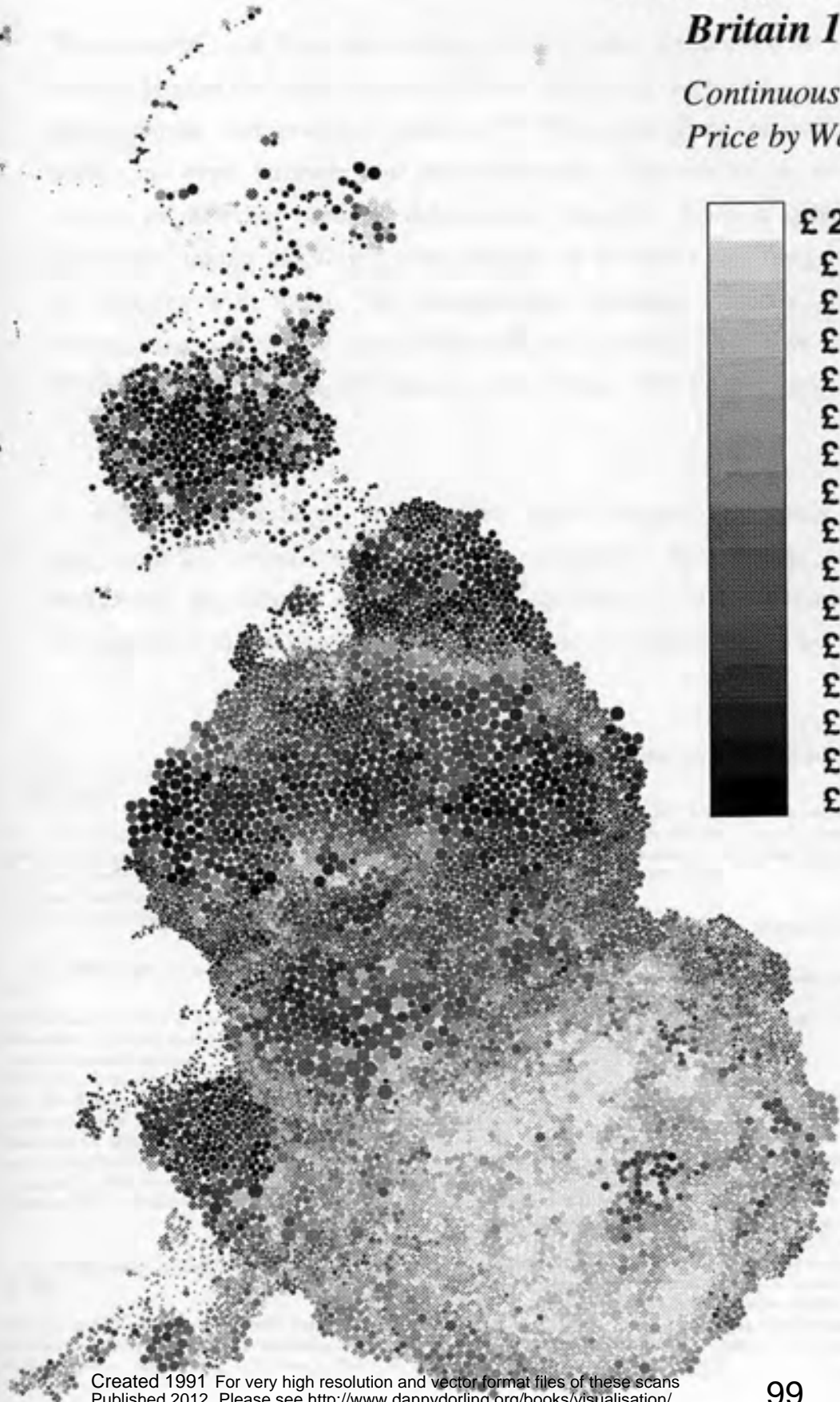
*The Distribution of
Housing Price
Inflation in
Britain, 1988/1989.*

*Continuous Mean Price
Inflation by Ward of:*



The Distribution of Housing Price in Britain 1989.

*Continuous Mean
Price by Ward of:*



Ten British General Elections 1955-1987
 Voting Composition
 by Constituency

Labour
 Liberal / Alliance
 Conservative



Ten British General
Elections 1955-1987
The Distribution of
First Placed Party
Conservative
Labour
Liberal
Alliance
Nationalist
Other



Ten British General
Elections 1955-1987
The Distribution of
Second Placed Party

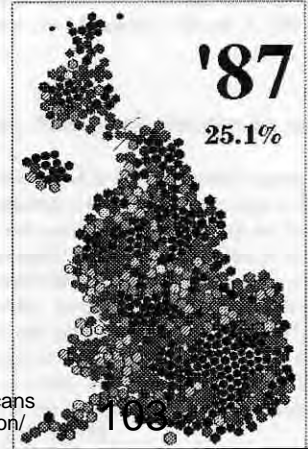
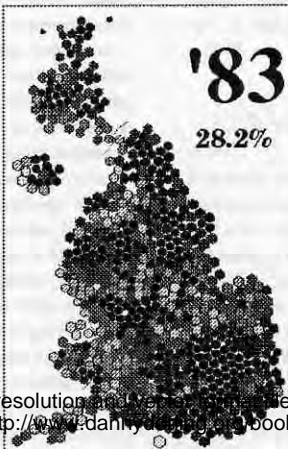
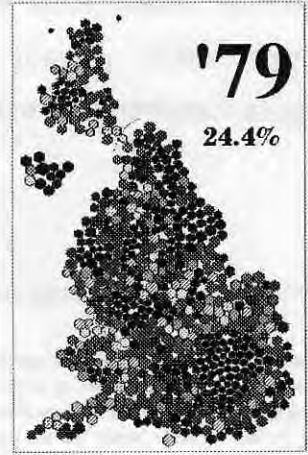
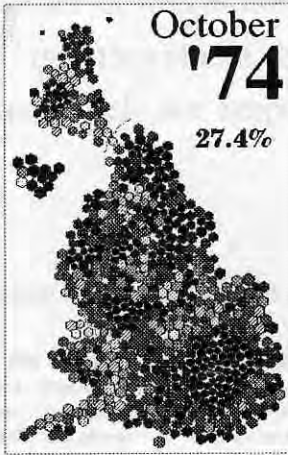
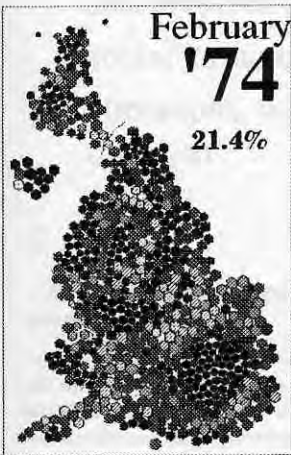
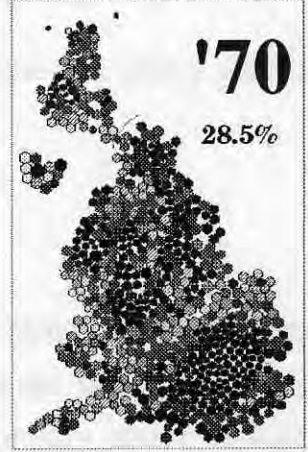
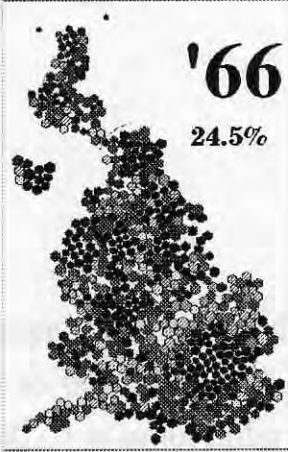
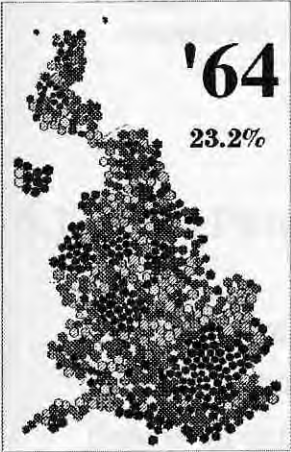
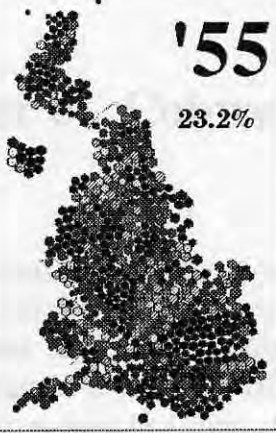
Conservative
Labour
Liberal
Alliance
Nationalist
Other



Ten British General
Elections 1955-1987

**Non-Voting by
Constituency**

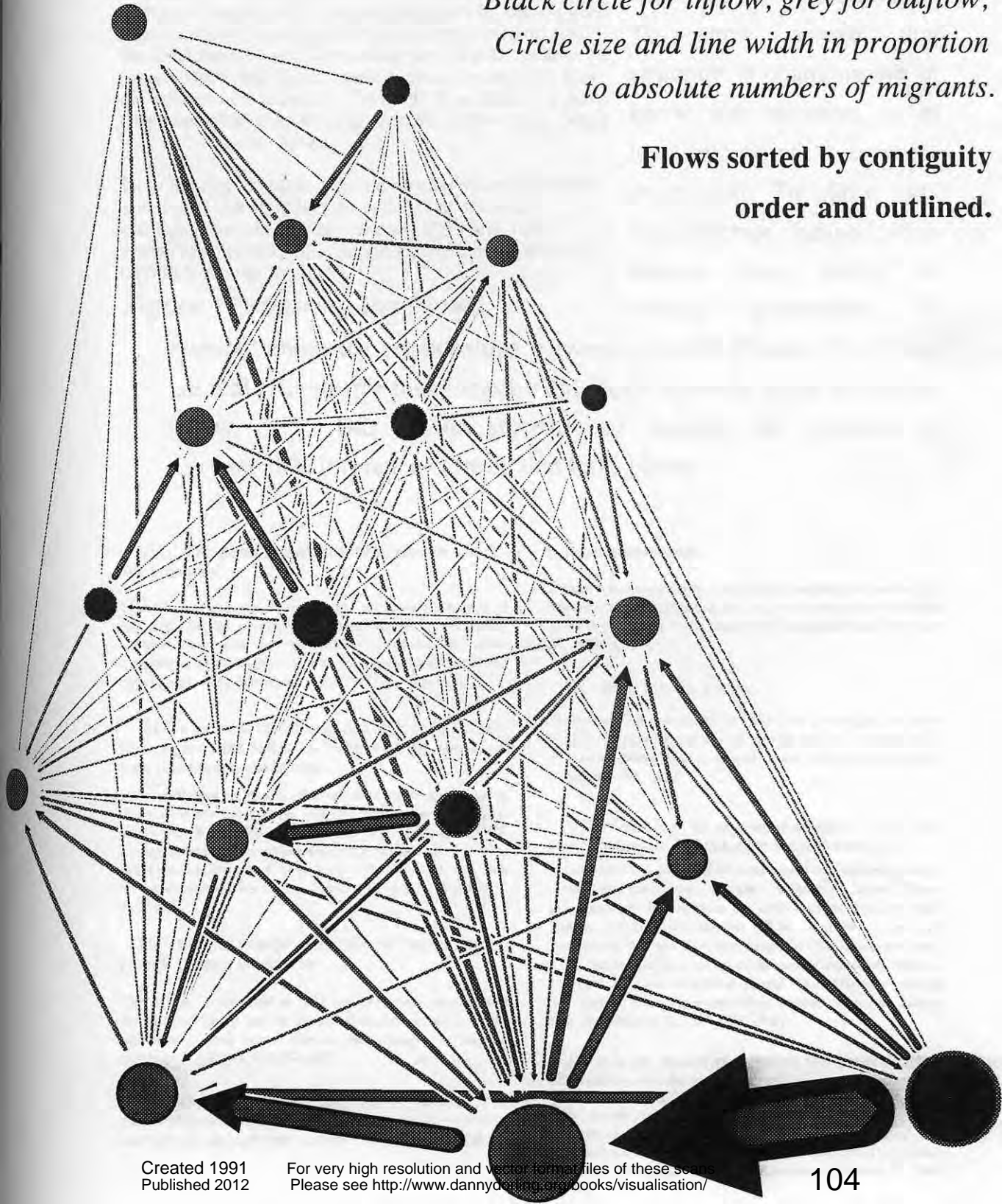
Low - to - High



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.*

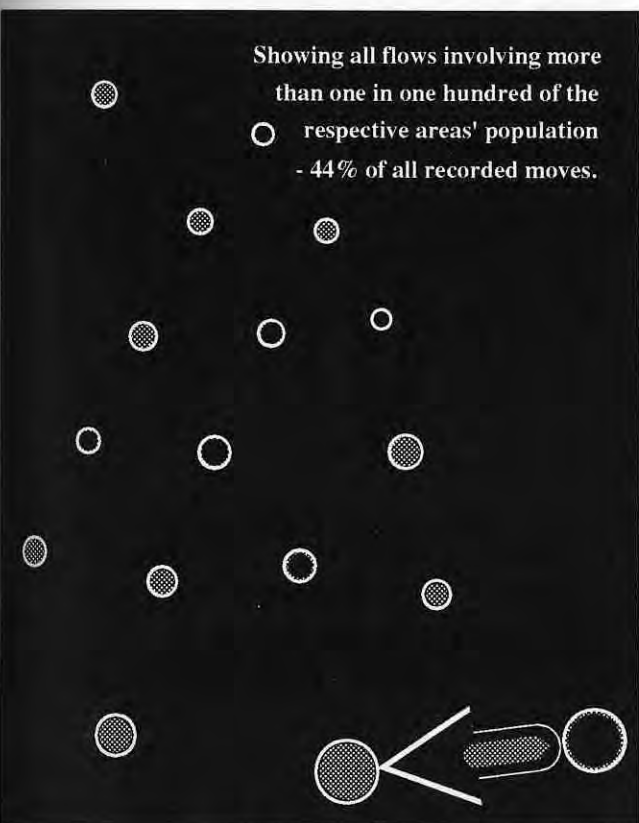
**Flows sorted by contiguity
order and outlined.**



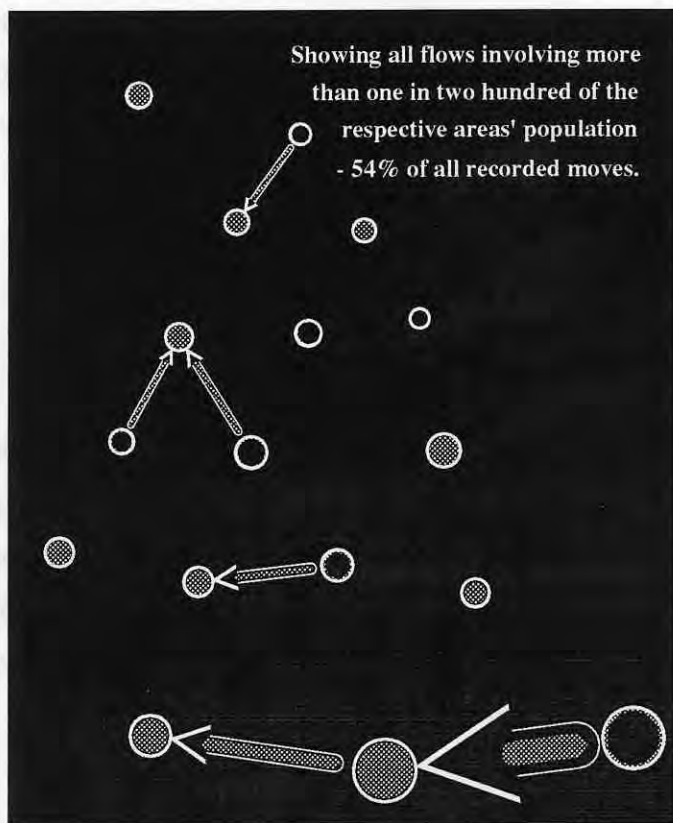
Migration Flows Between Metropolitan Counties and Other Areas Between 1975 and 1976

*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.*

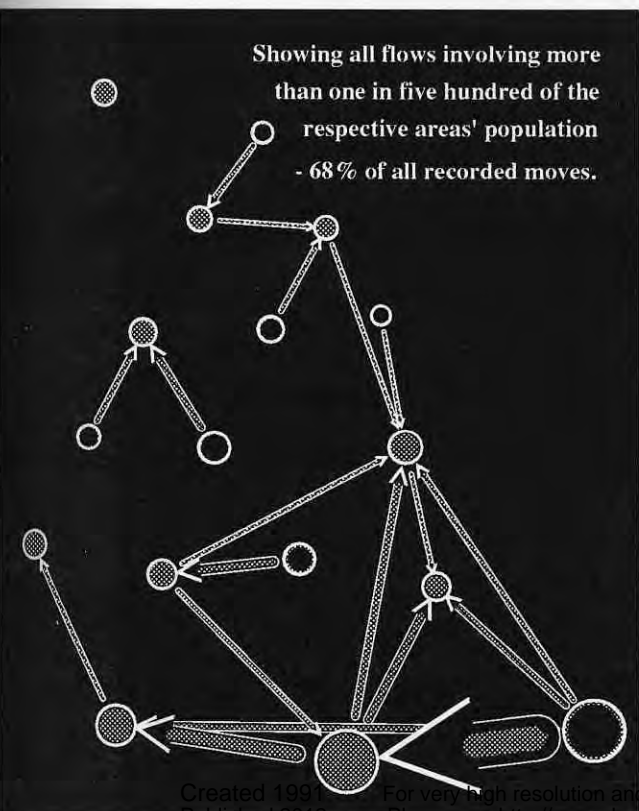
Showing all flows involving more
than one in one hundred of the
respective areas' population
- 44% of all recorded moves.



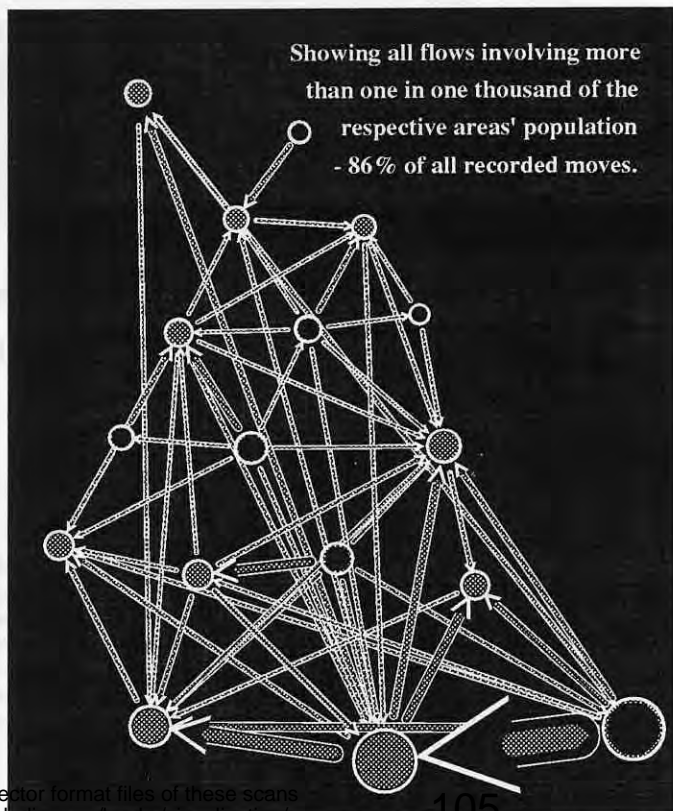
Showing all flows involving more
than one in two hundred of the
respective areas' population
- 54% of all recorded moves.



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.



***Daily Commuting Flows
Between English and
Welsh Wards in 1981.***

*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.*



***Daily Commuting Flows
Between English and
Welsh Wards in 1981.***

*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.*



Daily Commuting Flows Between English and Welsh Wards in 1981.

Where-

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

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

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 .

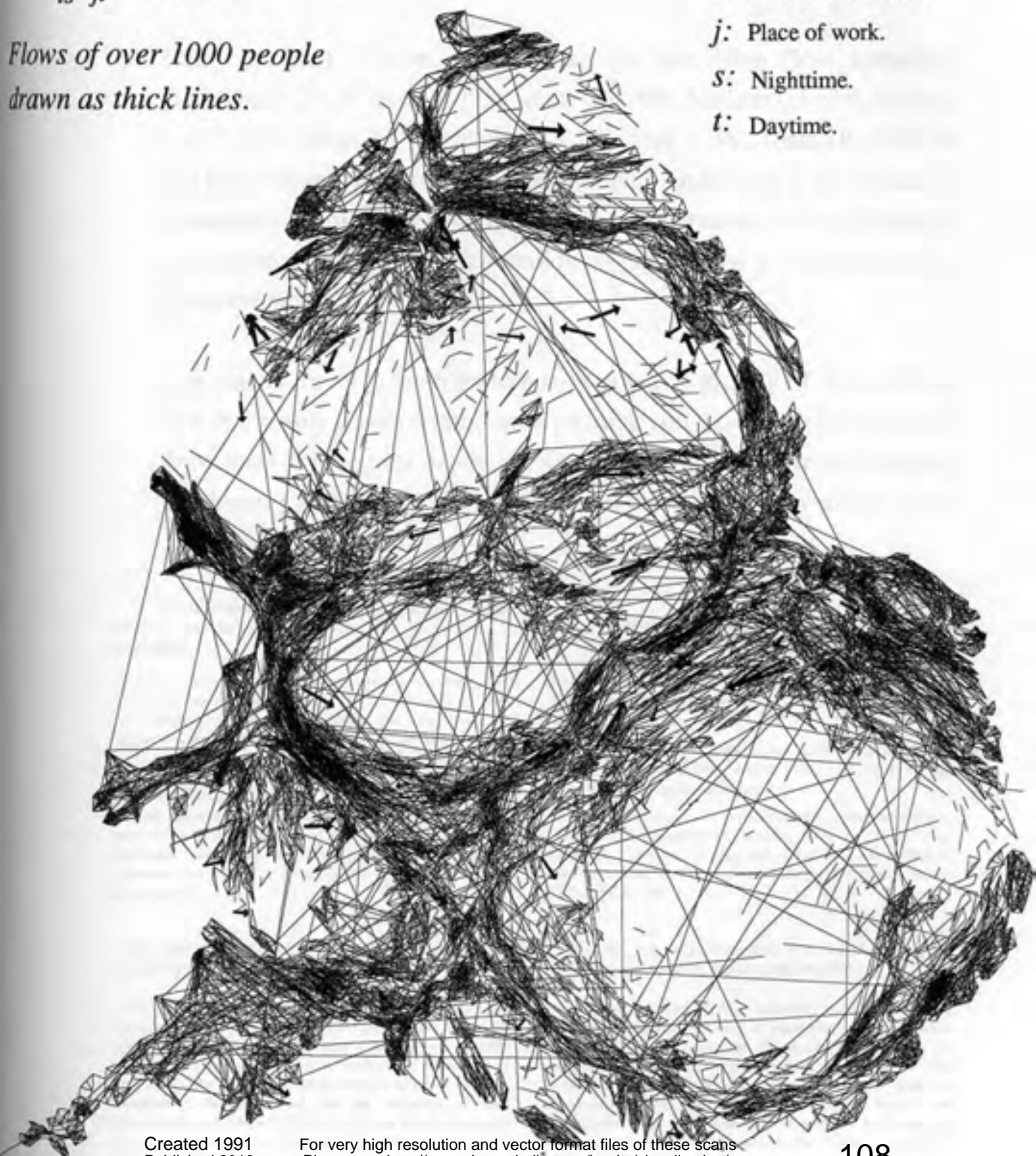
p_{is} : The number of people at place i time t .

i : Place of residence.

j : Place of work.

s : Nighttime.

t : Daytime.



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 .

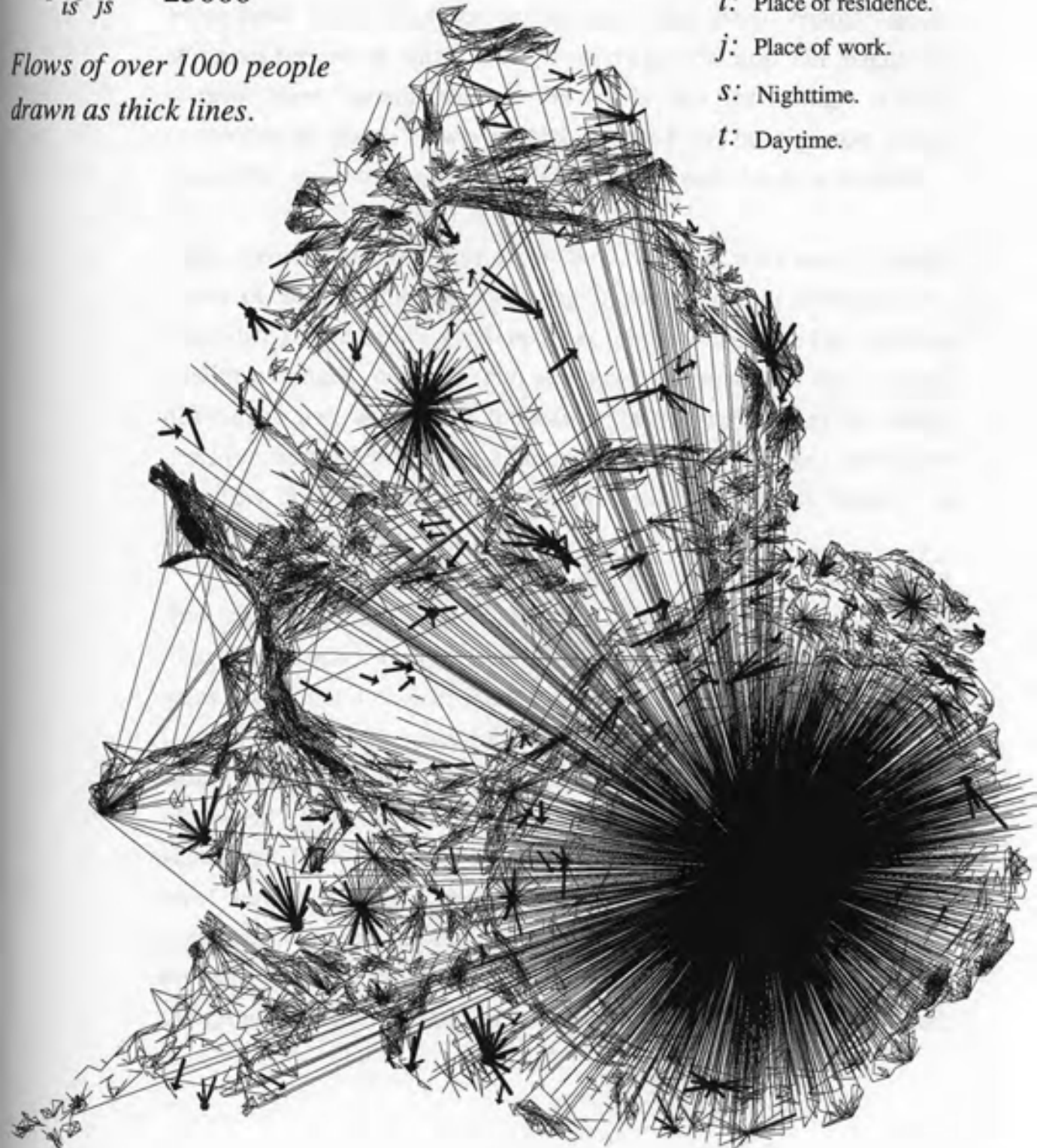
p_{is} : The number of people at place i time t .

i : Place of residence.

j : Place of work.

s : Nighttime.

t : Daytime.



Daily Commuting Flows Between English and Welsh Wards in 1981.

*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:



Daily Commuting Flows Between English and Welsh Wards in 1981.

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.

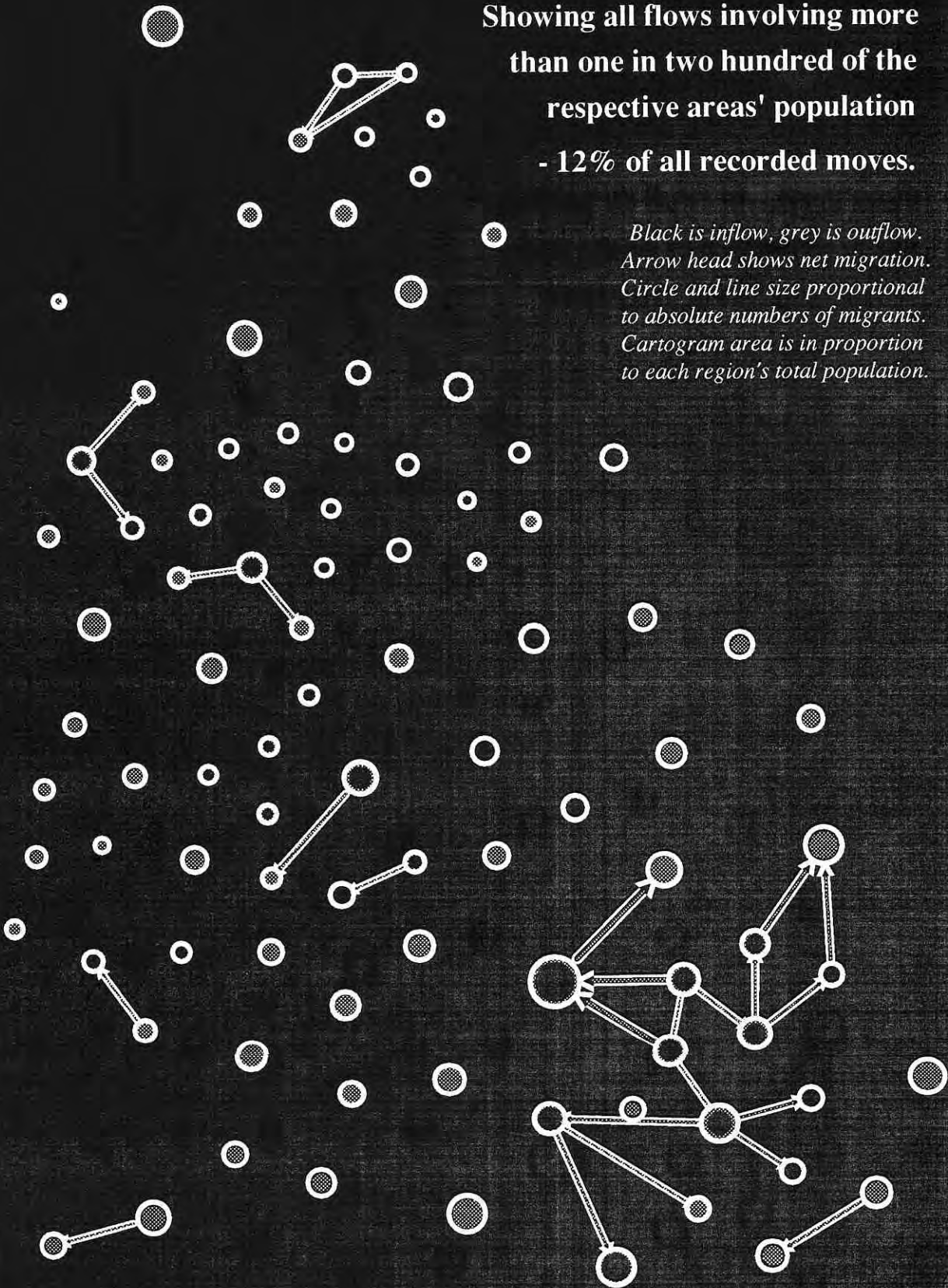
Quartile levels by ward of:



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.

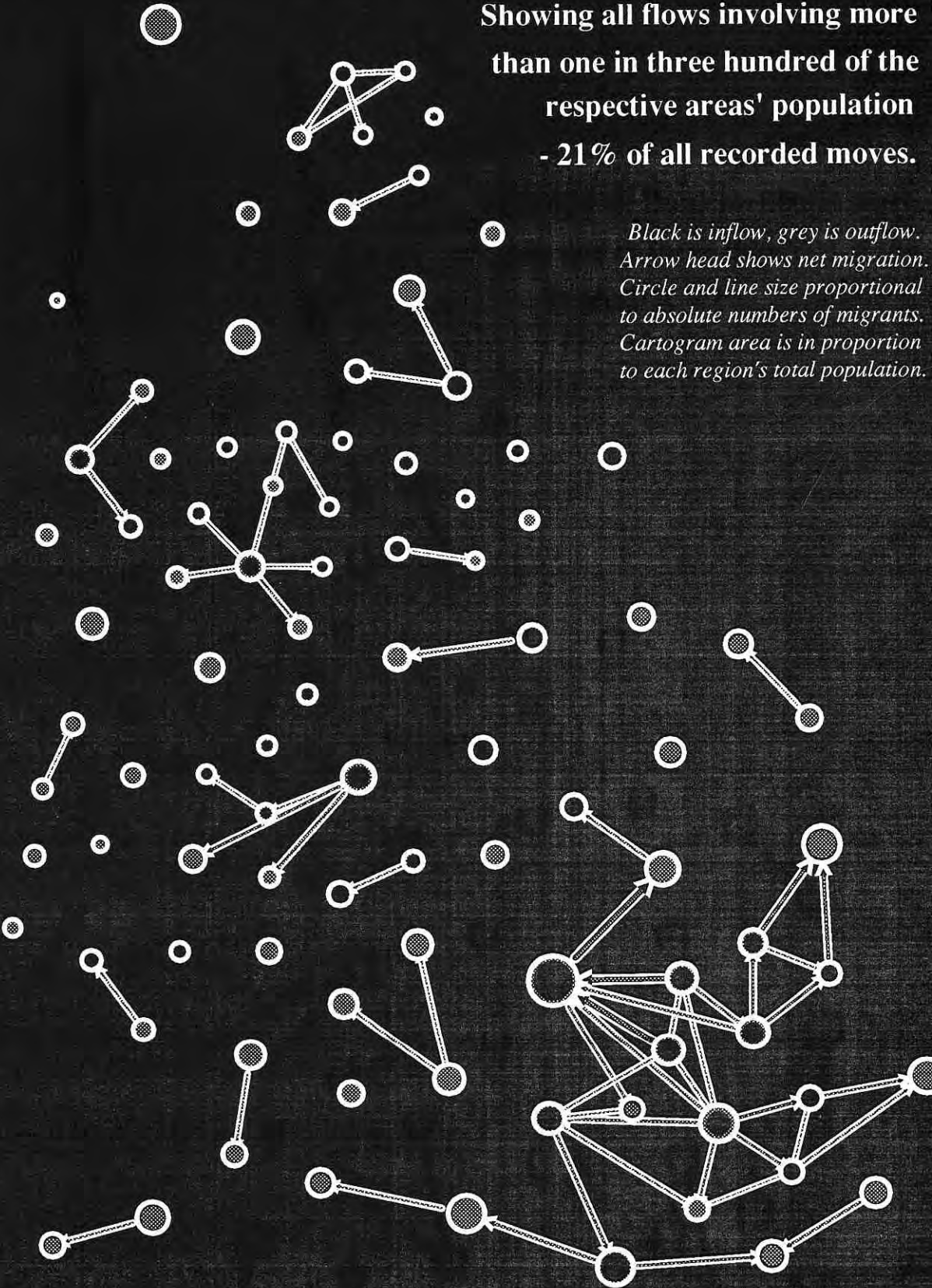
*Black is inflow, grey is outflow.
Arrow head shows net migration.
Circle and line size proportional
to absolute numbers of migrants.
Cartogram area is in proportion
to each region's total population.*



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.

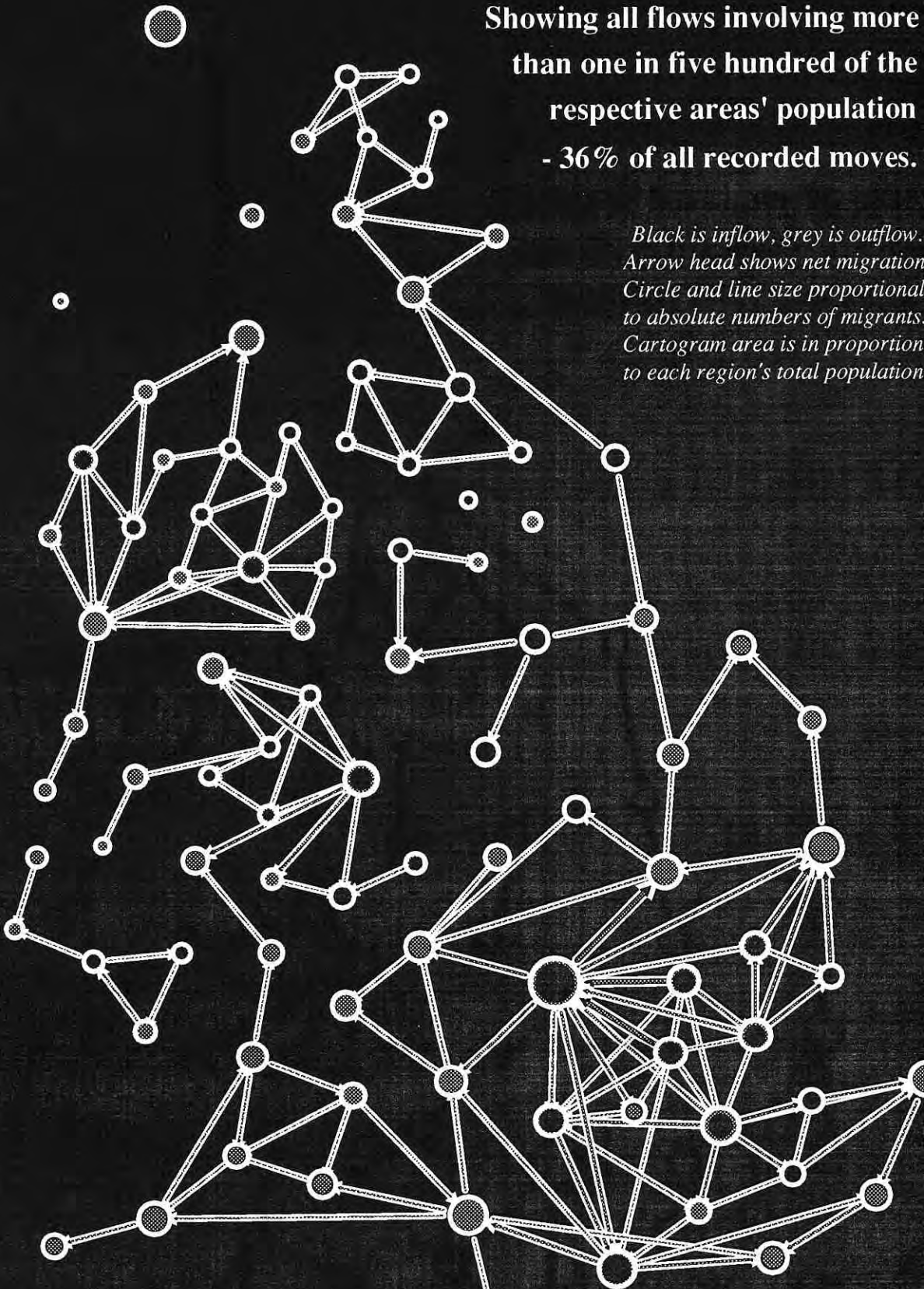
*Black is inflow, grey is outflow.
Arrow head shows net migration.
Circle and line size proportional
to absolute numbers of migrants.
Cartogram area is in proportion
to each region's total population.*



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.

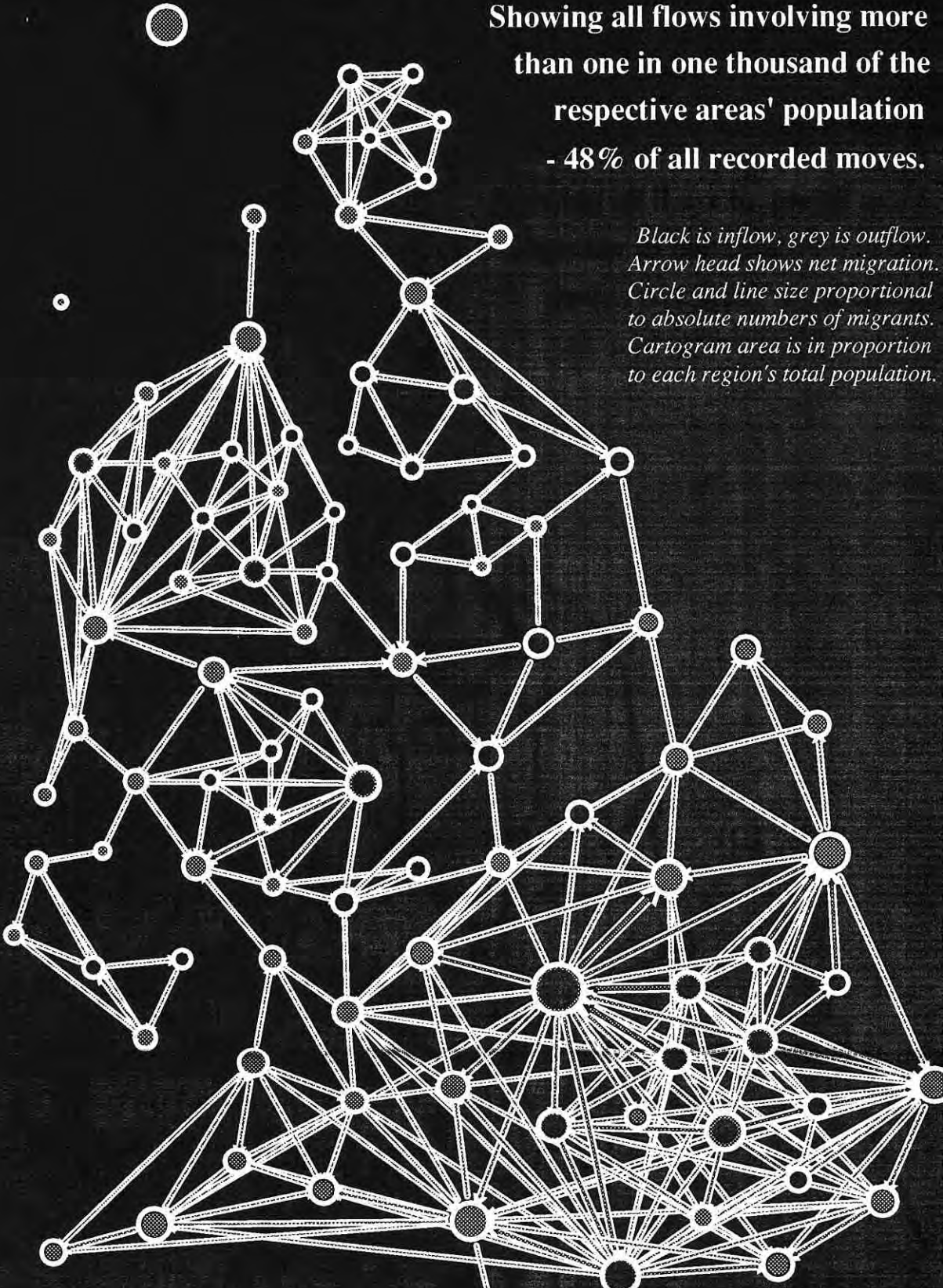
*Black is inflow, grey is outflow.
Arrow head shows net migration
Circle and line size proportional
to absolute numbers of migrants.
Cartogram area is in proportion
to each region's total population*



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.**

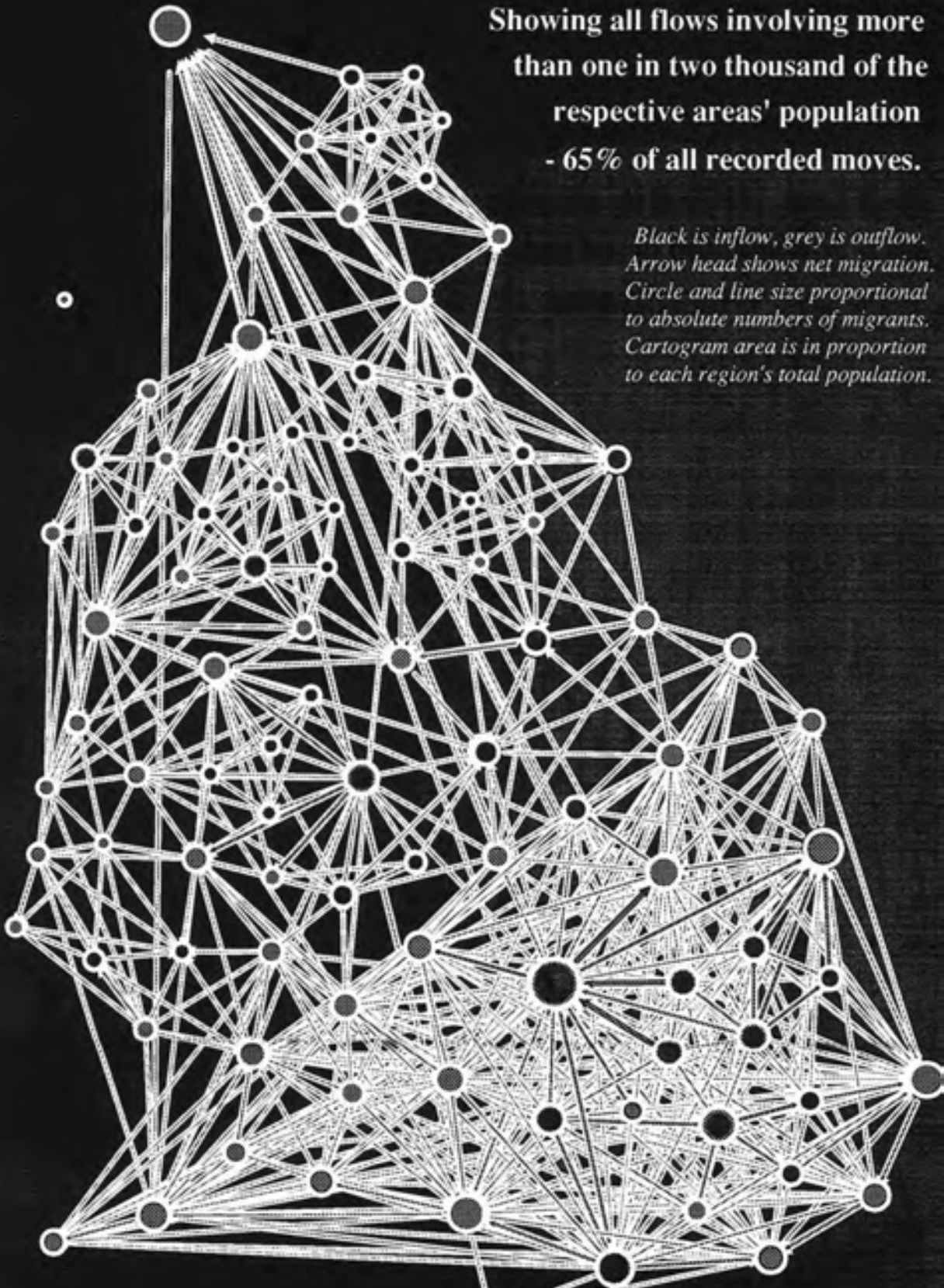
*Black is inflow, grey is outflow.
Arrow head shows net migration.
Circle and line size proportional
to absolute numbers of migrants.
Cartogram area is in proportion
to each region's total population.*



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.

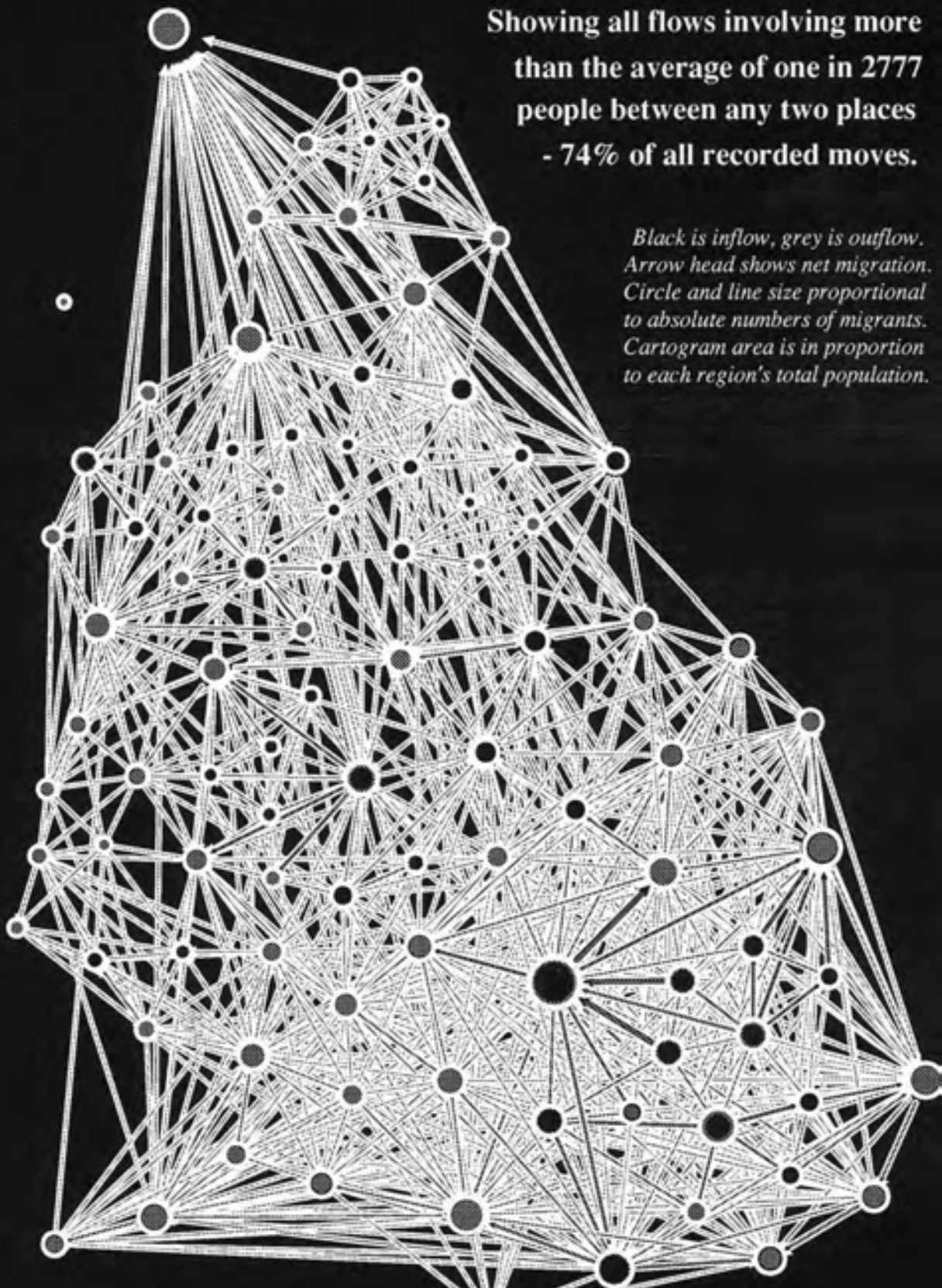
*Black is inflow, grey is outflow.
Arrow head shows net migration.
Circle and line size proportional
to absolute numbers of migrants.
Cartogram area is in proportion
to each region's total population.*



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.

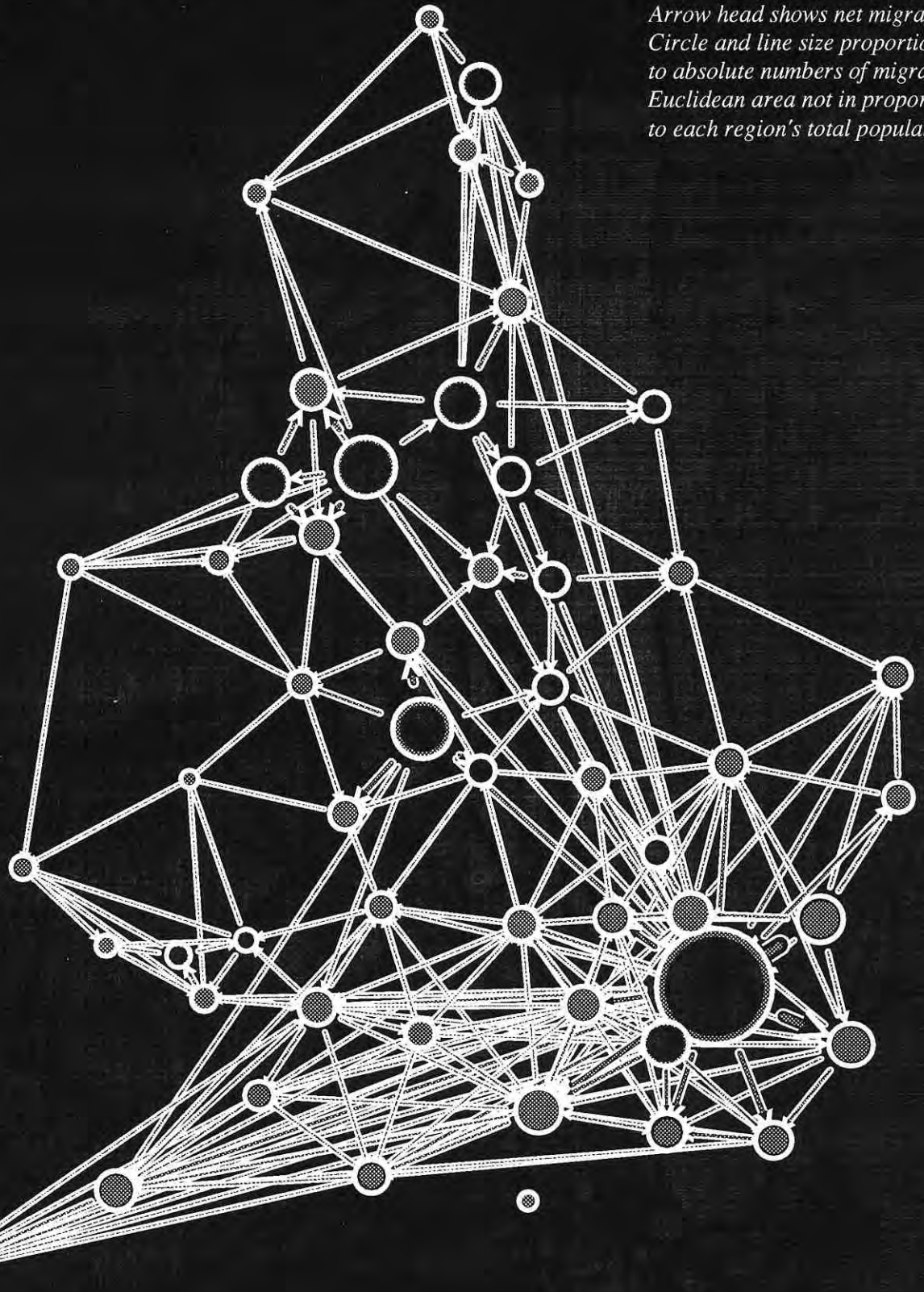
*Black is inflow, grey is outflow.
Arrow head shows net migration.
Circle and line size proportional
to absolute numbers of migrants.
Euclidean area not proportional
to each region's total population.*



*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.*



Yearly Migration Flows Between English and Welsh Wards 1980/1981.

*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:



Yearly Migration Flows Between English and Welsh Wards 1980/1981.

*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:



*The use of Contours and
Colour to Depict
Surface Height*

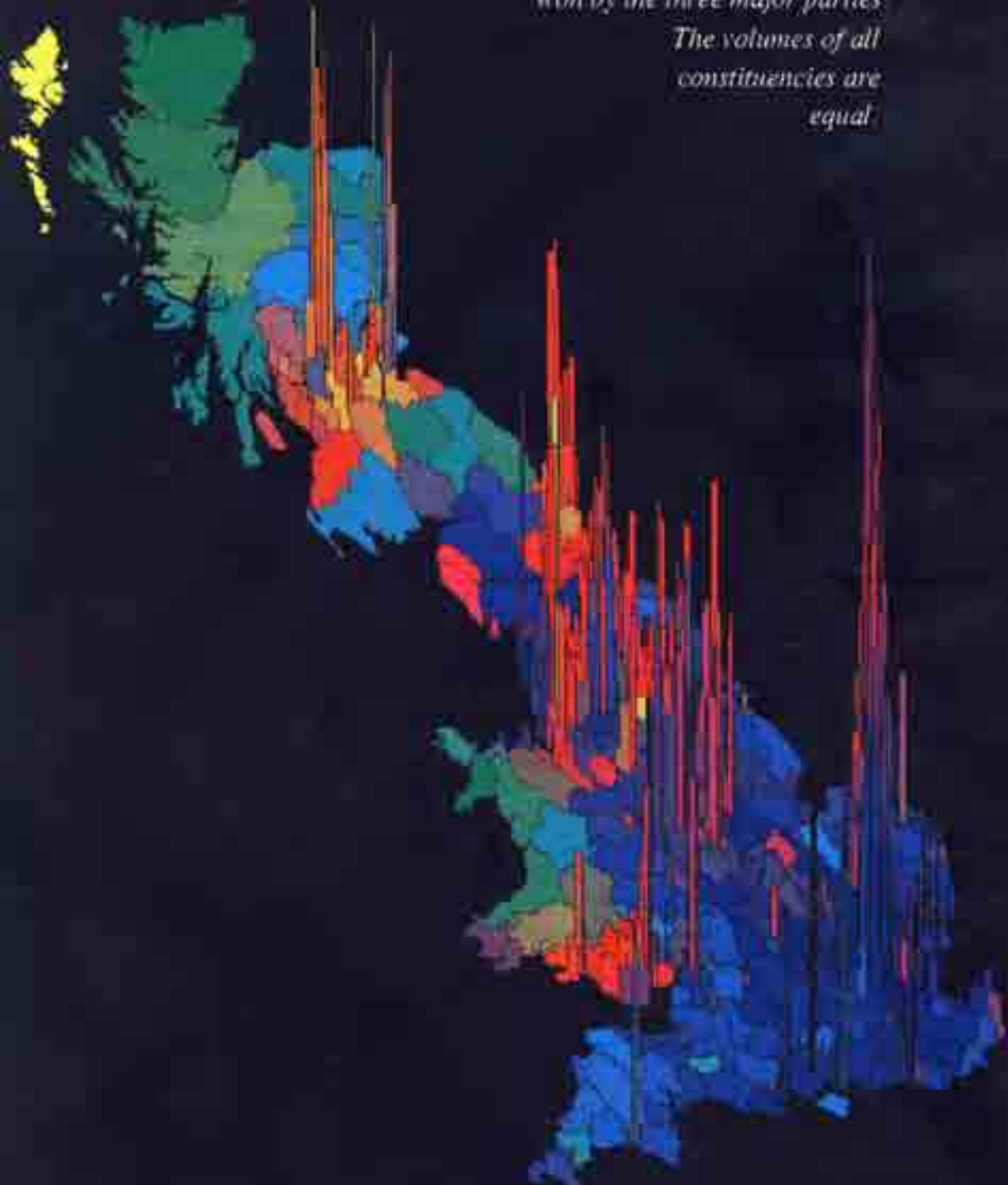


*The use of Contours
(without colour) to
Depict Surface Height*



*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:*

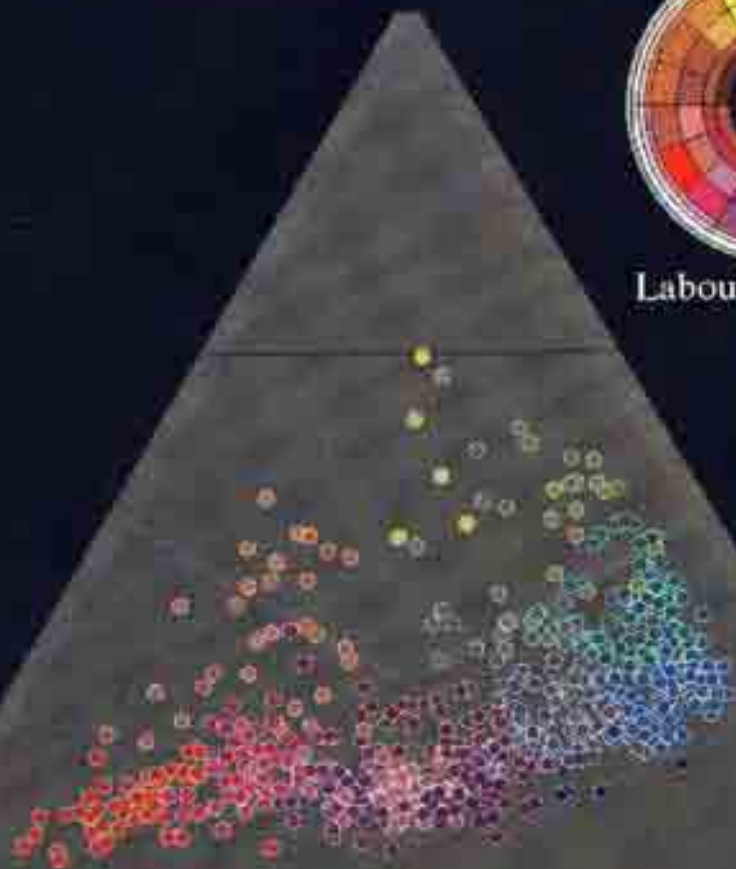
Alliance

Alliance



Labour

Conservative

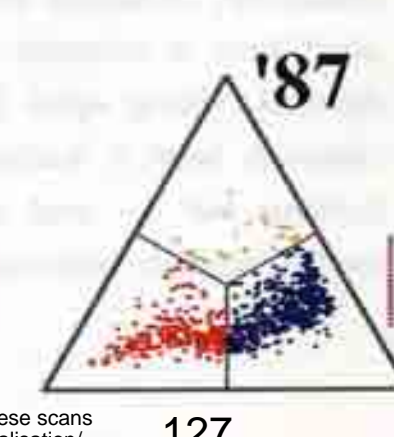
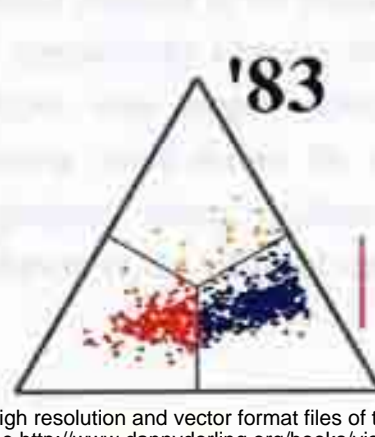
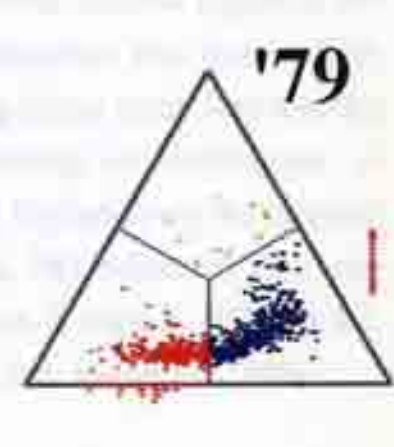
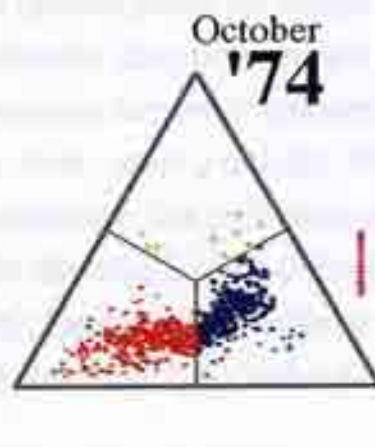
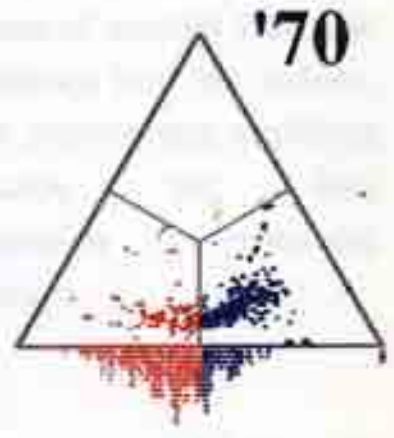
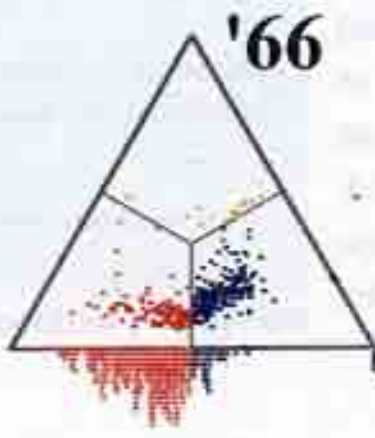
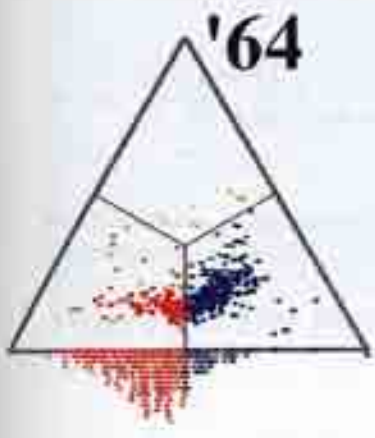
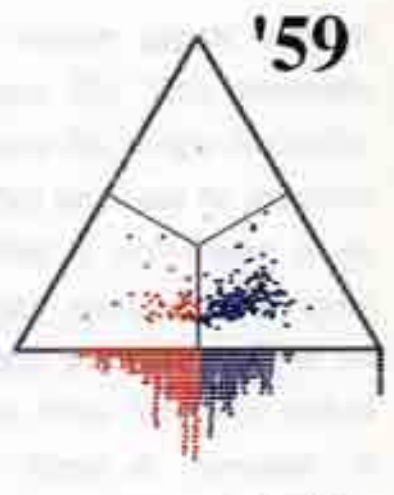
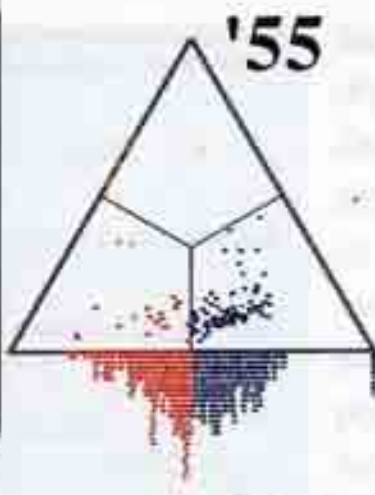


Labour

Conservative

Ten British General Elections 1955-1987
National Constituency
Voting Compositions

Liberal / Alliances
Other Conservative
Labour (Nationalist)



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.

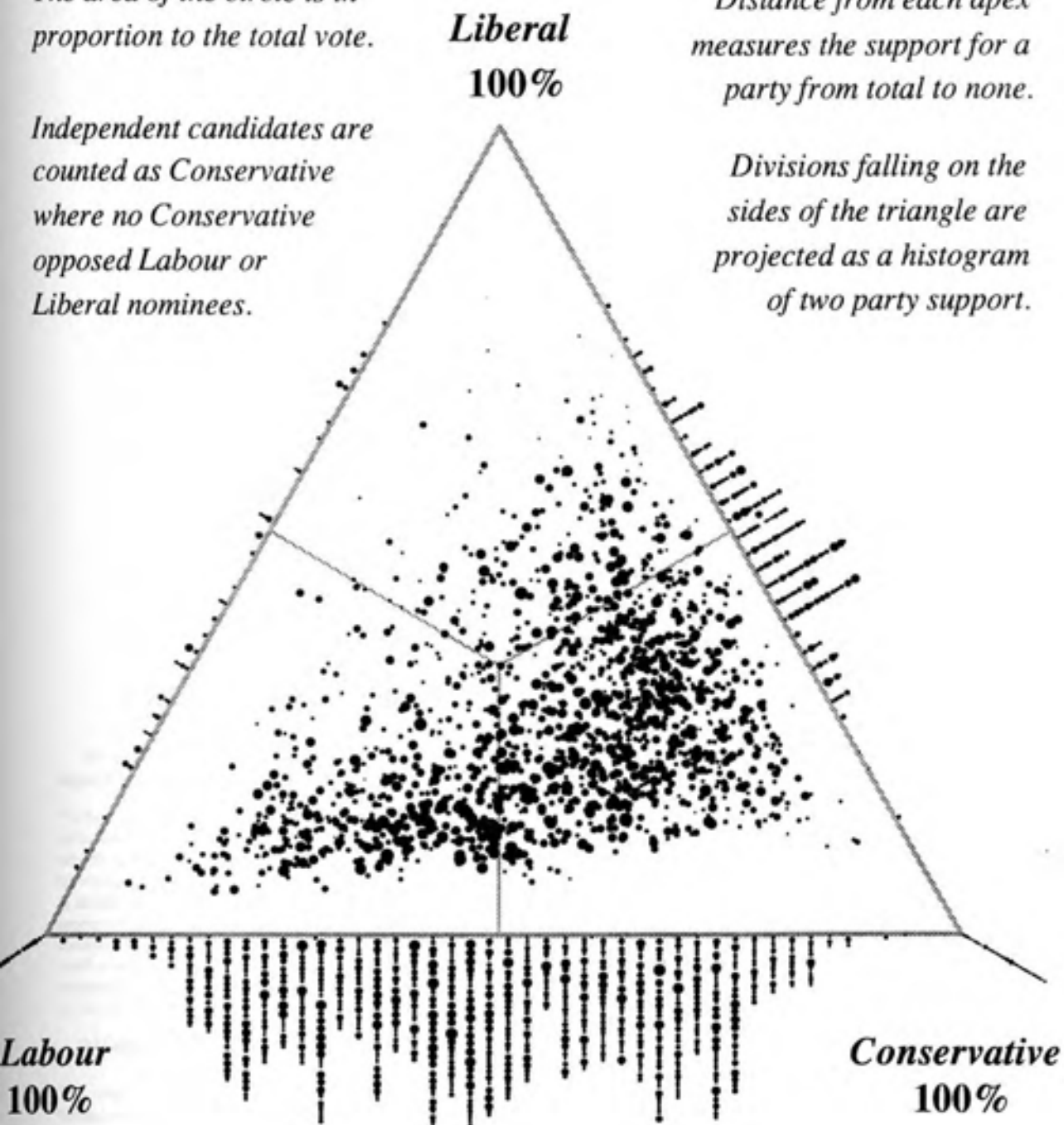
The area of the circle is in proportion to the total vote.

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.



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.

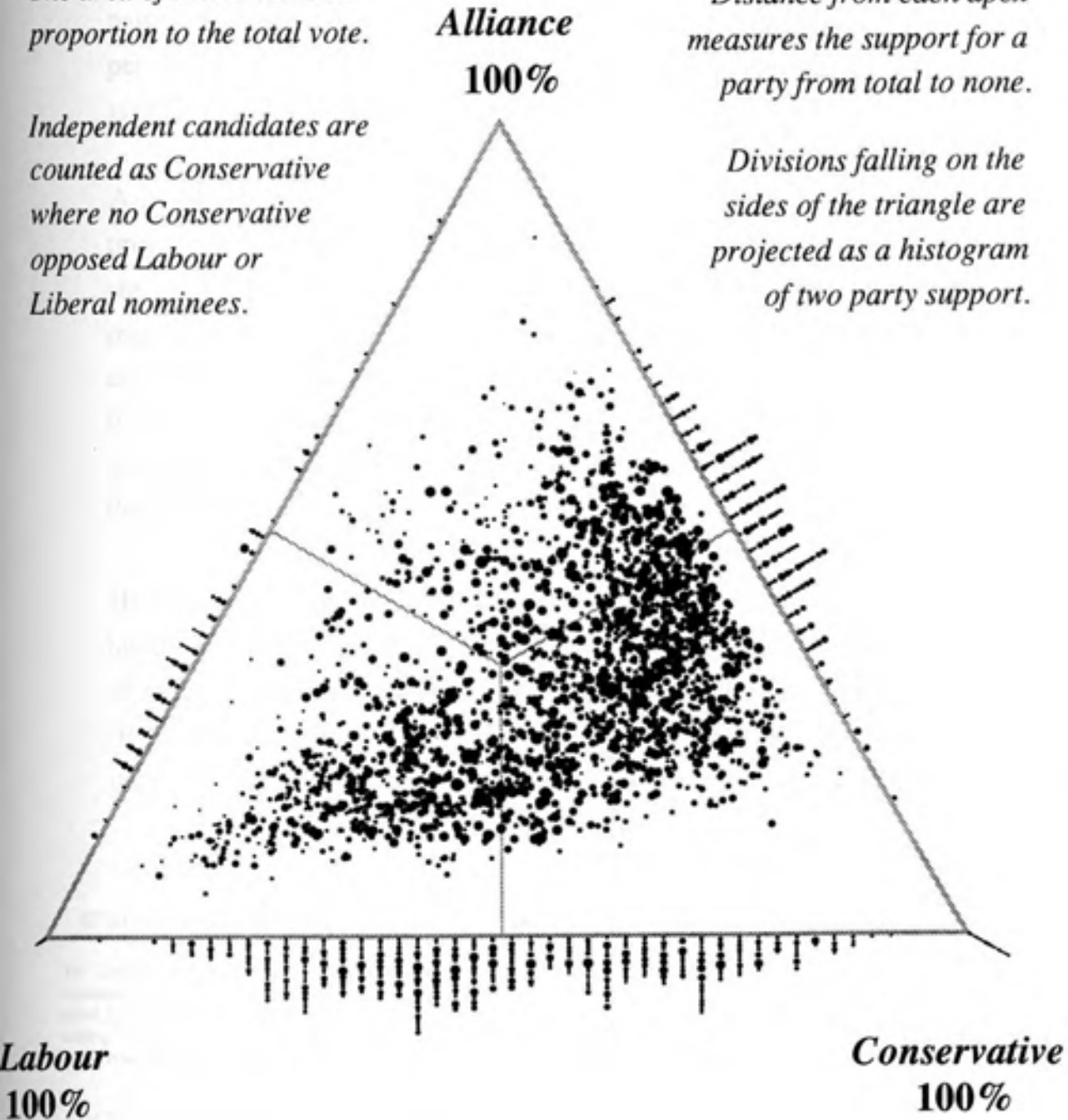
The area of the circle is in proportion to the total vote.

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

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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.

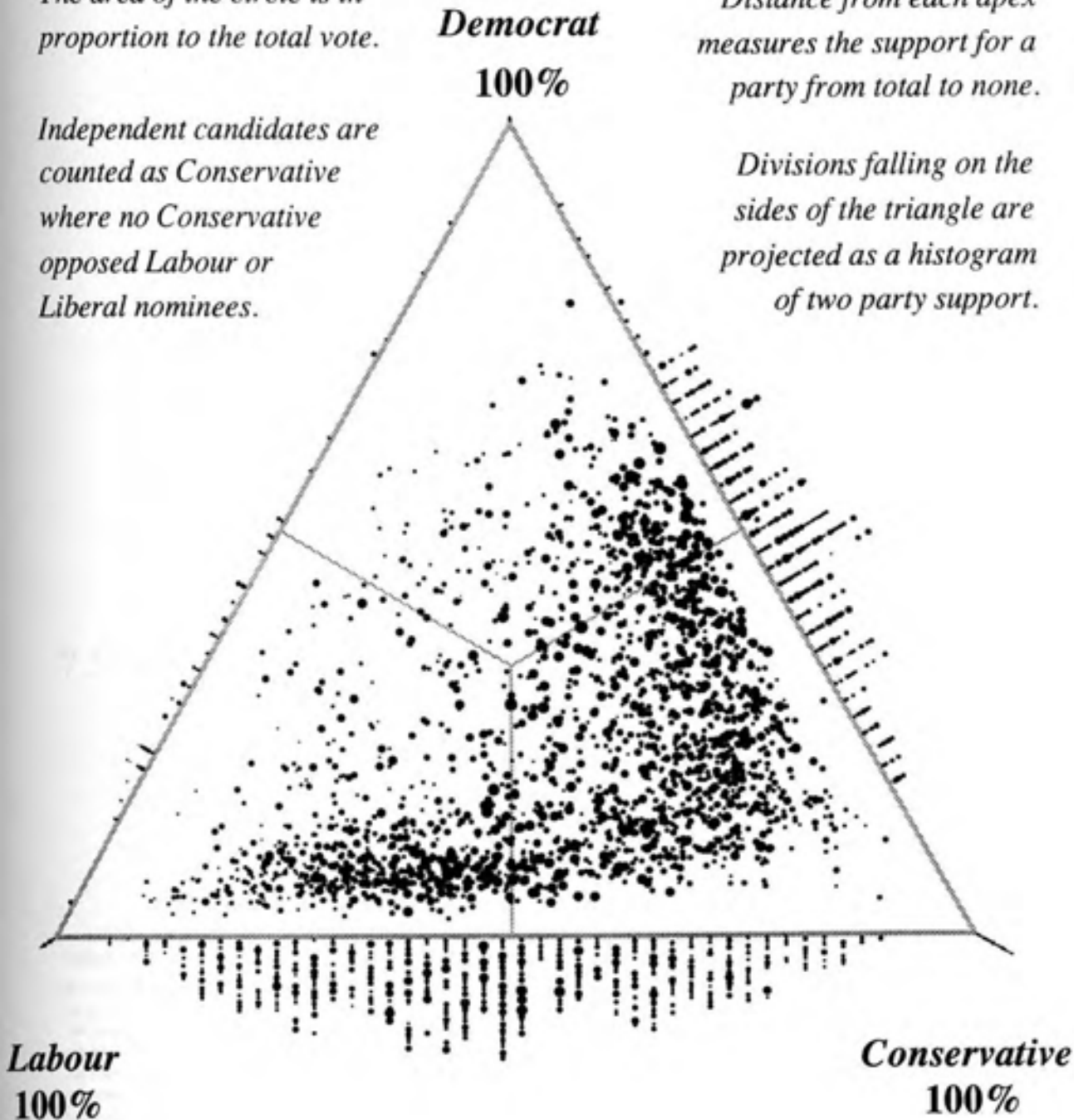
The area of the circle is in proportion to the total vote.

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

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.

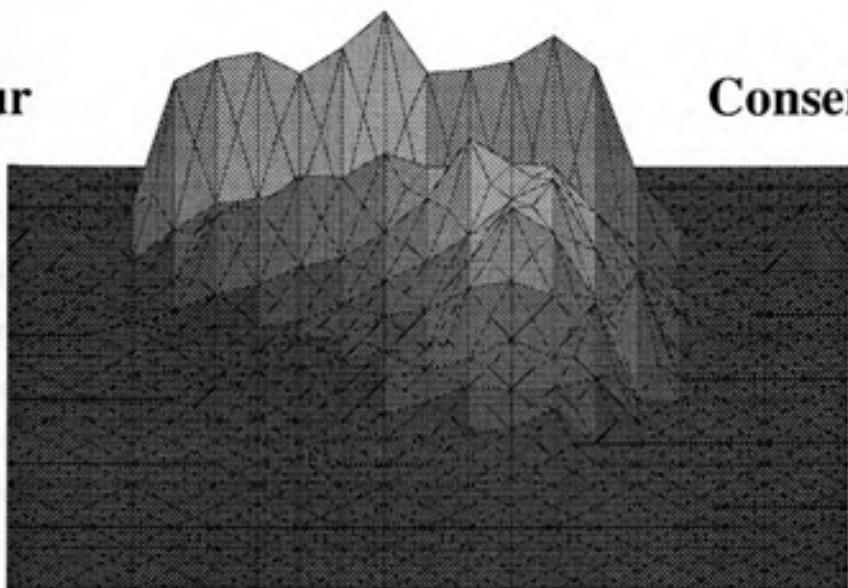


**1981 County Council Elections:
English Voting Composition Surface.**

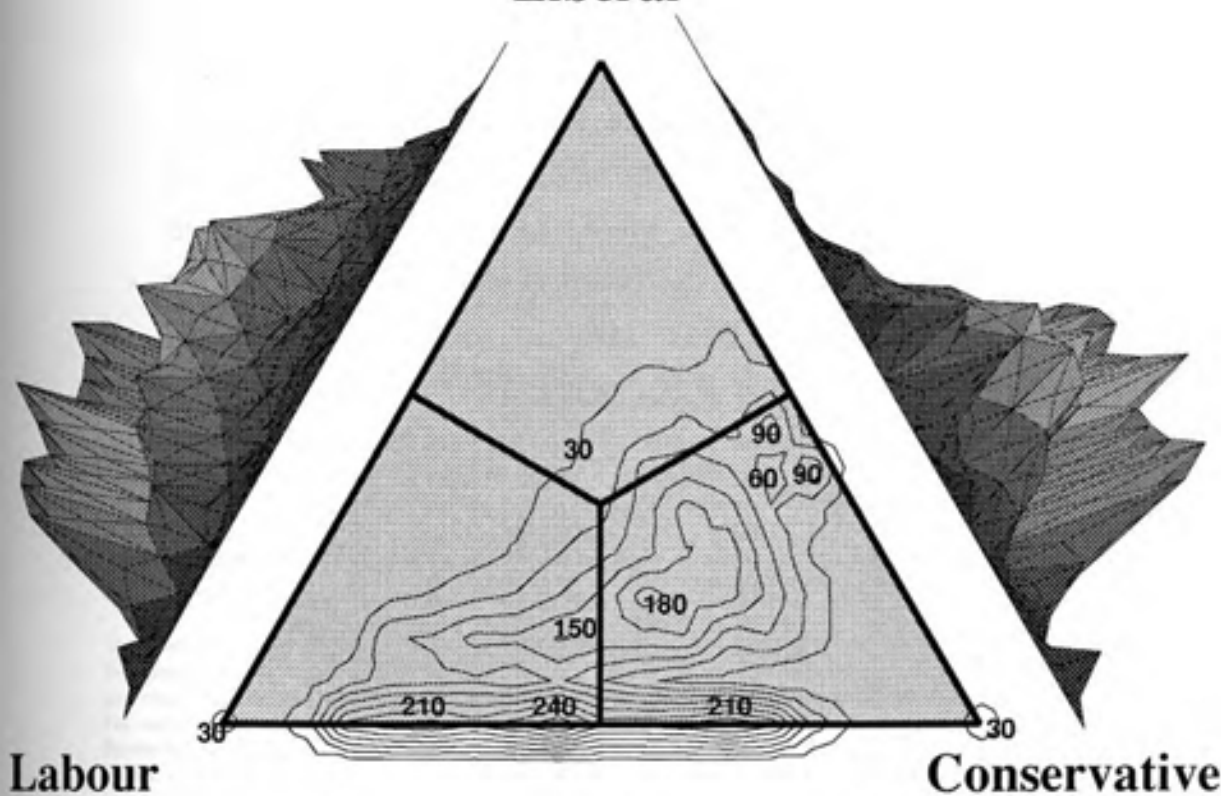
*Surface based on the
three party triangle,
height proportional to
numbers of votes.*

Labour

Conservative



Liberal



Labour

Conservative

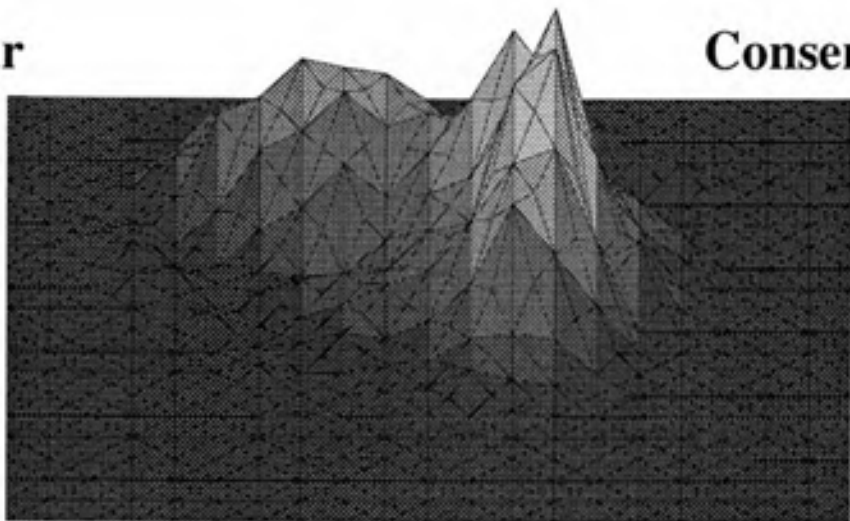
Contour values shown in thousands
of votes, total number 8,276,000.

1985 County Council Elections: English Voting Composition Surface.

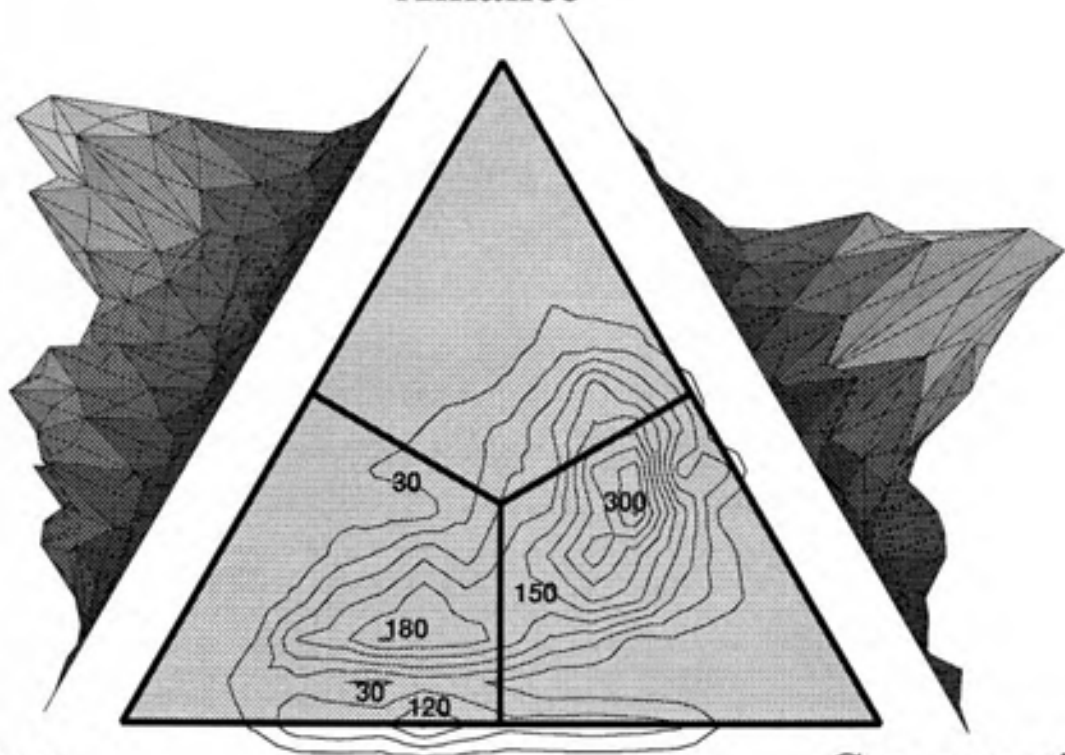
Surface based on the
three party triangle,
height proportional to
numbers of votes.

Labour

Conservative



Alliance



Labour

Conservative

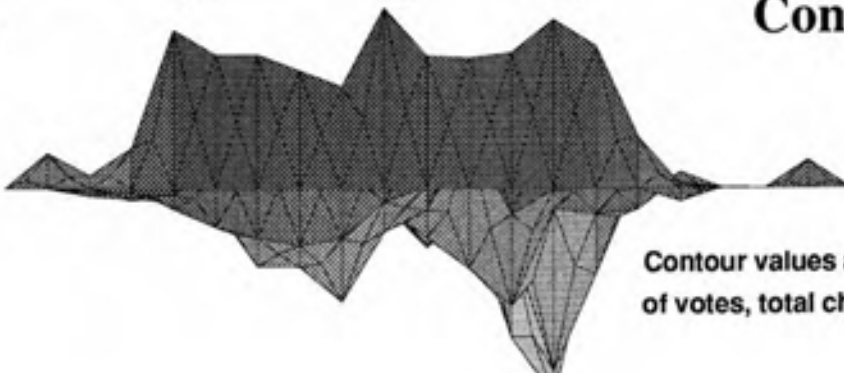
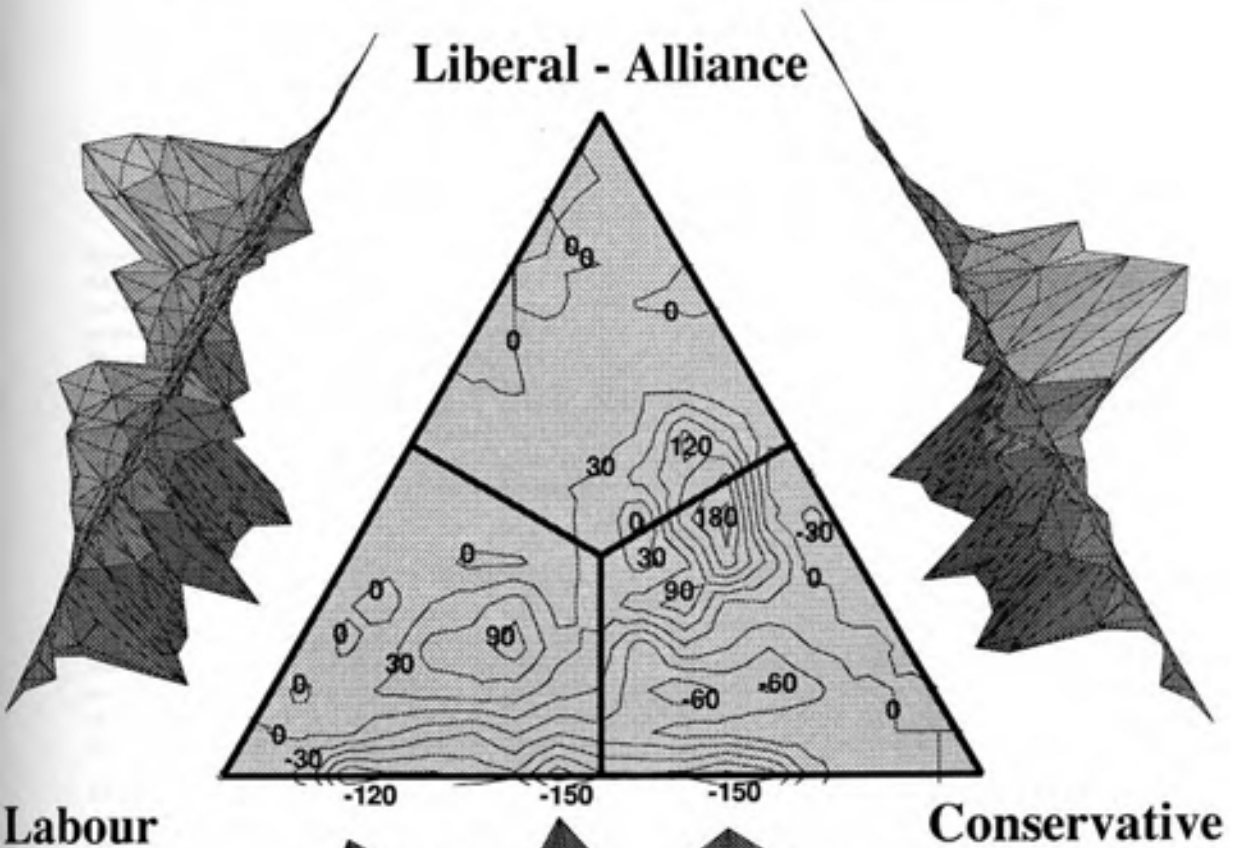
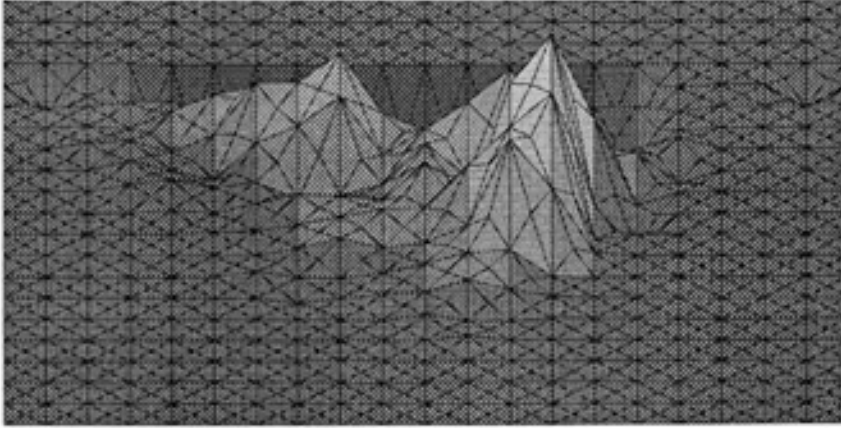
Contour values are shown in thousands
of votes, total number 8,688,000.

**1981-1985 County Council Elections:
Surface Showing the Change in the
English Voting Composition.**

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

Labour

Conservative



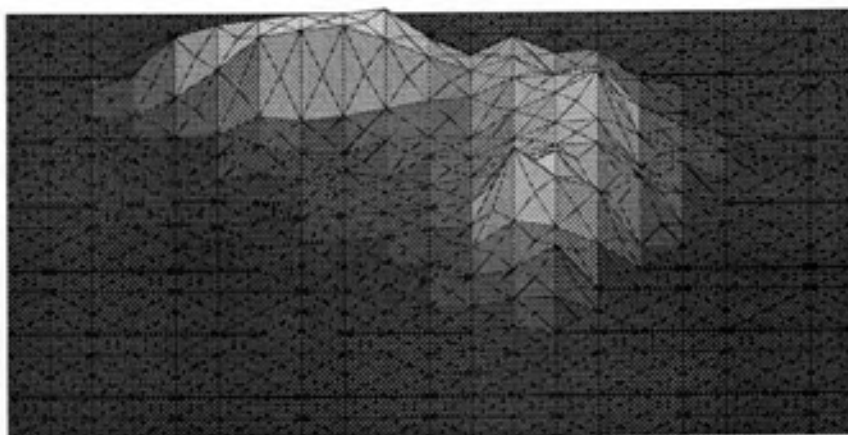
Contour values are shown in thousands
of votes, total change +412,000.

1989 County Council Elections: English Voting Composition Surface.

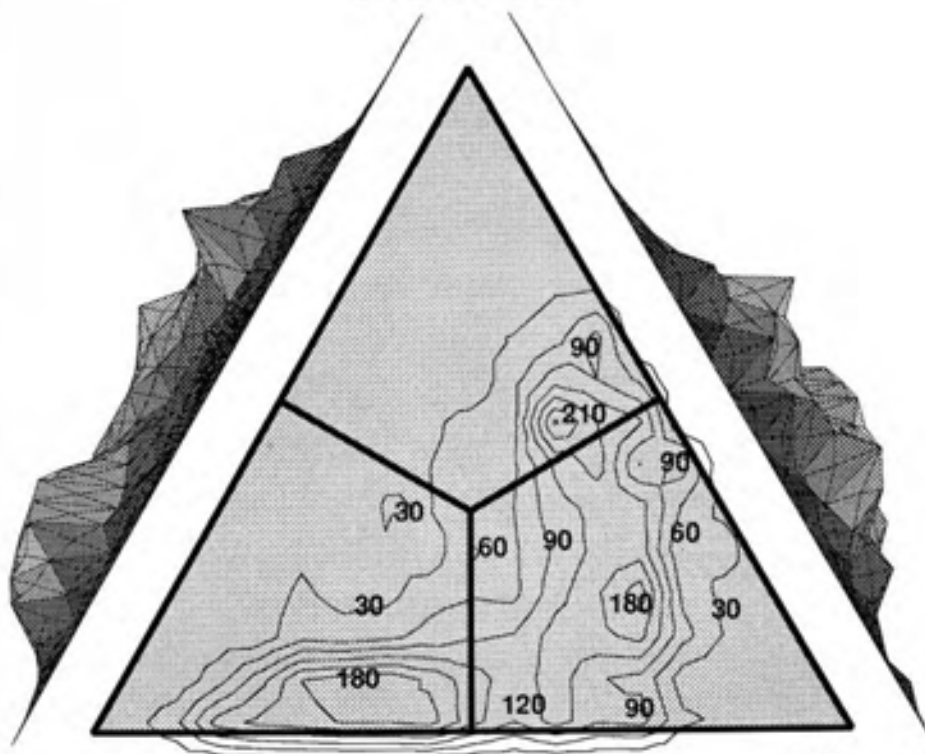
Surface based on the
three party triangle,
height proportional to
numbers of votes.

Labour

Conservative



Democrat



Labour

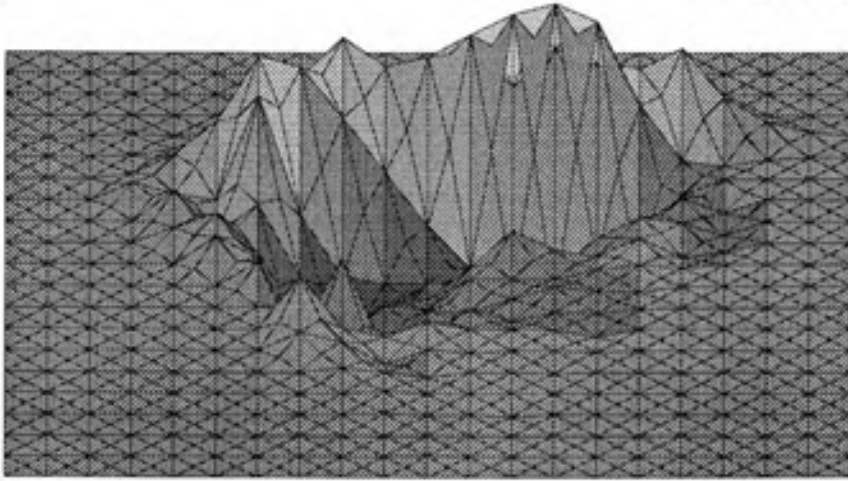
Conservative

**1985-1989 County Council Elections:
Surface Showing the Change in the
English Voting Composition.**

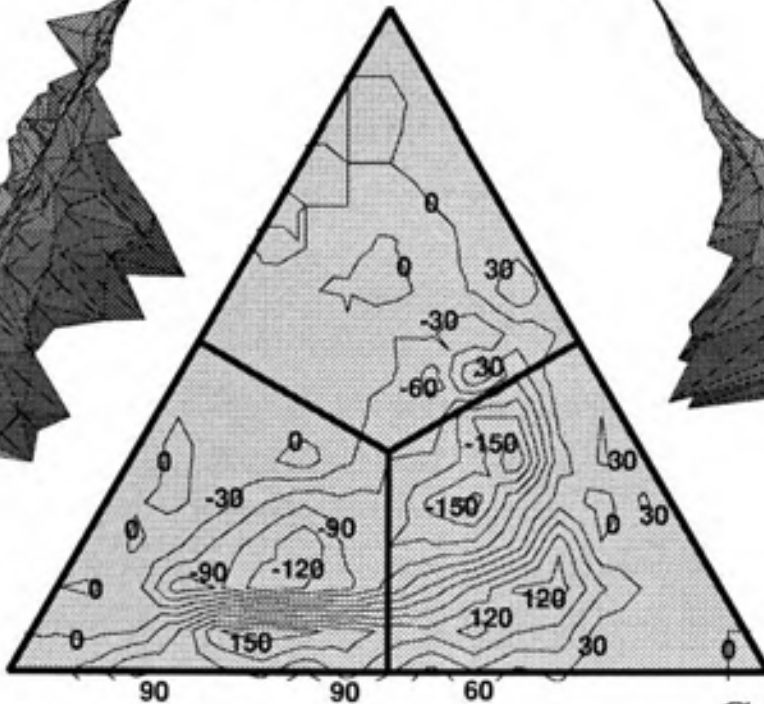
*Surface based on the
three party triangle,
height proportional to
change in number of votes*

Labour

Conservative

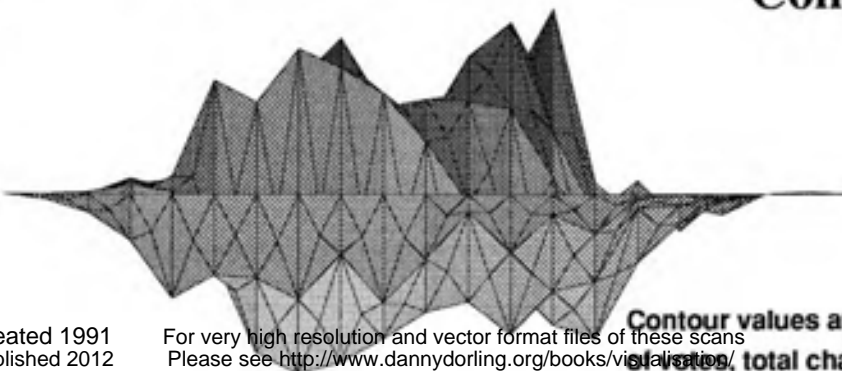


Alliance - Democrat



Labour

Conservative



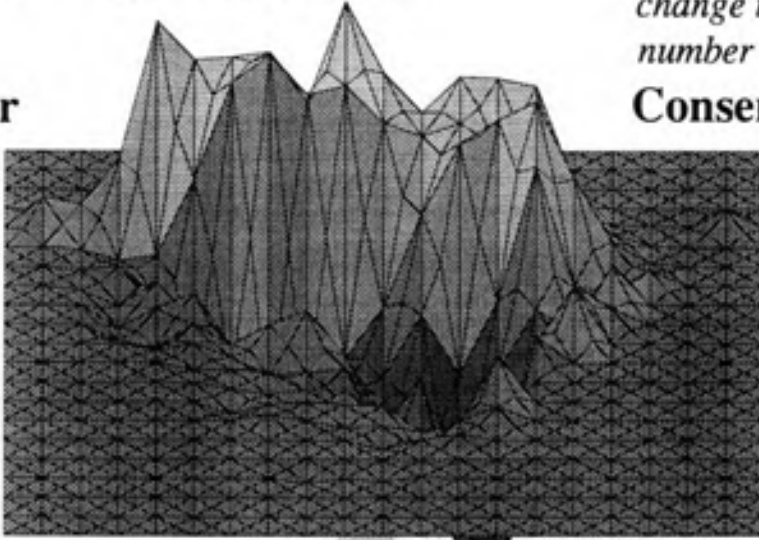
**Contour values are shown in thousands
of votes, total change 135,000.**

**1981-1985-1989 County Council Elections:
Surface Showing the Change in the Change
of the English Voting Composition.**

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

Labour

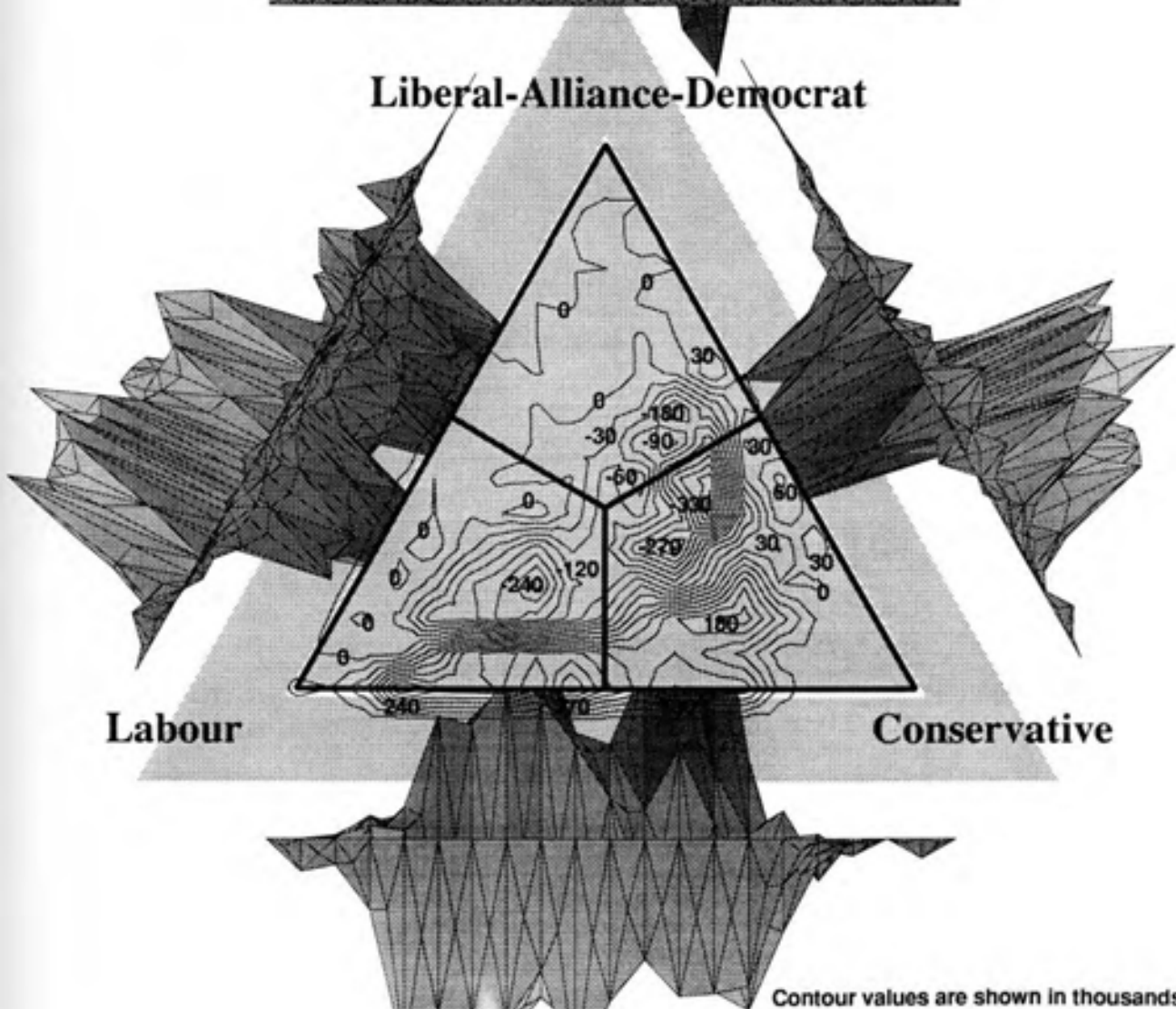
Conservative



Liberal-Alliance-Democrat

Labour

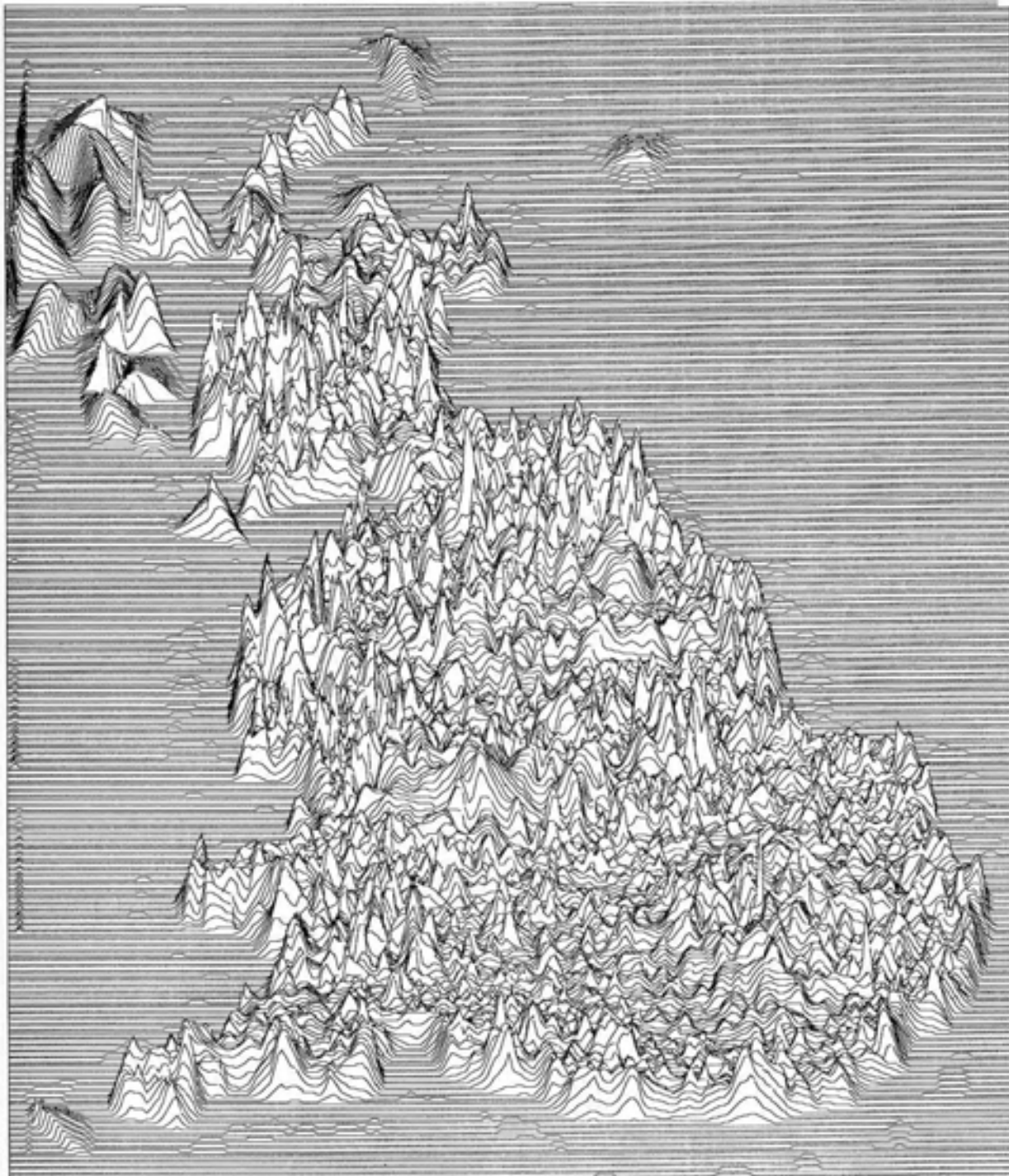
Conservative



Contour values are shown in thousands
of votes, total change in change -805,000.

*The Distribution of
Unemployment in
Britain 1981.*

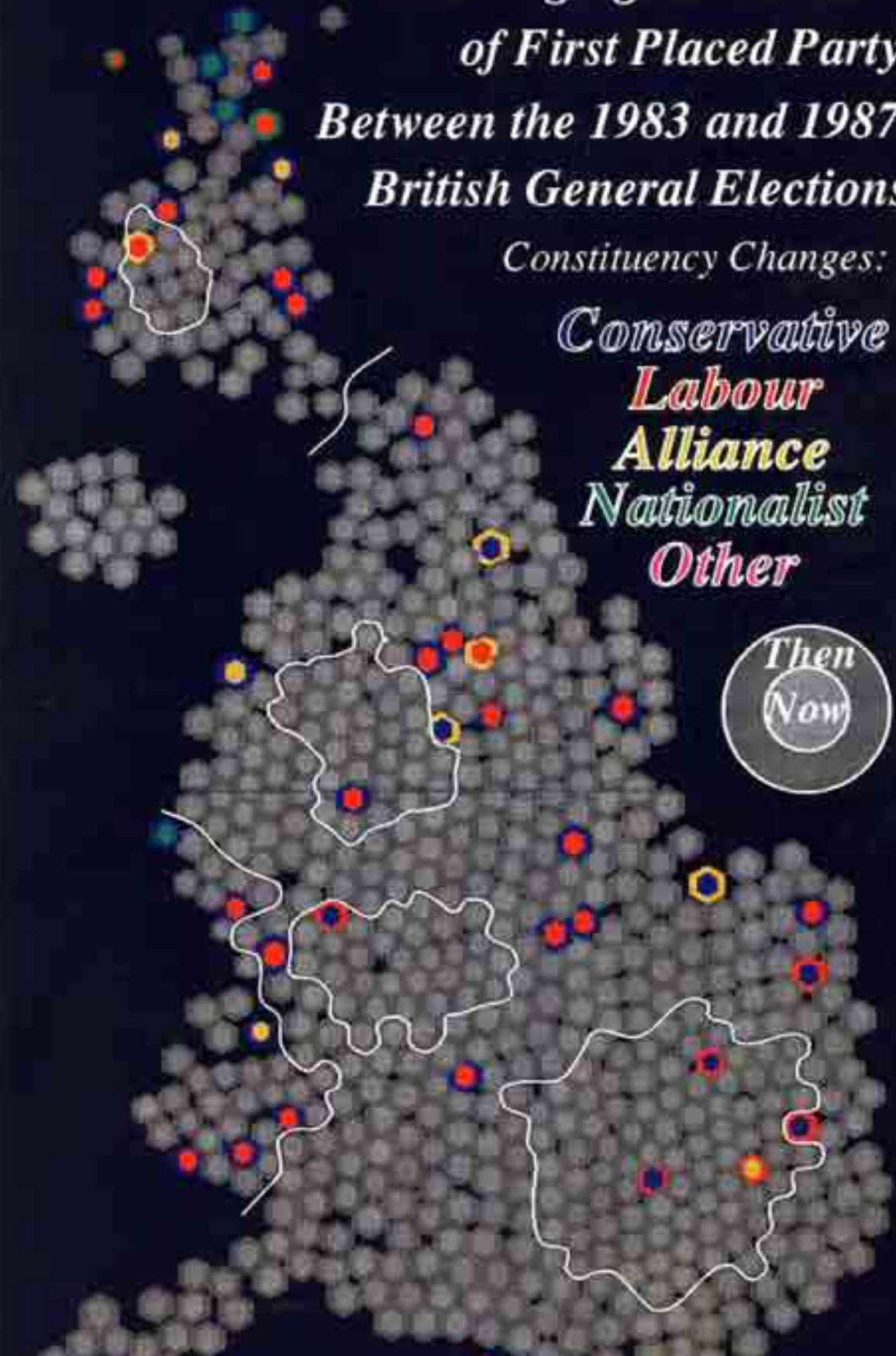
*Rate shown as surface height,
volume in proportion to the
number of unemployed upon
the population cartogram.
Resolution 300 by 450,
based on ward figures.*



*The Changing Distribution
of First Placed Party
Between the 1983 and 1987
British General Elections*

Constituency Changes:

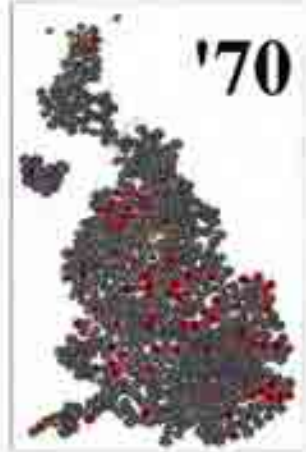
*Conservative
Labour
Alliance
Nationalist
Other*



Ten British General Elections 1955-1987
 Party Change by Constituency

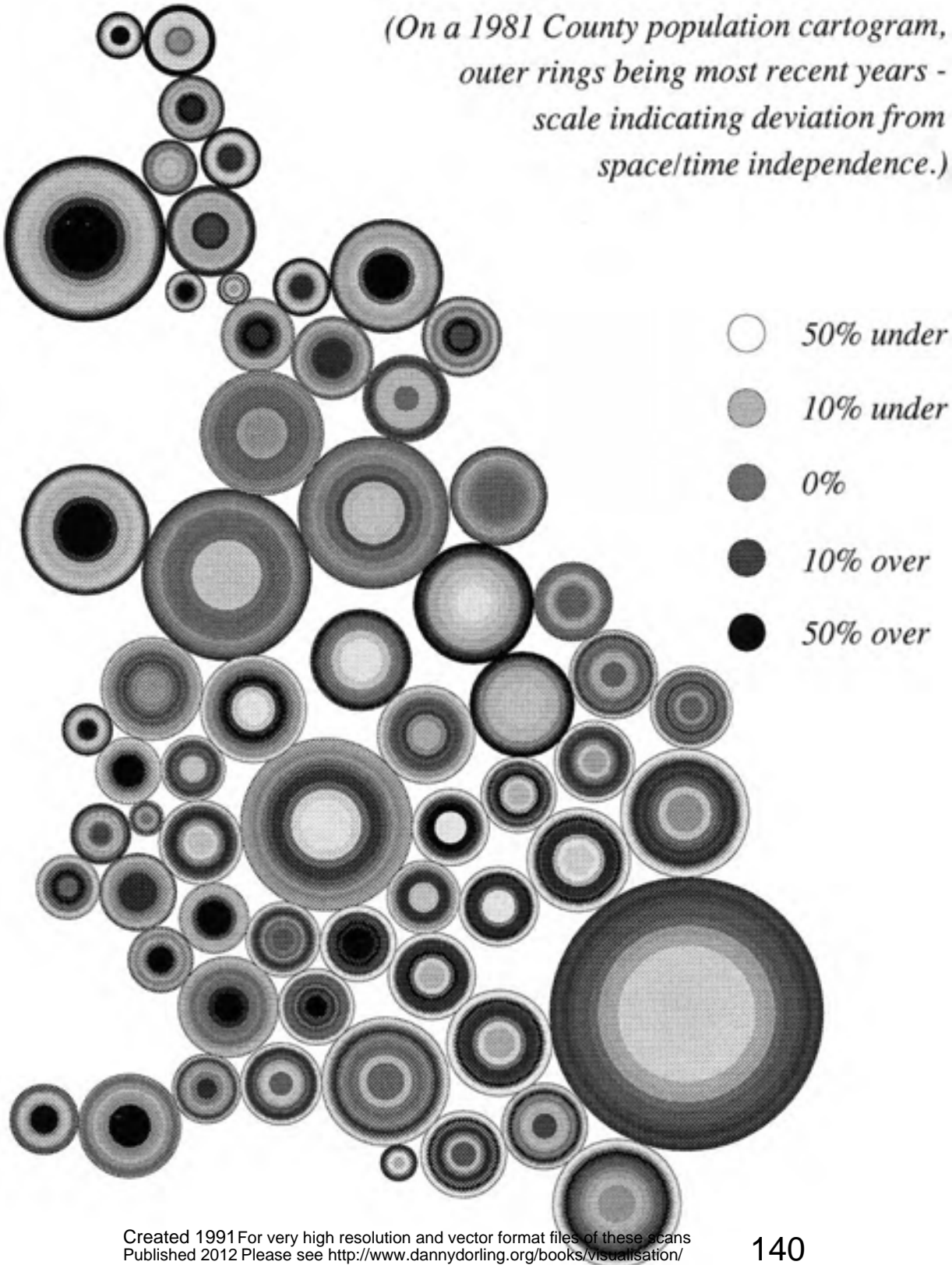
Conservative
 Labour
 Liberal
 Other
 Alliance
 Nationalist None

Then
 Now



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.)*



Industrial Classification



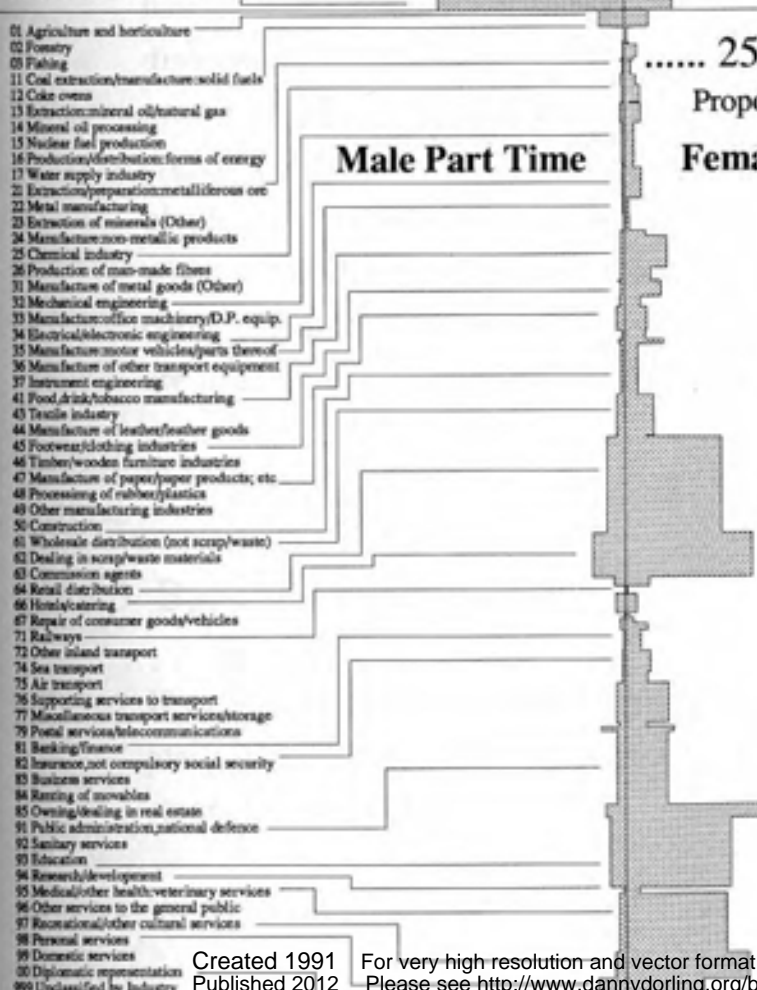
The Detailed National Composition of Industry in Britain by Employee Status and Gender, 1981.

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

Total Area = 21,309,409 jobs.

Male
Full Time

Female
Full Time



..... 25% 50% 75% 100%
Proportion of residents in type of employment.

Male Part Time

Female Part Time

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

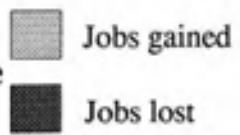
Industrial Classification



The Changing Detailed National Composition of Industry in Britain by Employee Status and Gender, 1984-1987.

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



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

Proportion of jobs lost to the industry.

Male Full Time Female Full Time 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.

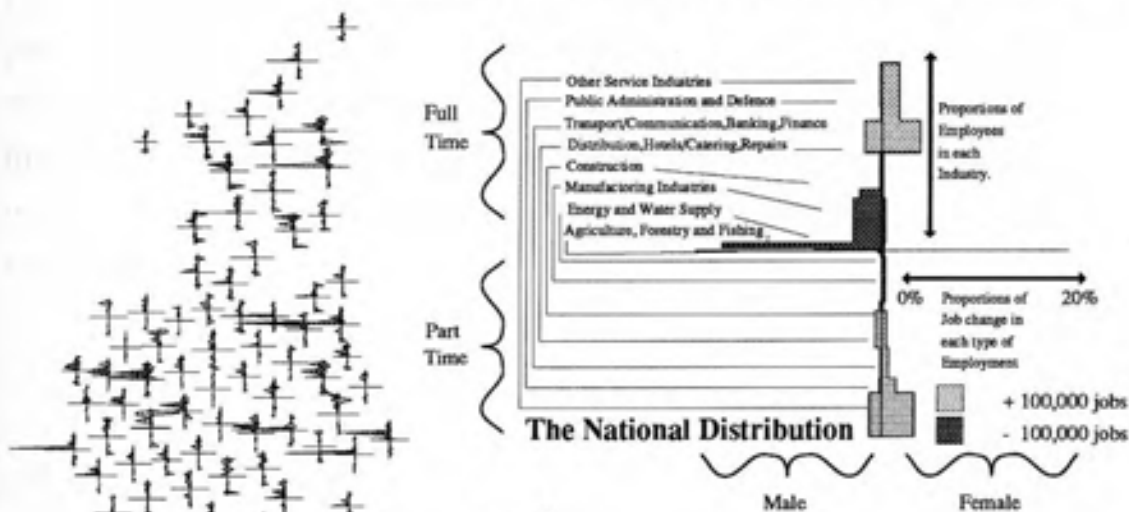
The width of the bars shows the overall share of jobs between the industries, the length of the bars indicates each industry's specific gender/status

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.

The Change in Employment by Industry, Status & Gender, 1984-1987.



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*

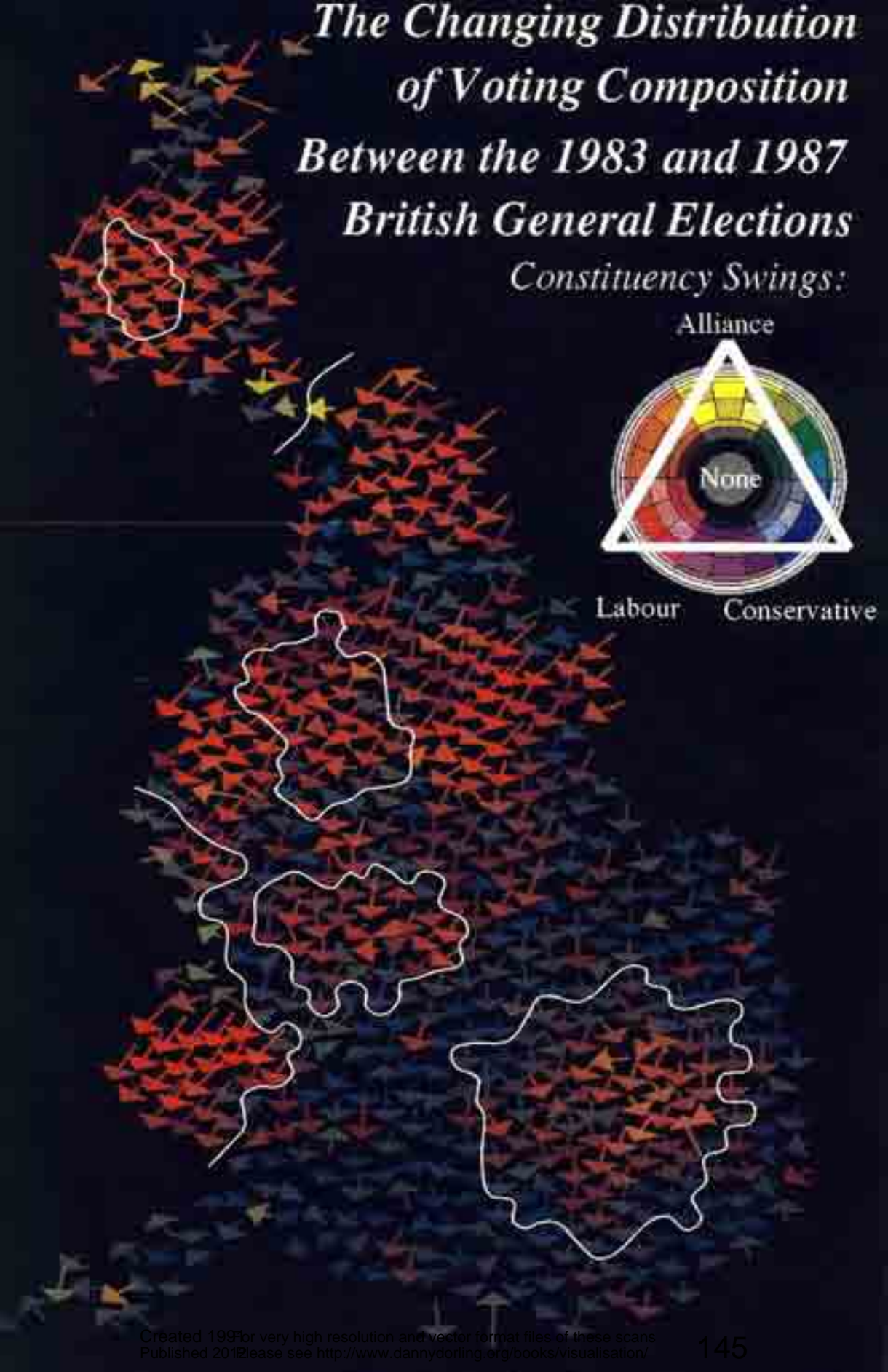
Constituency Swings:

Alliance



Labour

Conservative



Ten British General Elections 1955-1987
 Voting Change
 by Constituency

Liberal Alliance
 Labour
 Conservative

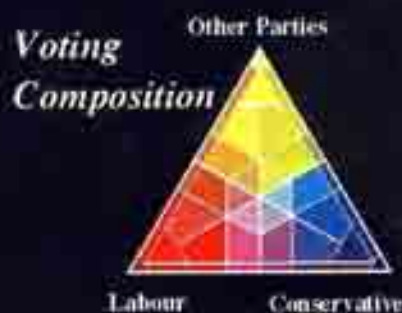


The Distribution of Housing by Price, Attributes and Sales, 1987



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*



*Voting
Composition
Change*



Labour Conservative

*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.

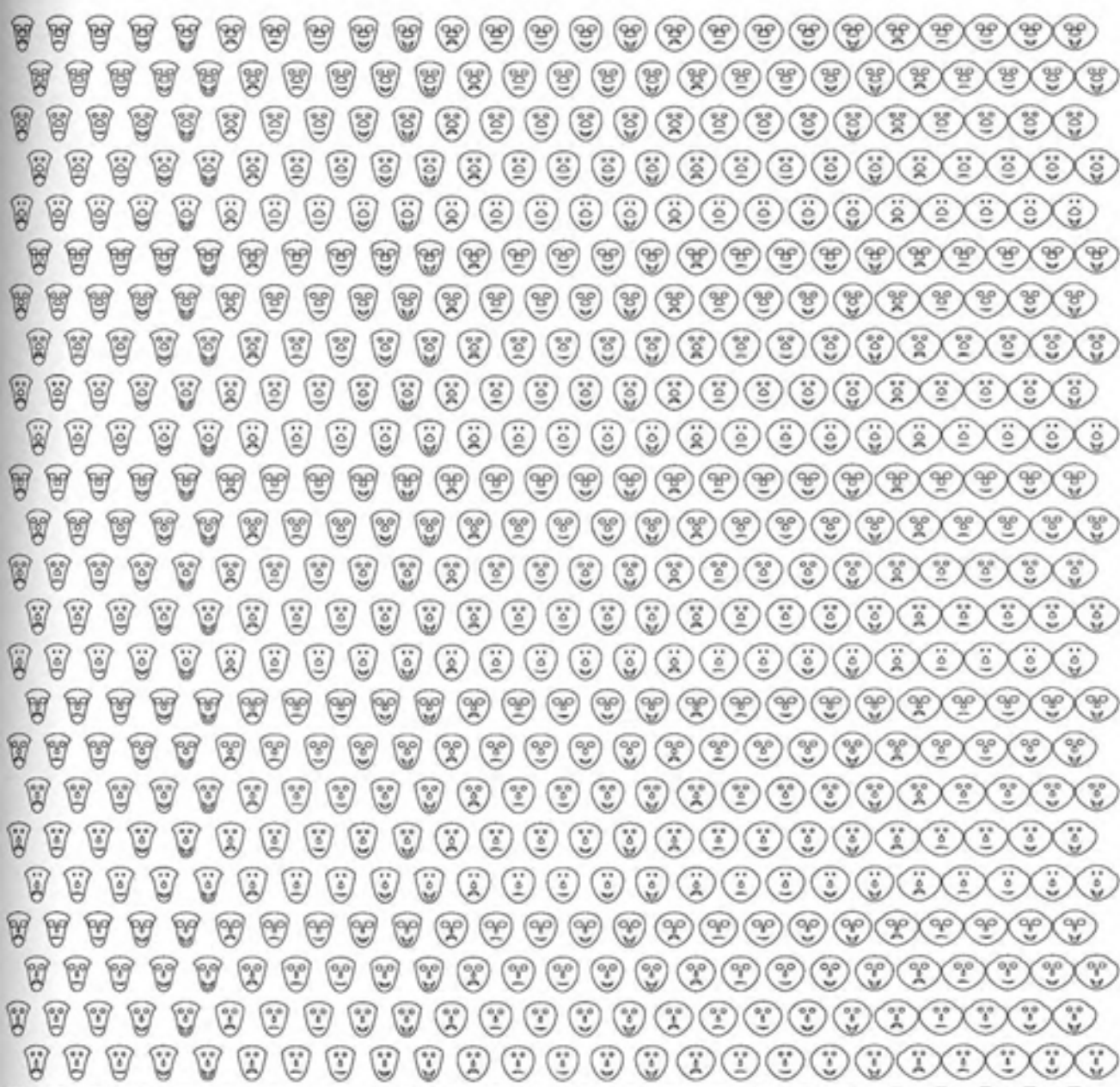


Lowest Levels



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.

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



**Voting
Composition**



Labour Conservative

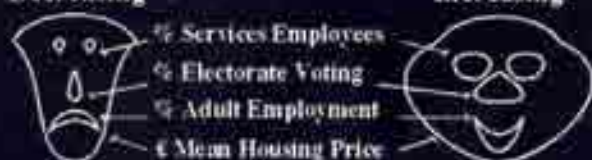
Facial features indicate the social & economic characteristics of the constituencies, colour shows the proportions of the vote for the parties.

The Changing Distribution of Voting, Housing, Employment and Industrial Compositions in Britain, 1983 to 1987.

Relative Social Indicators

Decreasing

Increasing



Direction of Voting Swing



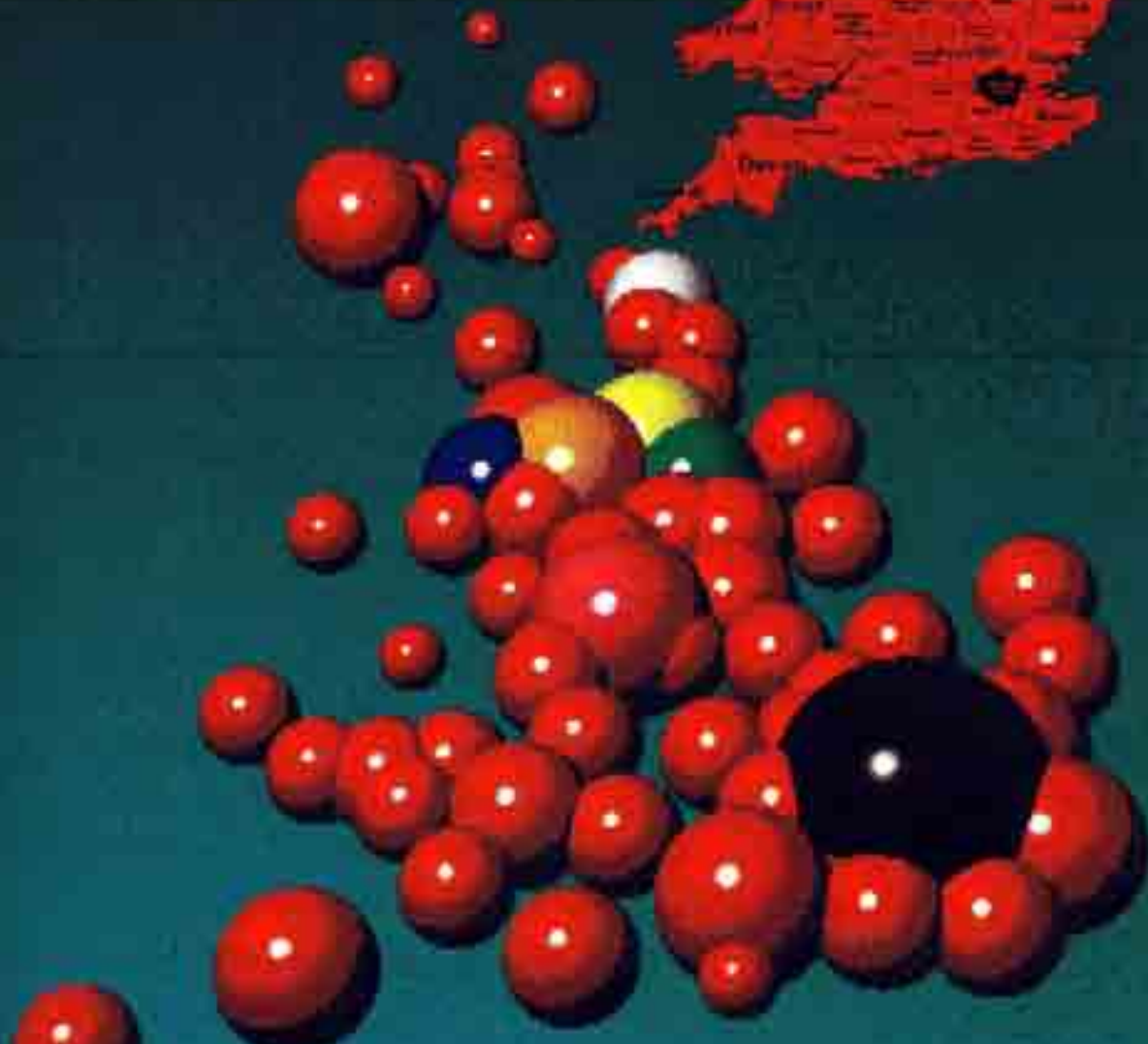
Labour

Conservative

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

The Distribution of Population by County in 1981.

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



Population Change in Britain by District, 1961 - 1991.

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.



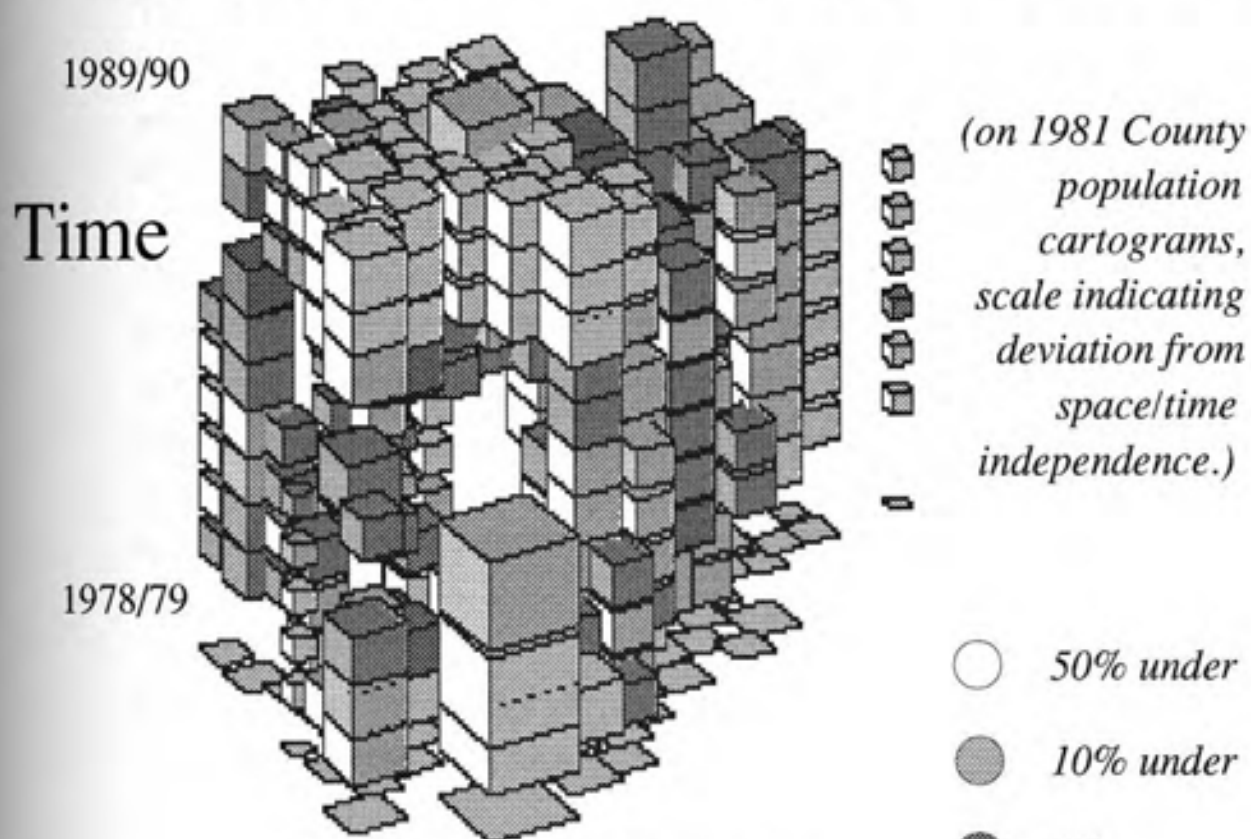
Colour shows when and where the lowest relative rates of population growth occurred:

1961/1971
 1961/1971 & 1971/1981
 1971/1981
 1971/1981 & 1981/1991
 1981/1991
 1981/1991 & 1961/1971

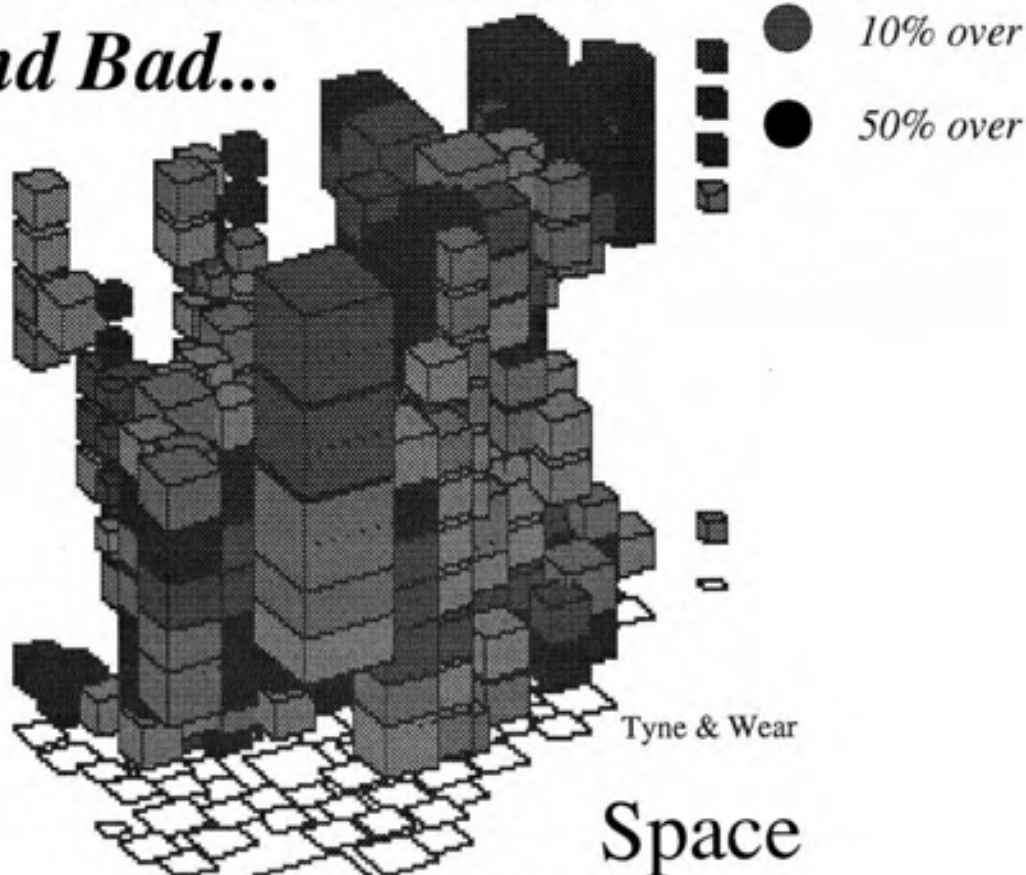
WHITE: Continuous Growth
BLACK: No Growth or Decline

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.

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



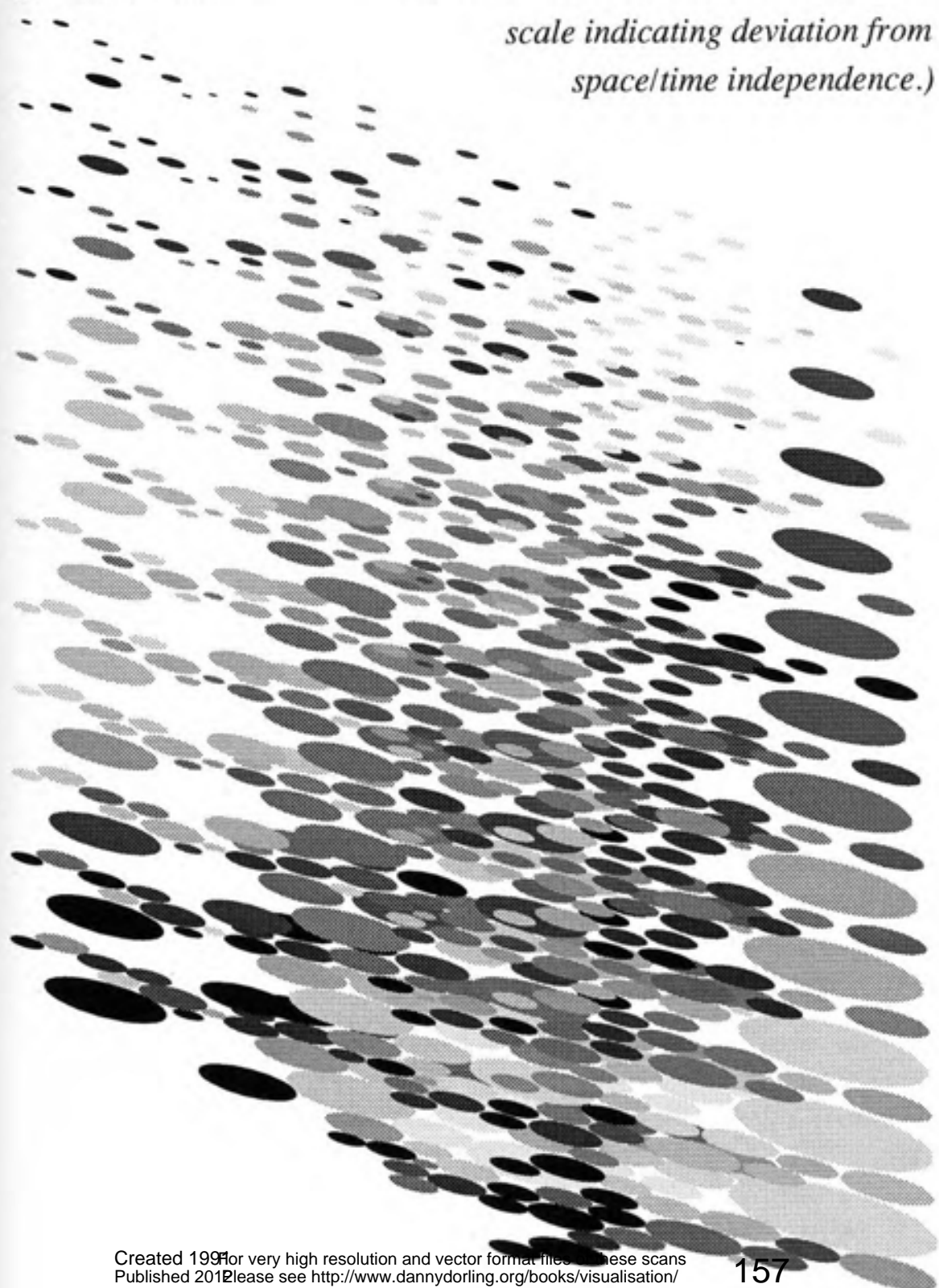
*...Good Times
and Bad...*



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

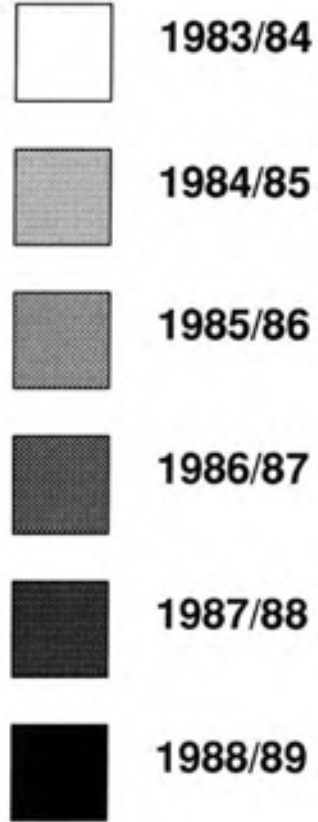
*(on 1981 County population cartograms,
higher levels being most recent years -
scale indicating deviation from
space/time independence.)*

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



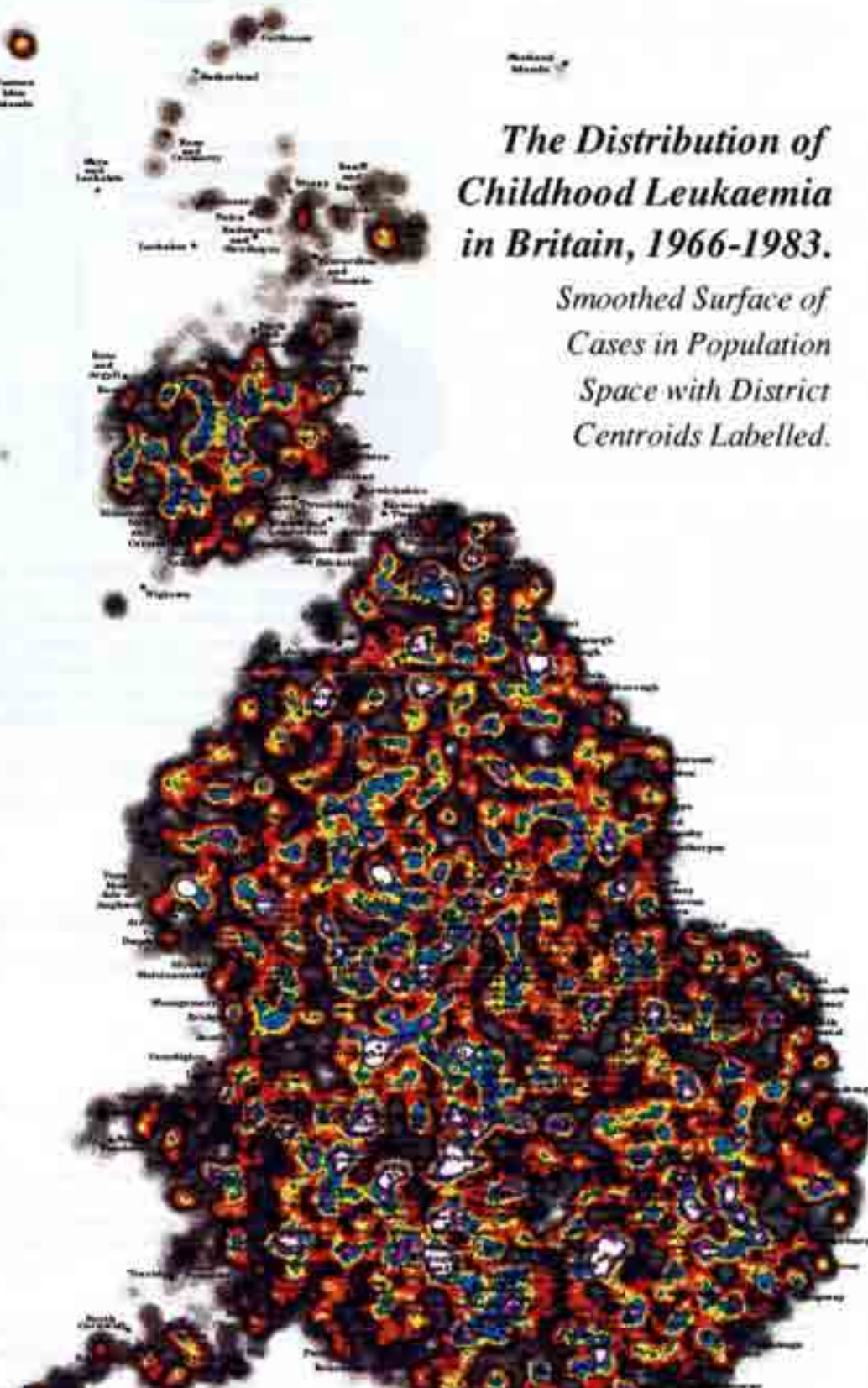
*The Distribution of
Years of Highest Housing
Price Inflation in
Britain, 1983 to 1989.*

*Years of highest local
inflation by ward:*



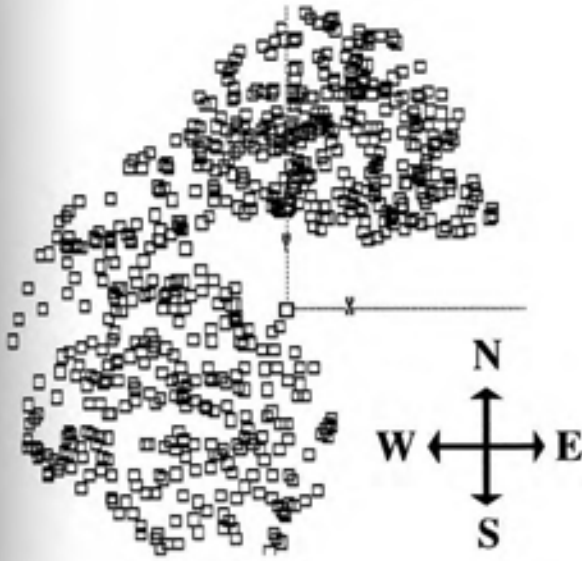
*The Distribution of
Childhood Leukaemia
in Britain, 1966-1983.*

*Smoothed Surface of
Cases in Population
Space with District
Centroids Labelled.*

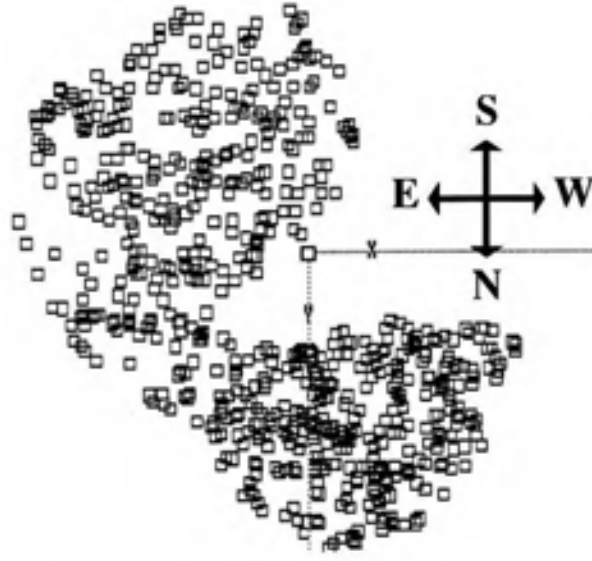


Six Views of the Childhood Leukaemia Spacetime Distribution, Northern England 1966-1986.

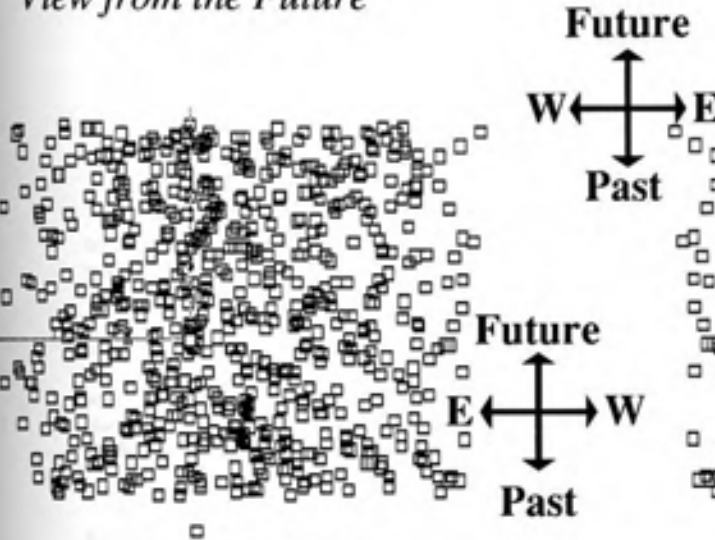
Wireframe images of the sides of the cuboid.



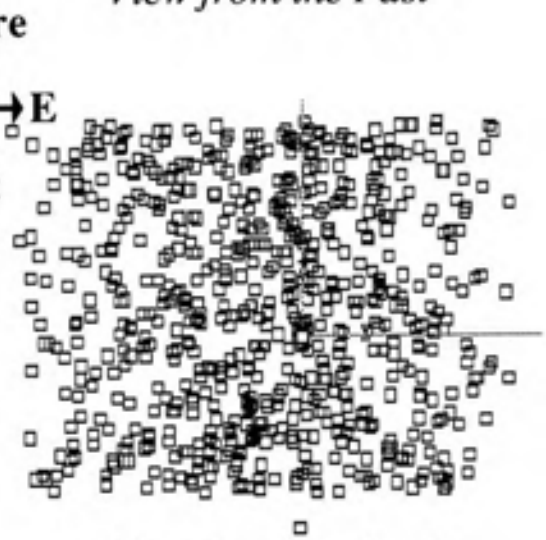
View from the Future



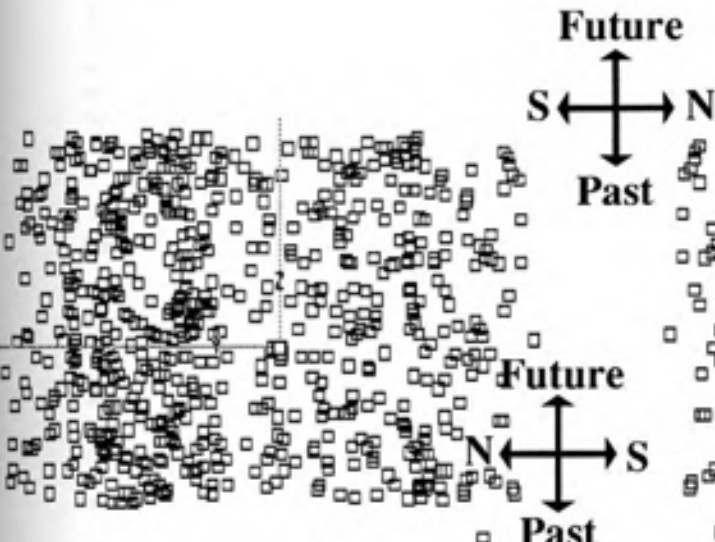
View from the Past



View from the North



View from the South



View from the West



View from the East

Key to Cancer Types Shown by Spheres in the Spacetime Diagrams.

From the Northern Region Children's Malignant Disease Registry.



Other Cancers:

Histiocytosis, 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

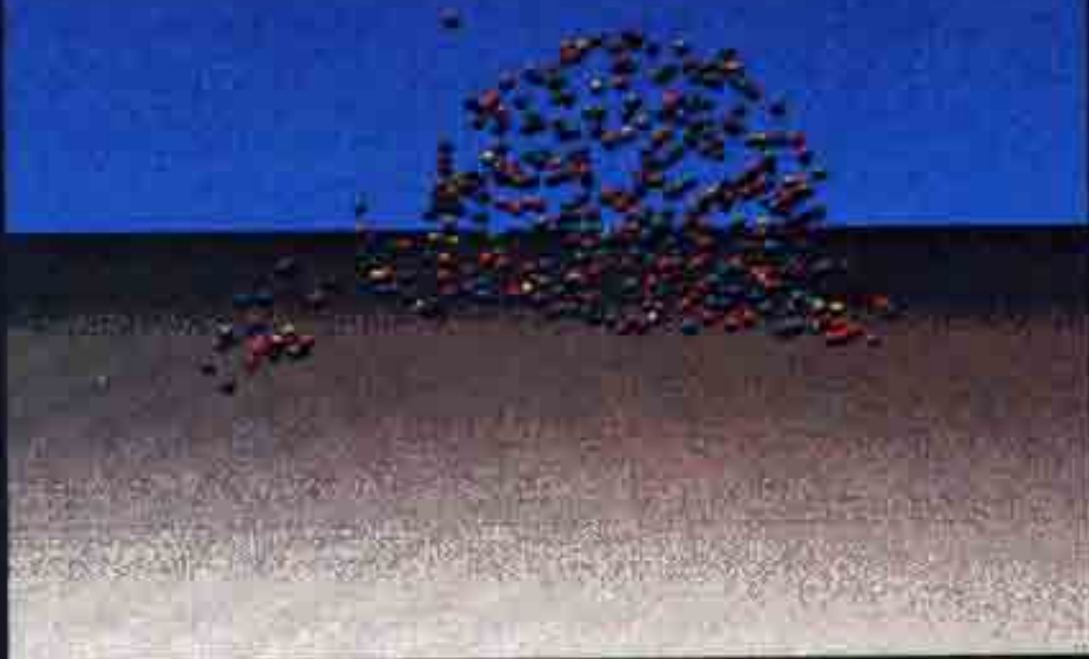
*The Distribution of Childhood Leukaemias
in North East English Euclidean Spacetime*



*The Distribution of Childhood Leukaemias
in the North East English Spacetime Cartogram*

1968 - 1973

Version 2.0.0.0



1974 - 1979

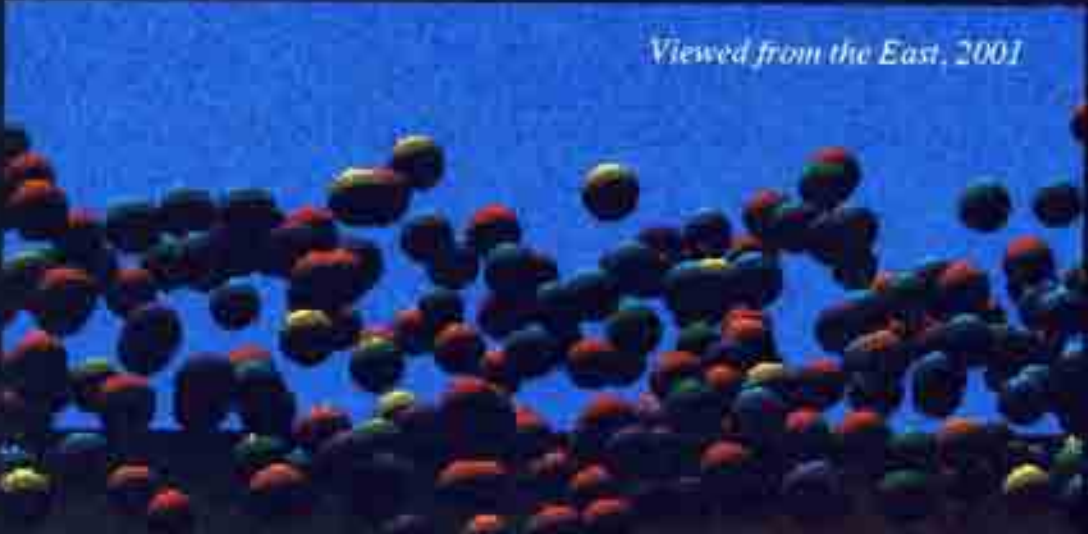
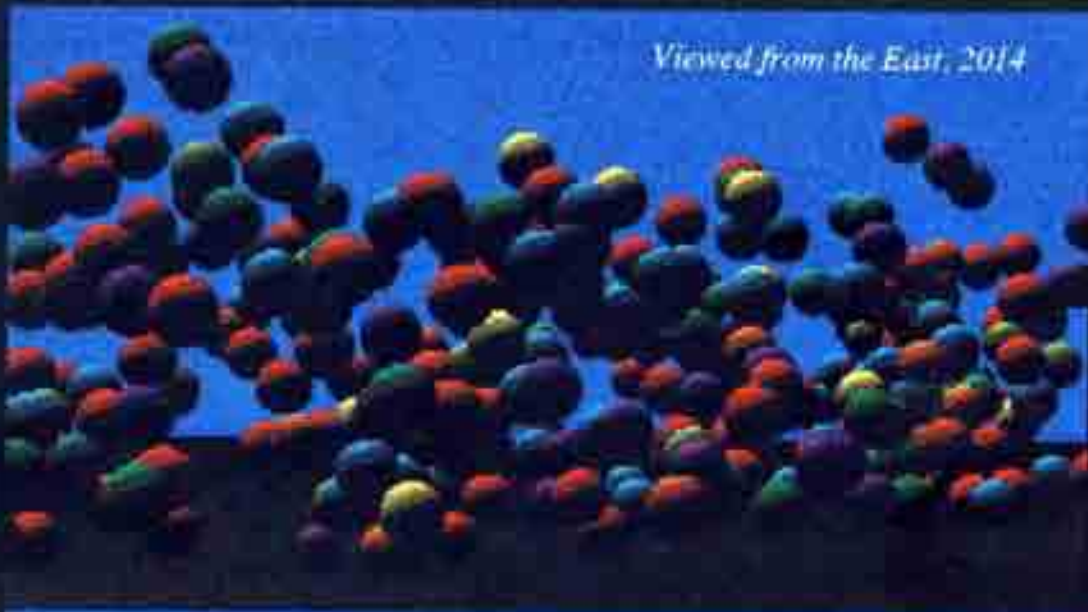
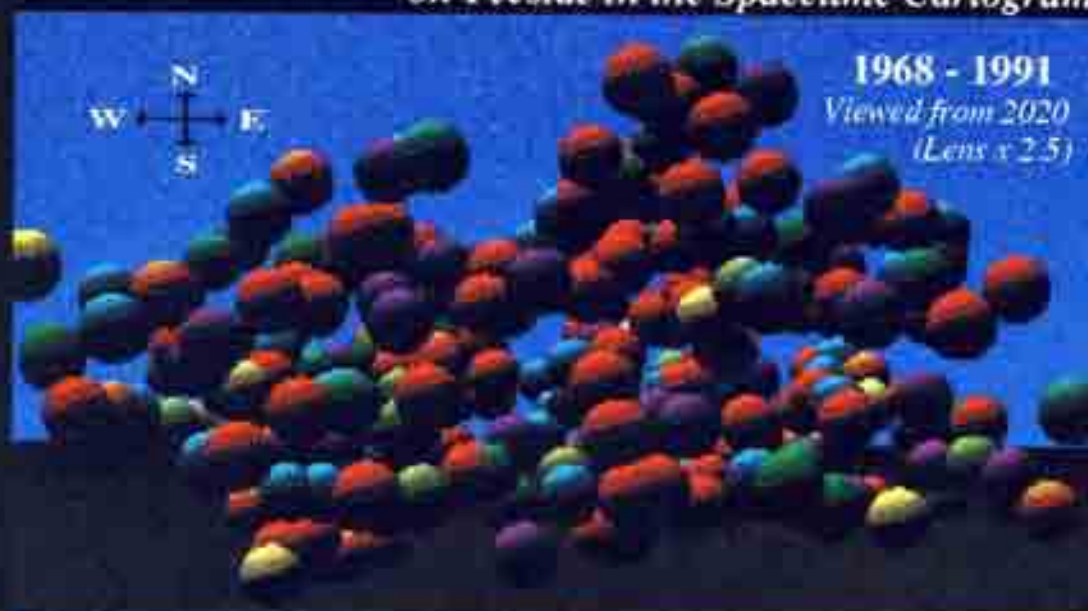
Version 2.0.0.0



*The Distribution of Childhood Leukaemias
in the North East English Spacetime Cartogram*



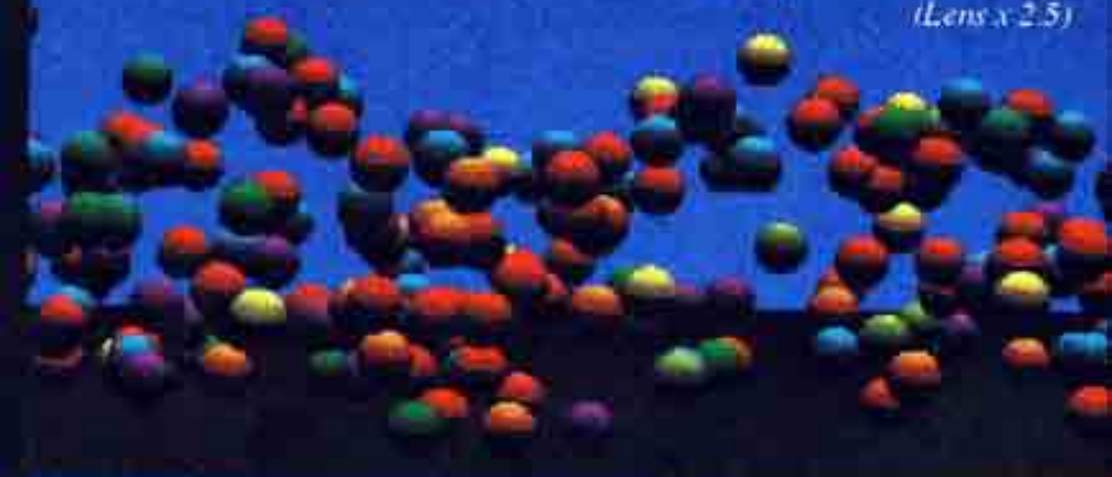
*The Distribution of Childhood Leukaemias
on Teeside in the Spacetime Cartogram*



*The Distribution of Childhood Leukaemias
on Teeside in the Spacetime Cartogram*

1968 - 1991

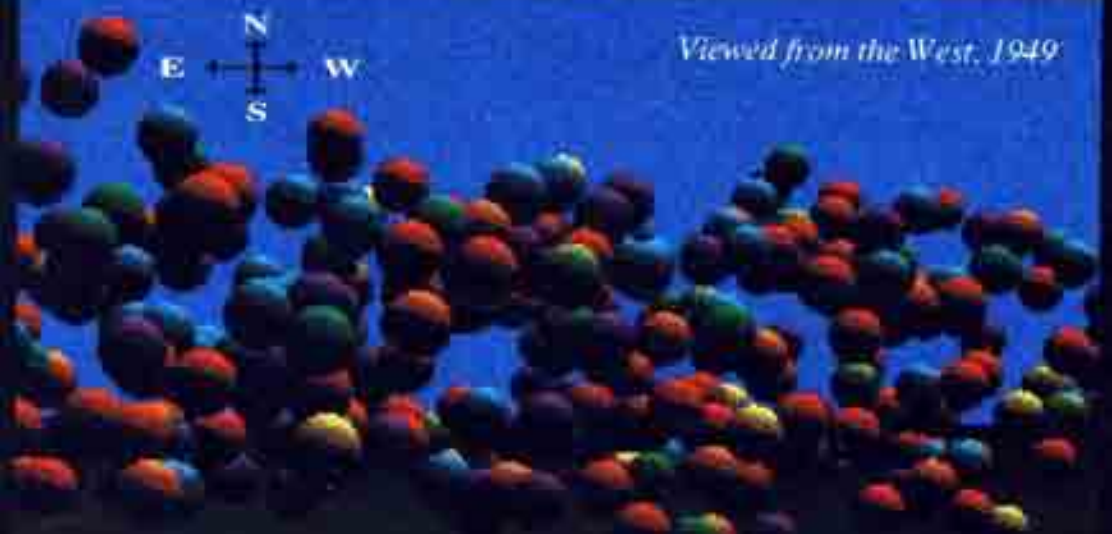
*Viewed from the West, 1982
(Lens x 2.5)*



Viewed from the West, 1963



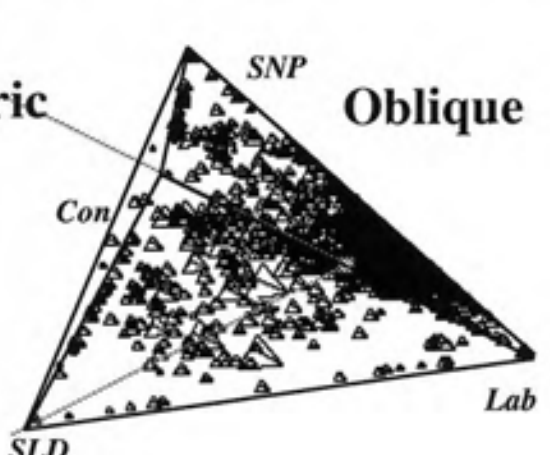
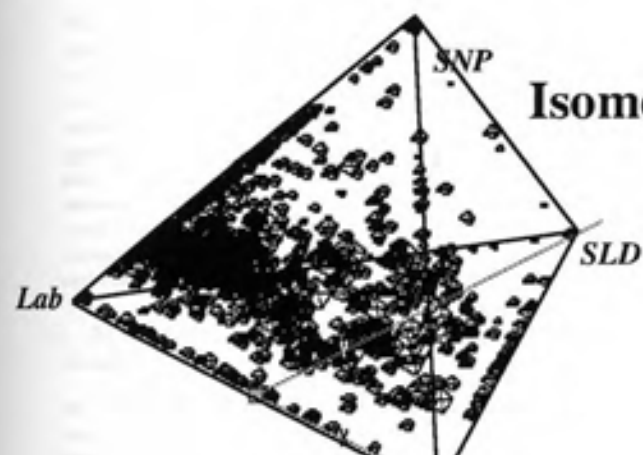
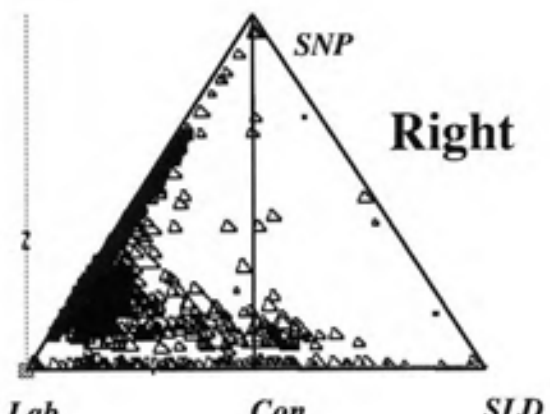
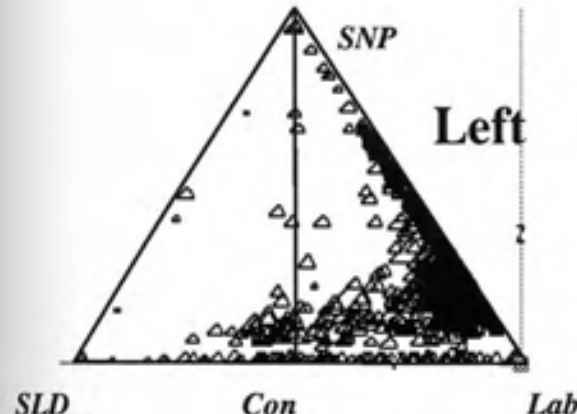
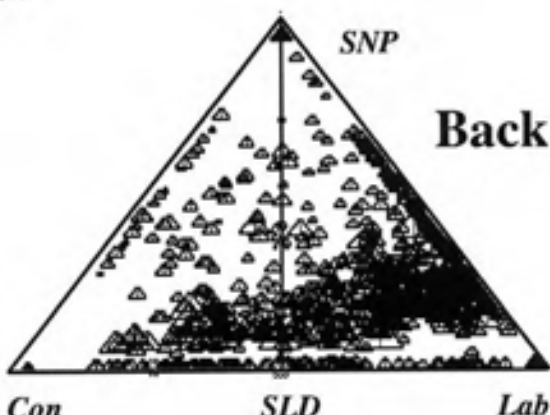
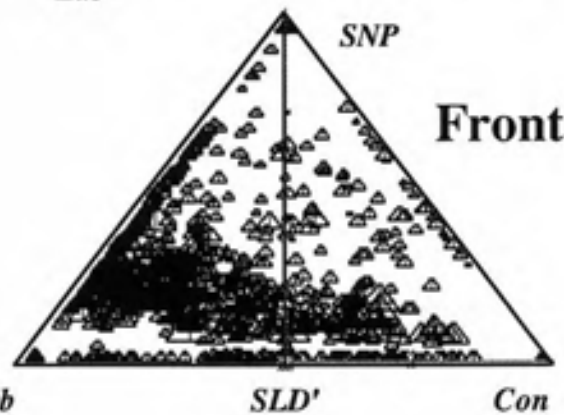
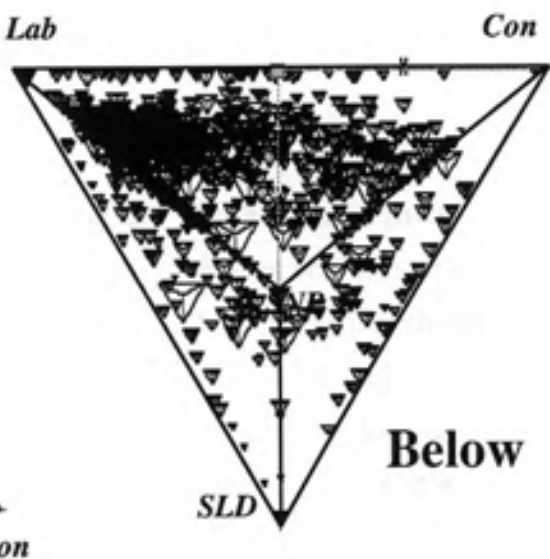
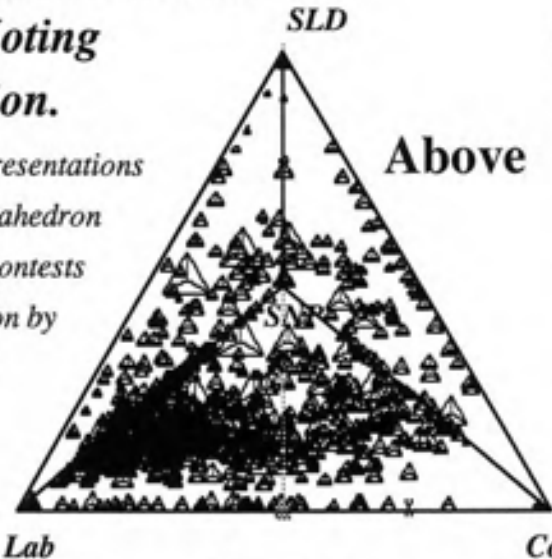
Viewed from the West, 1949



1988 District Elections:

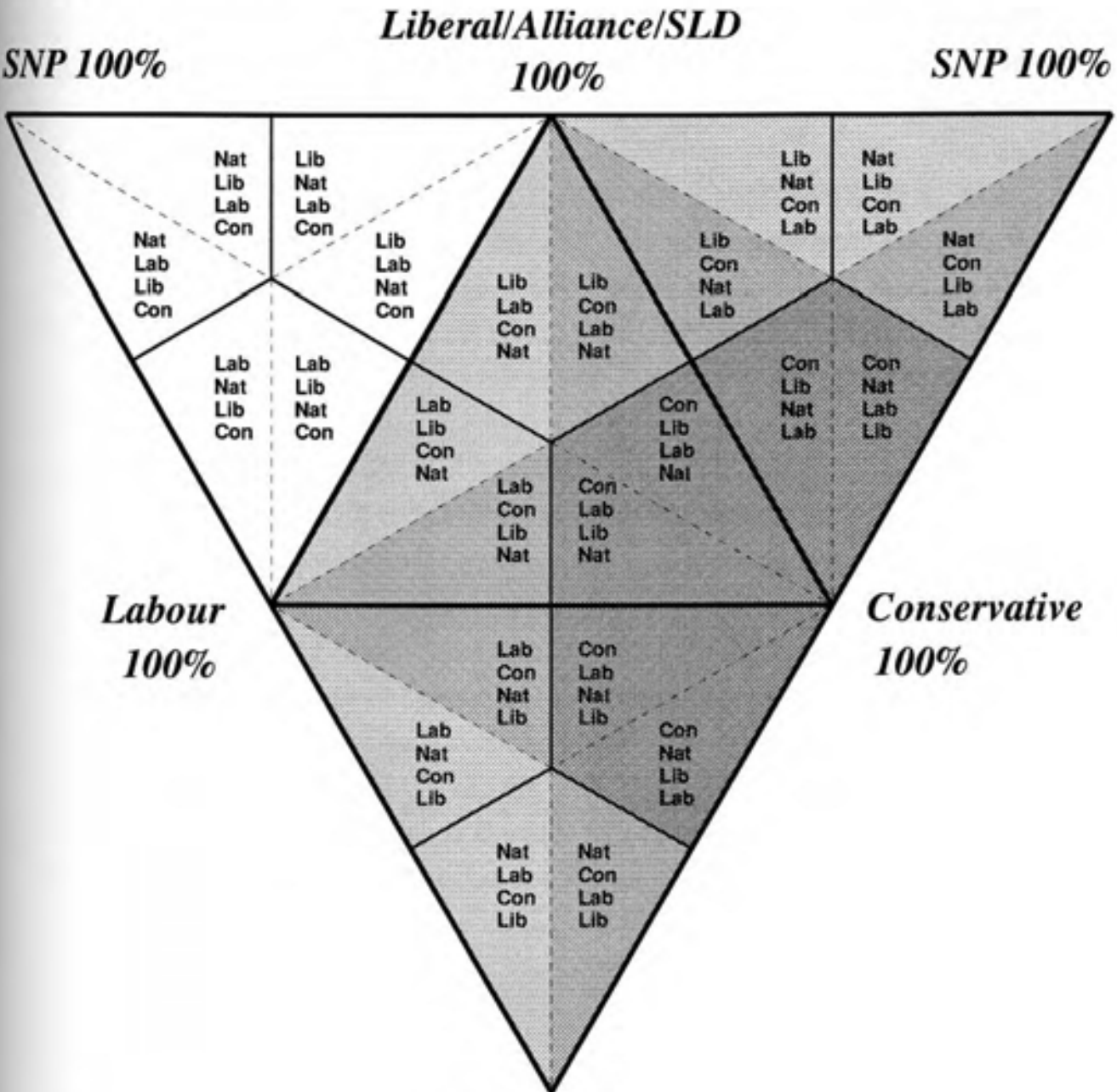
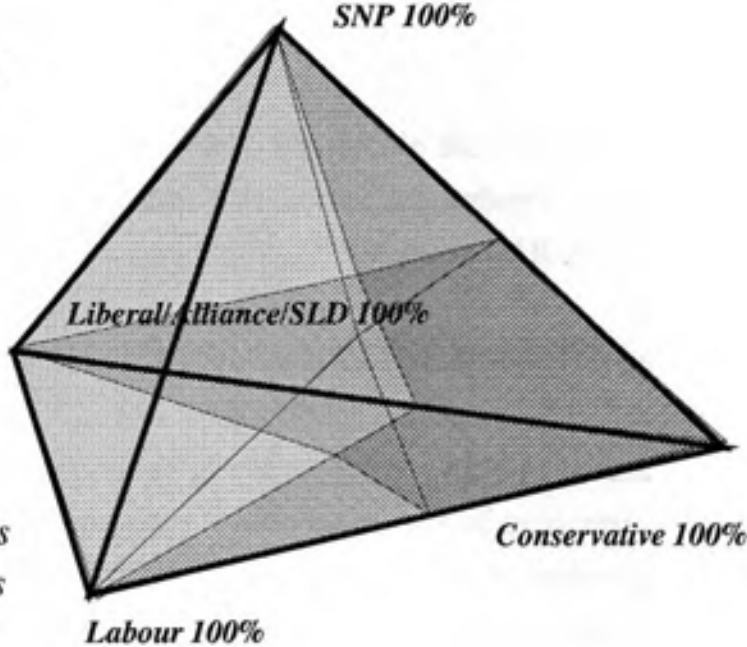
Scottish Voting Composition.

Wire-frame representations of a regular tetrahedron containing the contests of 920 wards won by one of the four major parties.



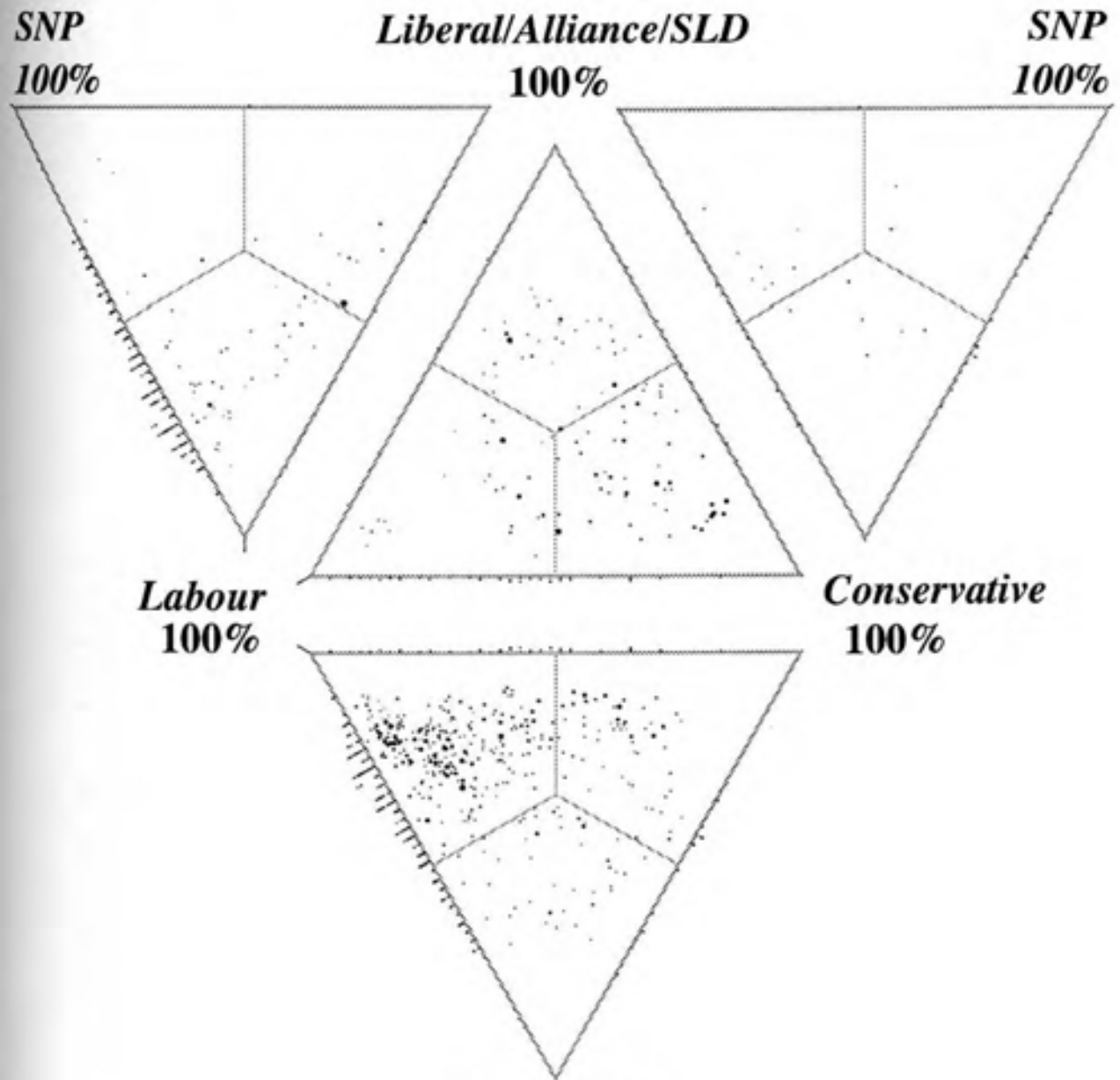
Schematic Representation of Four Party Voting Compositions.

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.

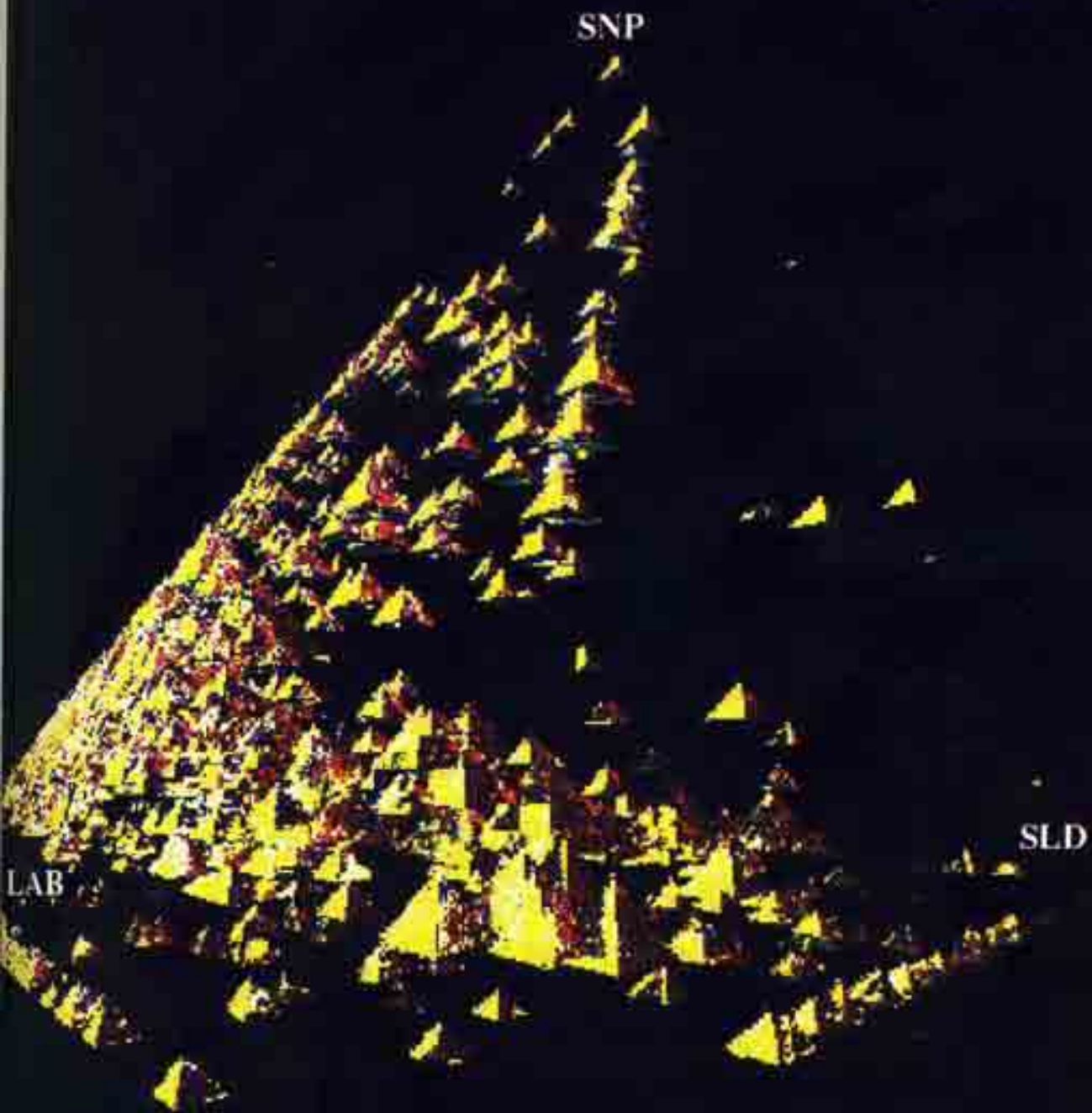


1988 District Elections: Scottish Voting Composition

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.



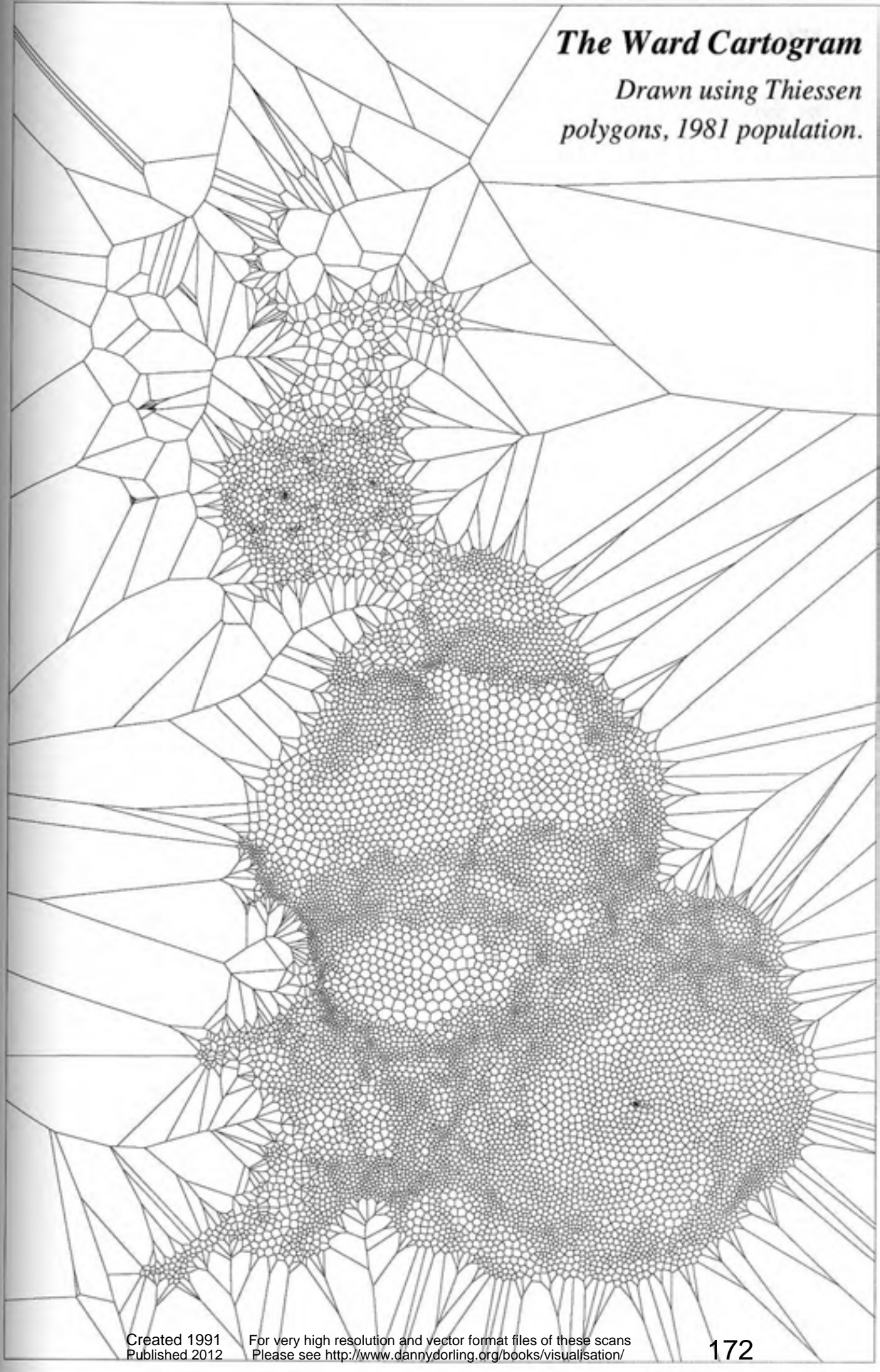
*A Ray-traced Image of the 1988
Scottish District Elections Voting
Composition.*



*The four party tetrahedron
viewed from just above the*

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



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:*

Low to High



Alliance

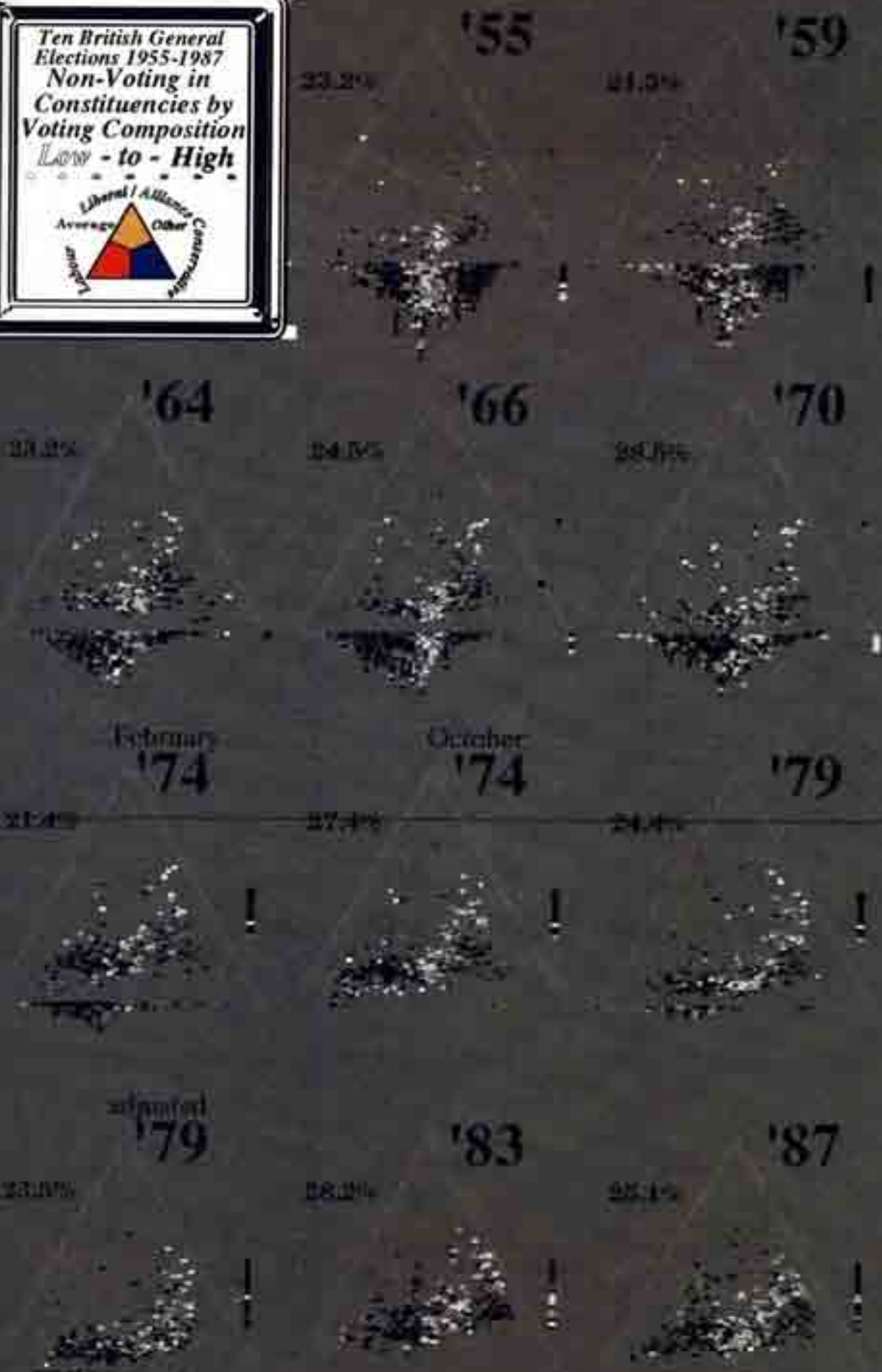
**Northern
Ireland**



Labour

Conservative

Ten British General
Elections 1955-1987
Non-Voting in
Constituencies by
Voting Composition
Low - to - High



The Distribution of Occupation in Britain 1981

*Quartile Levels by
Enumeration District of:*

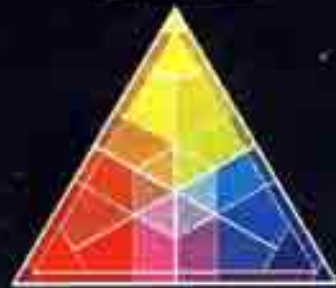


After 10 Passes of
Binomial Smoothing

*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