

# **BREVE HISTORIA DE LA VISUALIZACIÓN DE DATOS... Y LOS MAPAS TEMÁTICOS**

**Cartografía temática: desde sus  
orígenes hasta el presente**

2008

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Por qué la visualización de datos?

Desarrollo de la visualización de datos tuvo (tiene) una influencia considerable en el desarrollo de la cartografía temática

Representación gráfica  
(diagramas)



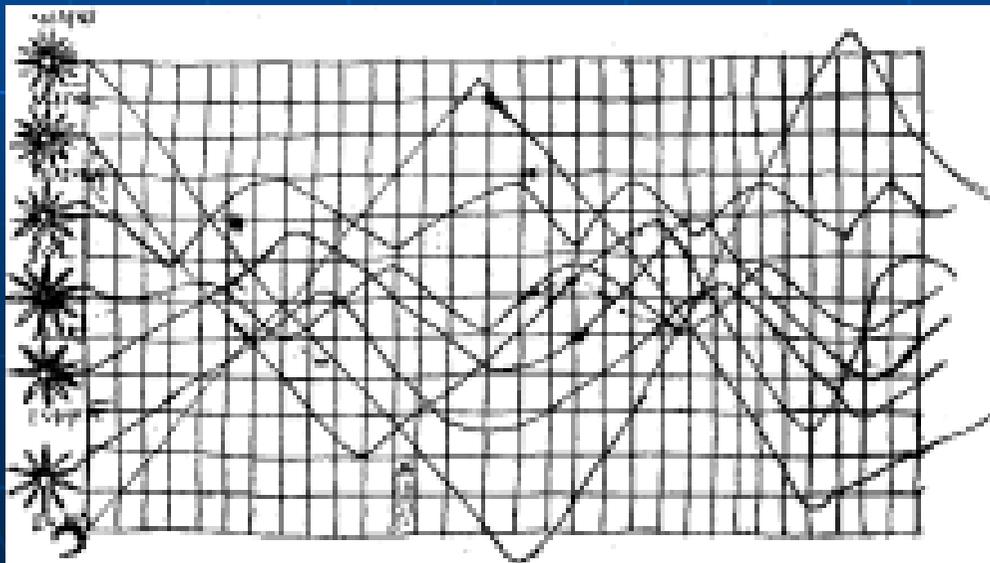
MAPAS TEMÁTICOS

Búsqueda de datos  
(Anuales – bases de datos)

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

*Aprox. 950*

Tal vez el primer diagrama hecho para representar el cambio de posición del Sol, la Luna y los planetas. Original en Bayerische Staats Bibliothek (München). Sigmund Günther (Profesor de Matemáticas, Technischen Hochschule München) lo encontró en 1877. Apéndice de un manuscrito que contiene la crítica de Macrobius a Cicerón, titulada „In Somnium Scipionis”. Su autor es desconocido.



Tufte, E. R. (1983). *The Visual Display of Quantitative Information*. Cheshire, CT: Graphics Press.

Funkhouser, H. Gray: A Note on a Tenth Century Graph. *Osiris*, Vol. 1, (Jan., 1936), pp. 260-262. Saint Catherines Press

<http://www.jstor.org/pss/301609>

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

**1375**

Atlas Catalán, Abraham Cresques (1325-1387)

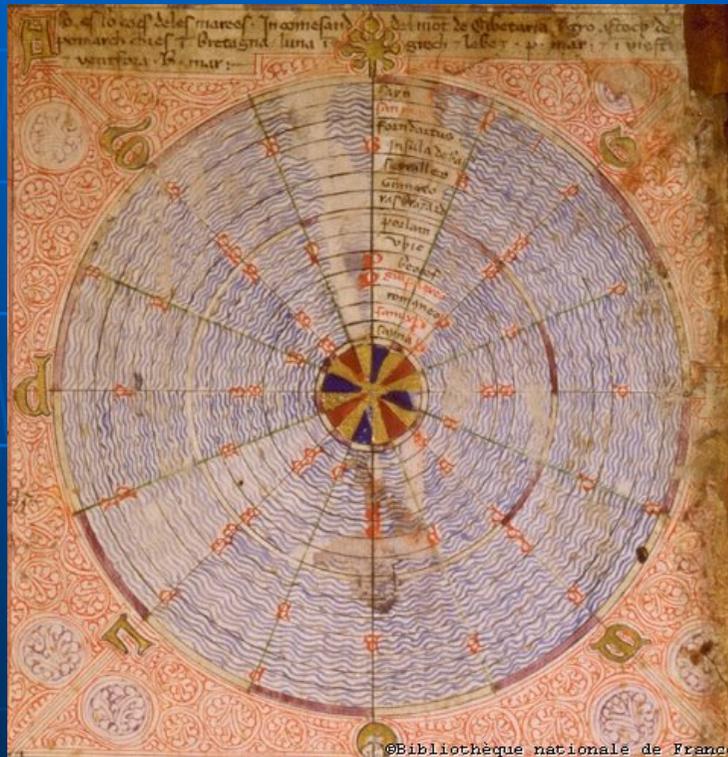


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Visualización de datos en los primeros atlas:

**1375**

Atlas Catalán, Abraham Cresques (1325-1387)



*Diagrama sobre las mareas*



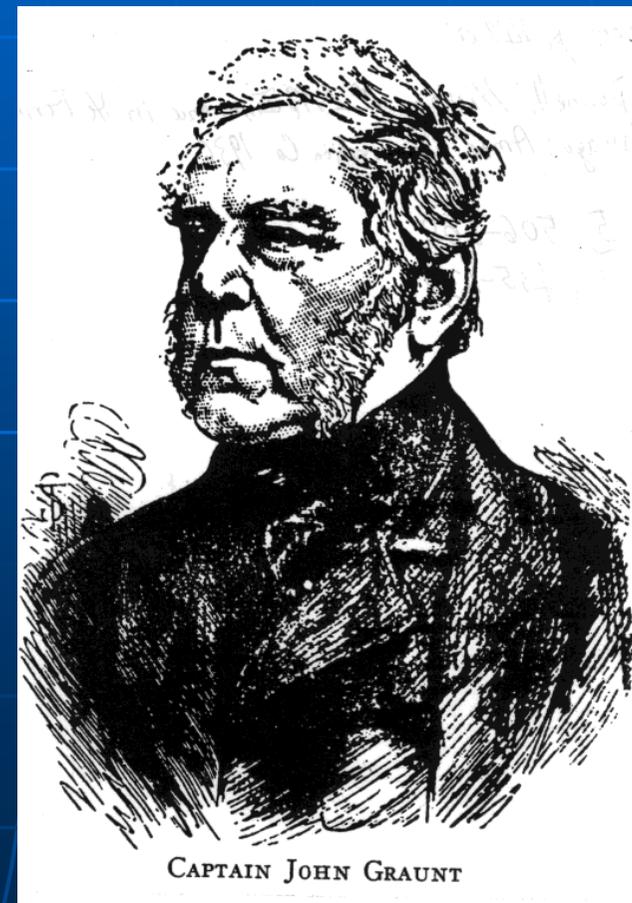
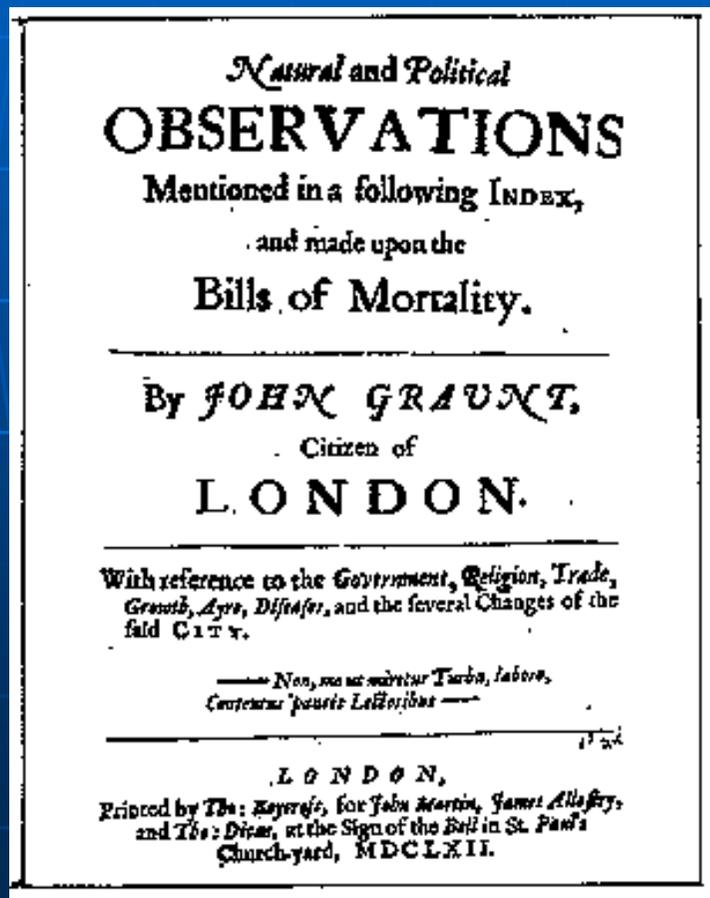
*Calendario eterno*



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Las primeras estadísticas demográficas:  
John Graunt (1620-1674), Inglaterra (Londres)

## Observations on the Bills of Mortality (1662)



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

A Table<sup>1</sup> shewing how many died weekly, as well of all Diseases, as of the Plague, in the Years 1592, 1603, 1625, 1630, 1636; and this present Year 1665.

Buried of all Diseases in the Year 1592 <sup>2</sup> .		Buried of all Diseases in the Year 1603 <sup>3</sup> .		Buried of all Diseases in the Year 1625 <sup>4</sup> .		Buried of all Diseases in the Year 1630 <sup>5</sup> .		Buried of all Diseases in the Year 1636 <sup>6</sup> .		Buried of all Diseases in the Year 1665 <sup>7</sup> .										
Total	Pla.	Total	Plag.	Total	Plag.	Total	Pl.	Total	Pla.	Total	Plag.									
March 17	230	3	March 17	108	3	March 17	262	4	June 24	205	19	April 7	119	2	December 27	291				
March 24	351	31	March 24	60	2	March 24	226	8	July 1	209	25	April 14	205	4	January 3	349				
March 31	219	29	March 31	78	6	March 31	243	11	8	217	43	April 21	290	37	10	394				
April 7	307	27	April 7	66	4	April 7	239	10	15	250	50	April 28	310	41	17	415				
April 14	203	33	April 14	79	4	April 14	256	24	22	229	40	May 5	350	29	24	474				
April 21	290	37	April 21	98	8	April 21	230	25	29	279	77	May 12	339	38	31	409				
April 28	310	41	April 28	109	10	April 28	305	26	August 5	250	56	May 19	300	42	February 7	393				
May 5	350	29	May 5	90	11	May 5	292	30	12	246	65	May 26	450	58	14	461	1			
May 12	339	38	May 12	112	18	May 12	423	45	19	269	54	June 2	410	62	21	393				
May 19	300	42	May 19	122	22	May 19	379	71	26	270	67	June 9	441	81	28	396				
May 26	450	58	May 26	122	32	May 26	401	78	September 2	230	66	June 16	399	99	May 5	251	10	March 7	441	
June 2	410	62	June 2	114	30	June 2	395	69	9	259	63	May 12	308	55	14	433				
June 9	441	81	June 9	131	43	June 9	434	91	16	264	68	May 19	299	35	21	365				
June 16	399	99	June 16	144	51	June 16	510	161	23	274	57	May 26	330	62	28	353				
June 23	401	108	June 23	182	72	June 23	640	239	30	269	56	June 2	339	77	April 4	344				
June 30	850	118	June 30	267	158	June 30	942	390	October 7	236	66	9	345	87	11	382				
July 7	1440	927	July 7	445	263	July 7	1222	593	14	261	73	16	381	103	18	344				
July 14	1510	893	July 14	612	424	July 14	1781	1004	21	248	60	23	304	79	25	390	2			
July 21	1491	258	The Out-Parishes this Week were joined with the City.			21	2850	1819	28	214	34	30	352	104	May 2	388				
July 28	1507	852	July 21	1186	917	August 4	3583	2471	November 4	242	20	July 7	215	81	9	347	9			
August 4	1503	983	July 28	1728	1396	August 4	4517	3059	11	215	29	14	372	104	16	353	3			
August 11	1550	797	August 4	2256	1922	August 11	4855	4115	18	200	18	21	365	120	23	385	14			
August 18	1532	651	August 11	2077	1745	August 18	5205	4463	25	226	7	28	423	151	30	399	17			
August 25	1508	449	August 18	3054	2713	August 25	4841	4218	December 2	221	20	August 4	491	206	June 6	405	43			
September 1	1490	507	September 1	2853	2539	September 1	3897	3344	9	198	19	11	538	283	13	558	112			
September 8	1210	563	September 8	3385	3035	September 8	3157	2550	16	212	5	18	638	321	20	611	168			
September 15	621	451	September 15	3078	2724	September 15	2148	1672	Buried in the 97 Parishes without the walls	2696	September 1	787	429	27	684	267				
September 22	629	349	September 22	3129	2818	September 22	1994	1551	Whereof of the Plague	190	September 8	1011	638	July 4	1006	470				
September 29	450	330	September 29	2456	2195	September 29	4236	852	Buried in the 16 Parishes without the walls	4813	15	1069	650	11	1268	727				
October 6	408	327	October 6	1961	1732	October 6	833	538	Whereof of the Pl.	603	22	1306	865	18	1761	1089				
October 13	422	323	October 13	1831	1641	October 13	815	511	Buried in the 9 Out-Parishes in Middlesex and Surrey, and at the Pest-house	3045	29	1229	775	25	2785	1843				
October 20	330	308	October 20	1312	1149	October 20	651	331	Whereof of the Pl.	524	October 6	1403	928	August 1	3014	2010				
October 27	320	302	October 27	766	642	October 27	375	134	Buried in Westminster	566	13	1405	921	8	4030	2817				
November 3	310	301	November 3	625	508	November 3	357	89	Whereof of the Pl.	31	20	1405	921	15	5319	3880				
November 10	309	209	November 10	737	594	November 10	319	92	Whereof of the Pl.	566	27	1302	792	22	5568	4237				
November 17	301	107	November 17	545	442	November 17	274	48	Buried in Westminster	566	November 3	1002	555	29	7496	6102				
November 24	321	93	November 24	198	105	November 24	231	27	Whereof of the Pl.	566	October 6	900	458	September 5	8252	6988				
December 1	349	94	December 1	223	102	December 1	190	15	Whereof of the Pl.	31	10	1300	838	12	7690	6544				
December 8	331	86	December 8	163	55	December 8	181	15	The Total of all the Burials this year is	23359	17	1104	715	19	8207	7165				
December 15	329	71	December 15	200	96	December 15	168	6	Whereof of the Pl.	10400	24	950	573	26	6460	5533				
December 22	386	39	December 22	168	74	December 22	157	1	The Total of all the Burials this year is	97306	December 1	857	476	October 3	5720	4929				
The Total of all that have been buried is	25886		The Total of all is	37294		The Total of all is	51578			8	614	321	10	5068	4327					
Whereof of the Plague	11503		whereof of the Plag.	30561		Whereof of the Plague	35403			15	459	167	17	3219	2665					
										19	385	85	24	1806	1421					
										31	1388	1031	31	1388	1031					
										November 7	1787	1414	14	1359	1050					
										14	1359	1050	21	905	652					
										28	544	333	28	544	333					
										December 5	428	210	12	442	243					
										12	442	243	19	525	281					
										19	525	281	The Total of the Burials this year is	97306						
													Whereof of the Pl.	68596						

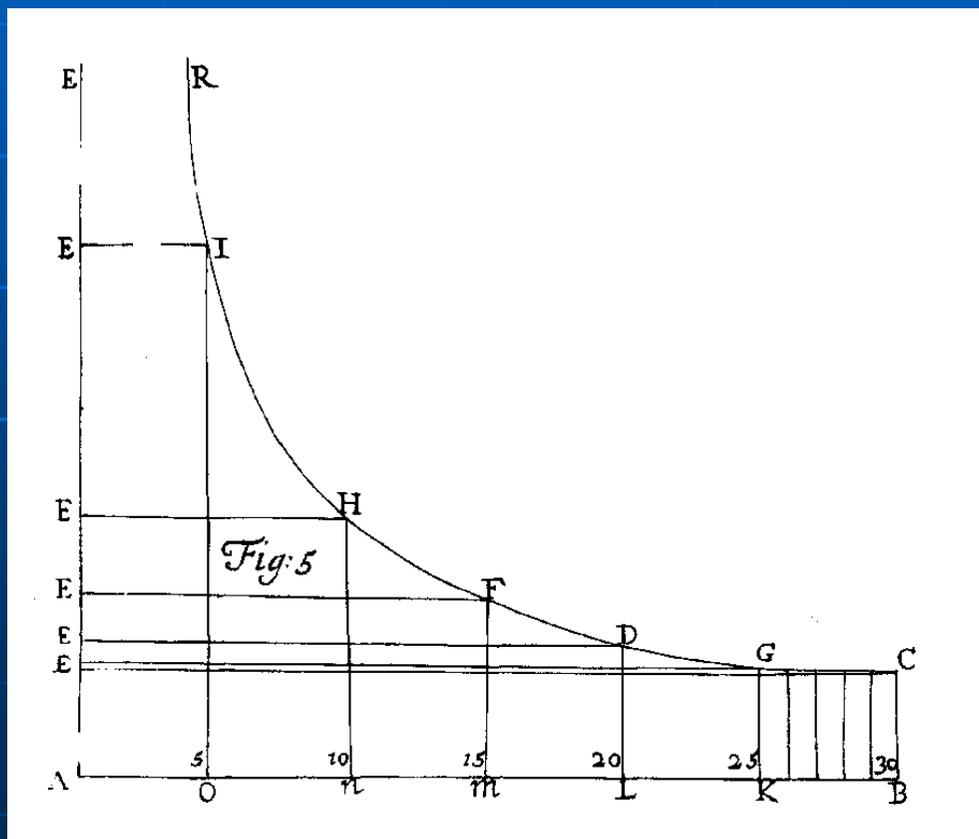
Place this Table at page 426.

Graunt  
1662

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1686-1693

Edmund Halley (1656-1742), Inglaterra



**1686**

Cambios de presión en  
dependencia de la altitud

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Edmund Halley  
(1656-1742), Inglaterra

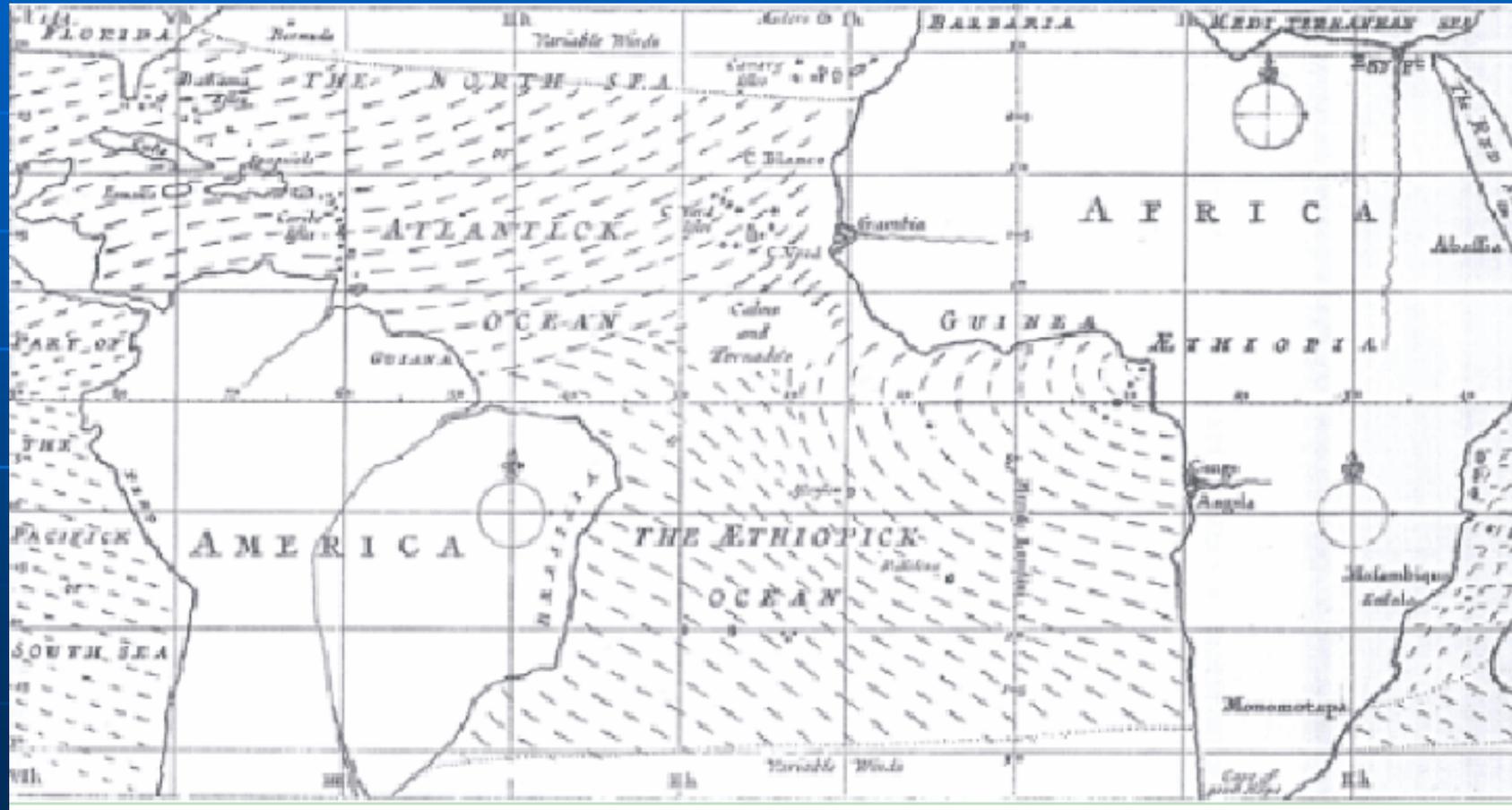


**1701**

Primer mapa temático: Mapa representando los cambios de la declinación magnética mediante isolíneas (isogonas)

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Detalle interesante: ya en 1686 Halley representó la ubicación y dirección de los vientos en otro mapa



<http://www.zevross.com/special/history/thematic.html>

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1752

Phillippe Buache (1700-1773), Francia:

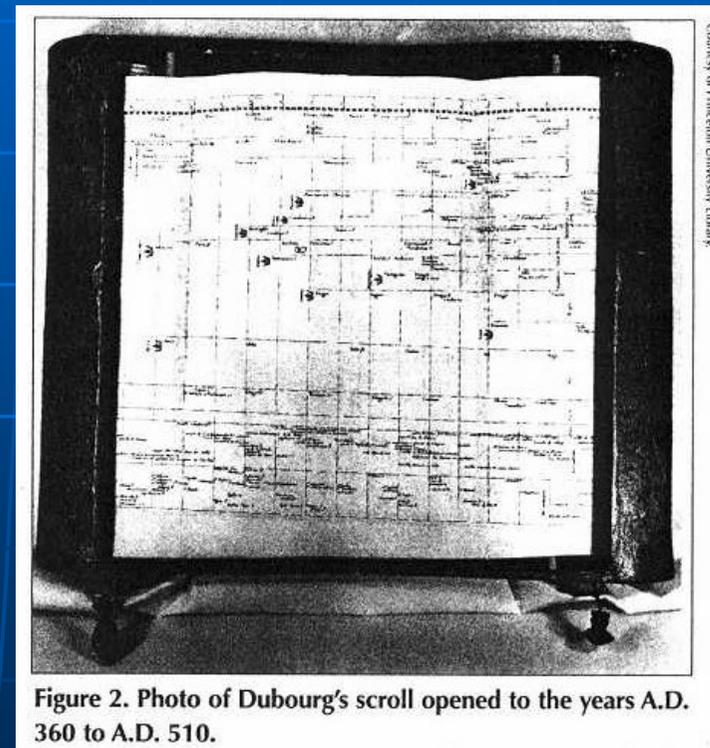
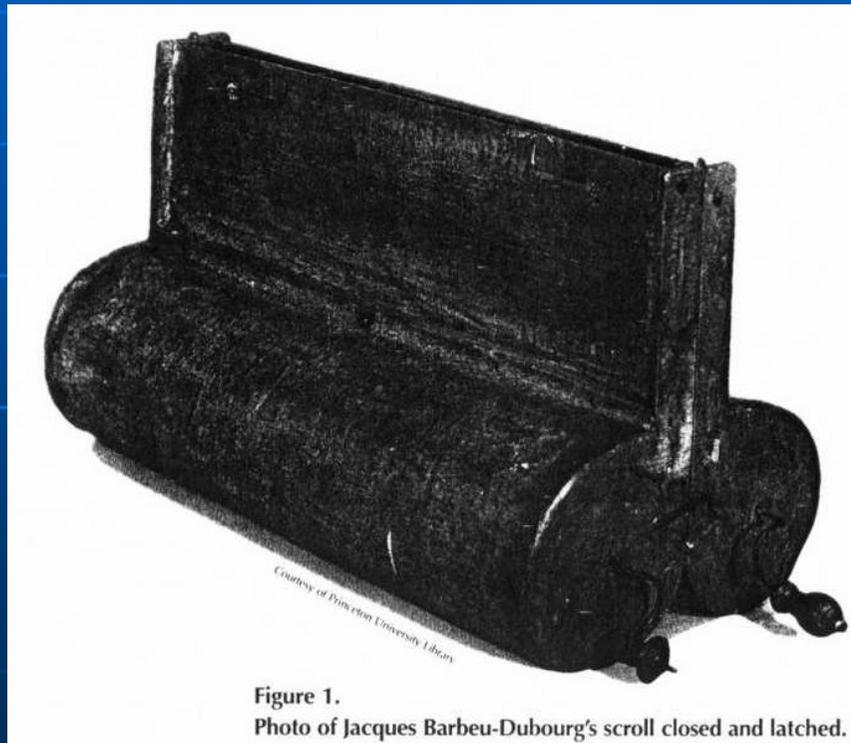
Es el primer cartógrafo en enfatizar el relieve y la hidrografía por encima de la división político administrativa.



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1753

Jacques Barbeu-Dubourg (1709-1779, botánico, Franklin), Francia: „Barra histórica ó cronológica” impresa (Carte chronologique). La información es clasificada en temas, uso de símbolos para representar la información.



Carte chronologique was an annotated timeline of history (from Creation) on a 54-foot scroll. It included names and descriptive events, grouped thematically, with symbols denoting character (martyr, tyrant, heretic, noble, upright, etc.) and profession (painter, theologian, musician, monk, etc.)

<http://www.math.yorku.ca/SCS/Gallery/timelines.html>

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

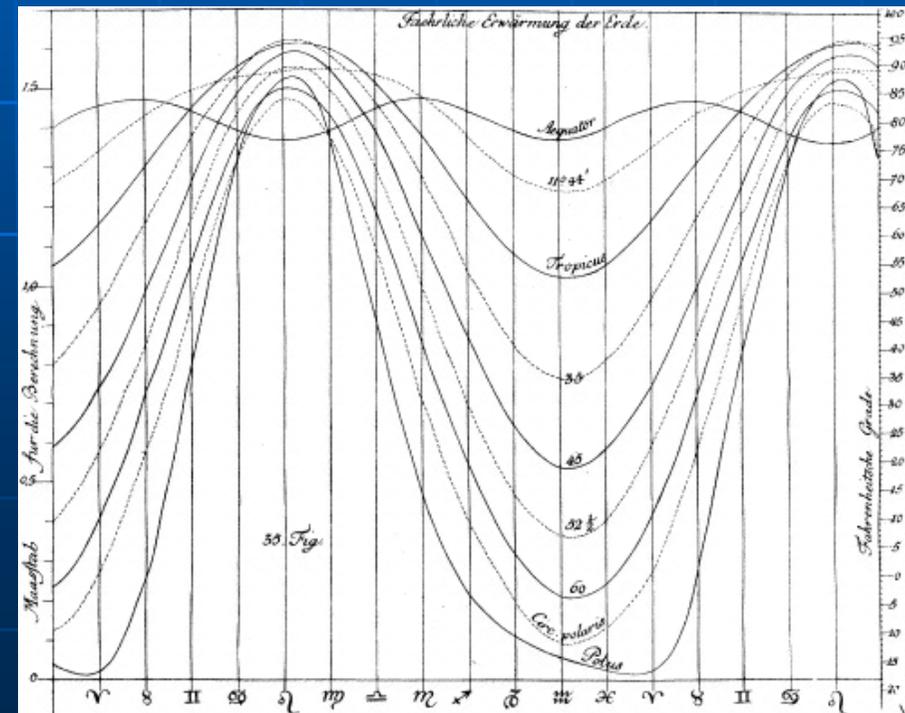


1779

- Variación de la temperatura del suelo
- Variación de la radiación solar en función de la latitud

Johann Heinrich Lambert  
(1728-1777)

1735	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Jun.						1	4	8	9	4	4						
Jul.											21	7	3				
Aug.												9	10	5	1		
Sept.											1	15	8	5			
Oct.										1	6	16	7	1			
Nov.					-1	9	3	1	6	7	3						
Dec.				5	14	12											
1736																	
Jan.		3	4	12	10	2											
Febr.	1	4	8	11	4	1											
Mart			1	5	17	5	3										
Apr.				1	5	7	10	5	2								
May						1	2	5		13	3	7					
Jun.										1	6	18	2	3			
Jul.												4	7	4	7	8	1
Aug.													1	7	14	8	
Sept.														11	8	1	
Oct.							2	8	6	5	7	2					
Nov.				5	3	6	16										

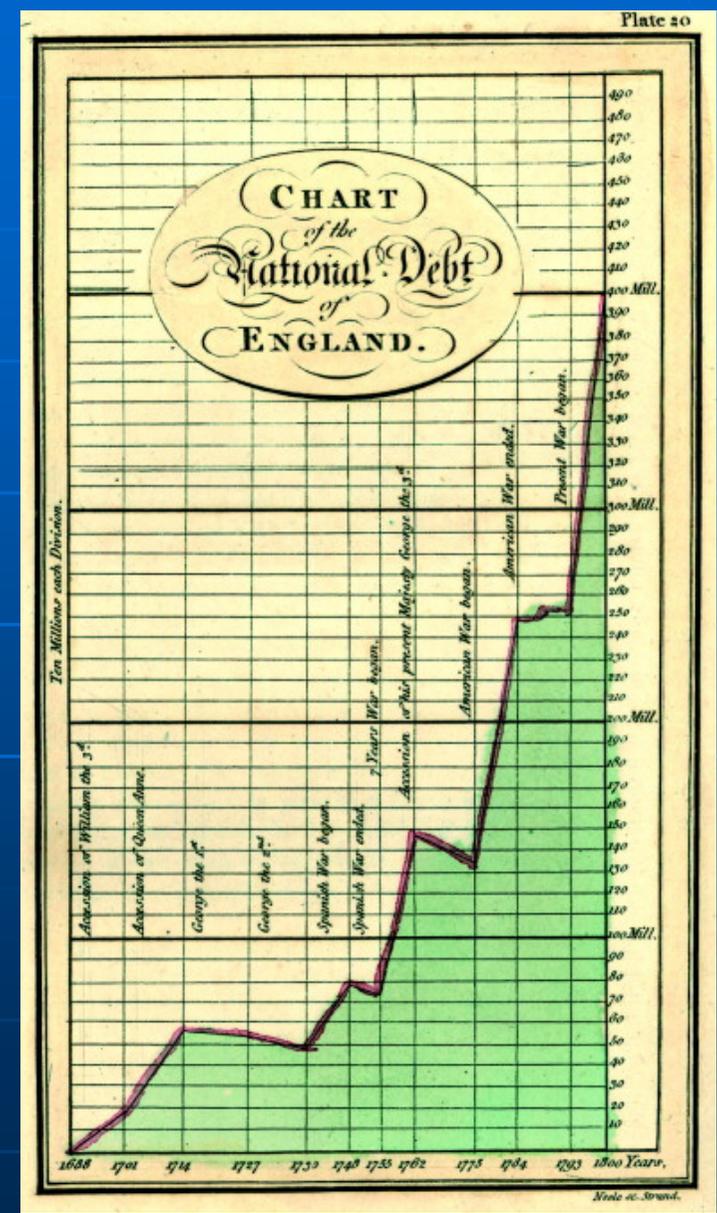
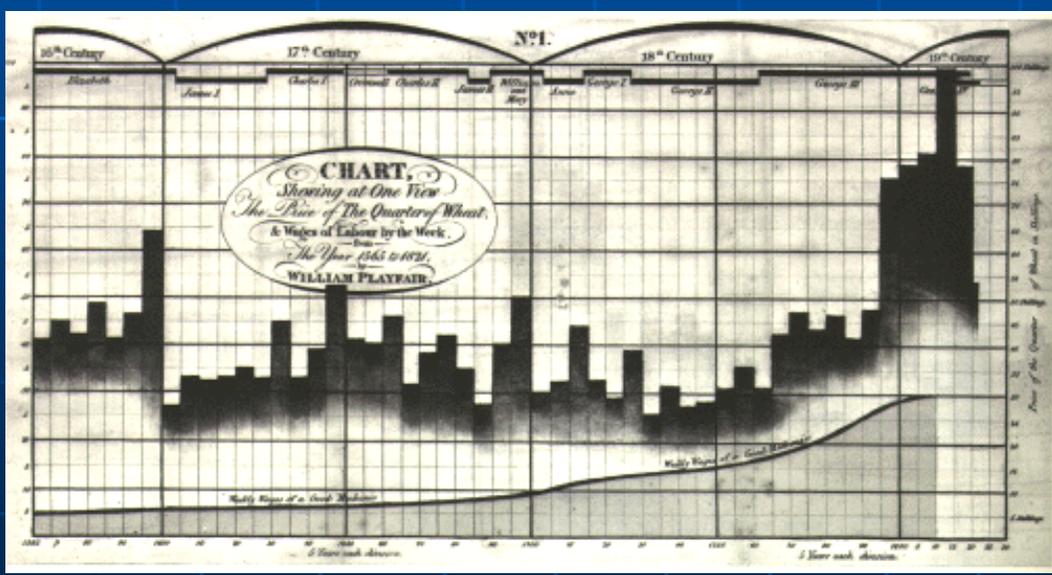


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1786

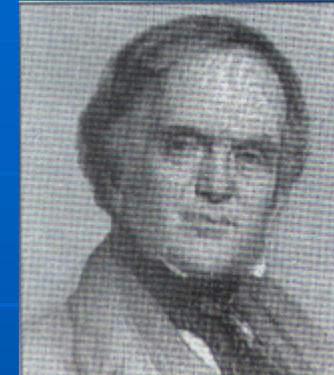
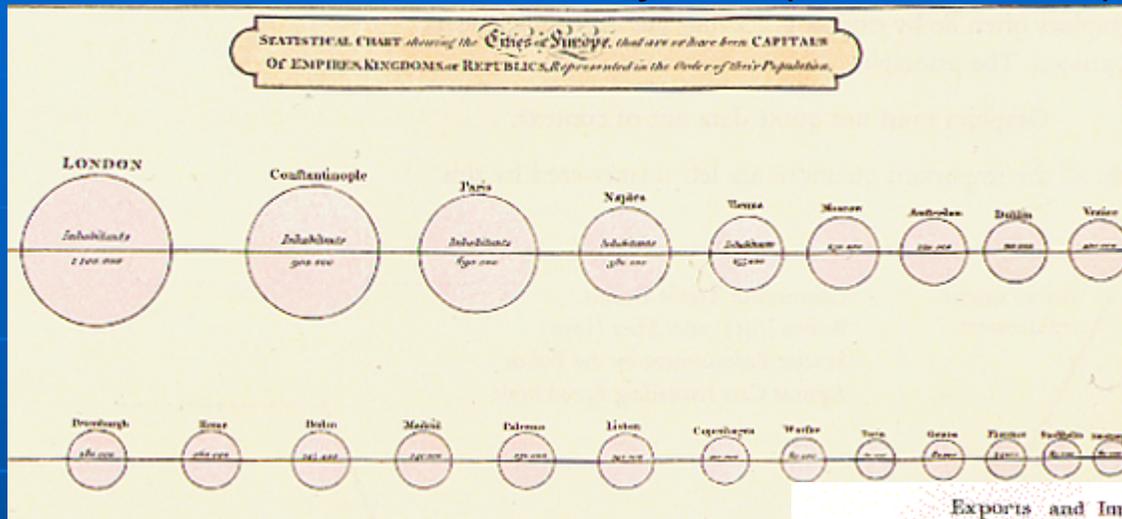
William Playfair (1759-1823),  
Inglaterra:

Representación de datos de carácter económico usando diagramas (línea, área, barras y pastel) en *The Commercial and Political Atlas*



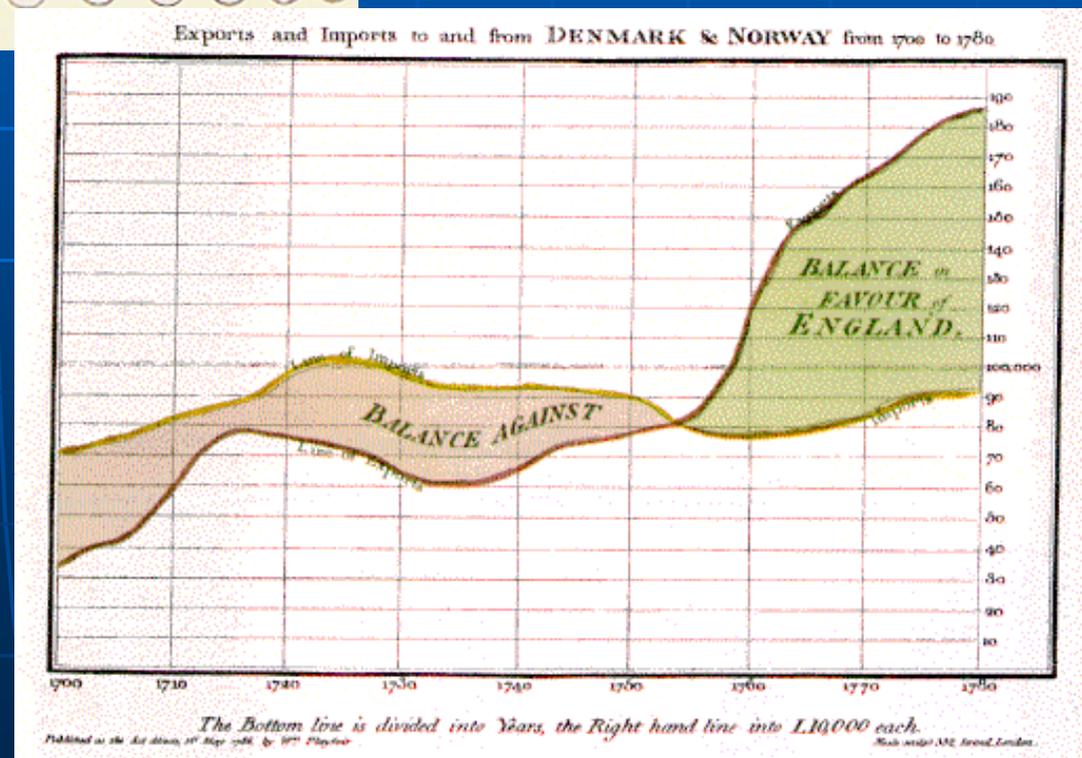
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1786: William Playfair (1759-1823), Inglaterra



...pie charts... are one of the four major chart types (along with bar charts, line charts and scatter plots), and were invented by William Playfair, the father of statistical graphing, sometime around the 1790's.

([www.usablemarkets.com/?m=200611](http://www.usablemarkets.com/?m=200611))



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1798

Valentin Seaman  
(1770-1817),

USA:

Primer mapa

„sanitario” ó

médico (fiebre

amarilla en New

York)

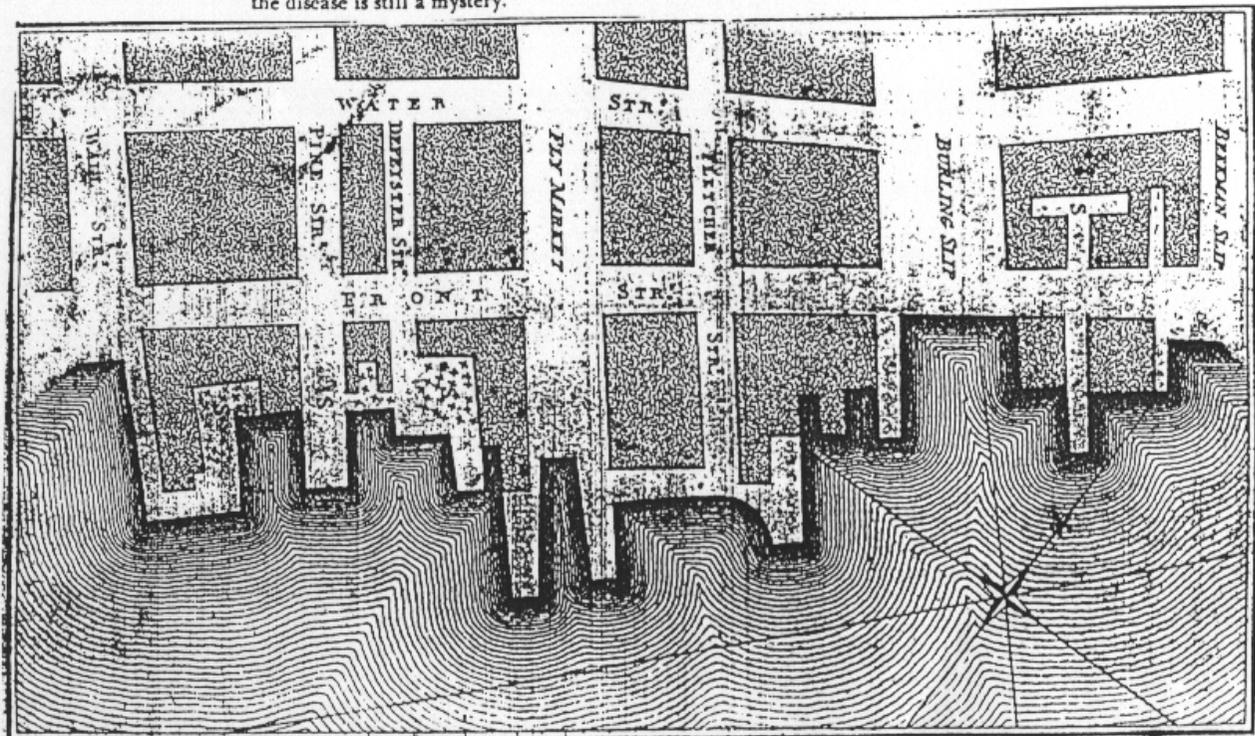
*El primer mapa  
SIG!?*

Yellow fever in New York, 1797. (*Med. Reposit.*, 1798, 1, opp. 317; cf. n. 30).

"The south-eastern end of Pine-street, (S on plate II.) lies considerably lower than the dock which is continued from it; so that it there keeps a constant puddle of stagnant filthy water and mud. . . . The slips (SS) on each side of this central spot, have been left, during the summer, to be fortuitously filled up by the free contributions of the neighbourhood. . . . But beside all this, the spaces . . . marked S with crosses, particularly that to the north-eastward of the dock, has [sic], from its being open and so contiguous to the Market, become the common convenience to a multitude of people. . . ."

Cases of yellow fever were too numerous "to get an accurate history of them all." This and "the want of proper marks to identify it where it is slight" led Seaman to note only the fatal cases. Ten cases, listed by name, "appear to have originated in East George-street," all but two residing "within the small compass of seventeen houses, in the lower part of the street." Three more cases are listed in Chestnut, Roosevelt, and Water Streets respectively.

Then follow the cases numbered on the map: .1 Kelly/ .2 Wiggins/ .3 Van Deventer/ .4 Hitchcock/ .5 Hamilton/ .6 Comstock/ .7 Rogers/ .8 Beers. One more case (Mowatt) "resided in a healthy, cleanly part of the town: and how or where he could have taken the disease is still a mystery."

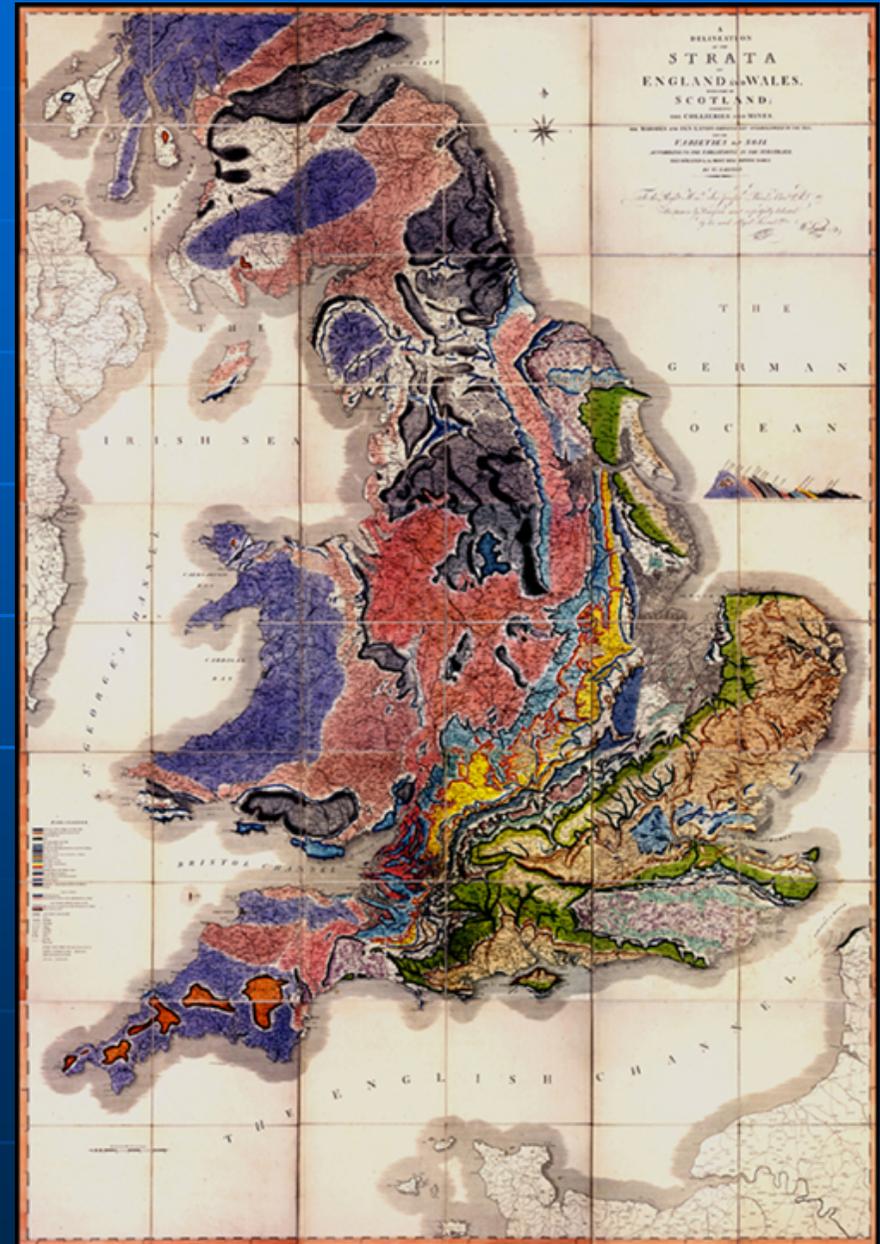


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1801

William Smith (1769-1839):  
Geological Map of England  
and Wales and part of Scotland  
(1815)

*Primer mapa basado en la  
estratigrafía*

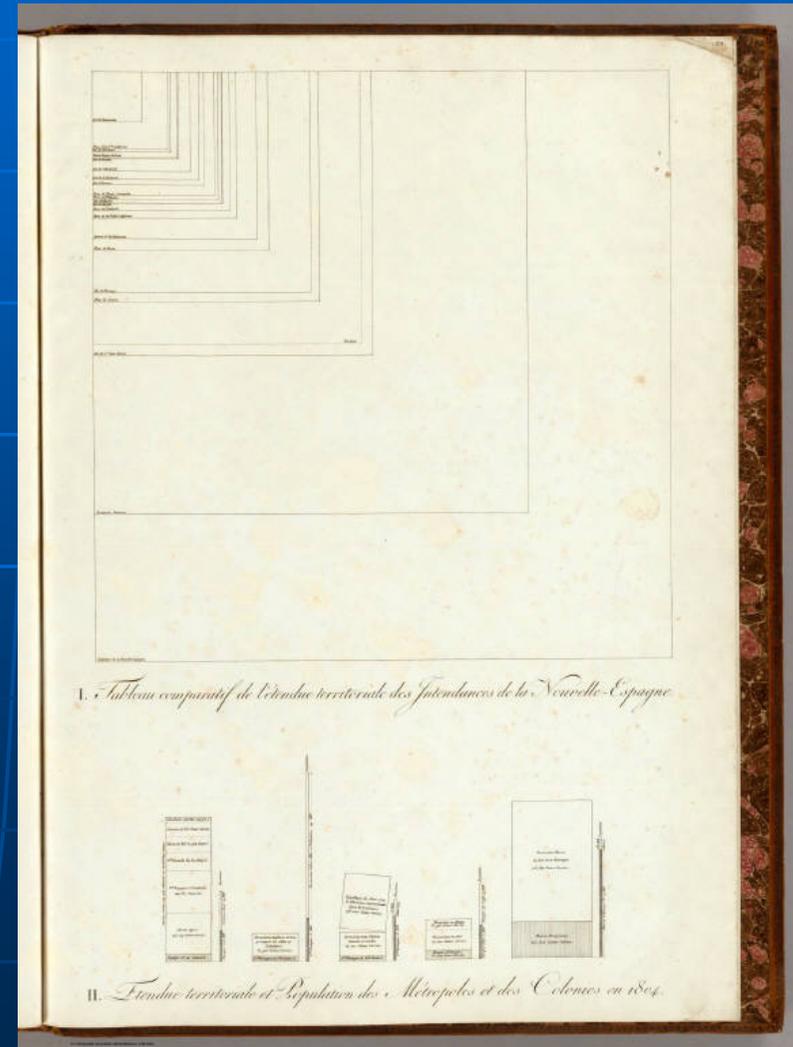


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Alexander von Humboldt (1769-1859), Alemania:

**1811**

- Diagramas de barra
- Comparación de territorios y población de México usando cuadrados...



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

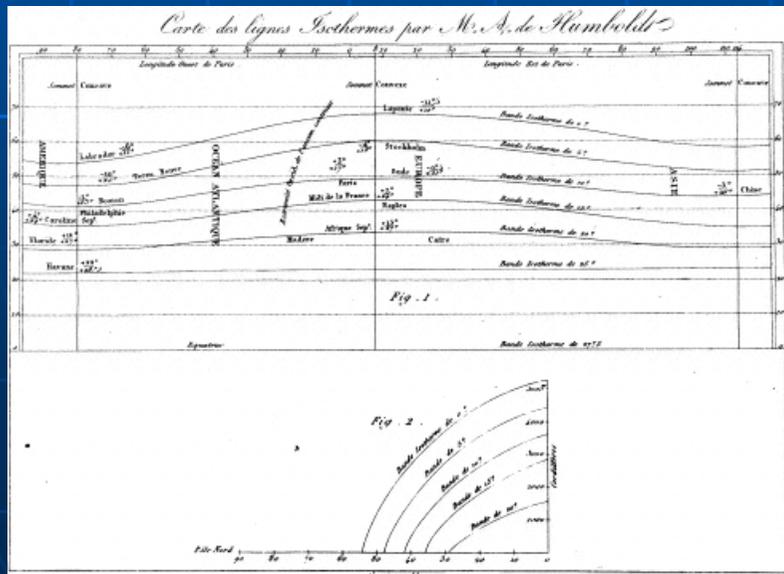
Alexander von Humboldt (1769-1859), Alemania:

**1817**

Primer mapa y diagrama de isotermas

Cambios de temperatura dependiendo de la latitud y longitud.

Publicado por primera vez en el atlas de Berghaus en 1849.



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Alexander von Humboldt (1769-1859), Alemania:  
**1817** - Primer mapa y diagrama de isotermas



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

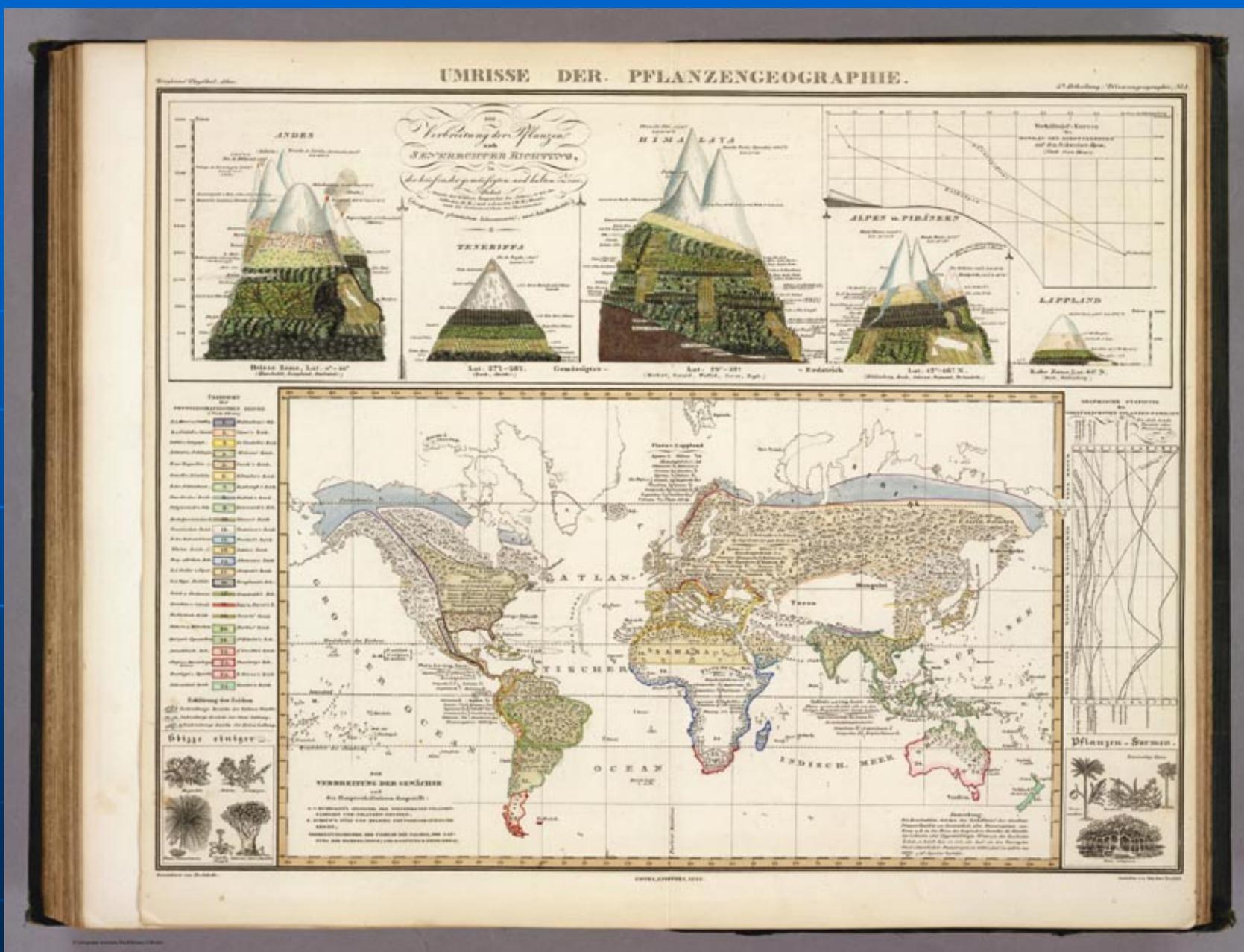
1843

Heinrich Berghaus (1797-1884), Alemania:  
El primer atlas (temático) de Geografía Física



Direcciones  
del viento

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Vegetación

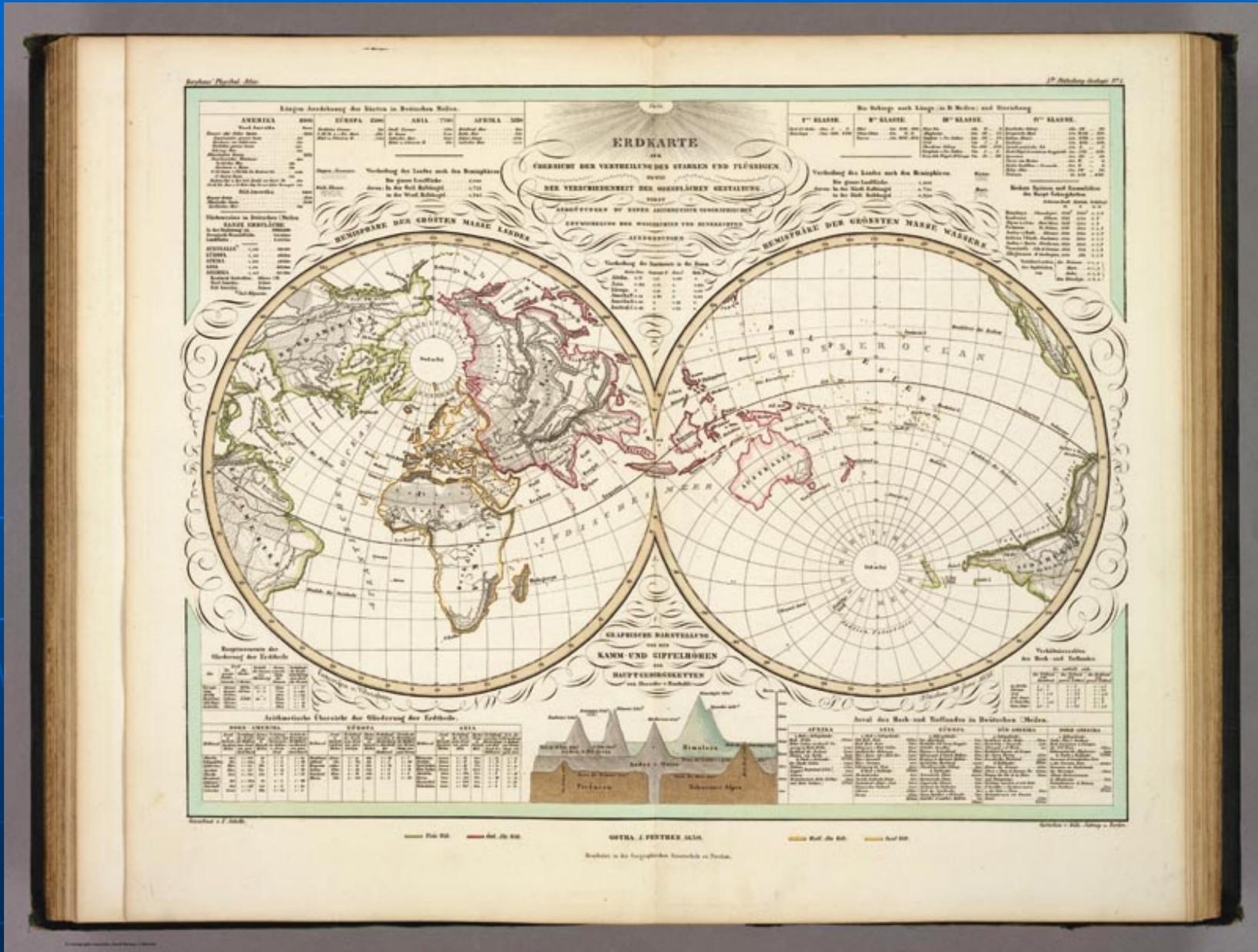
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Isotermas del hemisferio Norte



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Mapamundi

<http://www.humboldt-portal.de/cd/index.htm>

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



América Central y volcanes de Guatemala

<http://www.humboldt-portal.de/cd/index.htm>

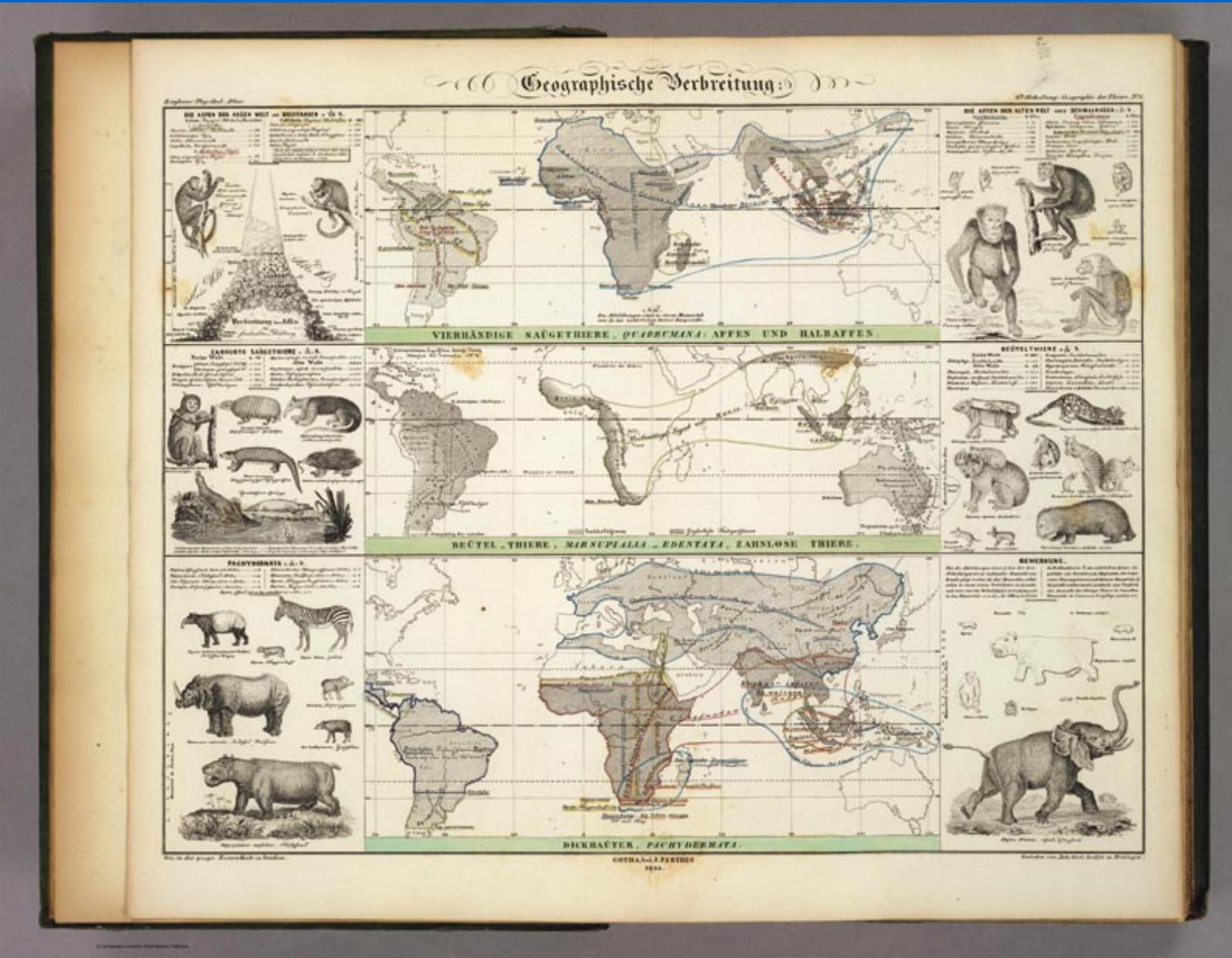
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Relieve y geología (Quito)

<http://www.humboldt-portal.de/cd/index.htm>

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



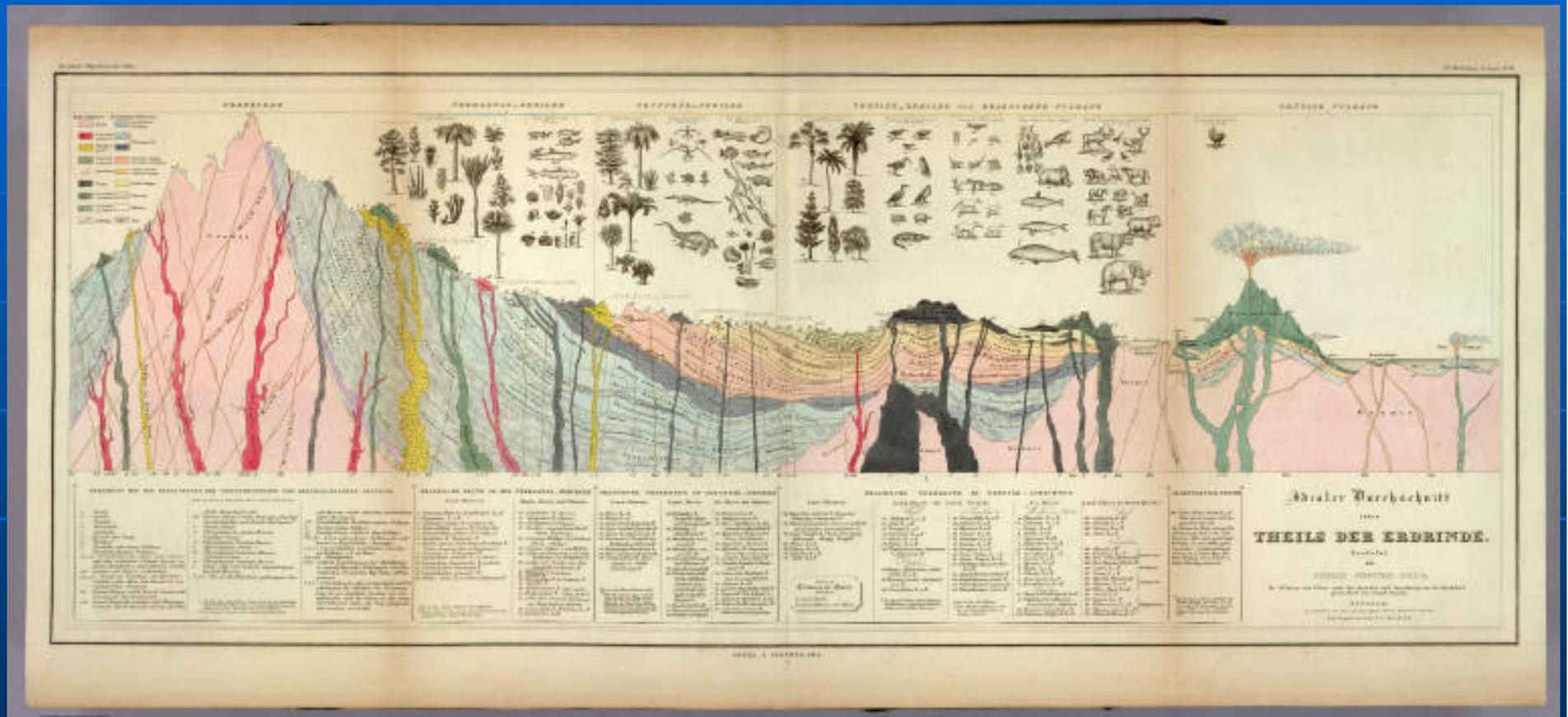
Razas humanas (pueblos)

<http://www.humboldt-portal.de/cd/index.htm>





# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Corte transversal geológico

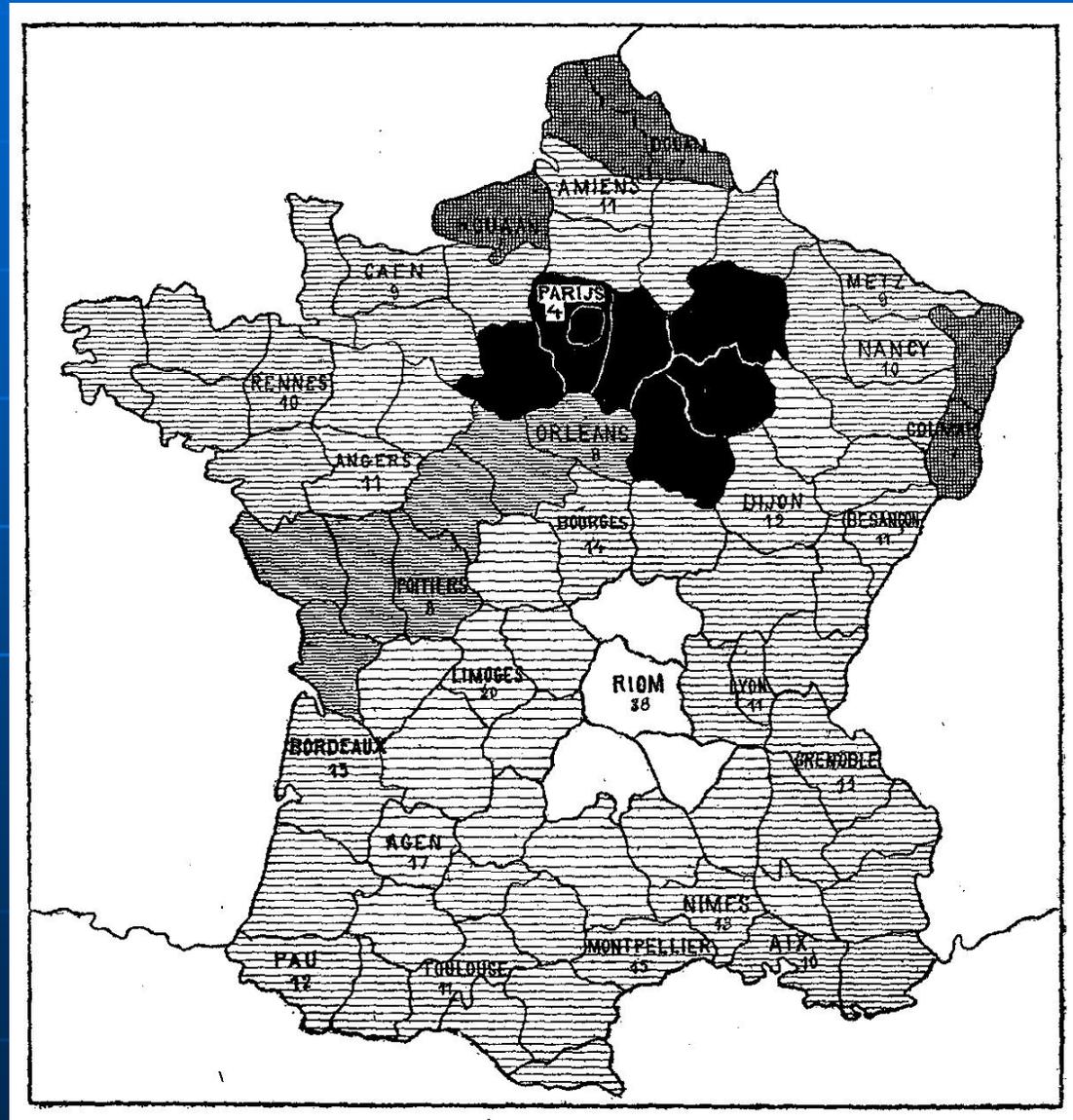
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Baron Pierre Charles Dupin (1784-1873), Francia:

**1819**

Primer mapa de coropletas en blanco y negro

Esta imagen es una copia hecha posiblemente en 1826...

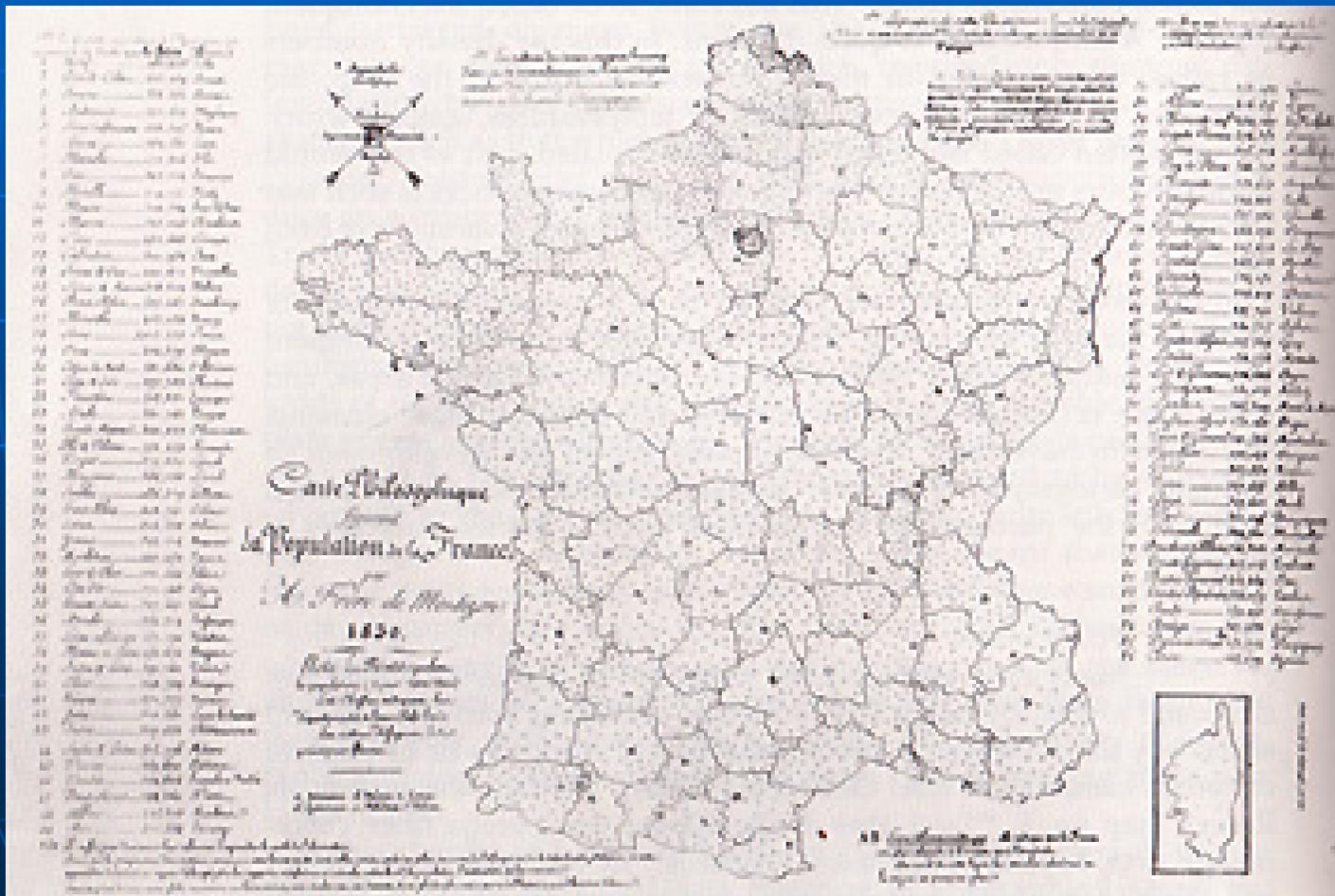


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1830

Frère de Montizon, Francia:

Primer mapa de puntos – Población total de Francia  
(1 punto=10 000 habitantes)



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Charles Joseph Minard (1781-1870), Francia:

**1851**

Uso de círculos proporcionales a la producción de carbón en mapas temáticos (publicado en 1861)

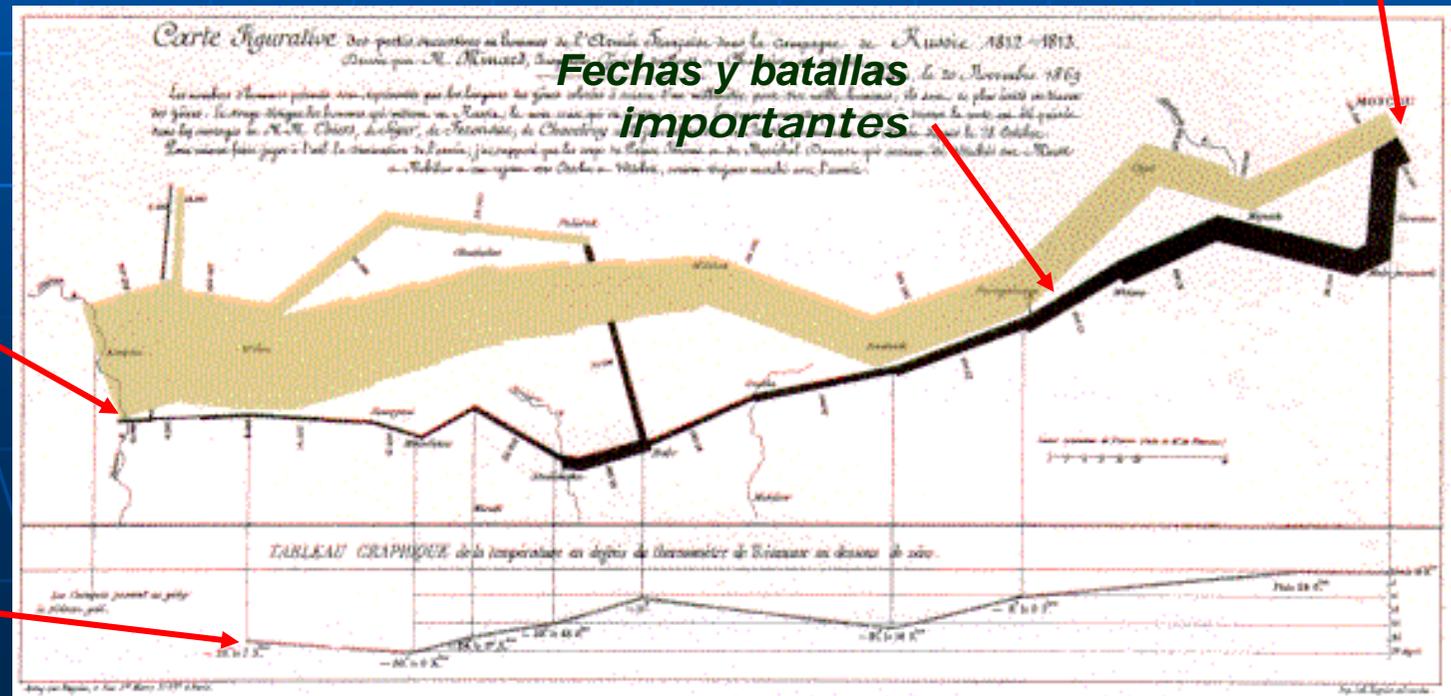
**1869**

Representación de los resultados desastrosos de la campaña (marcha) de Napoleón a Moscú: „historia visual(izada)”

Moscú

Partida y regreso del ejército

Temperaturas



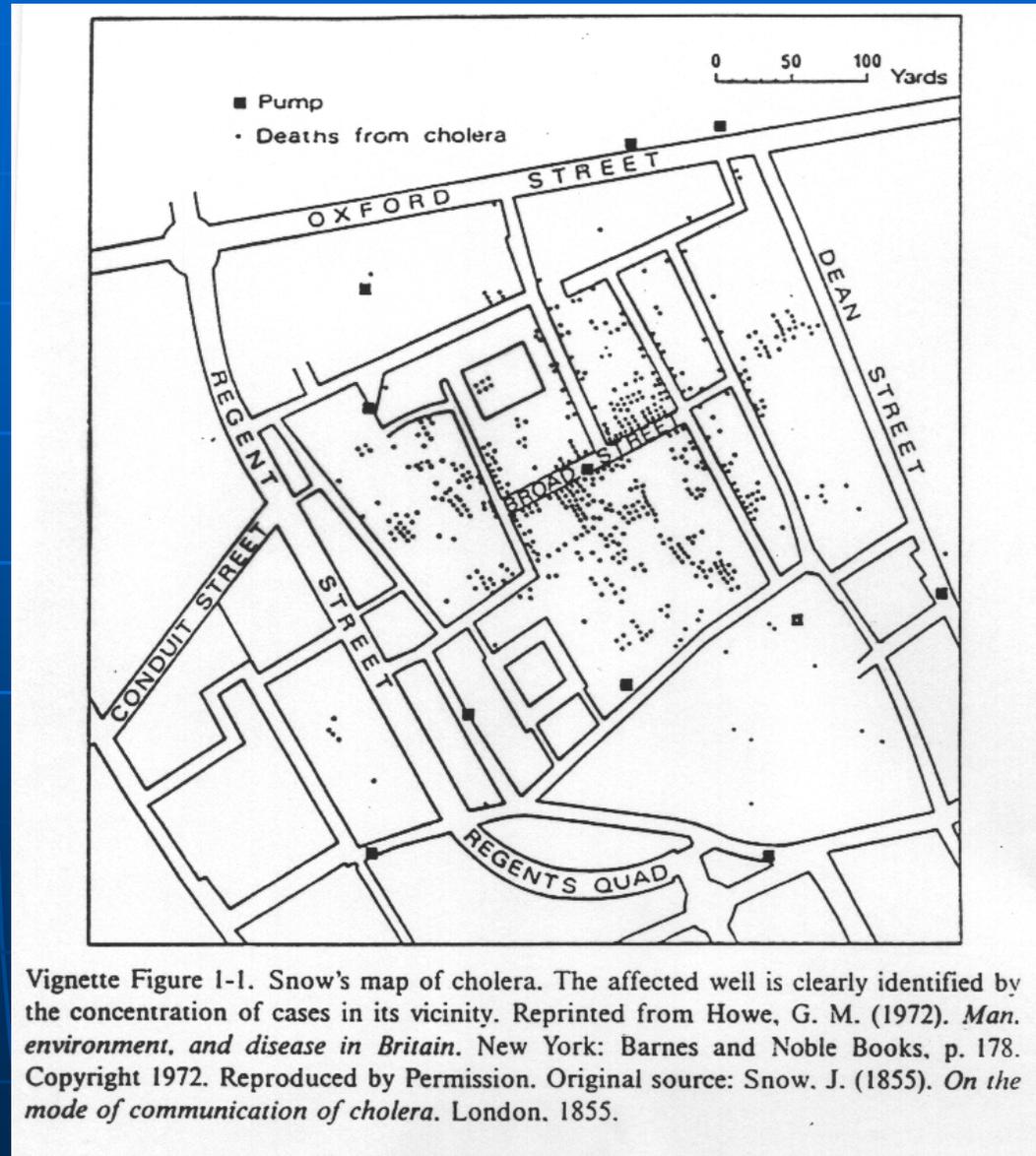
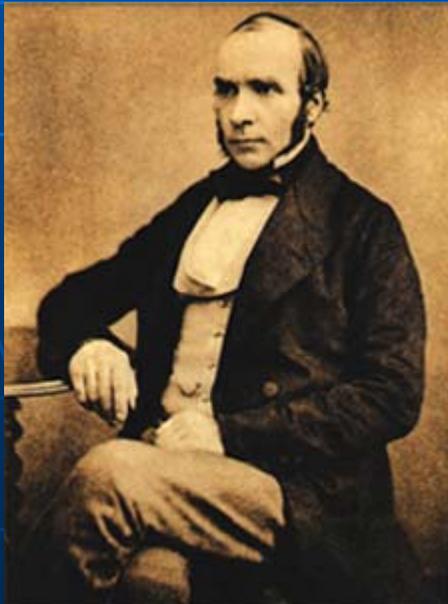


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1855

John Snow (1813-1858),  
Inglaterra:

Mapa de focos de cólera,  
mapa de símbolos „con  
efecto de puntos”.

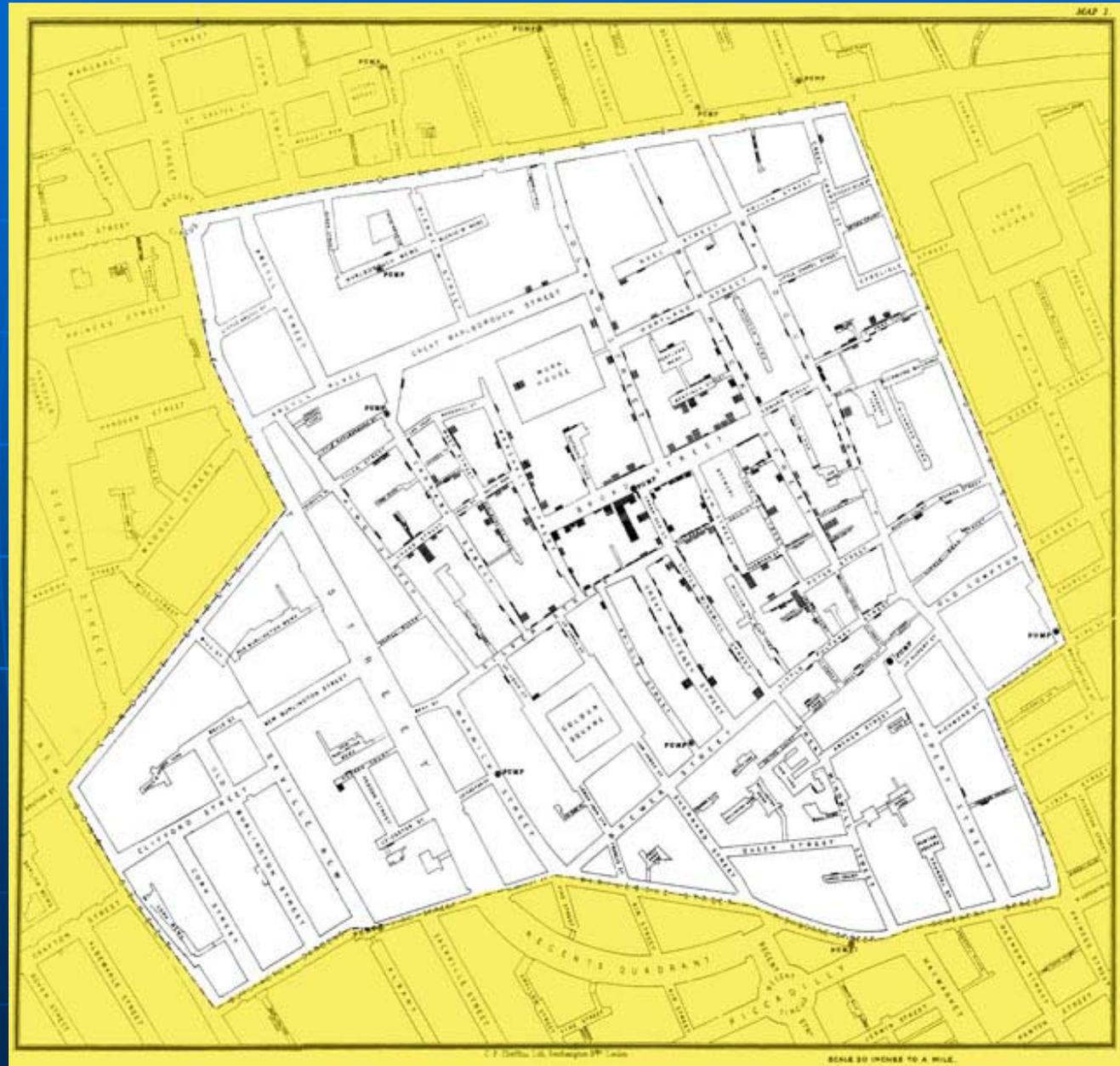


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

**1855**

John Snow  
(1813-1858),  
Inglaterra:

Mapa de focos  
de coléra

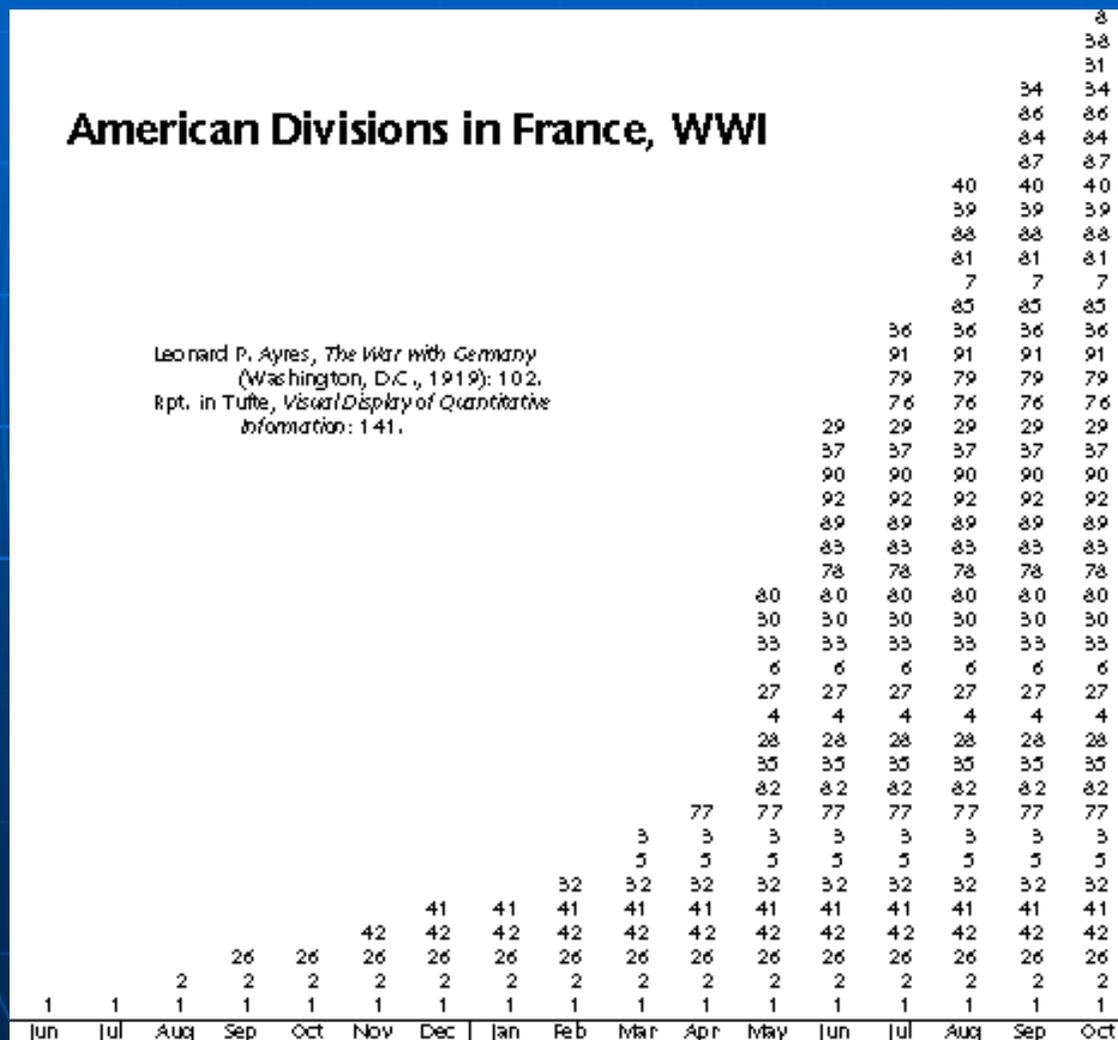


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## 1919

Leonard Porter Ayres (1879-1946), USA :

Nuevos métodos en la representación de datos estadísticos



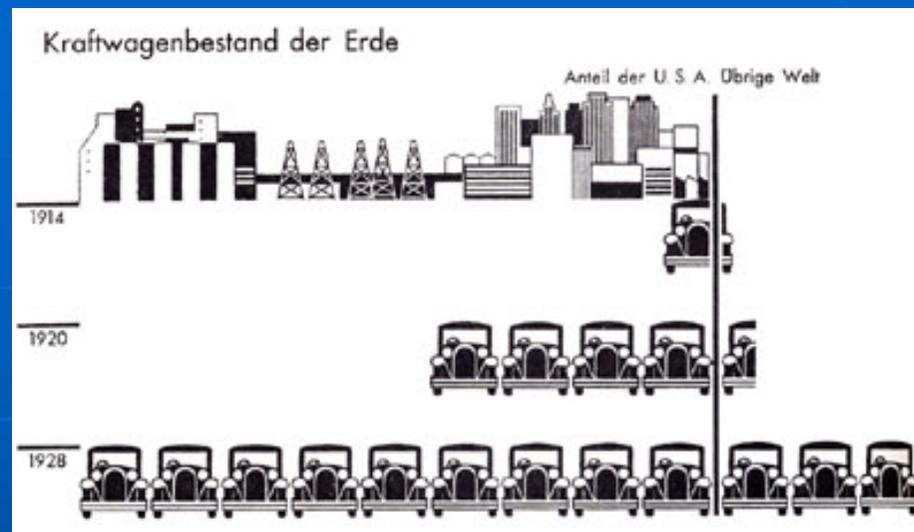
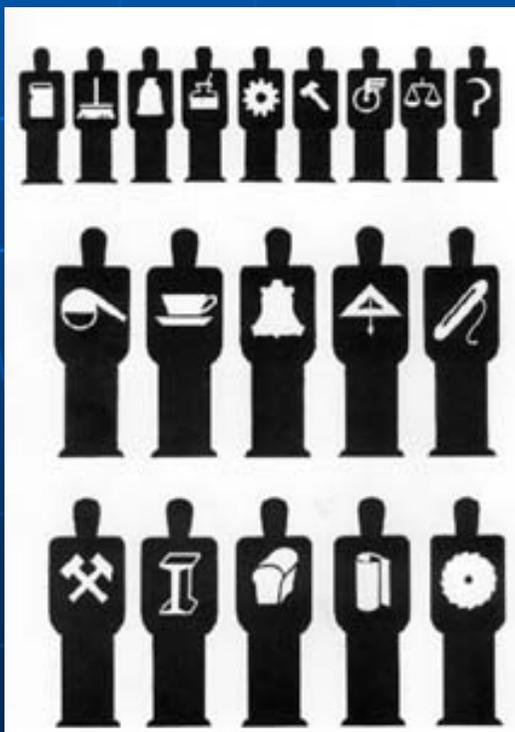
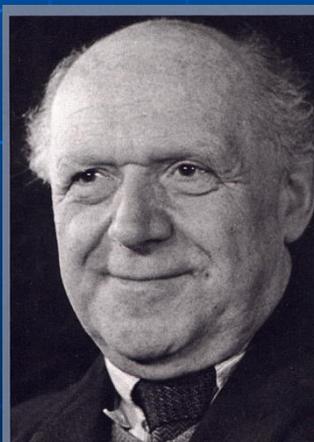
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1924

Otto Neurath (1882-1945),

Austria:

Diagramas de isotipos  
(pictogramas)



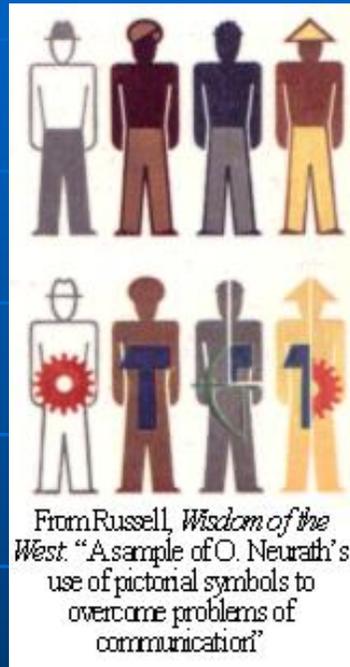
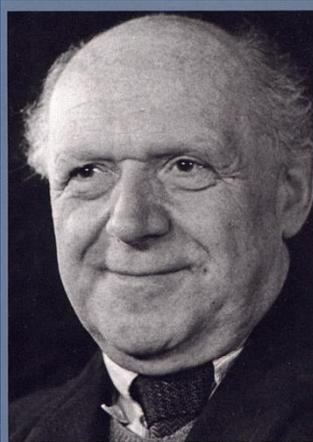
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1924

Otto Neurath (1882-1945),

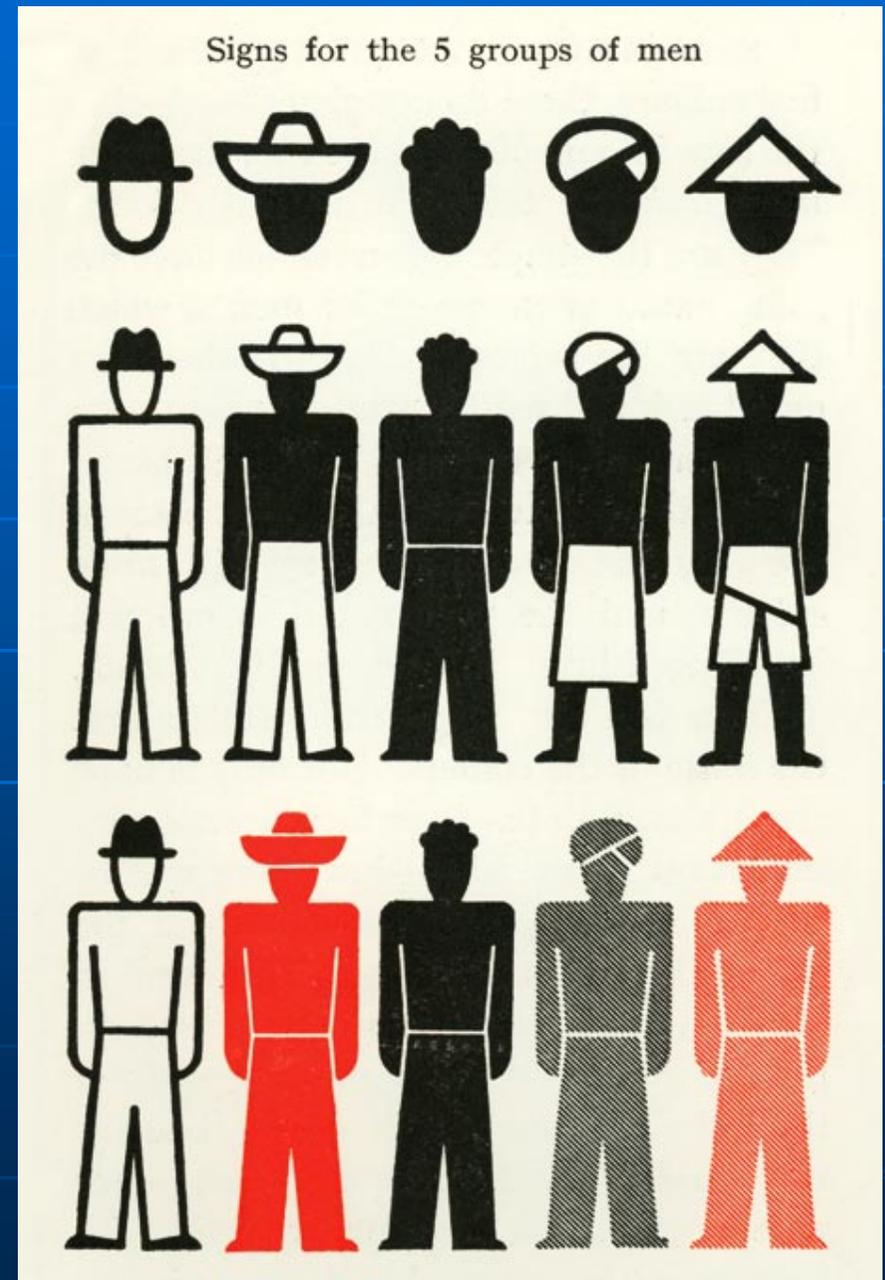
Austria:

Diagramas de isotipos  
(pictogramas)



Otto Neurath: *International Picture Language* (1936),  
presenando diferentes iconos para diferentes pueblos o razas humanas

[www.cabinetmagazine.org/issues/24/pendle.php](http://www.cabinetmagazine.org/issues/24/pendle.php)

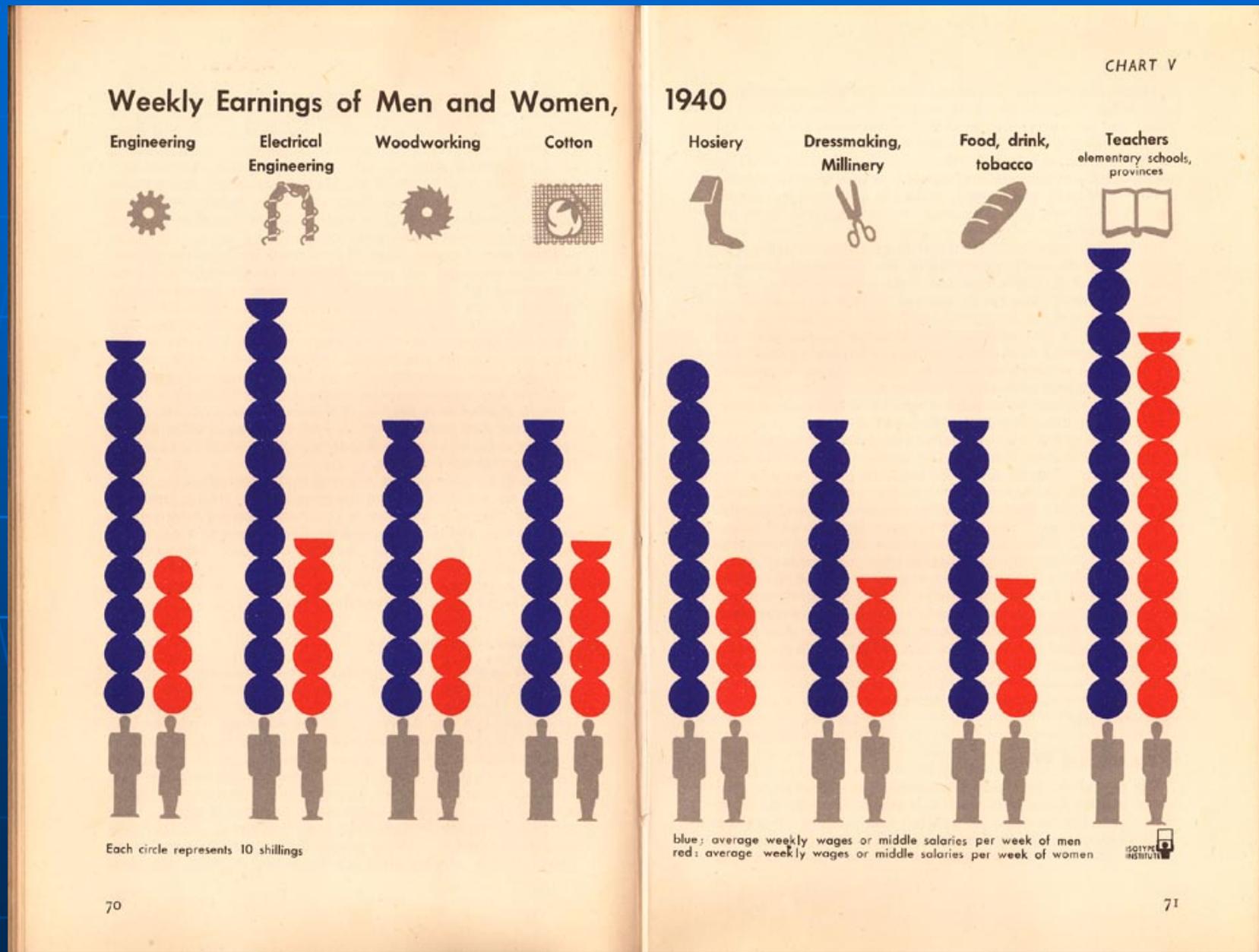


# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



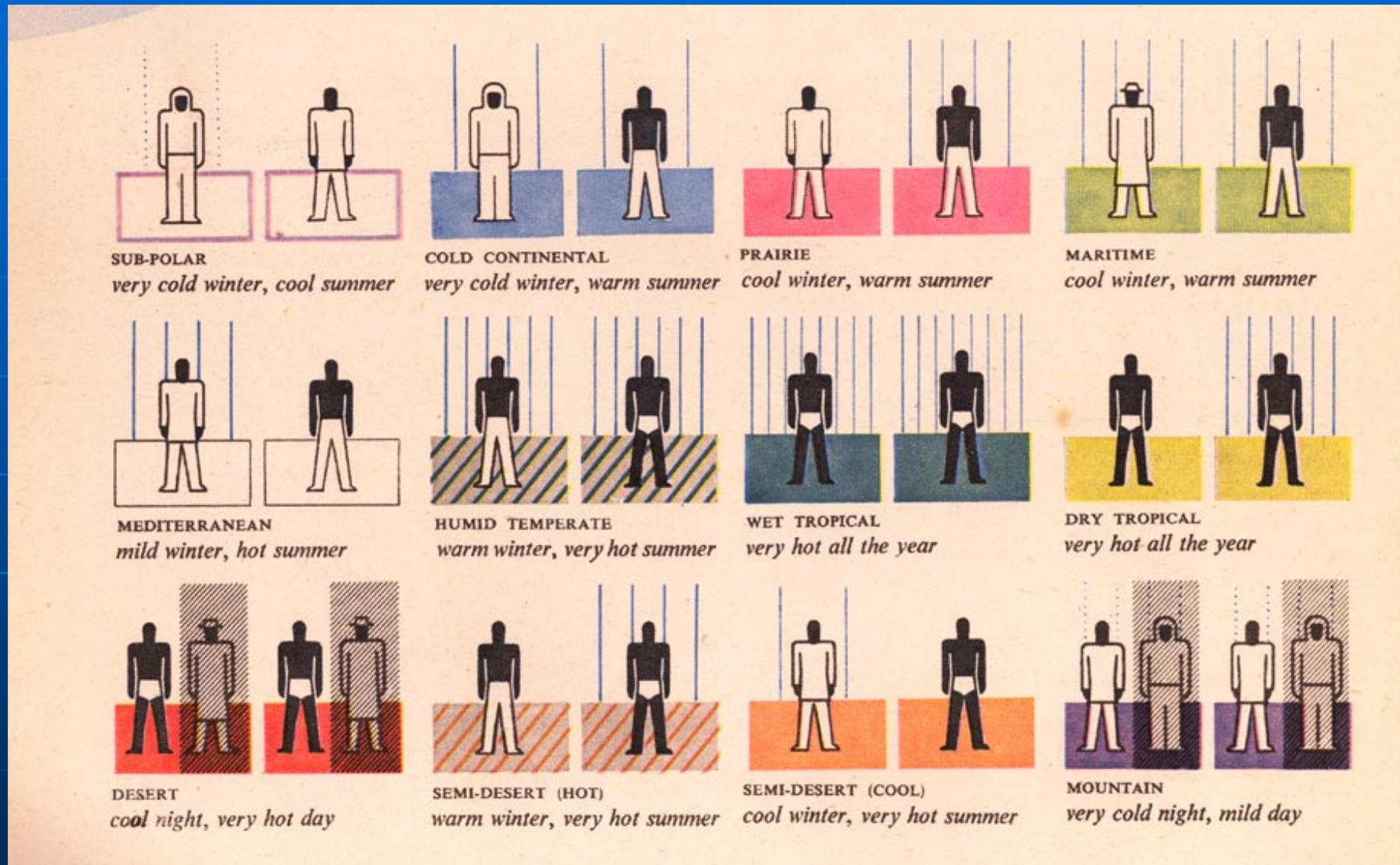
Isotipos como diagramas (<http://www.fulltable.com/iso/images01/16.jpg>)

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



Isotipos como diagramas (<http://www.fulltable.com/iso/images01/15.jpg>)

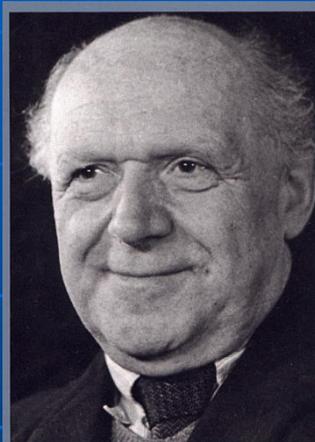
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

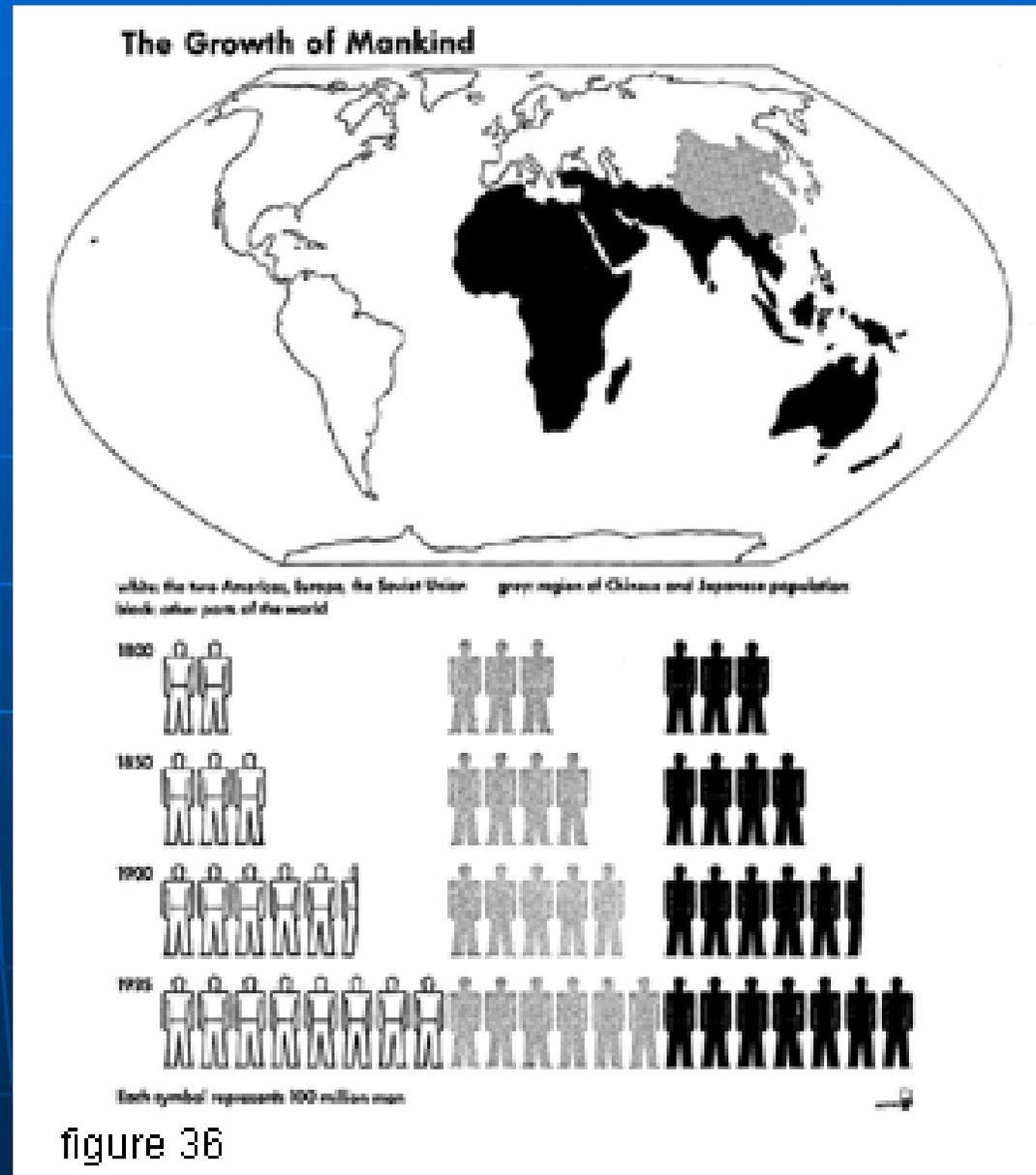
1924

Otto Neurath (1882-1945),  
Austria:  
Diagramas de isotipos



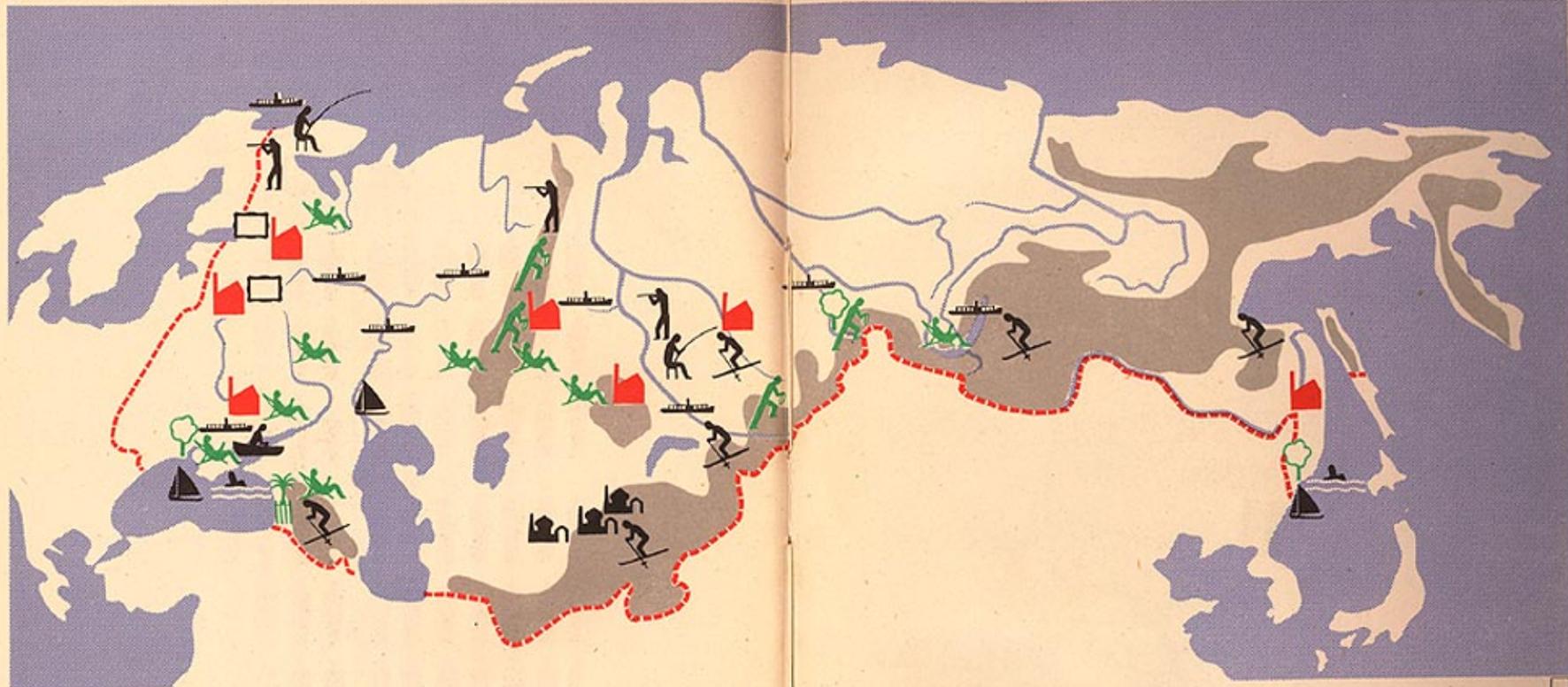
Complementación de mapa  
con pictograma isotipo

[www.agglutinations.com](http://www.agglutinations.com)



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## Industrial and Holiday Centres

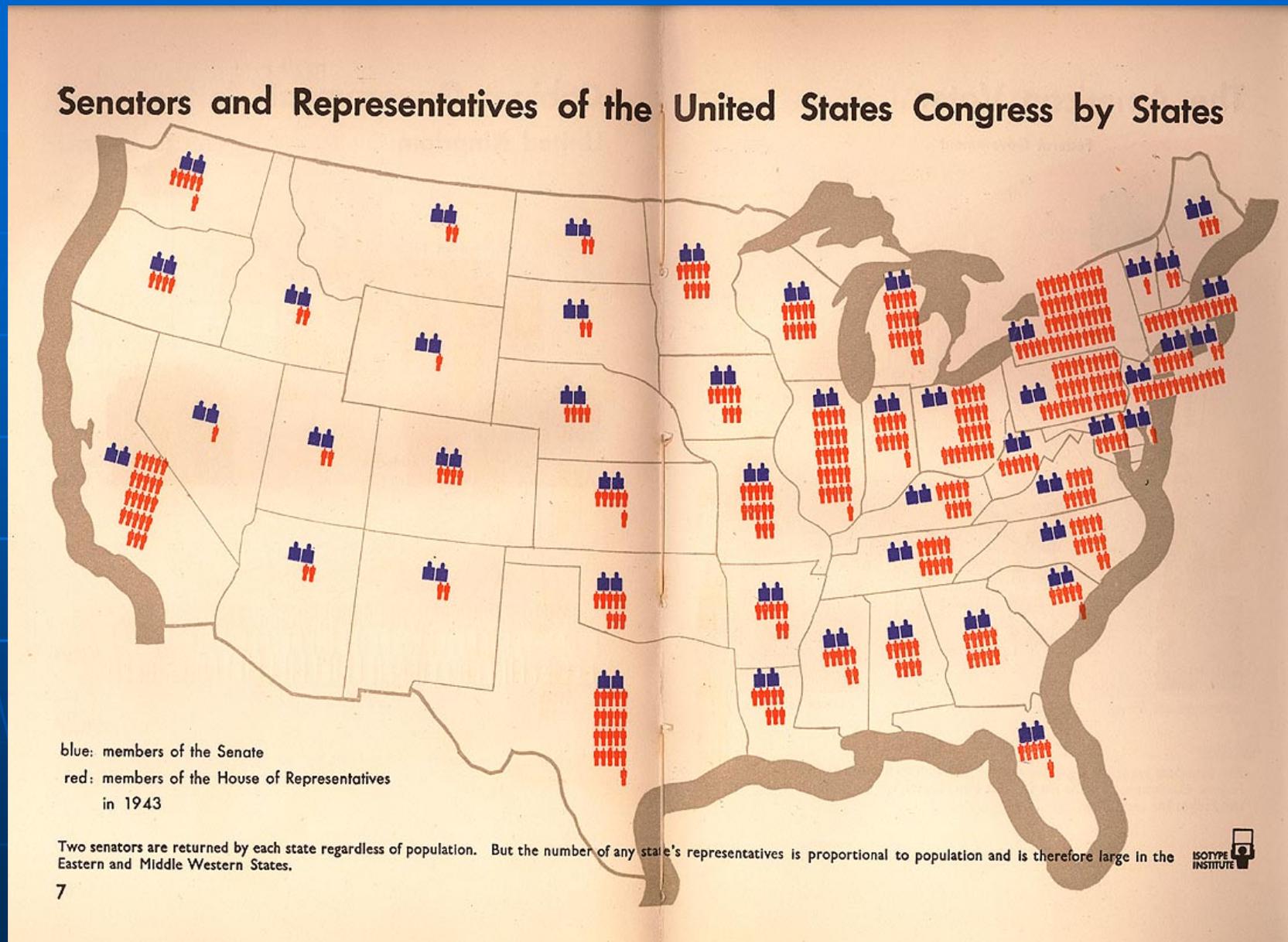


red : main industrial areas  
blue : rivers, lakes, coasts  
green : wild life preserves, botanical garden, spas, health centres, etc., climbing  
black : swimming, hunting, fishing, skiing, museums, architecture, steamers, sailing, and rowing  
grey : mountains

ISO TYPE  
INSTITUTE

Pictogramas isotipos en los mapas  
(<http://www.fulltable.com/iso/images01/03.jpg>)

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

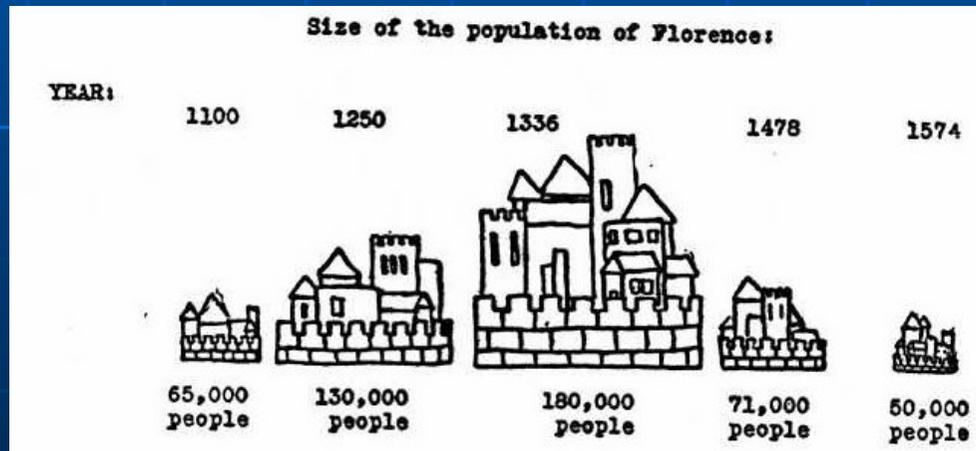


Pictogramas isotipos en los mapas  
(<http://www.fulltable.com/iso/images01/05.jpg>)

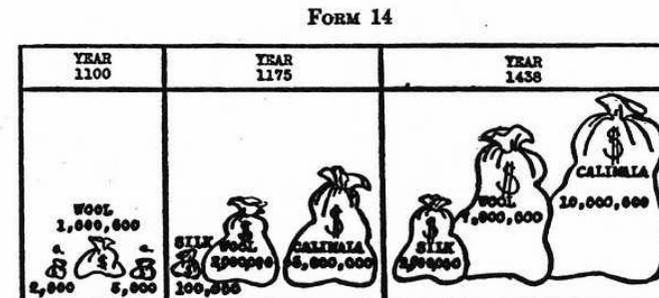
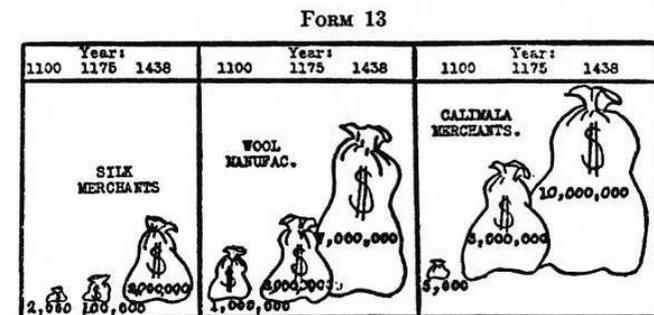
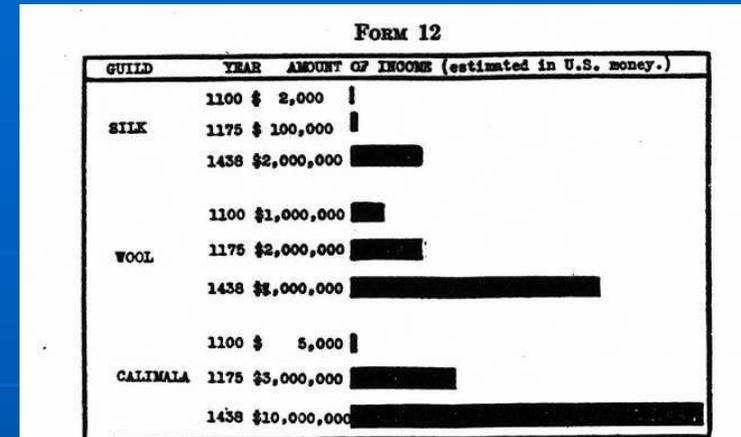
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1927-1932

R. von Huhn, F. E. Croxton, J. N. Washburne:  
Continúan los trabajos de Neurath

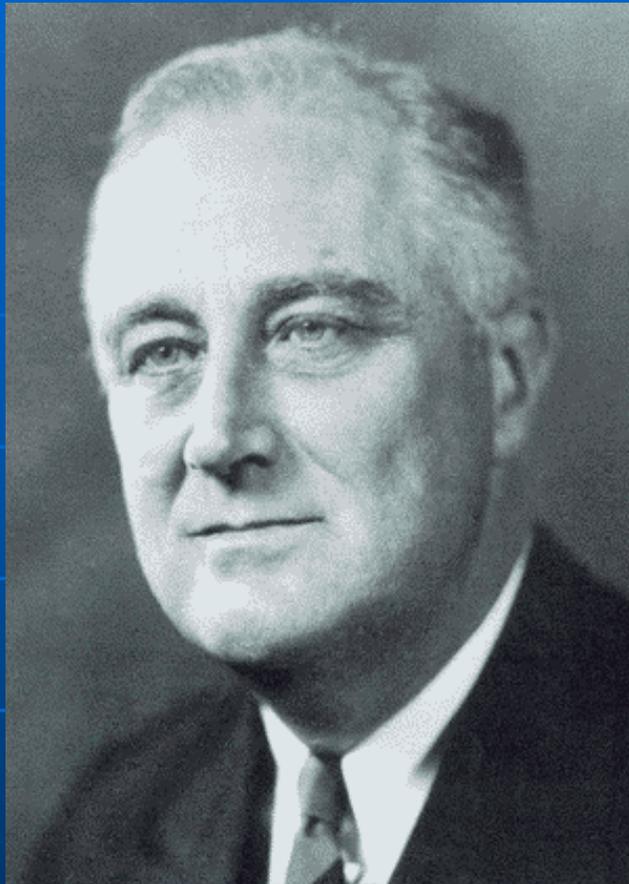


Diagramas de Washburne



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1942-1945: Primeros mapas hechos con técnicas de animación



Franklin D. Roosevelt



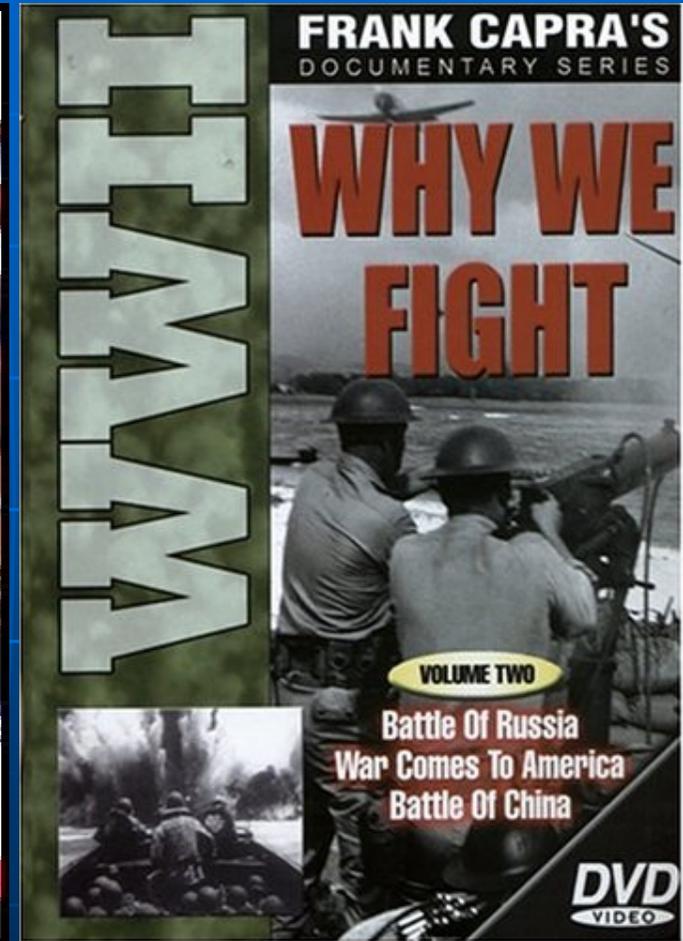
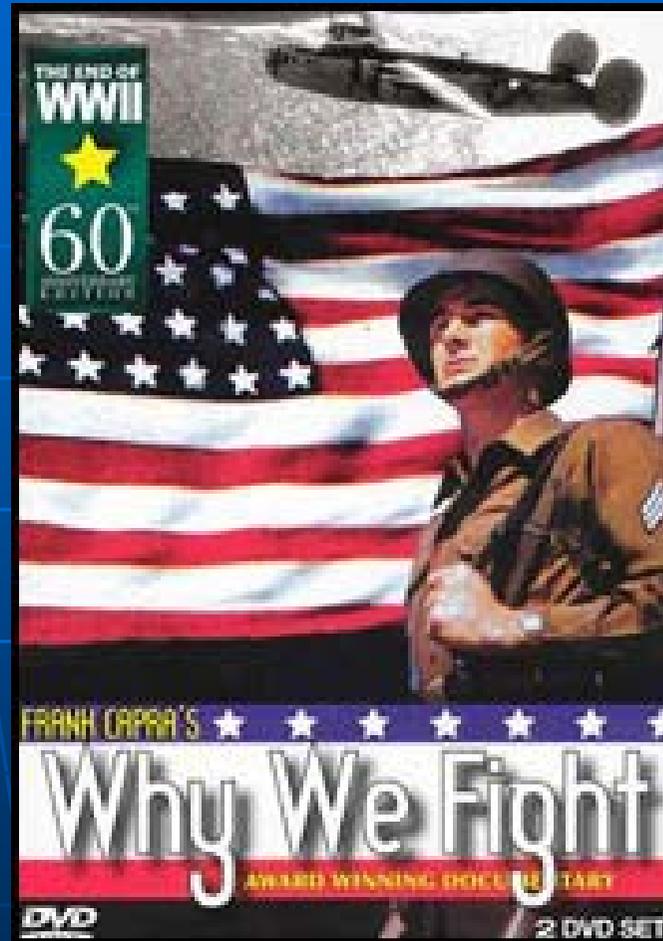
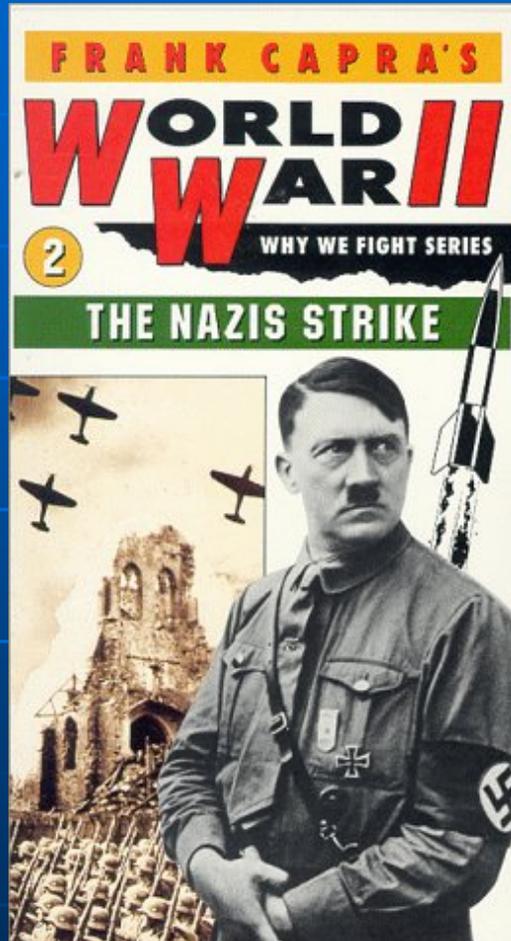
Walt Disney



Frank Capra

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## 1942-1945: Primeros mapas hechos con técnicas de animación





# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

**1944**

Howard H. Aiken (1900-1973) y Grace Hopper (1906-1992),  
USA:

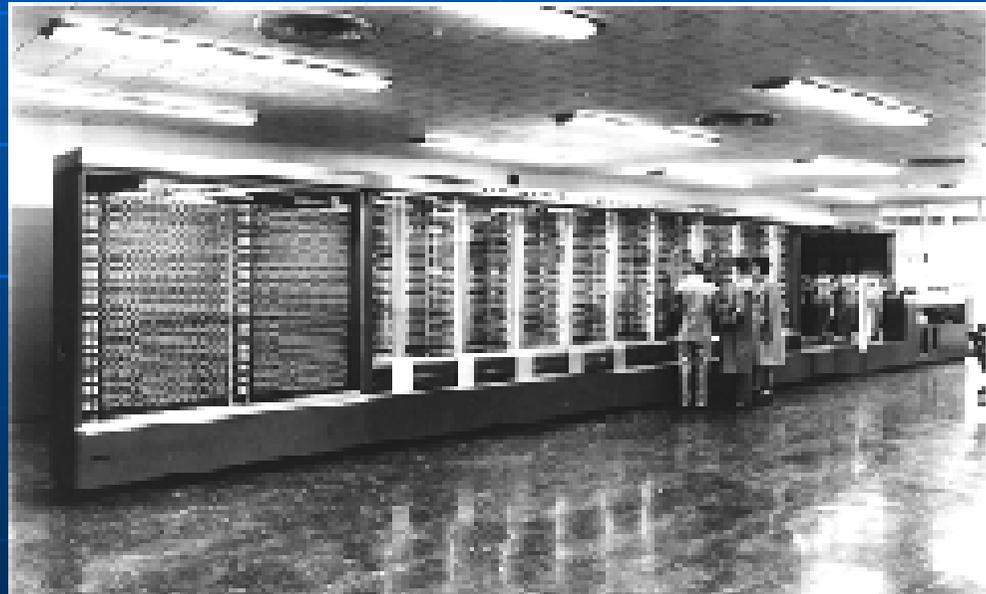
Creación de la computadora Mark-1 en Harvard. Nombre  
„oficial”: „IBM Automatic Sequence Controlled Calculator  
(ASCC)”, ~ 16 m de longitud y peso de 50 toneladas.



Howard H. Aiken



Grace Hopper con la  
Mark-1



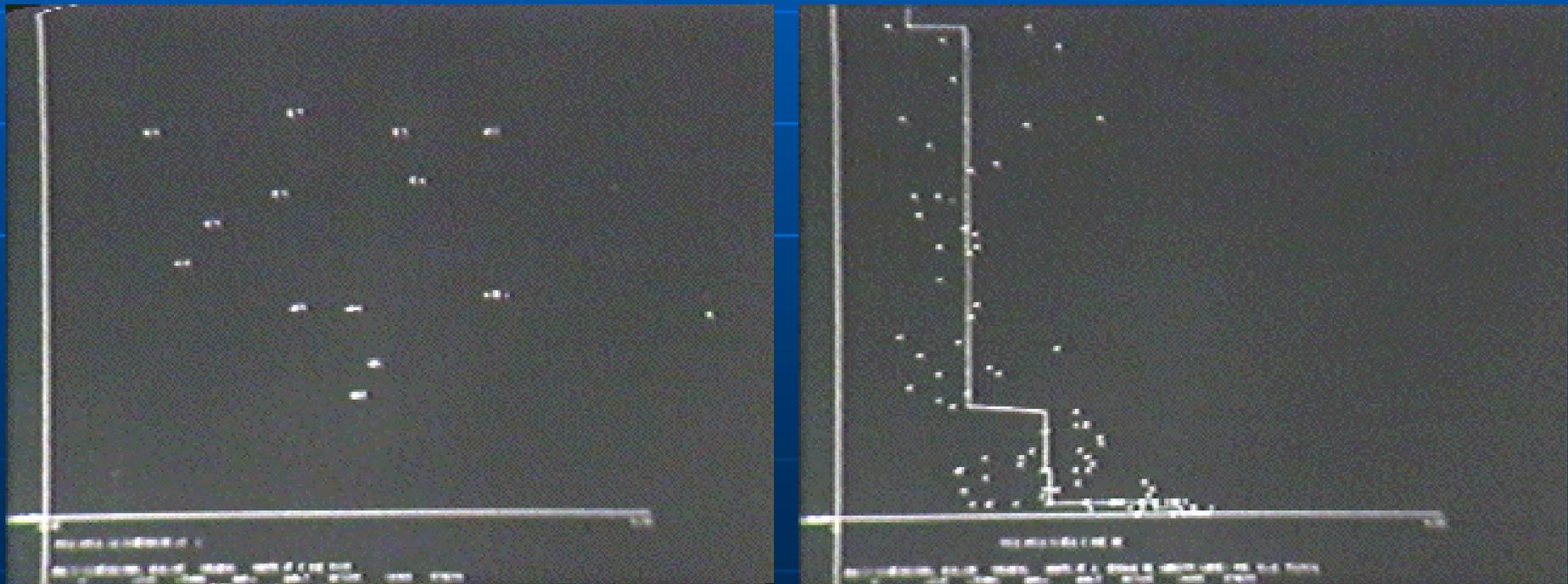
La computadora Mark-1

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1962

Primer diagrama animado (AT&Bell Labs)

Duración: ~ 1 minuto



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## A partir de 1962-1964: SISTEMAS DE INFORMACIÓN GEOGRÁFICA (GIS,SIG)

The screenshot shows the GeoGratis website home page in a Microsoft Internet Explorer browser. The page title is "Canada Land Inventory (CLI)". The main content area contains text about the CLI, its history, and its significance. A sidebar on the left lists various categories under "ONLINE MAPPING", including Agriculture, Land Use, Recreation, Ungulates, and Waterfowl. The footer includes the date "Updated 11 January 2000" and the "Canada" logo.

The screenshot shows the "On-Line Mapping - Soil Capability for Agriculture" tool on the GeoGratis website. The main area displays a map of a region with a grid overlay, showing soil capability data. A legend indicates that green areas represent "Soil Capability for Agriculture map is available" and brown areas represent "No Map available". A search box at the bottom left contains the text "001k - Trepassay" and a list of related locations: "001l", "001m - Belleoram", "001n - St. John's", and "002c - Benevista". There are "Submit Query" and "Reset" buttons below the search box.

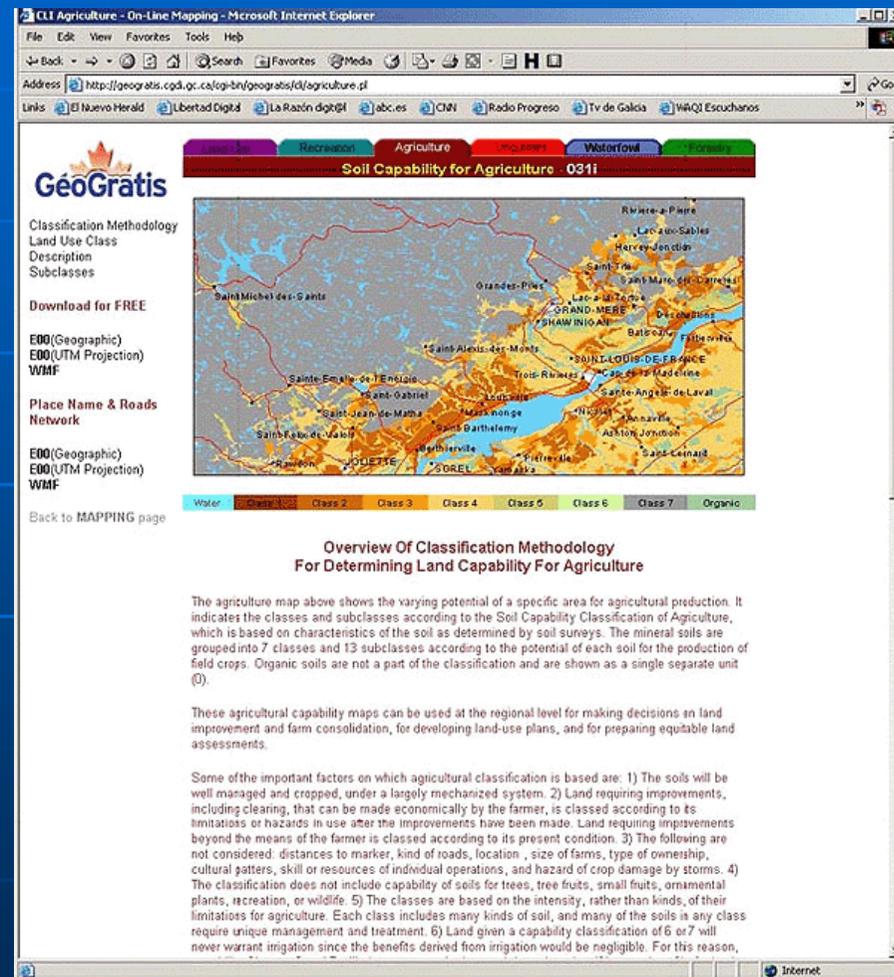
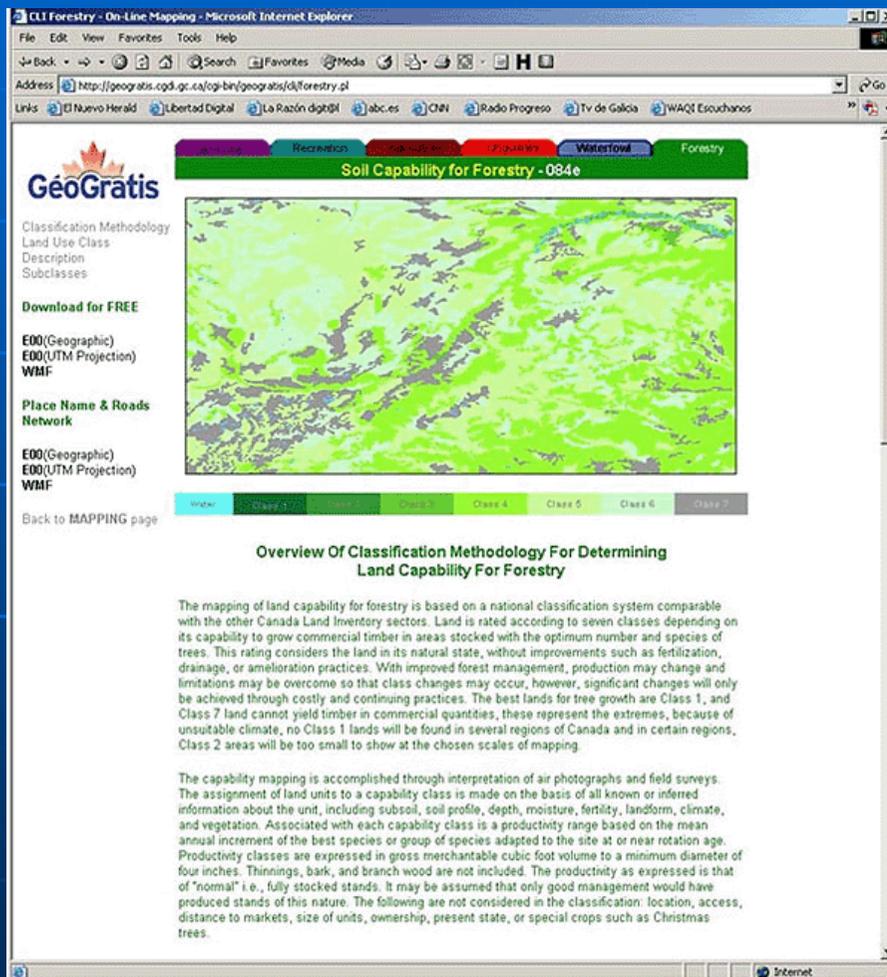


Canada Land Inventory

Roger Tomlinson

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

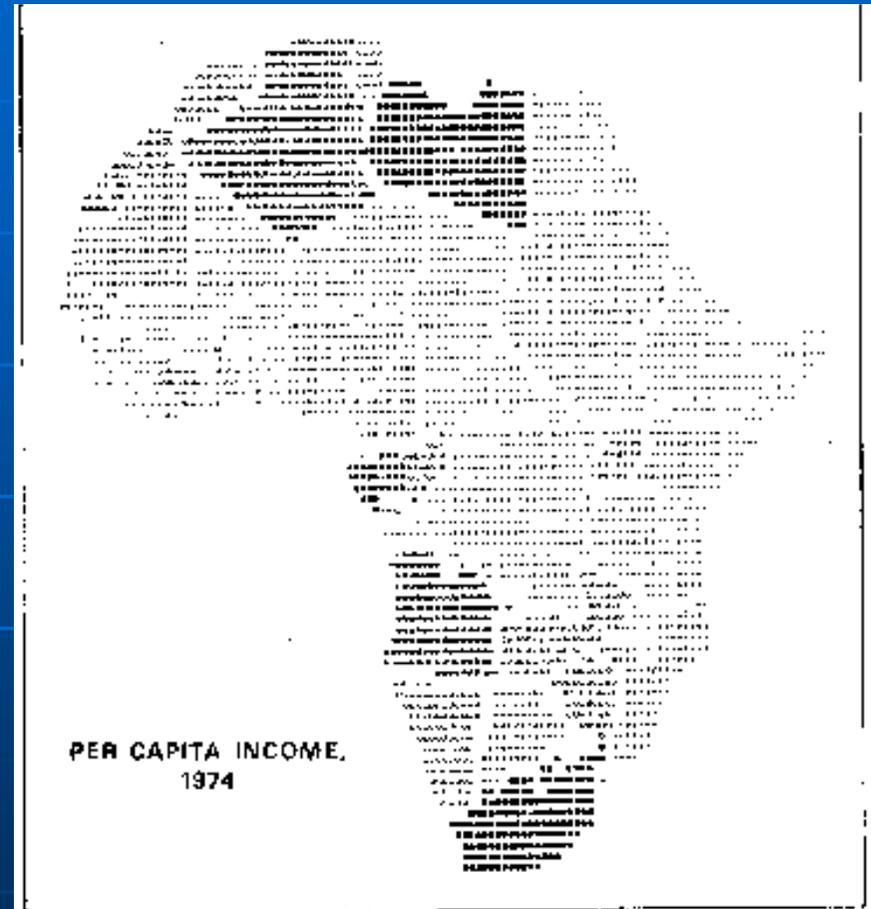
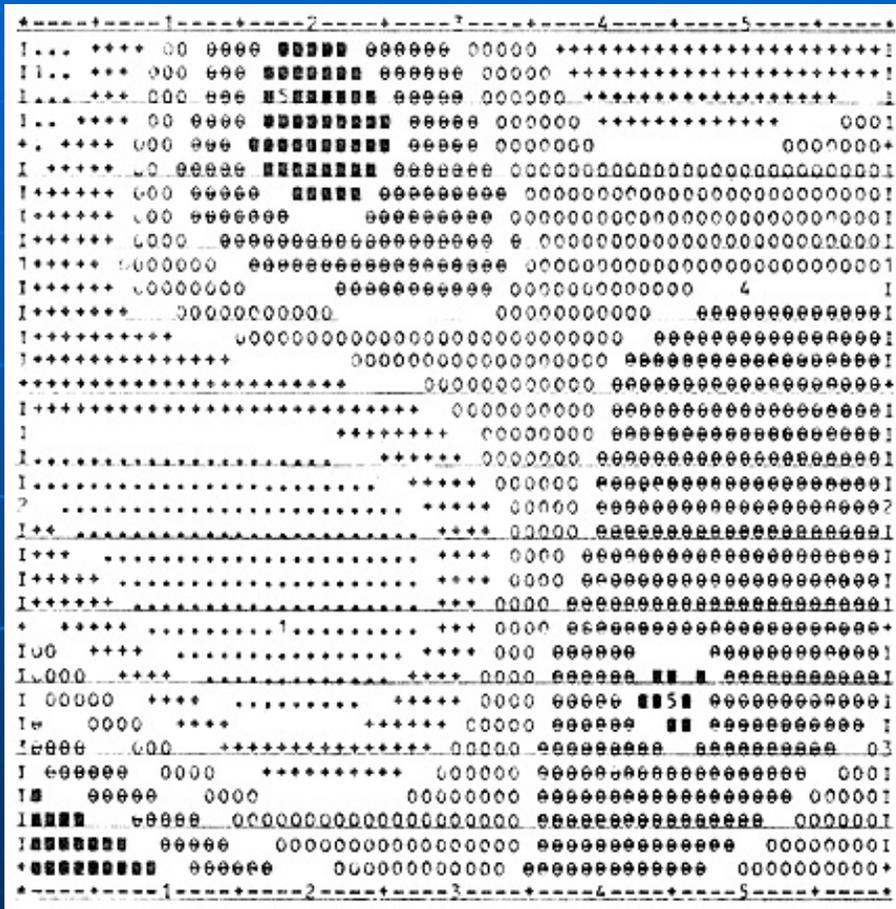
## A partir de 1962-1964: SISTEMAS DE INFORMACIÓN GEOGRÁFICA (GIS,SIG)



Canada Land Inventory

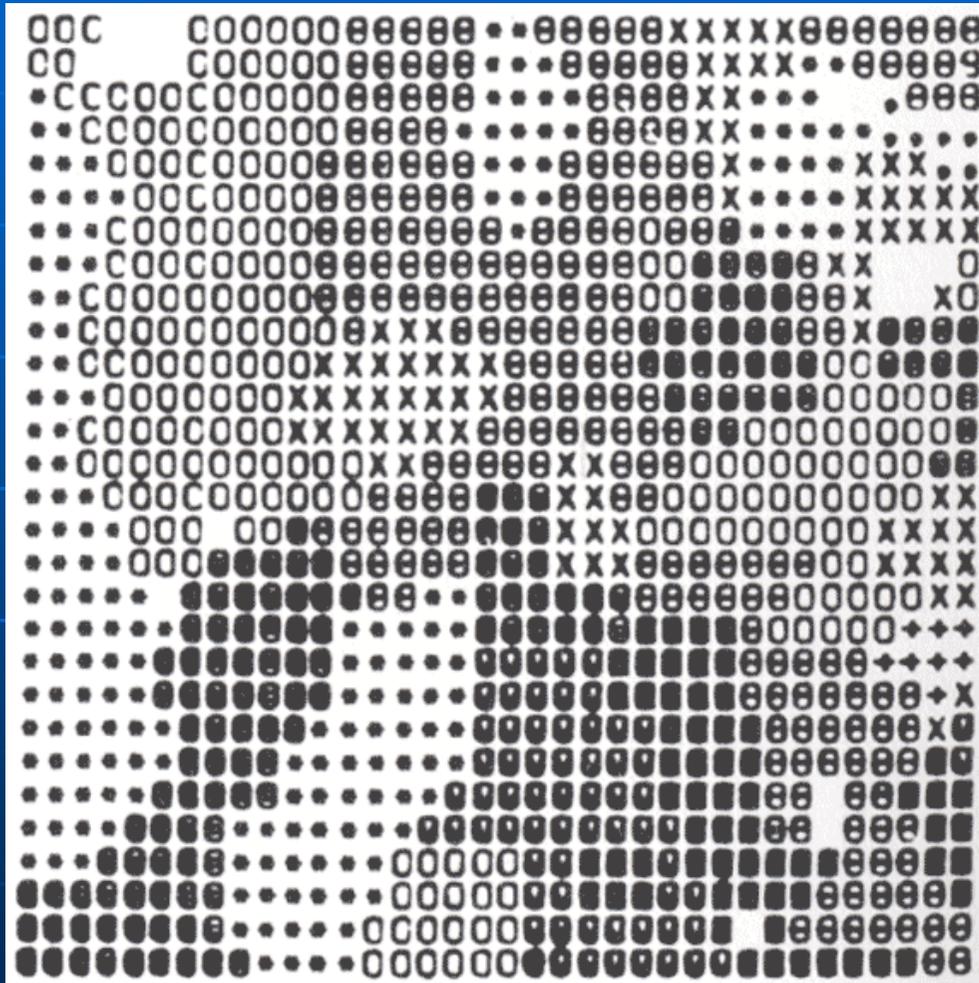
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## A partir de 1962-1964: SISTEMAS DE INFORMACIÓN GEOGRÁFICA (GIS,SIG)

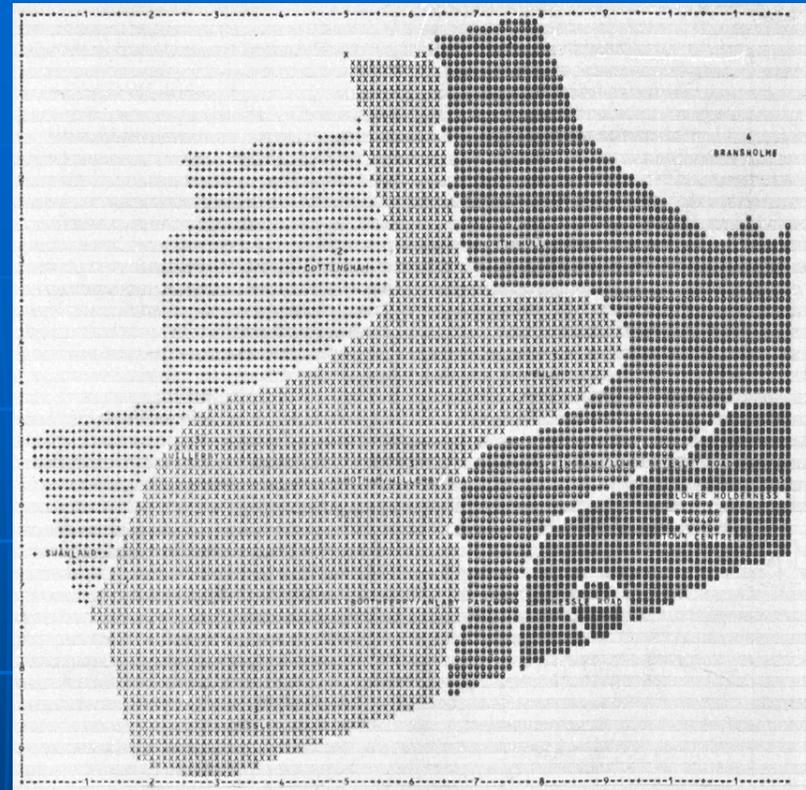


SYMAP (Harvard Laboratory)

# 1962-1964: Sistemas de Información Geográfica (GIS, SIG)



**SYMAP (Harvard Laboratory)**



ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL  
(\*MAXIMUM INCLUDED IN HIGHEST LEVEL ONLY)

MINIMUM	10.00	30.00	50.00	70.00	90.00	100.00
MAXIMUM	10.00	30.00	50.00	70.00	90.00	100.00

PERCENTAGE OF TOTAL ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL

	10.00	20.00	20.00	20.00	20.00	10.00
	10.00	20.00	20.00	20.00	20.00	10.00

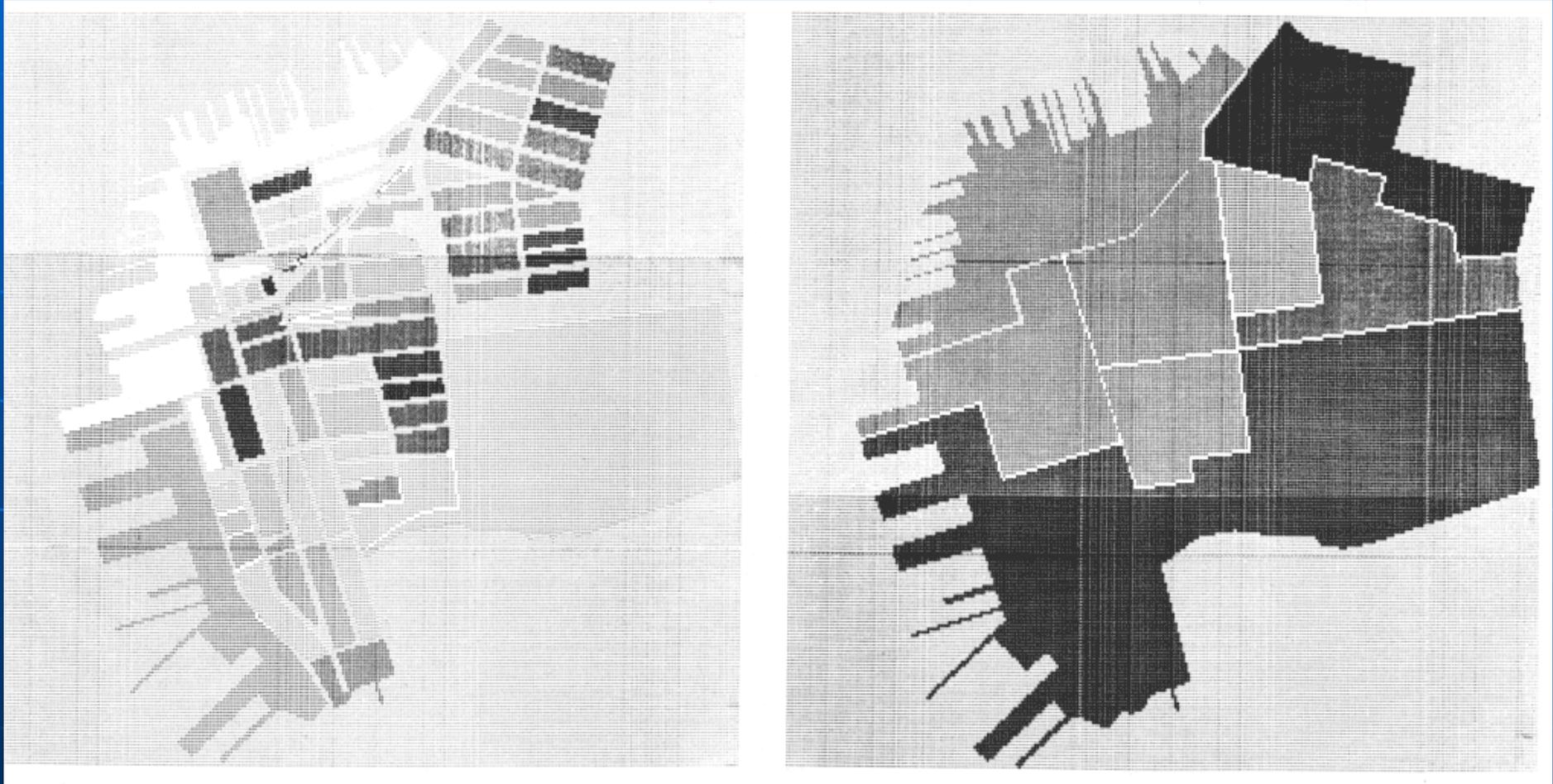
FREQUENCY DISTRIBUTION OF DATA POINT VALUES IN EACH LEVEL

LEVEL	1	2	3	4	5	6
SYMBOLS	.....	.....	.....	.....	.....	.....
FREQ.	.....	.....	.....	.....	.....	.....

This map is based on SYMAP V as modified by P. Adman, Centre for Computer Studies, University of Hull. It shows residential preference of sixth-formers in Haltemprice and West Hull, drawn from a sample of 25 sixth-formers in each of 7 Hull schools. Each sixth-former was asked to rank each of 16 residential areas in order of residential desirability. The values represent the percentage of the total possible preferences (i.e. total possible =  $25 \times 7 \times 16 = 2800$  and the summed preferences of each area are expressed as a percentage of this). The lower the percentage the higher the preference.

**1962-1964:**

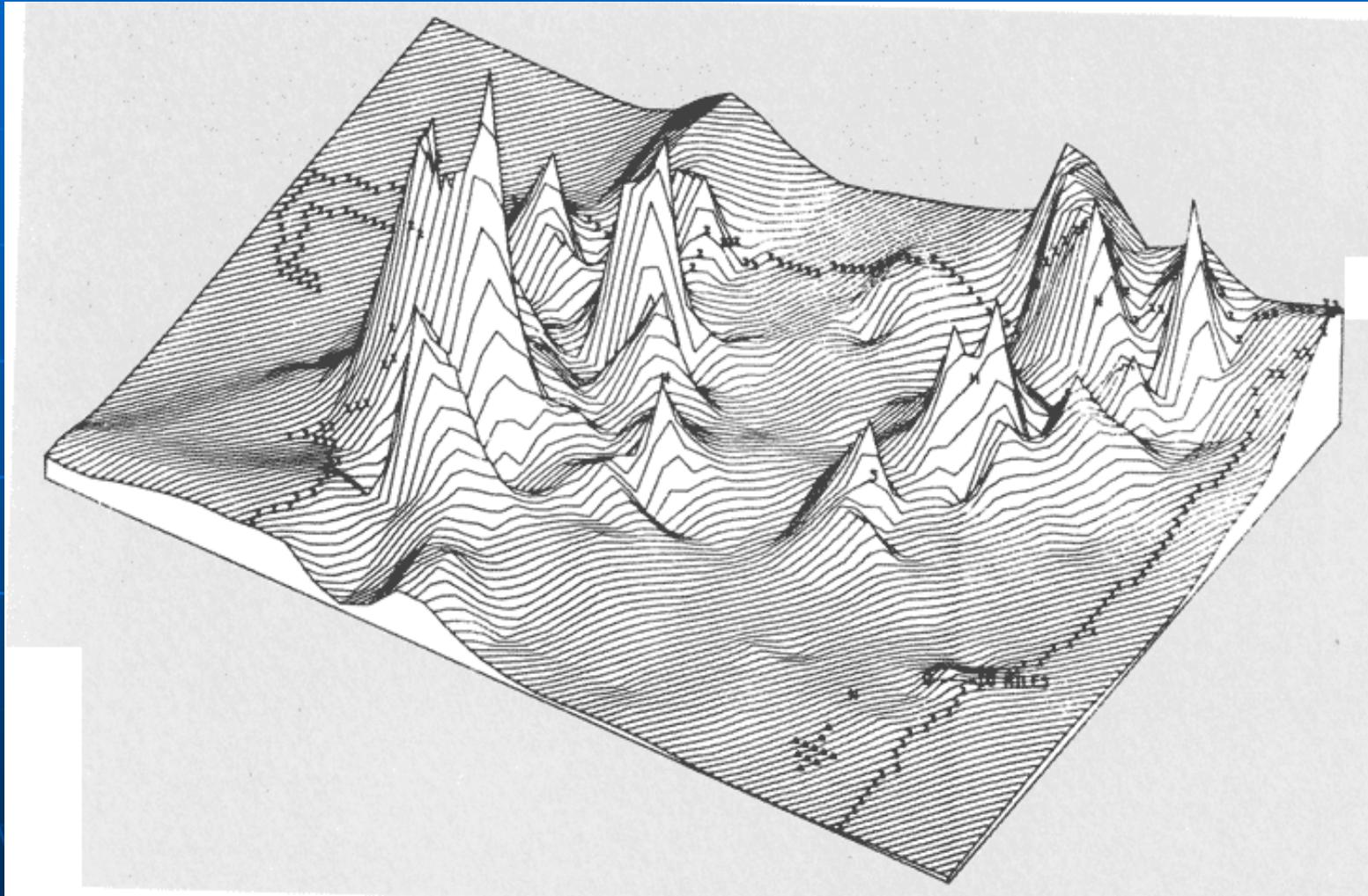
## Sistemas de Información Geográfica (GIS, SIG)



***SYMAP (Harvard Laboratory)***

**1962-1964:**

**Sistemas de Información Geográfica (GIS, SIG)**



***SYMAP (Harvard Laboratory)***

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

*1960-1980*

*Desarrollo paralelo en dos direcciones:*



**Avances en la cartografía tradicional**

**Desarrollo de SIG**



**Aún no estaban dadas las condiciones mínimas para hacer mapas digitales con la calidad gráfica exigida por la cartografía**

**Se hizo hincapié en la posibilidad que estos sistemas dan para el rápido procesamiento de grandes bases de datos, sin la calidad gráfica de un mapa hecho por métodos tradicionales**



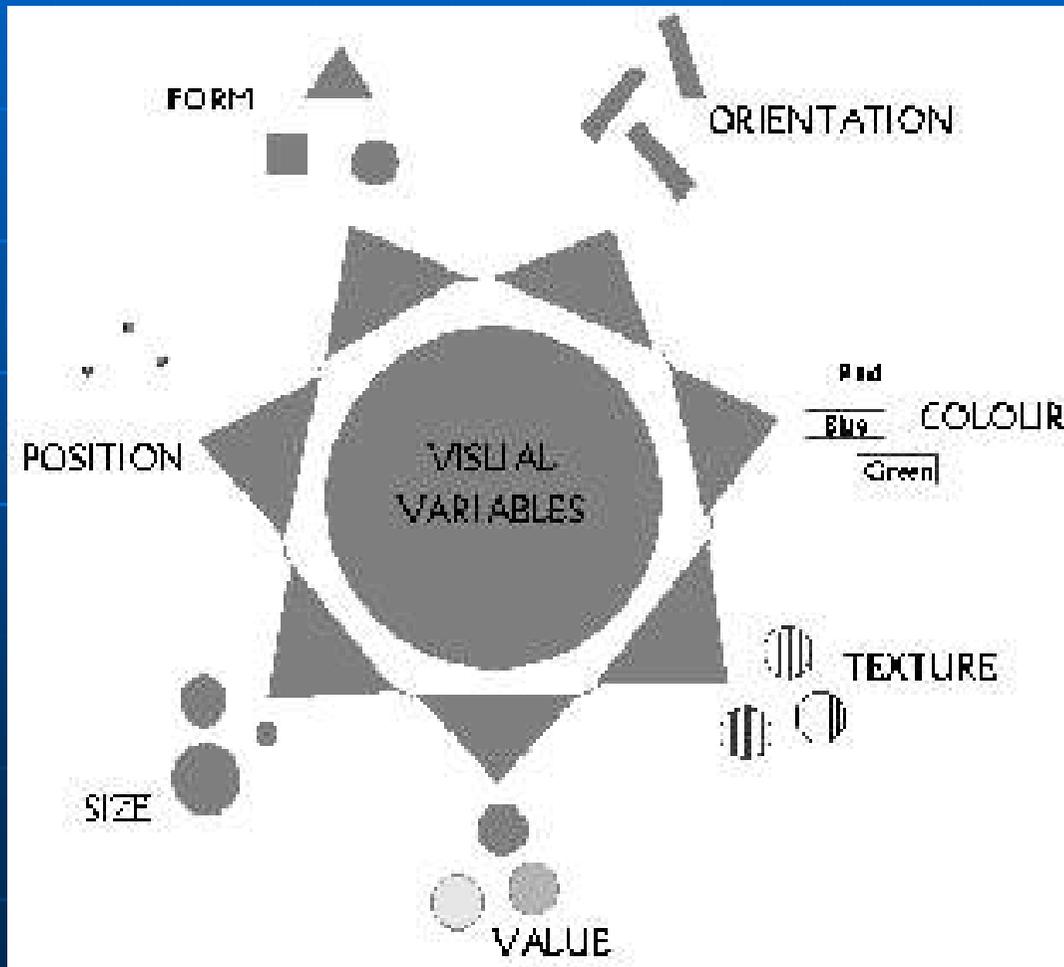
**Computadoras personales**



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1967

Jacques Bertin (1915-2000), Francia:  
Semiología gráfica



Las siete variables visuales de Bertin

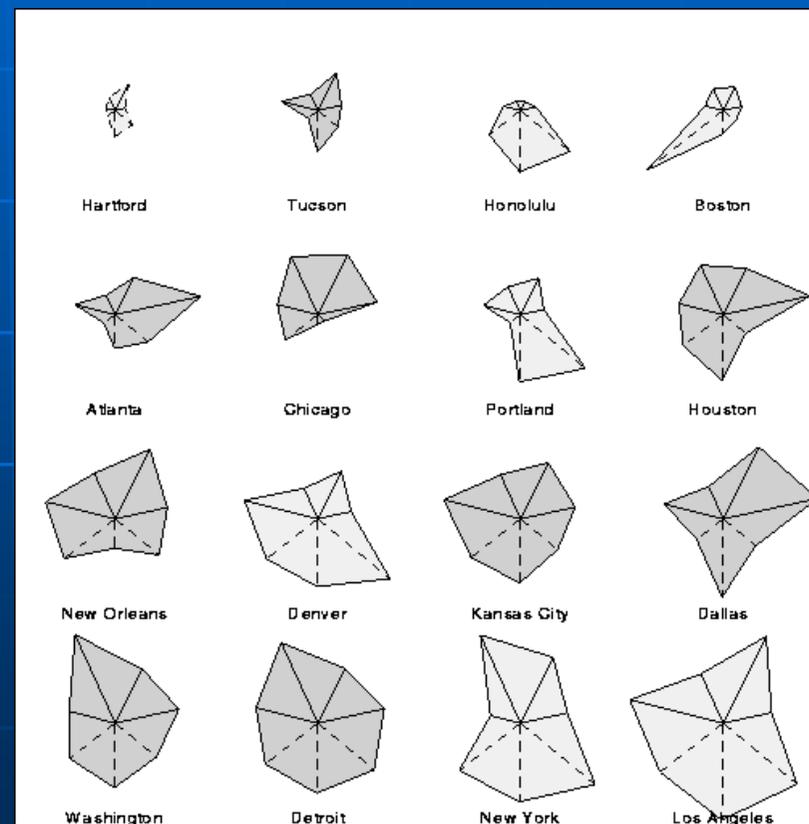
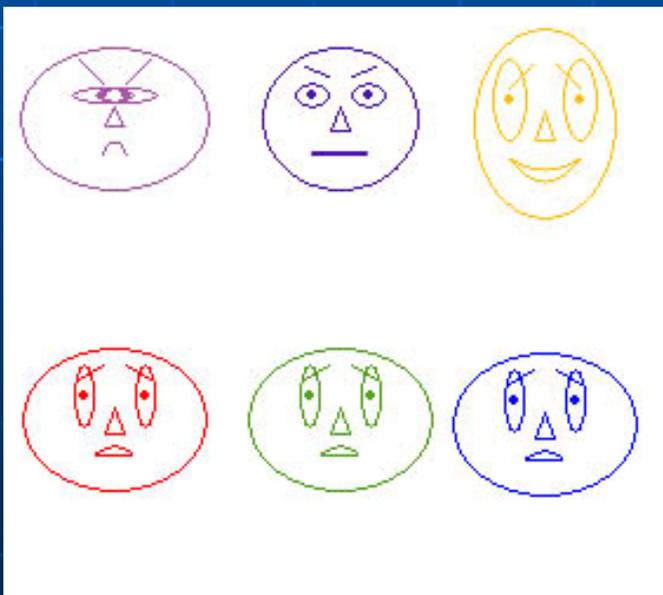
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

**1971**

„Star plot” (diagramas de estrella): asesinatos en las ciudades norteamericanas (polígonos irregulares)

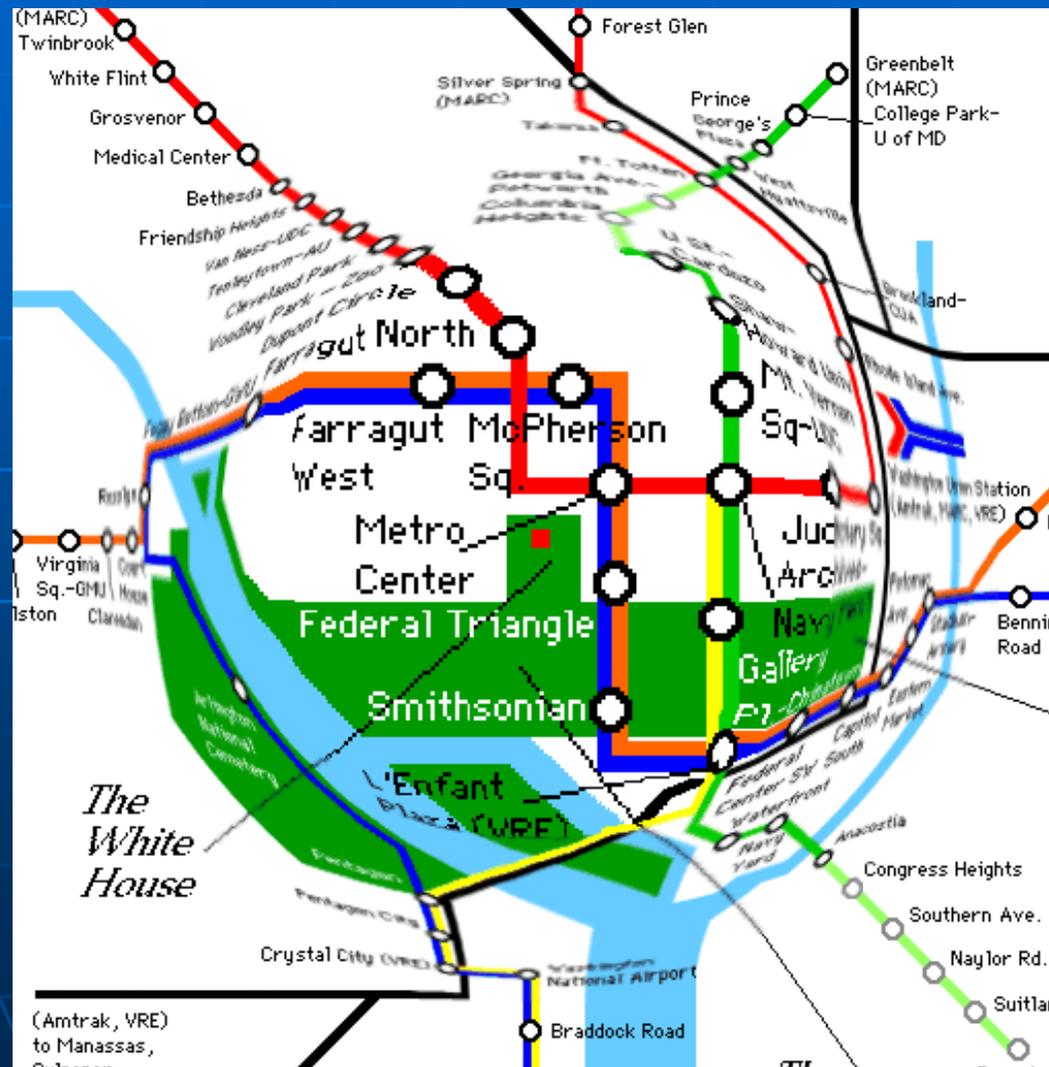
**1973**

Faces de Chernoff –  
representación simultánea  
de diferentes datos



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1981- Efecto „Fisheye” en gráfica por computadoras



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Desde 199...: SIG y Cartografía en la Web

www.esri.com

Netscape: ESRI - Home of The GIS People

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New ArcGIS Explorer Available  
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- ESRI Law Enforcement Seminar  
May-July, 2008 · Nationwide  
Register Today
- ESRI International User Conference  
August 4-8, 2008 · San Diego, CA  
Submit Your Work | Register Today
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August 2-5, 2008 · San Diego, CA  
Submit Your Work | Register Today
- ESRI Survey & Engineering GIS Summit  
August 2-5, 2008 · San Diego, CA  
Submit Your Work | Register Today
- ESRI Health GIS Conference  
September 28-October 1, 2008  
Washington, D.C.  
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# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

Free Resources | FAQs | Home



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Search for place name (e.g., Cairo):

Or draw a search area :



**2 What would you like to discover?**

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Choose content type:  
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Optional Keyword (e.g., river):

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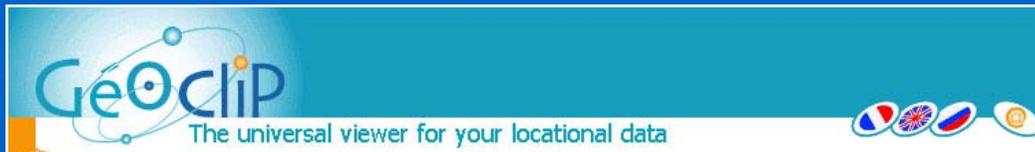
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**Maps** **Data**

www.geographynetwork.com

# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## Geoclip(Francia): Atlas temático en la Web



- Features**
  - What is Géoclip? A smooth interface A wealth of information Multiple themes
- Services**
  - Our services Recent achievements On-going research Géoclip galleries
- Technical information**
  - From GIS to the Web Zooming, selecting... Database access Display modes Flash, SVG and so on
- Getting started**
  - Enter your data Build your Géoclip
- Resources**
  - Sites, forums and lists Referencing sites
- Who are we?**
  - Our team Other activities Partners and customers

**Features > What is Géoclip?**  
**Géoclip is an interactive cartography tool for the Internet**

Do you handle data concerning a particular area?  
 • e.g.: data sorted by American state, by European country, by city in Derbyshire, and so on.

Do you publish information relating to this area on your website?  
 • e.g.: progress reports, summary statistics tables, various lists and results, and so on.

Do you want to improve the way you display this information, in order to make it attractive for people visiting your site? Have you considered using maps, but felt information systems to be too complicated and expensive?

Géoclip is THE solution you need: a simple, affordable, and efficient solution

Main advantages	
Smooth and highly interactive	Géoclip is based on Flash, a powerful format that easily connects to databases and provides extra-compact, easy view files.
Content-rich	Géoclip has a highly flexible interface, allowing a large amount of important information to be displayed.
Information that speaks for itself	Géoclip can create cartographic images from all types of data, using appropriate viewing modes.
High-quality graphics	Géoclip uses a vectorial format that ensures a perfect on-screen and printed appearance.
Adaptable	Géoclip is easy to use and can be supported by any environment.
User-friendly	Géoclip benefits from the extensive experience acquired by its developers in statistics and thematic geography.
Low-cost	Géoclip can be yours for free, thanks to the Géoclip bulk. Only custom implementations will be charged.

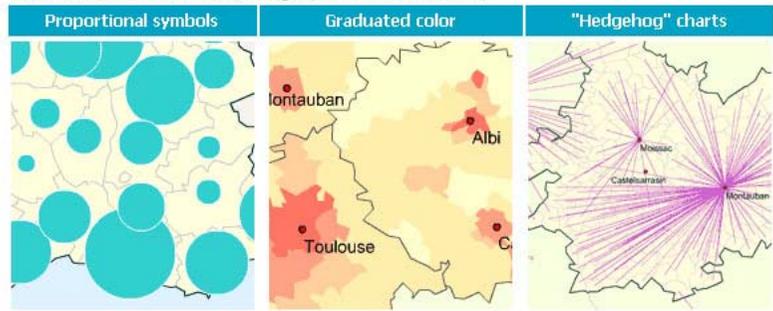


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**Features > Multiple themes**  
**To each data type its appropriate display mode**

The various display modes offered by Géoclip are based on standard cartographic representation rules. Géoclip strives to create precise, clear, and attractive maps.

Géoclip creates thematic maps. To achieve this, it offers various display modes depending on which data are to be viewed. The three following "basic" modes are offered:



<p>displayed data type: <b>absolute values</b></p> <ul style="list-style-type: none"> <li>• e.g.: population, number of facilities, and so on.</li> </ul> <p>the symbol used is a circle, the simplest and clearest geometric shape; the circle's area is proportional to the represented data.</p>	<p>displayed data type: <b>relative values</b></p> <ul style="list-style-type: none"> <li>• e.g.: population density, evolution rate, and so on.</li> </ul> <p>these maps are called "choropleth" maps; variables need to be made "discrete," i.e. thresholds have to be determined to separate each bracket.</p>	<p>displayed data type: <b>flow data</b></p> <ul style="list-style-type: none"> <li>• e.g.: major urban centres</li> </ul> <p>each geographic unit is connected by a line to another geographic unit (pole); the stronger the flows, the clearer the map, because fewer lines will cross each other.</p>
---	---	--

**Combined representations**  
 Some of these display modes can be combined for two-level viewing: foreground and background, the bracket view is always in the background. A special combination can be made using brackets and proportional circles: the circles can be filled with colours corresponding to the various brackets (see Display modes).



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## Geoclip(Francia): Atlas temático en la Web

**Geoclip**  
The universal viewer for your locational data

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- Services**
  - Our services
  - Recent achievements
  - On-going research
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  - From GIS to the Web
  - Zooming, selecting...
  - Database access
  - Display modes
  - Flash, SVG and so on
- Getting started**
  - Enter your data
  - Build your Géoclip
- Resources**
  - Sites, forums and lists
  - Referencing sites
- Who are we?**
  - Our team
  - Other activities
  - Partners and customers

**Services > Géoclip galleries > Unlimited Géoclip!**  
Read native geodatabases directly with no server-side GIS software

**Discover France**  
Travel across France and its 36,557 municipalities

**Smooth navigation from small to large scale**

A wide range of readily accessible public data

Click on the image to access a

**New features:**

- Zooming and moving:** Moving in all directions is easier and smoother. Map sections automatically adapt to the zoom level. Data is extracted at the geographic level that is adapted to the size of the map frame. But you can also **choose the basic geographic unit** ("mesh") at any scale between employment area, county or city, if it is compatible with the zoom level. New **hotkeys** make moving easier: the **four arrow keys** are used to move laterally, the **spacebar** is used to zoom in. When you reach the maximum zooming capacities of the active view, pressing it again automatically launches a new database query in order to create a new view.
- Thematic displays:** Making values discrete for a choropleth map is always adjustable "manually" and using the histogram of the statistical distribution. A new tool allows you to automatically set thresholds for **quantiles**.
- Information on the selection:** Clicking on a group of selected geographic units gives access to a table of indicators, which are automatically recalculated for the selected

www.geoclip.fr

**Getting started > Build your Géoclip**  
Download the creation application from MapInfo or ArcGIS

- ArcGIS version:** Download [cgeoclip\\_ag05.zip](#) (version 0.55 dated 19/12/2002, 225kb)  
See also the [history of changes and corrections](#)
- Mapinfo version:** Download [cgeoclip\\_mi05.zip](#) (version 0.60 dated 6/01/2003, 198kb)  
See also the [history of changes and corrections](#)

The Géoclip builder for MapInfo (4.5 and later) or ArcGIS (8 and later) consists basically of a compiled mapbasic script (geoclip.mbx) or a dll (ArcGIS) and of a compiled Flash interface (geoclip.swf). The minimum entries required are a polygon-based base map with at least two fields – one for naming the geographic units, the other for describing each unit's population. It can handle up to 10 numeric variables and allows for 5 additional indicators defined as ratios. The builder then creates a fully independent geostatic application that can be placed on a website or copied to a CD-ROM. The MapInfo or ArcGIS application generates the html start-up page and groups the geographic and statistical data into one – or two – compressed swf file(s). A browser with the [Flash 6](#) player installed is all you need to view the map.

The builder writes coordinate vectors and statistical data directly in swf format – click [here](#) for swf specifications. It uses Jean-Loup Gally and Mark Adler's wonderful [zlib](#) compression library. The interface included in geoclip.swf has been specially optimised to allow the Flash player to handle sorting tasks, statistical calculations and complex drawings without the help of a server. The Géoclip builder can handle up to 3,000 geographic units, as demonstrated by some examples included in the [Géoclip gallery](#).

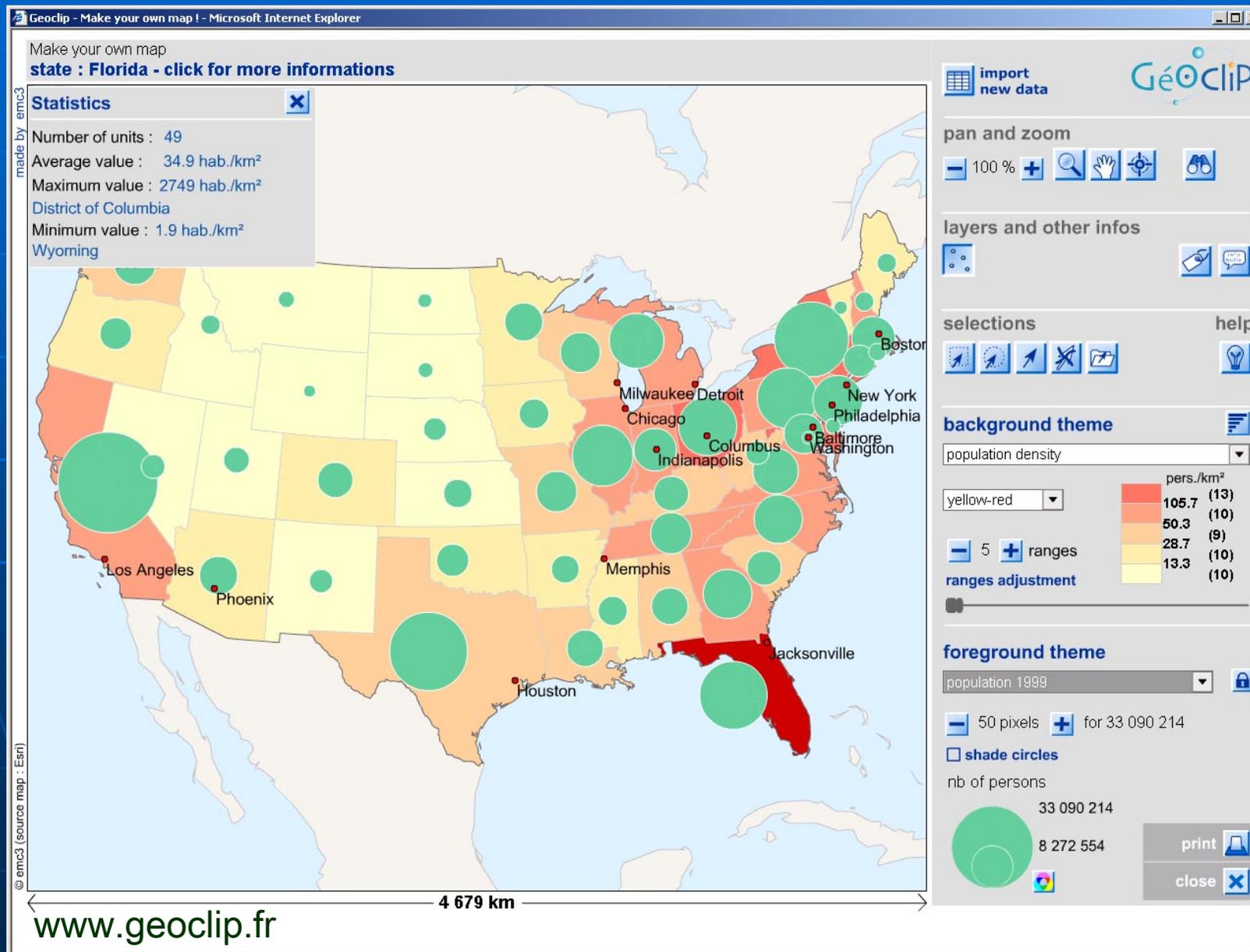
Instructions for use follow:

- Copy all the zipped files in the same directory.
- Open MapInfo and run the application geoclip.mbx. An additional "Géoclip" item is displayed in the menu bar.
- Open ArcMap, Tools/Customise menu, Commands tab. Click the "Add from file" button and search for a\_geoclip.dll. A "Géoclip" item is displayed in the "Command" zone. Drag it to any ArcMap toolbar.
- Open the files needed to build your Géoclip:
  - a file of the area you want to explore; it is of course compulsory and must contain – in addition to the geographic objects – at least one character variable containing the name of the geographic units, and one numeric variable indicating their population;
  - one or two complementary file(s) – major cities, surrounding contours; these are optional (see [below](#)).

Start the builder from the Géoclip / Internet builder menu. The following dialog box appears:

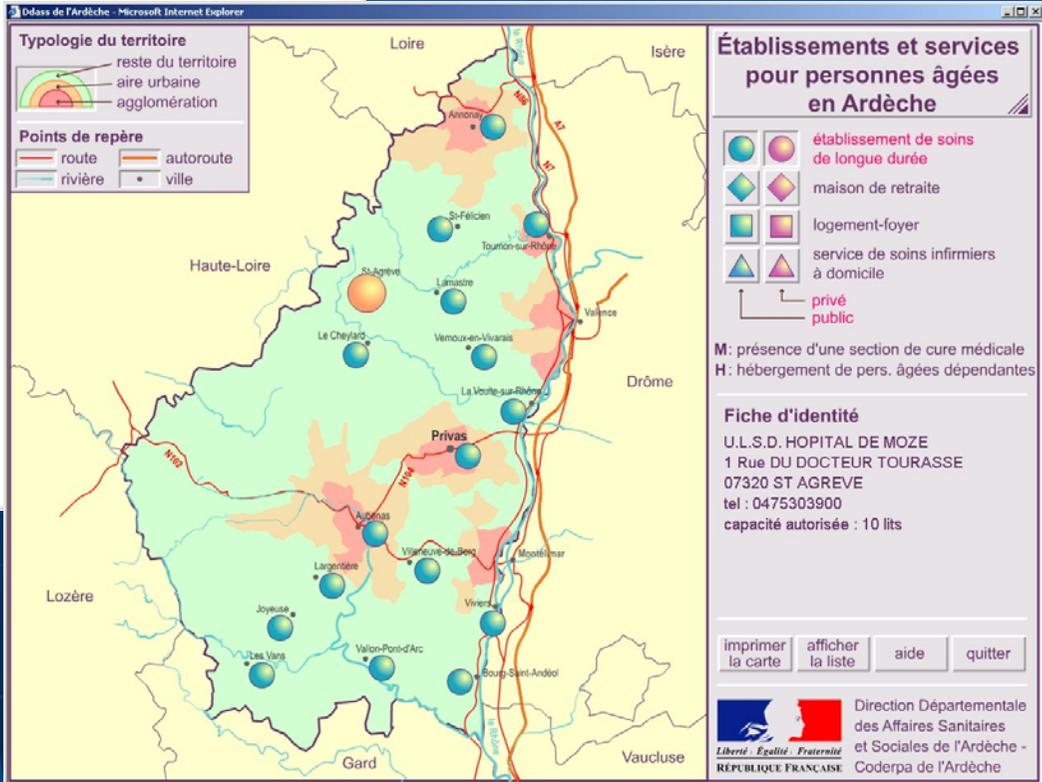
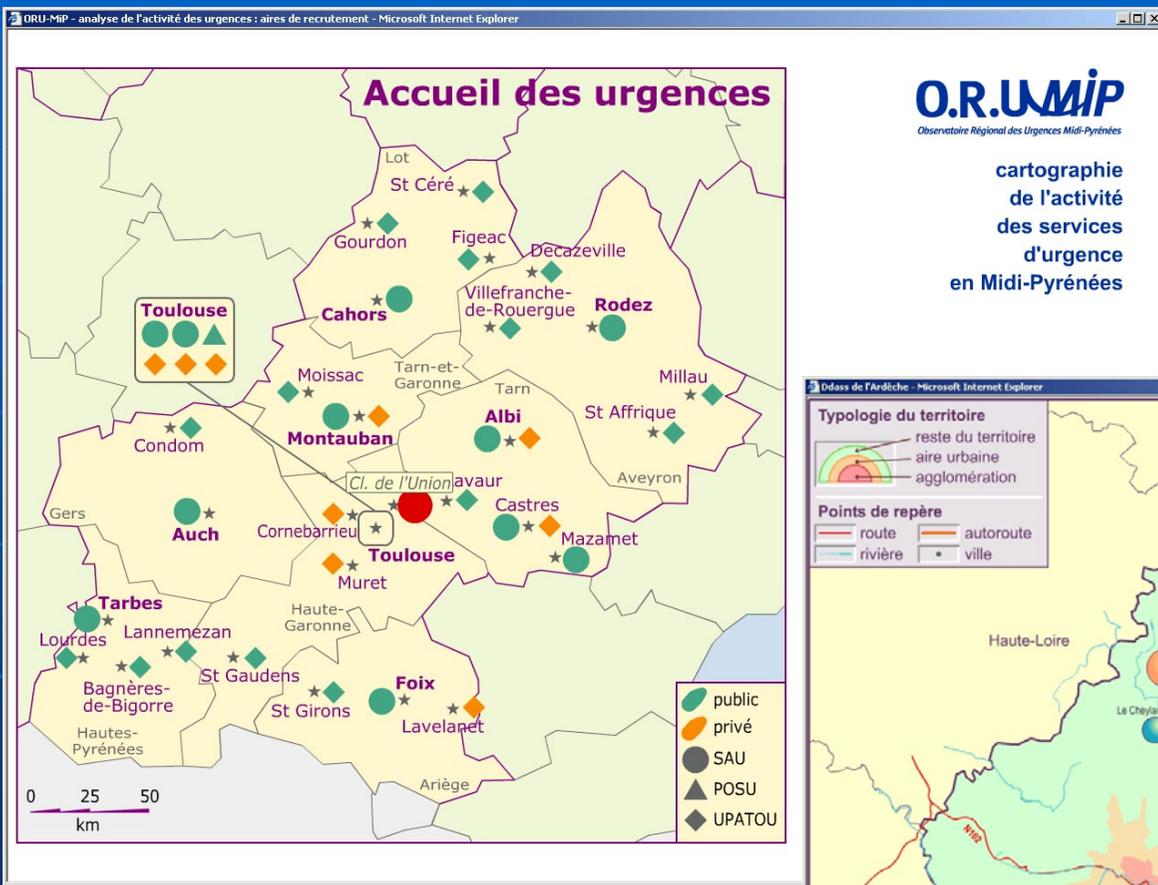
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## Geoclip(Francia): Atlas temático en la Web



# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

## Geoclip(Francia): Atlas temático en la Web



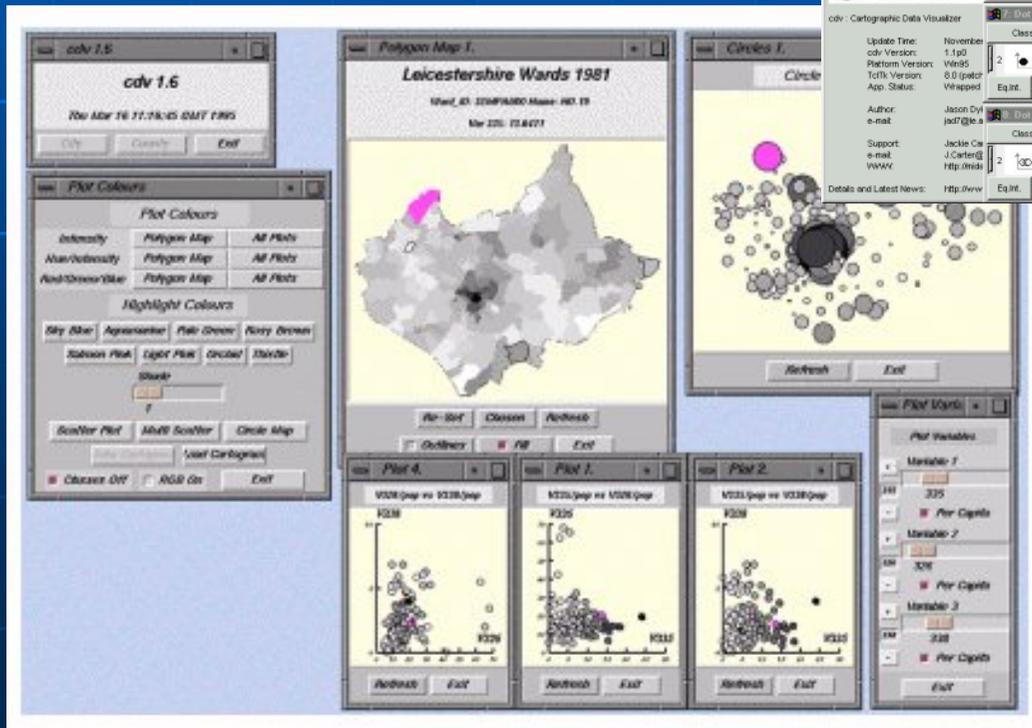
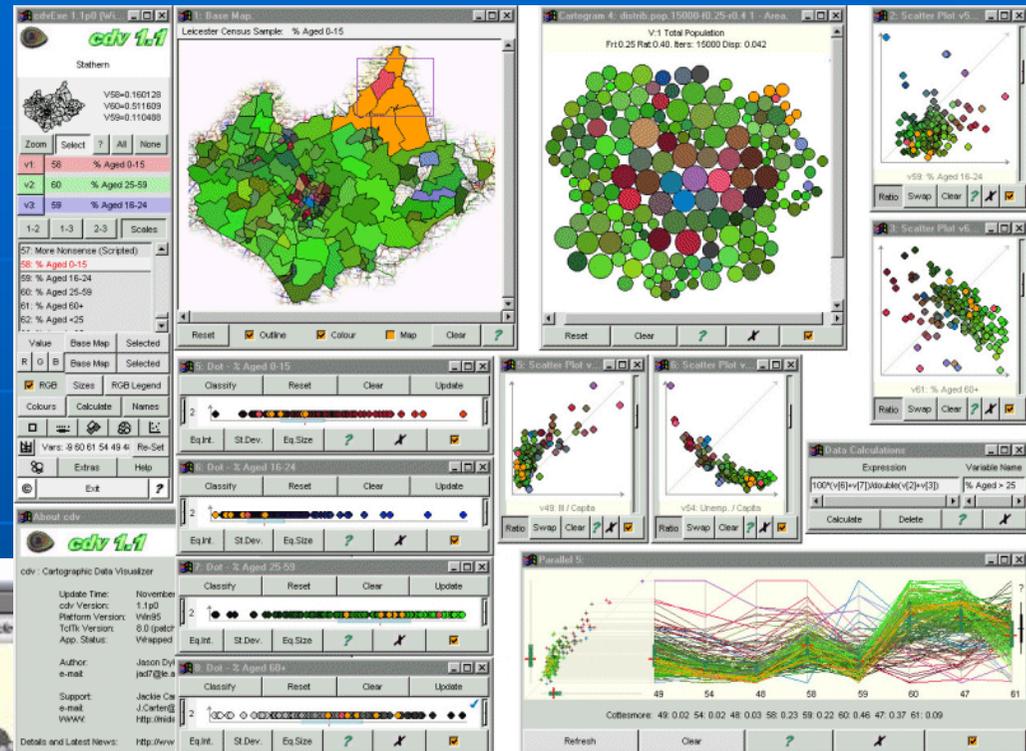
# VISUALIZACIÓN DE DATOS Y CARTOGRAFÍA TEMÁTICA

1996

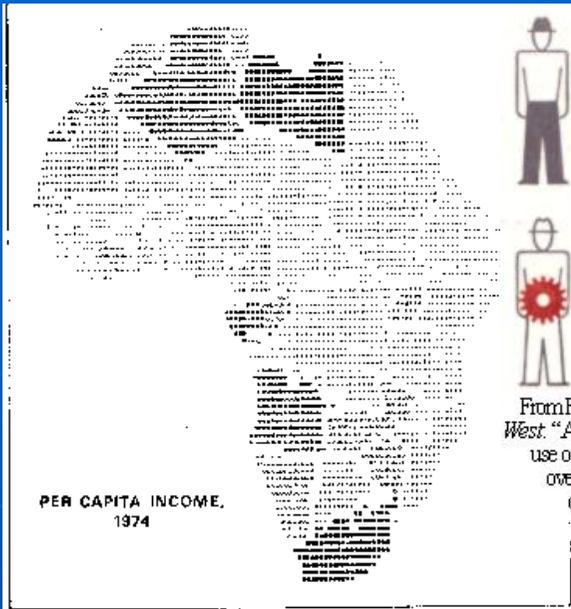
Jason Dykes, Gran Bretaña:

Programa „Cartographic Data Visualizer” (CDV)

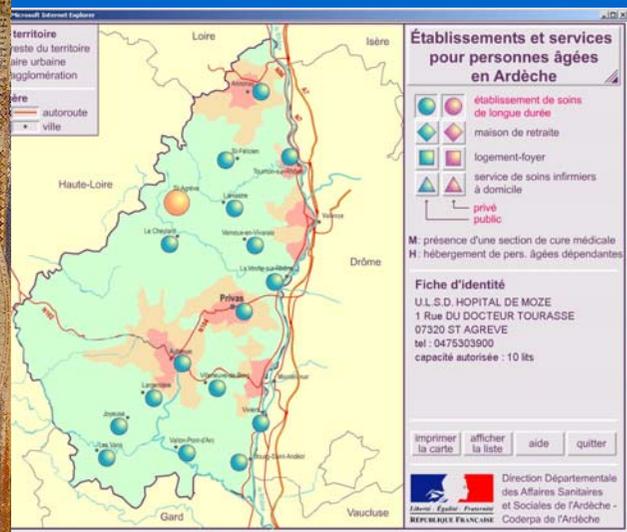
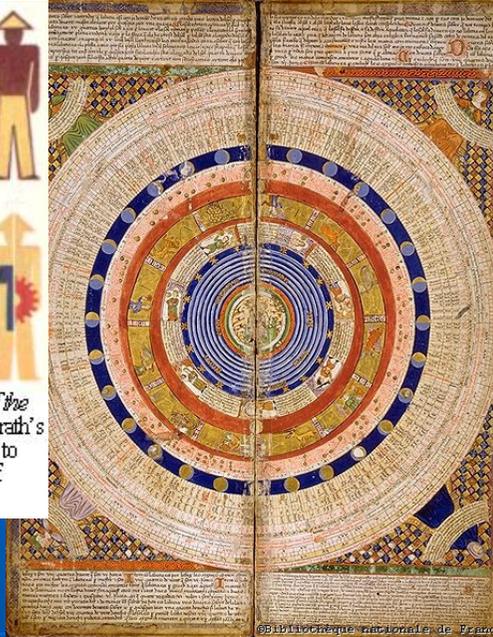
GRATIS!!!



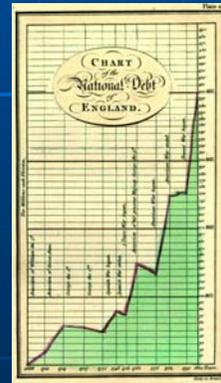
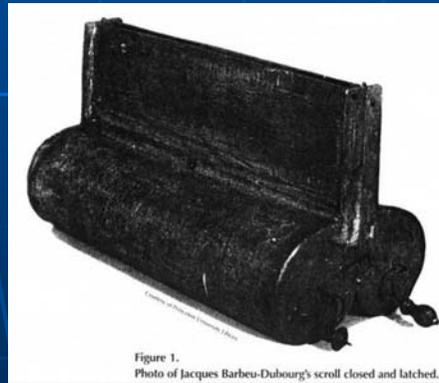
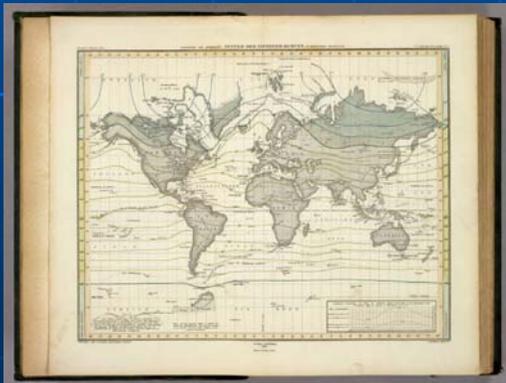
<http://www.soi.city.ac.uk/~jad7/>



From Russell, *Wisdom of the West*. "A sample of O. Neurath's use of pictorial symbols to overcome problems of communication"



# MUCHAS GRACIAS



Breve historia de la visualización de datos y los mapas temáticos