

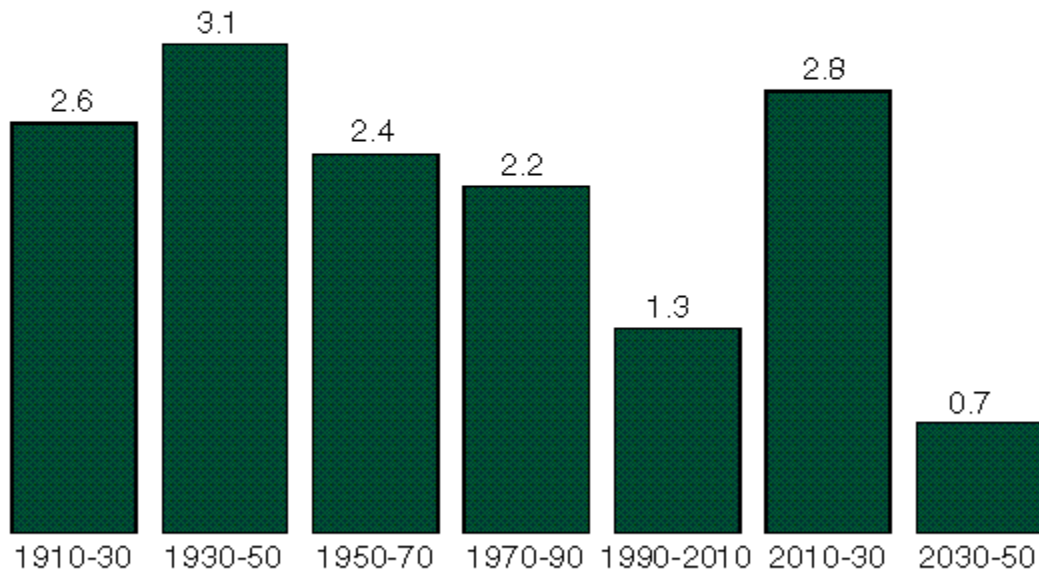
Geog183: Cartographic Design and Geovisualization Winter Quarter 2020

Lecture 4: A brief history of information graphics

How old are graphs and charts?

Fifteen Years From Now, Elderly Population Growth Will Explode

Average annual growth rate (in percent) of the elderly population:
1910-30 to 2030-50



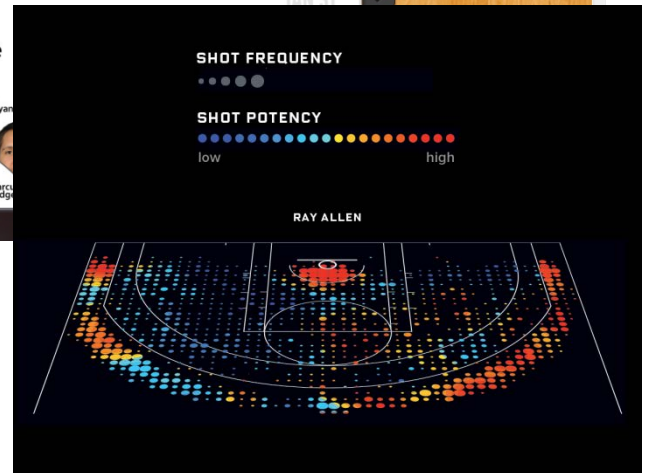
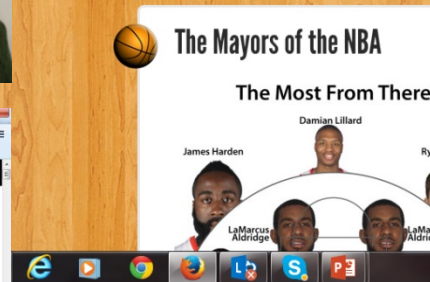
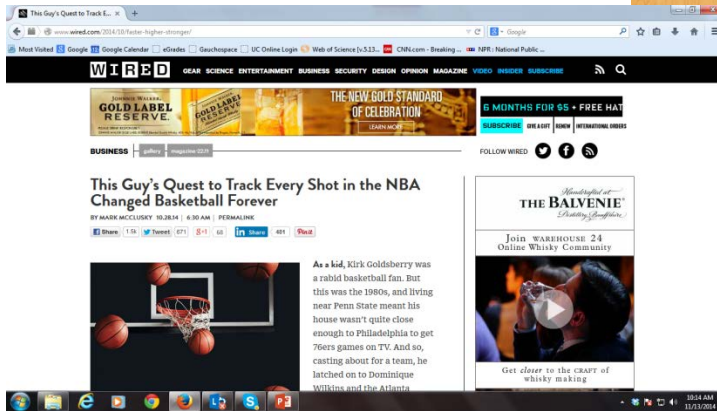
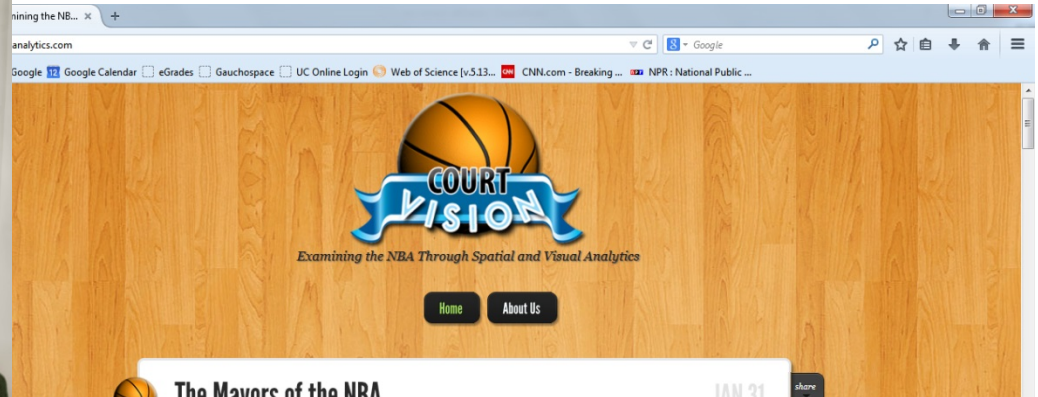
The Birth of Quantitative Graphics

- Tied to the emergence of statistical thinking and data collection
- Tied to media
 - Printers, paper, computer screens, etc.



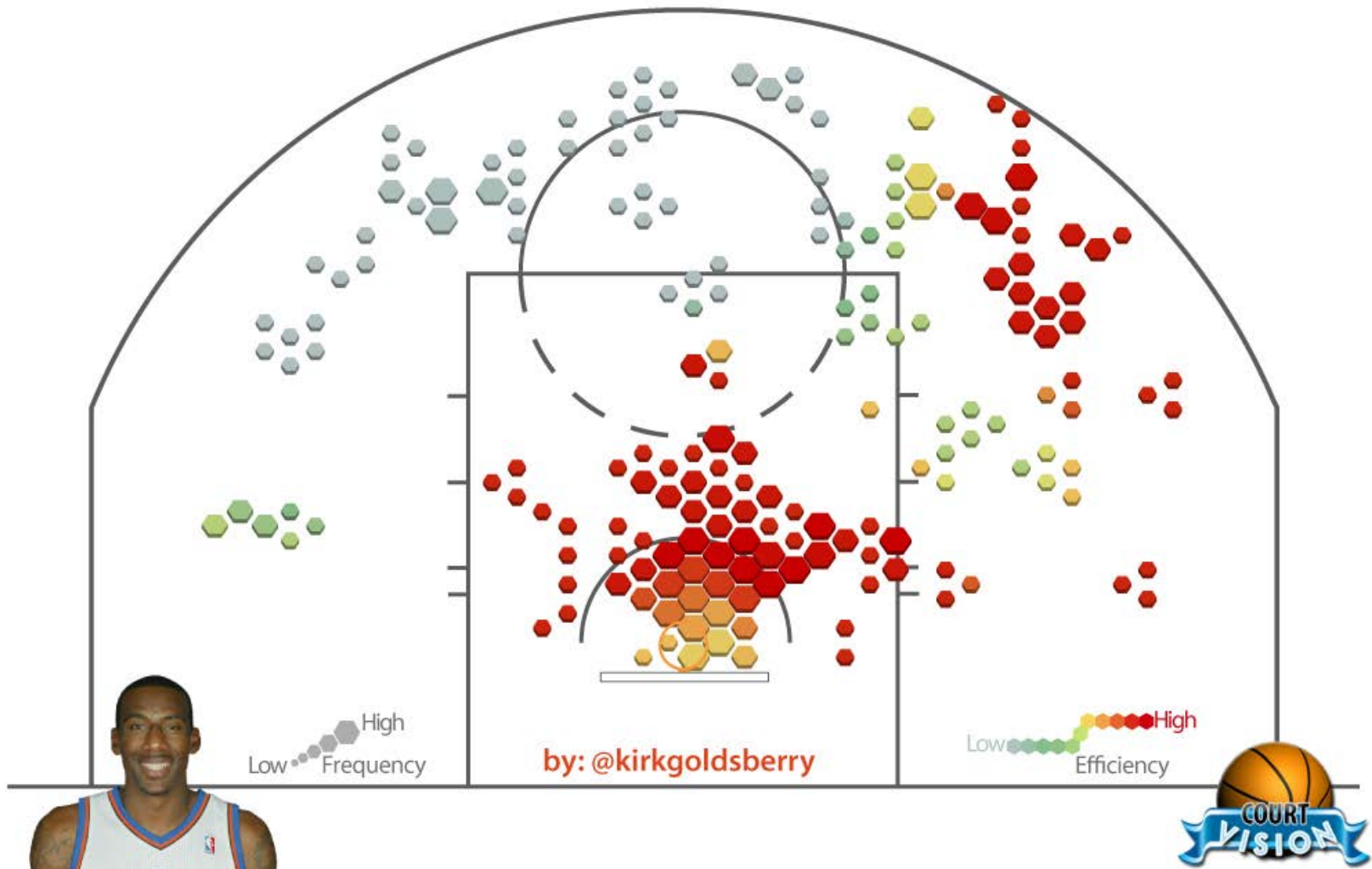
- This lecture source originally:
- <http://www.math.yorku.ca/SCS/Gallery/milestone/>

With help from Kirk Goldsberry



Court Vision

Amar'e Stoudemire



Precise Scientific Observation

- Data graphics are bound to data collection
- Census in Egypt 3340 BC and in 3050 BC
 - Well-developed and precise data collection techniques: Late 1500's



Census/Inventory

Domesday Book: 1086

WARWICSHIRE.

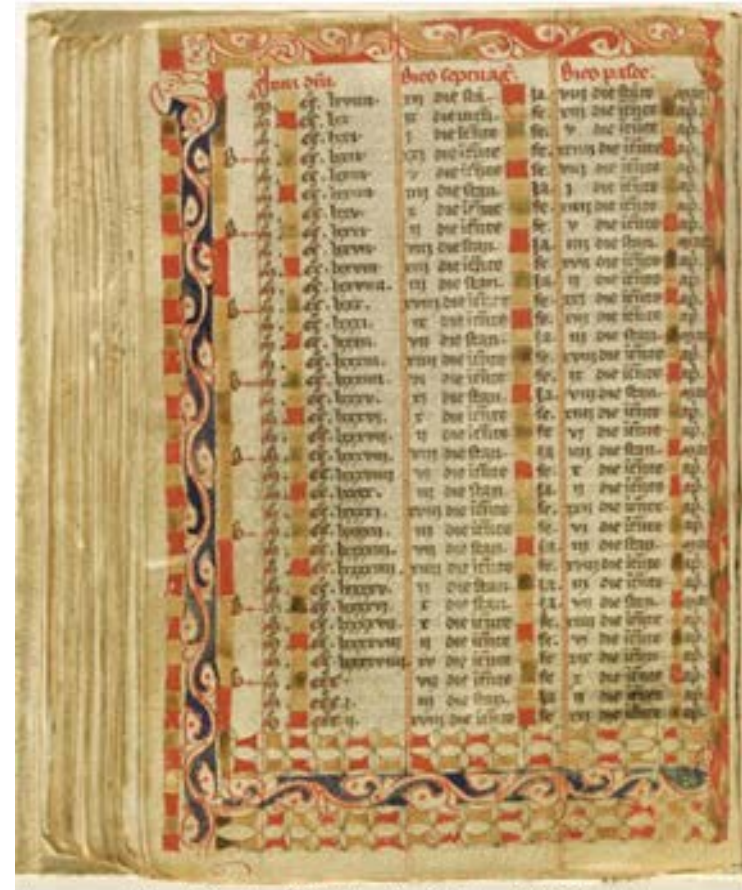
TERRA RADOLPHI DE MORTIMER. In Domesday Bk.
Radolphus de Mortimer tot' ditionem h'ogge
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IN BRANTONE. Tor. iij. car. ad gld. Tra. ad. u. car. xx. s.
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IN TRESHEFETZ. Gamelbar. iij. car. ad gld.
IN CUCNELAI. Torchil. ii. car. ad gld.
IN BRADELEI. Archil. Torchil. Gamel. vij. car. ad gld.
IN TERNEHIL. Gamel. ii. car. ad gld.
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IN ESEBRUNE. Gamelbar. 7. i. bou. ad gld.
IN VZELAI. Wills. i. car. ad gld. 7. vi. car. ad gld.
IN CRICHETAI. Vichel. Thole. Bauensuard. Wills.
IN WILFEDENE. Gamelbar. iij. car. ad gld.
IN ACURDE. Gamelbar. Wills. i. car. ad gld.
IN NEWHUSE. Wills. i. car. ad gld.
IN LACOC. Bauensuard. ii. car. ad gld.
IN SUZUN. Bauensuard. ii. car. ad gld.
IN MELLINGE. Thomebi. Wemmigeun. vij. ix. car. ad gld.
IN HIDE. Th. Orme. ii. car. ad gld.
IN TORMECUN. 7. in Borch. Orm. vi. car. ad gld.

TERRA WILLELMII DE WARRINGTON. In Domesday Bk.
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Statistical Thinking and Visual Thinking

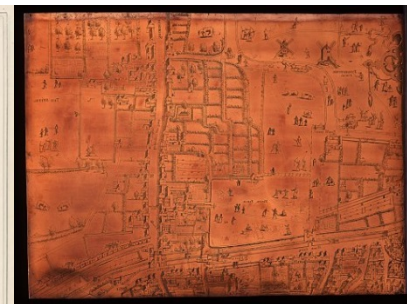
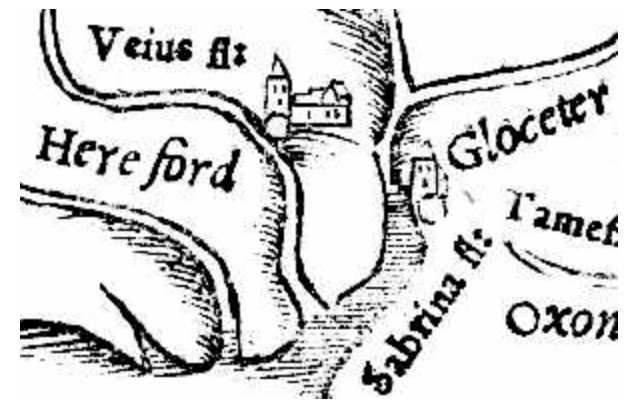
- Diagrams began to accompany mathematical proofs
- Various graphic forms were invented to help communicate numerical / statistical findings
- E.g. Color Coding



Manuscript written in 1269 for the Order of Cistercians.

Media for Statistical Graphics

- Early graphics were hard to produce and distribute
 - Hand and paper
 - Wood and stone blocks
 - Copper plate etching
 - Lithography
 - Photo etching
 - Computers
- Ease of creation improves

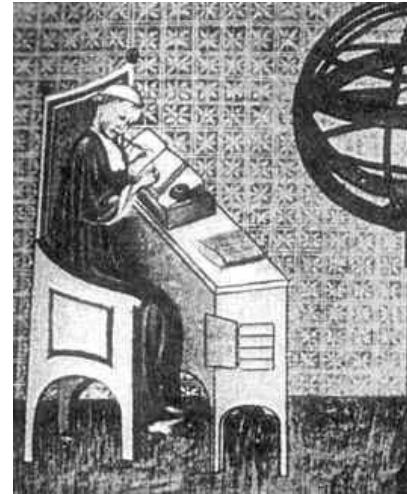


1350: Proto-bar graph

- Nicole Oresme

- Bishop of Lisieux (1323-1382)
- French
- Proposed the use of a graph for plotting a variable magnitude whose value depends on another
- Implies a coordinate system!

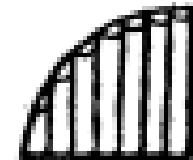
- Before Descartes



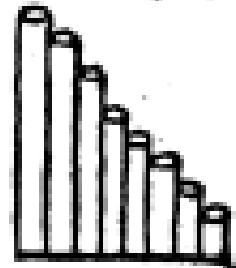
temp. et dist. ed. h. g.



dist. ed. h. g.



et. ed. h. g.

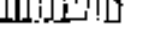
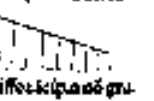
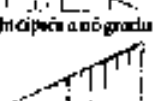
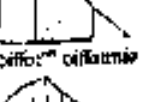
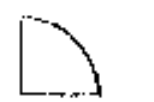


Incipit pariter tractatus de latitudinibus semper
fuit in eorum dei peccati magister Nicholai bozen.

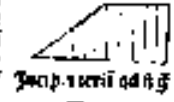


Est latitudo forma que
multiplex varians
in multiplicibus va-
rietatibus difficiliter
invenitur.

Ad figuram geometricam consideratio referat. Quod per se latitudo est quodammodo latitudo in diffinitione sua. In se non variatur ad figuram. In se non variatur applicando quibus pro claritate apparet. Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet. Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet.



Incipit a nullo gradu

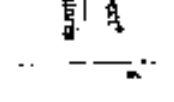
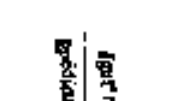
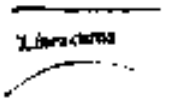


Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet. Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet. Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet.



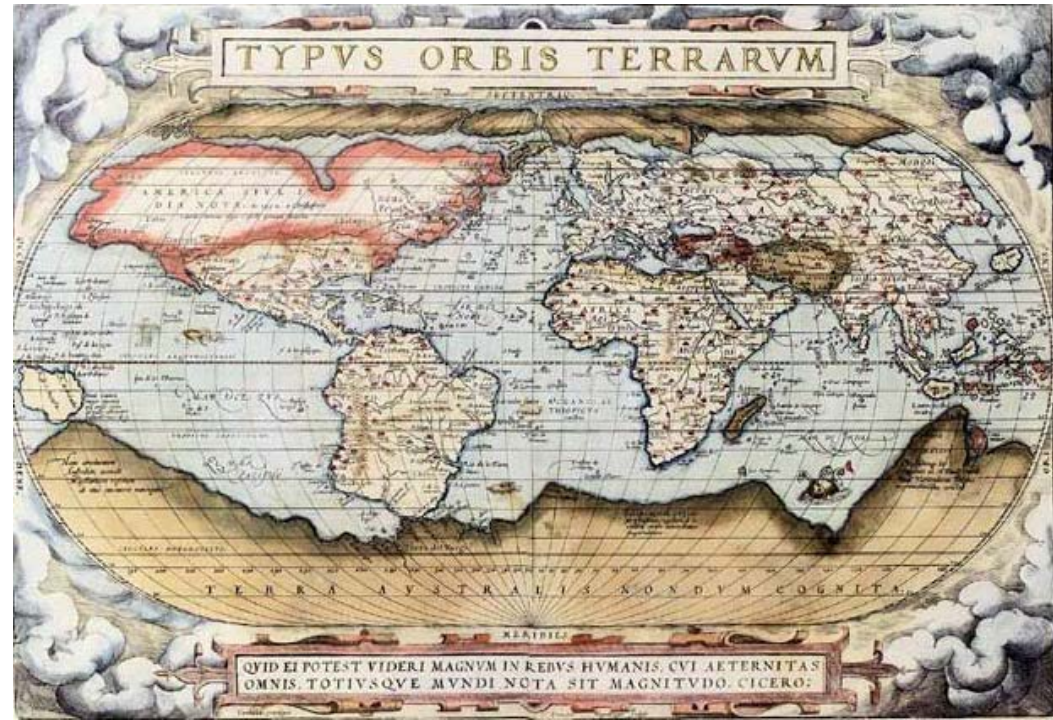
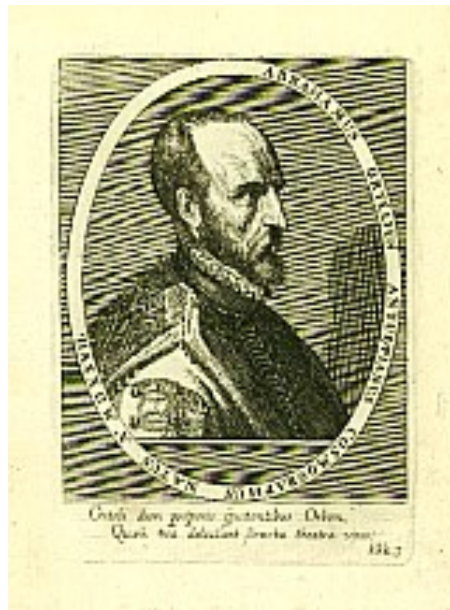
Sequitur tractatus de latitudinibus...

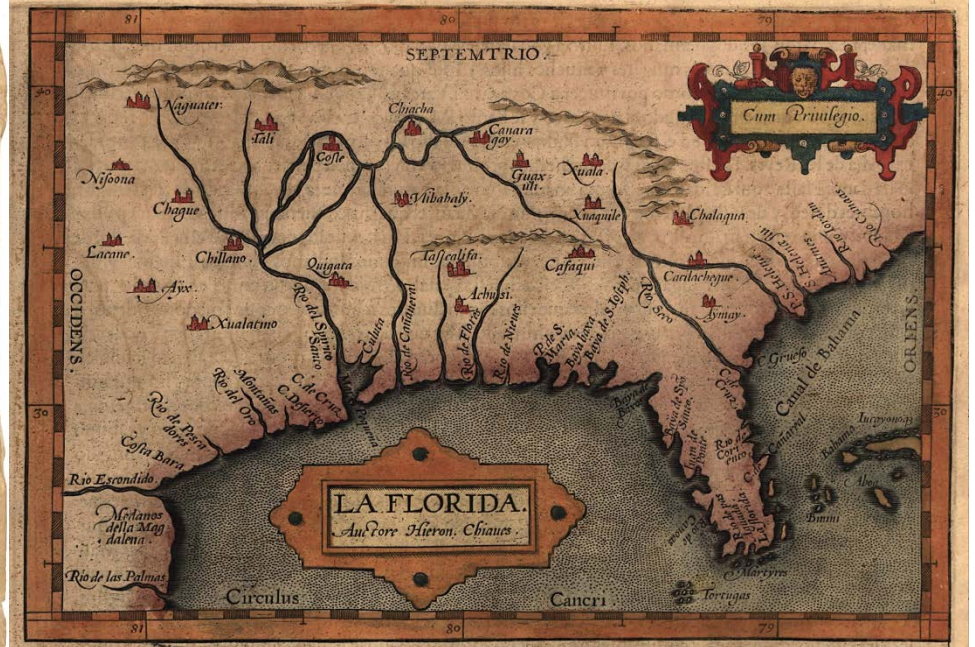
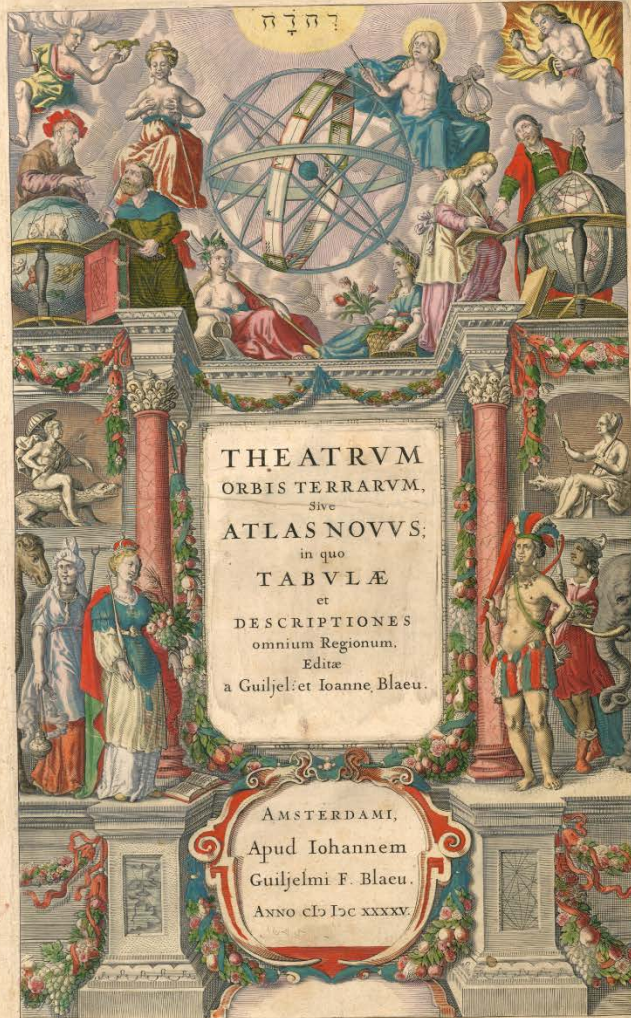
Ad figuram geometricam consideratio referat. Quod per se latitudo est quodammodo latitudo in diffinitione sua. In se non variatur ad figuram. In se non variatur applicando quibus pro claritate apparet. Latitudo est quodammodo in se non variatur ad figuram. Latitudo est quodammodo in se non variatur applicando quibus pro claritate apparet.



1570: First Modern Atlas

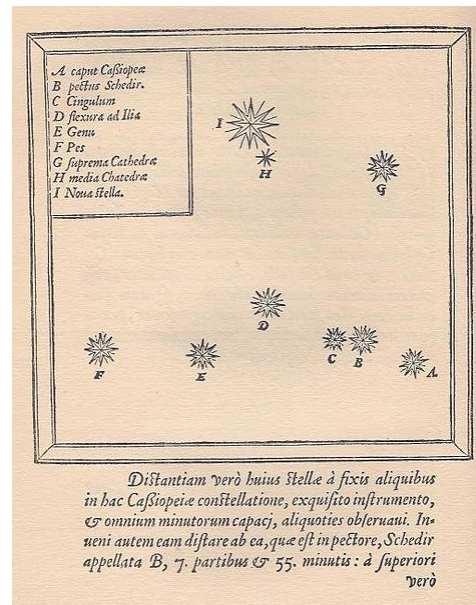
- Theatrum Orbis Terrarum
- Abraham Ortelius, 1527-1598
- Belgian





1572: Instruments for astronomy

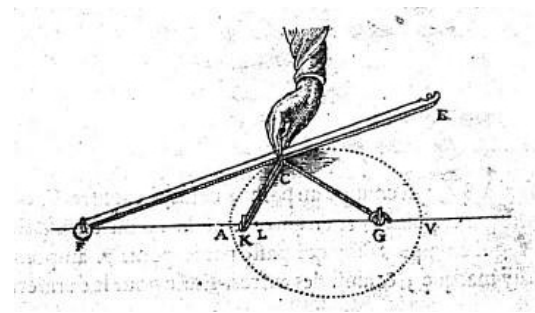
- Tycho Brahe 1546-1601, Danish
- Improved instruments for accurate measurement of stars and planets
- Kept logs and supported record keeping



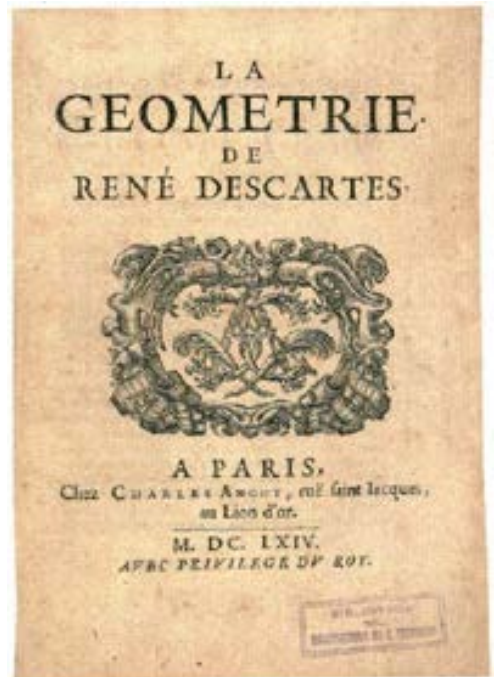
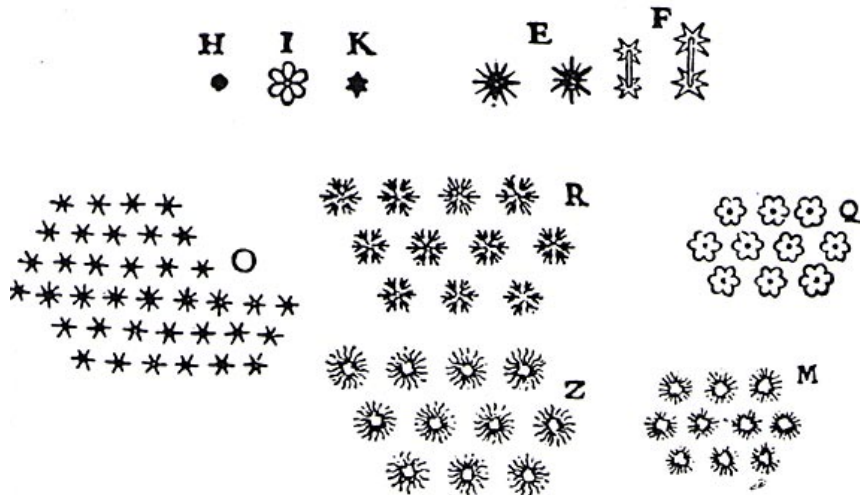
Disputed quote

- I've studied all available charts of the planets and stars and none of them match the others. There are just as many measurements and methods as there are astronomers and all of them disagree. What's needed is a long term project with the aim of mapping the heavens conducted from a single location over a period of several years.

17th Century

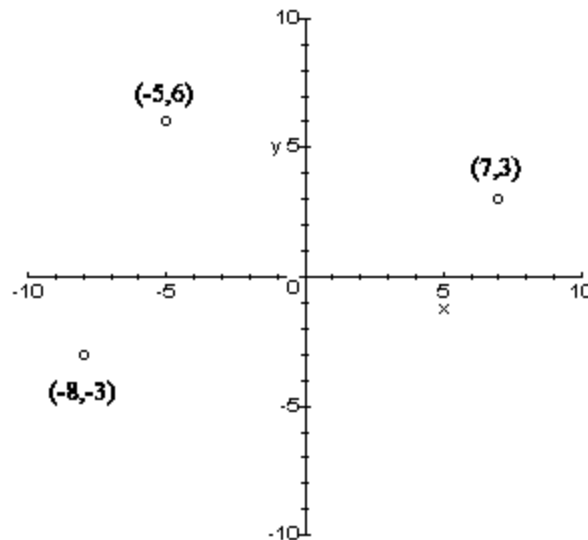


- The rise of analytic geometry
- Beginnings of demographic statistics
- Descartes: Variables, exponents
- 1637 *La Géométrie* (*Geometry*)



1637: Coordinates reintroduced

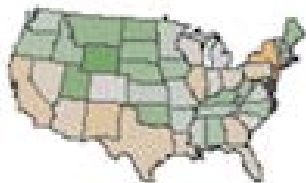
- Cartesian Coordinates
- Relationship established between graphed lines and equations
- Rene Descartes 1596-1650
 - French



1626: First “Small Multiples”

- Shows a series of images
 - Arranged in a logical sequence
 - Depicts changes over time graphically
- Christopher Scheiner (1575-1650)
 - Italian
 - Changes in sunspots over time
 - Same idea used by Galileo in 1610

Income under \$20,000



\$20-40,000



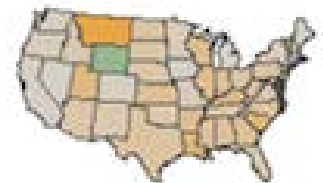
\$40-75,000



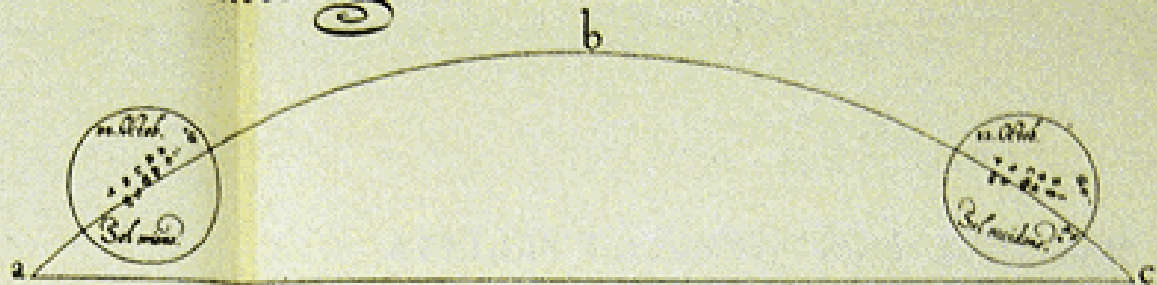
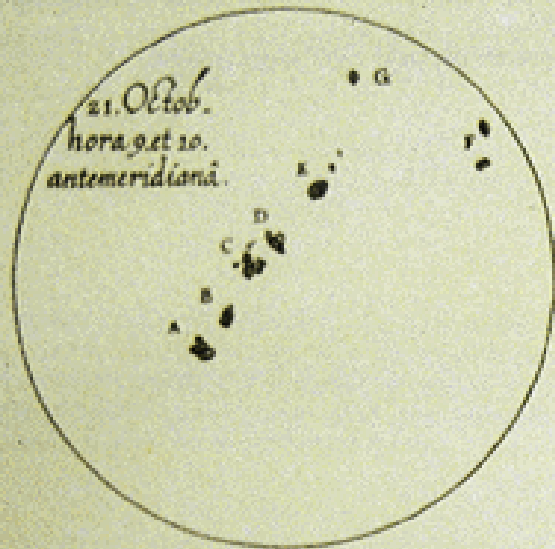
\$75-150,000



Over \$150,000



MACVLAE IN SOLE APPARENTES, OBSERVATAE anno 1611. ad latitudinem grad. 48. min. 40.



a c, horizon. a b c, arcus solis diurnus. Sol oriens ex parte a, maculas exhibet quas vides, occidens vero c, easdem ratione primj motus, non nihil inuertit. Et hanc matutinam vespertinamq; mutationem, omnes maculae quotidie subeunt. Quod semel exhibuisse et mouisse, sufficiat.



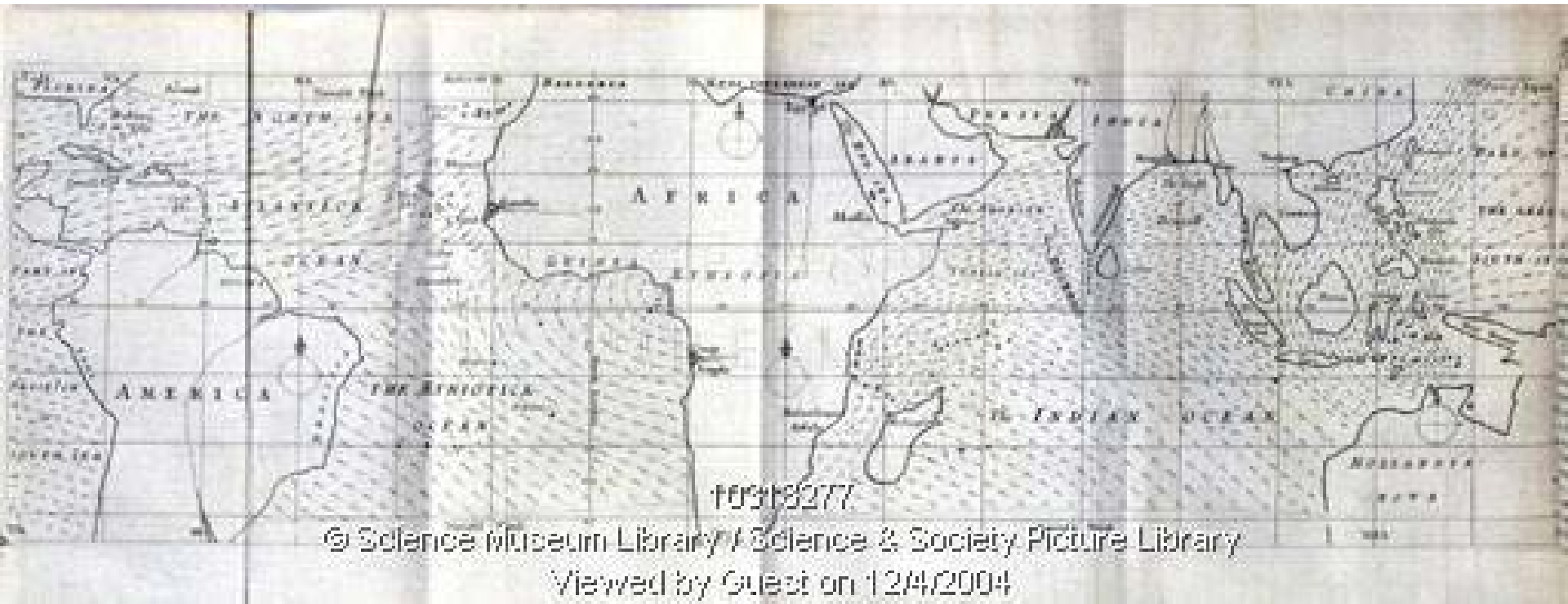
Macula I fuit valde conspicua, propter notabilem pra reliquis magnitudinem.

Figura qua habet antiquum signum X, et Omittere.

Macula M, est haec tenuis vasorum maxima, nulliq; prima magnitudinis, aderi fixo cadit.

1686: First Weather Map

- Edmond Halley, 1656-1742
 - English
- Prevailing winds atop a geographic map



18th and 19th centuries: Statistical Thinking

- Numbers, calculations and tables John Napier (1550 -1617)
- Leonhard Euler connects to the exponential function in the 18th century.
- Data collection surges
 - People/social stats
 - Medical stats
 - Economic stats
- Quantitative graphics arose out of need for reporting/summarizing techniques

Napier's Tables

Deg. 0		+ -			
mi	Sines	Logarith	Differen.	Logarith	Sines
		Infinite.	Infinite.		
0	0			.0	1000000.0
1	291	8142567	8142568	.1	1000000.0
2	582	7449419	7449421	.2	999999.8
3	873	7043952	7043956	.4	999999.6
4	1164	6756275	6756274	.7	999999.3
5	1454	6533131	6533130	1.1	999998.9
6	1745	6350810	6350808	1.6	999998.6
7	2036	6196659	6196657	2.2	999998.0
8	2327	6063128	6063126	2.8	999997.4
9	2618	5945345	5945342	3.5	999996.7
10	2909	5839986	5839814	4.3	999995.9
11	3200	5744676	5744671	5.2	999995.0
12	3491	5657665	5657658	6.2	999994.0
13	3781	5577622	5577615	7.3	999992.8
14	4072	5513514	5503506	8.4	999991.7
15	4363	5434522	5434513	9.6	999990.5
16	4654	5369984	5369973	10.9	999989.2
17	4945	5309360	5309348	12.3	999987.8
18	5236	5252202	5252188	13.8	999986.3
19	5527	5198136	5198120	15.4	999984.7
20	5818	5146843	5146836	17.0	999983.1
21	6109	5098054	5098045	18.7	999981.3
22	6399	5051534	5051514	20.5	999979.5
23	6690	5007083	5007060	22.4	999977.6
24	6981	4964524	4964499	24.4	999975.6
25	7272	4923703	4923676	26.5	999973.6
26	7563	4884483	4884454	28.7	999971.4
27	7854	4846743	4846712	30.9	999969.2
28	8145	4810376	4810343	33.2	999966.8
29	8436	4775286	4775250	35.5	999964.4
30	8726	4741385	4741347	38.1	999961.9

Min.

Deg. 89

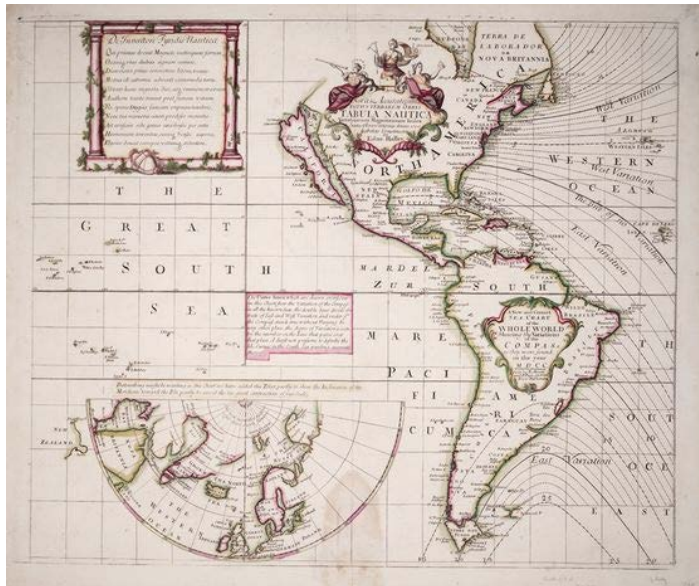
Deg. 0		+ -			
mi	Sines	Logarith	Differen.	Logarith	Sines
30	8726	4741385	4741347	38.1	999961.9
31	9017	4708596	4708555	40.7	999959.3
32	9308	4676848	4676805	43.4	999956.6
33	9599	4646077	4646031	46.1	999953.9
34	9890	4616225	4616176	48.9	999951.1
35	10181	4587239	4587187	51.8	999948.2
36	10472	4559069	4559014	54.8	999945.2
37	10763	4531671	4531613	57.9	999942.1
38	11054	4505004	4504943	61.1	999938.9
39	11344	4479030	4478965	64.4	999935.7
40	11635	4453713	4453645	67.7	999932.3
41	11926	4429022	4428950	71.1	999928.9
42	12217	4404925	4404850	74.6	999925.4
43	12508	4381396	4381318	78.2	999921.8
44	12799	4358408	4358326	81.9	999918.1
45	13090	4335936	4335850	85.7	999914.3
46	13380	4313958	4313868	89.6	999910.5
47	13671	4292453	4292360	93.5	999906.5
48	13962	4271401	4271304	97.5	999902.5
49	14253	4250783	4250682	101.6	999898.4
50	14544	4230583	4230477	105.8	999894.2
51	14835	4210781	4210671	110.1	999890.0
52	15126	4191364	4191250	114.5	999885.6
53	15416	4172317	4172198	118.9	999881.1
54	15707	4153627	4153504	123.4	999876.6
55	15998	4135279	4135151	128.0	999872.0
56	16289	4117263	4117130	132.7	999867.3
57	16580	4100664	4100527	137.5	999862.5
58	16871	4082175	4082032	142.4	999857.7
59	17162	4065082	4064935	147.3	999852.7
60	17452	4048276	4048124	152.3	999847.7

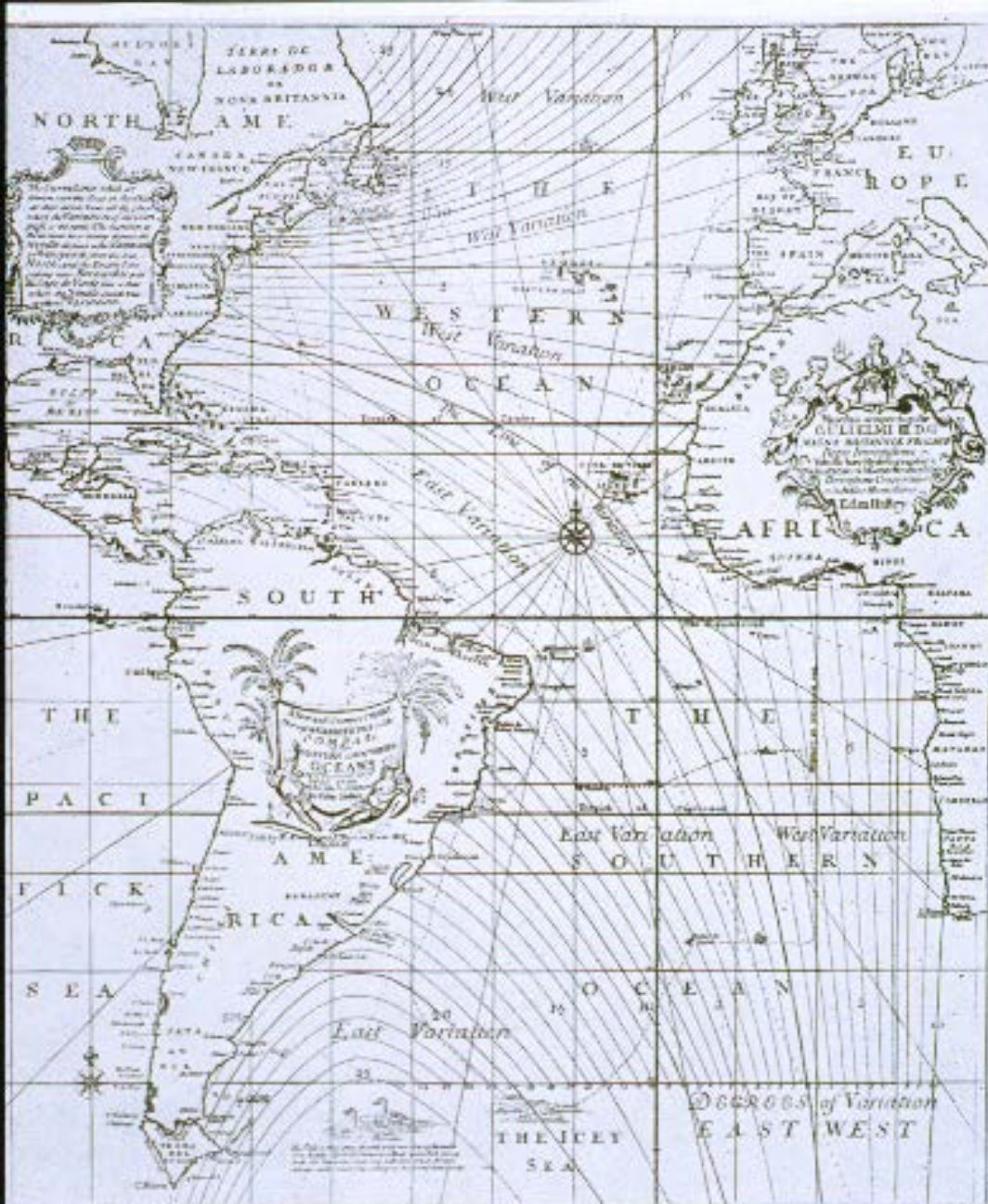
Min.

Deg. 89

1701: First isolines

- Edmond Halley
- Isogonic map: lines connect points of equal magnetic declination
- Attribute only possible by measurement





Edmond Halley, 1701

- An “isogonic” map
- Isogonic or “Halleyan” lines connect points of equal magnetic declination
- Invisible attribute!

FIG. 5. “A New and Correct Chart showing the Variations of the Compass in the Western and Southern Oceans,” ca. 1701 by Edmond Halley. From a copy in the Library of the Royal Geographical Society, London, reproduced by permission of the Society.

1700's

- 1710: Three-color printing invented (LeBlon)
- 1748: First use of the word “statistik”
- 1752: Three-dimensional coordinates (x,y,z)

I.

Of Preliminaries.

COLORITTO, or the *Harmony of Colouring*, is the *Art of Mixing COLOURS*, in order to represent naturally, in all Degrees of *painted Light and Shade*, the same *FLESH*, or the Colour of any other Object, that is represented in the true or *pure Light*.

PAINTING can represent all *visible Objects* with three Colours, *Yellow, Red, and Blue*; for all other Colours can be compos'd of these *Three*, which I call *Primitive*; for Example,

<i>Yellow</i>	}	make an <i>Orange Colour</i> .
<i>and Red</i>		
<i>Red</i>	}	make a <i>Purple and Violet Colour</i> .
<i>and Blue</i>		
<i>Blue</i>	}	make a <i>Green Colour</i> .
<i>and Yellow</i>		

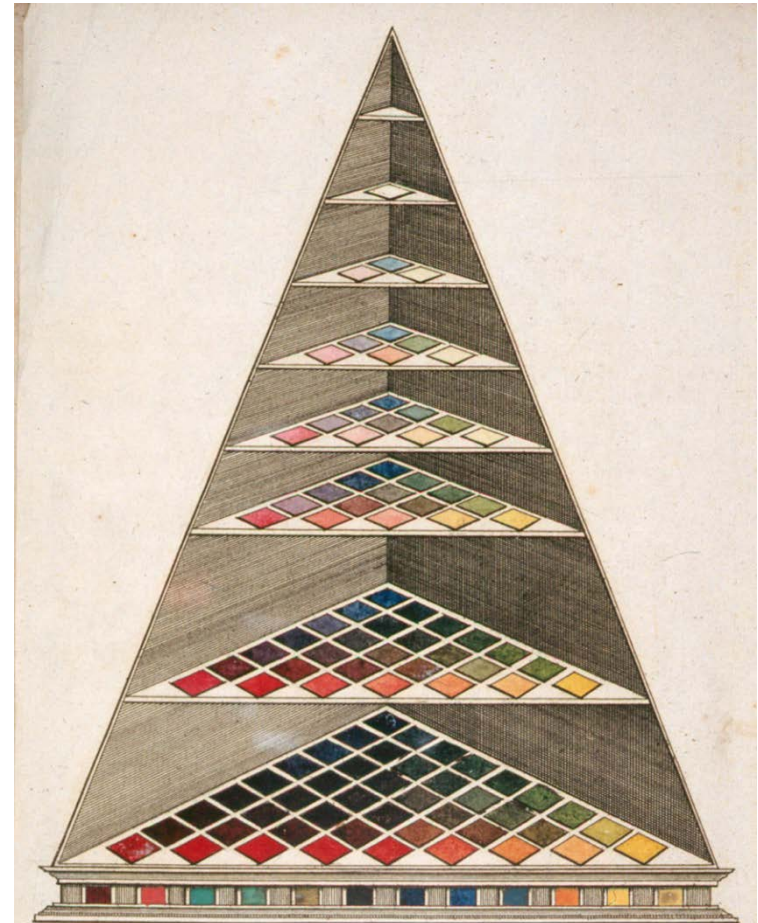
And a *Mixture* of those *Three Original Colours* makes a *Black*, and all other Colours whatsoever; as I have demonstrat'd by my *Invention of Printing Pictures and Figures with their natural Colours*.

I am only speaking of *Material Colours*, or those used by *Painters*; for a *Mixture* of all the primitive *impalpable Colours*, that cannot be felt, will not produce *Black*, but the very Contrary, *White*; as the Great Sir *ISAAC NEWTON* has demonstrat'd in his *Opticks*.

White, is a *Concentering*, or an *Excess* of Lights.
Black, is a deep *Hiding*, or *Privation* of Lights.

1758-1772: Color Diagrams

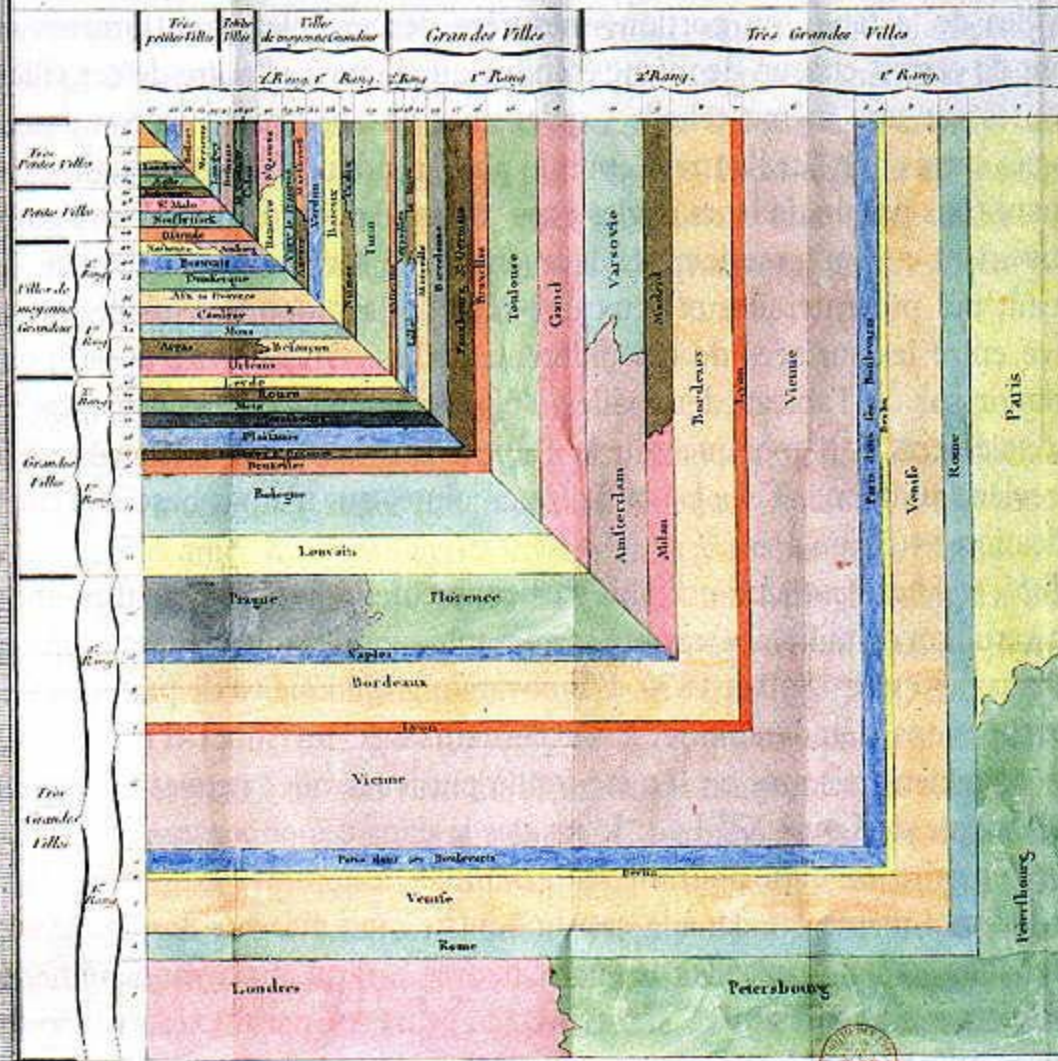
- Diagrams to represent color spaces
- 3D pyramid
- Johann Heinrich
 - German
- Tobias Mayer
 - German



1782: Proportional Symbols

- First use of geometric figures to compare attributes
- Charles de Fourcroy
 - French
 - Tableau Poléométrique 1782
- Used area of squares to depict urban statistics

TABLEAU POLEOMETRIQUE



L'Échelle de six Toises de Pied de Roi
 La Dîme Quatre-vingt six - 78 - Sixième Règne



Not all leaks are equal

File size of data leaks, selected

The Panama Papers (2016)
2.6TB

■ Wikileaks (2010)
1.7GB

■ HSBC files
(2015)
3.3GB

■ Luxembourg
tax files (2014)
4.4GB

Offshore
secrets
(2013)
260GB

Sources: ICIJ; Wikileaks

1782

- First topographical map
- Marcellin du Carla-Boniface
 - France

Expression des nivellements; ou,
Méthode nouvelle pour marquer sur les
cartes terrestres et marines les hauteurs
et les configurations du terrain.

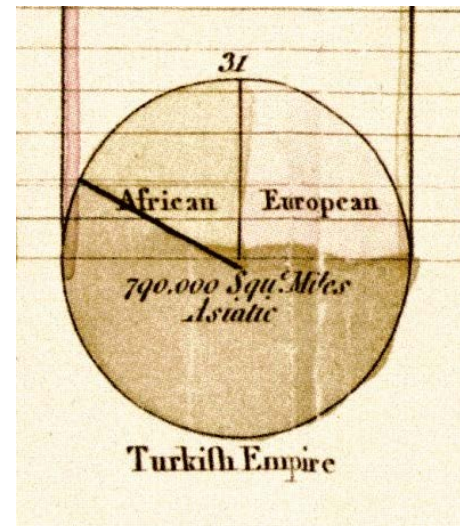


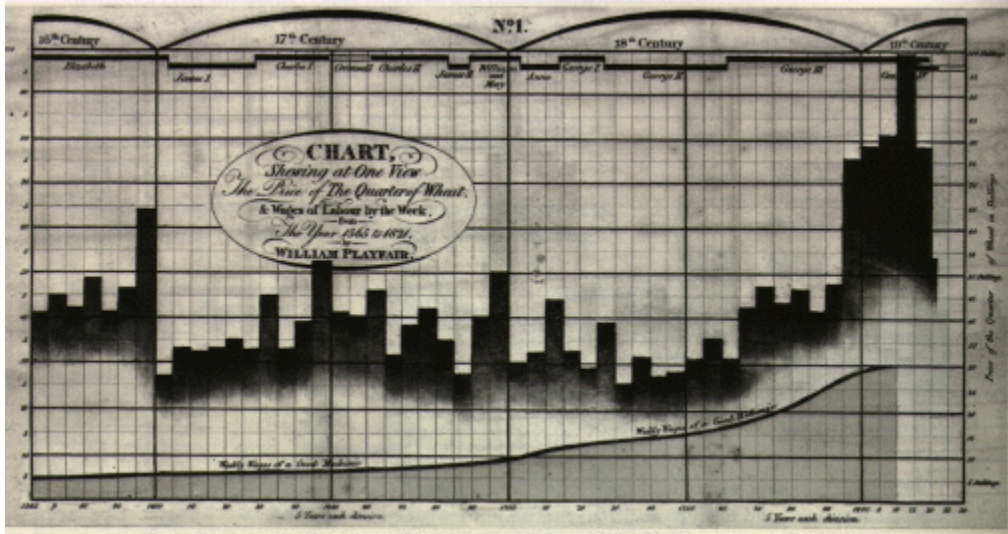
The National Map: Contour Separation



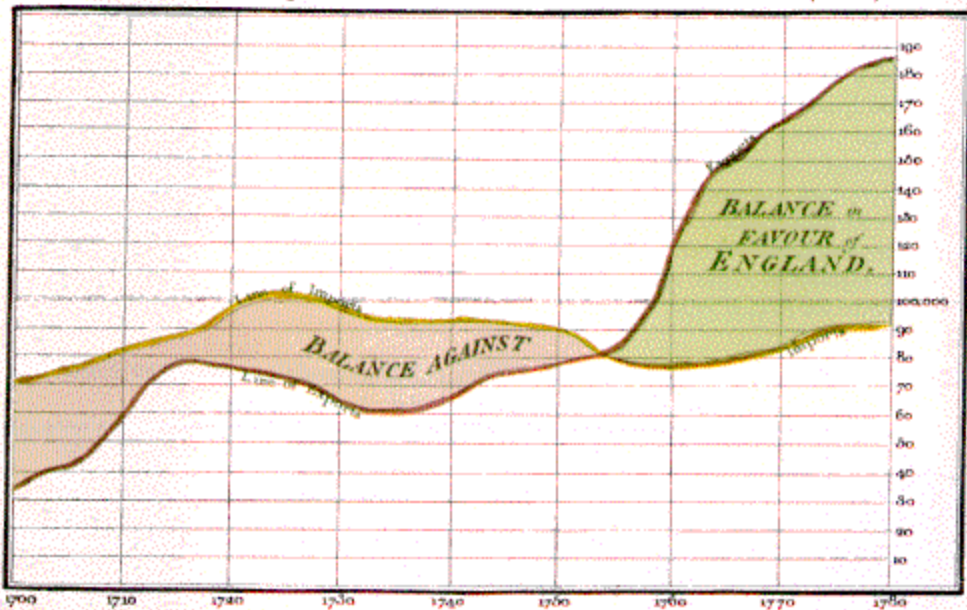
1786: Bar Charts, Line Graphs

- William Playfair (1759 –1823)
 - Huge figure in the world of figures
- First bar charts, line graphs, pie charts (1801)
- Trends in economic data

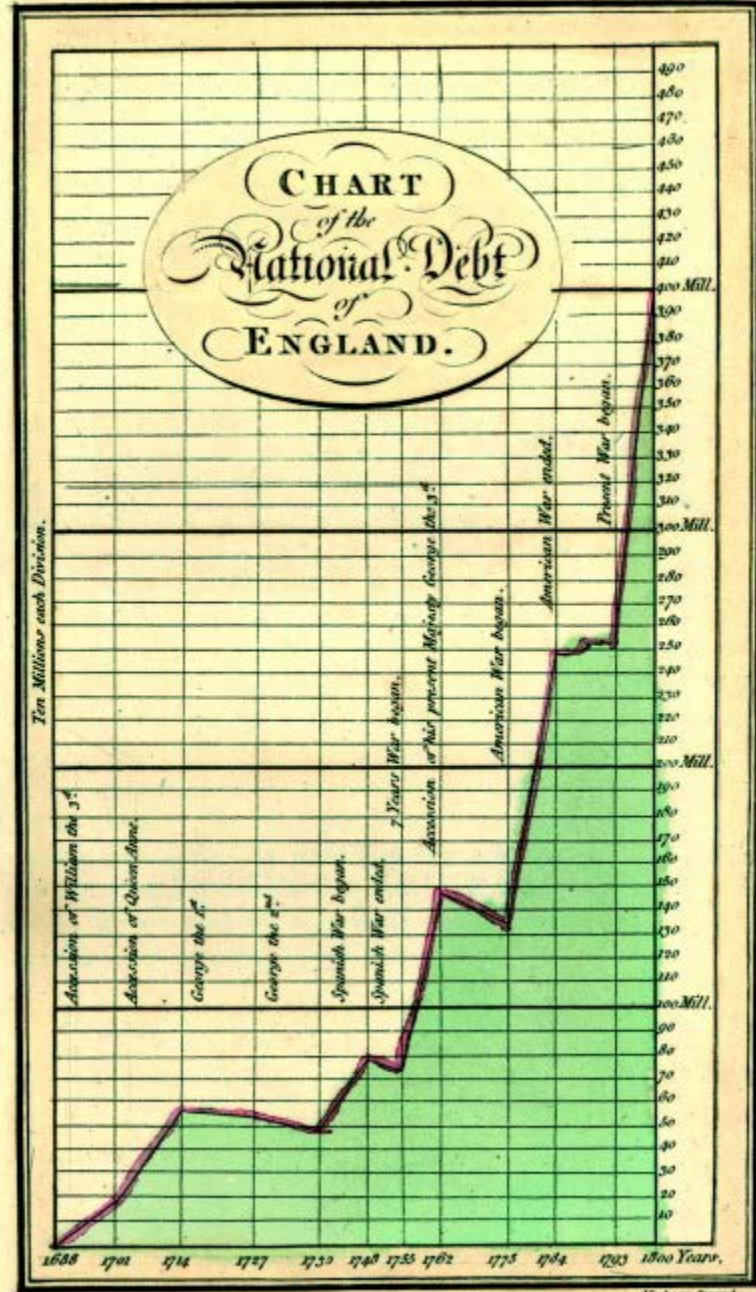


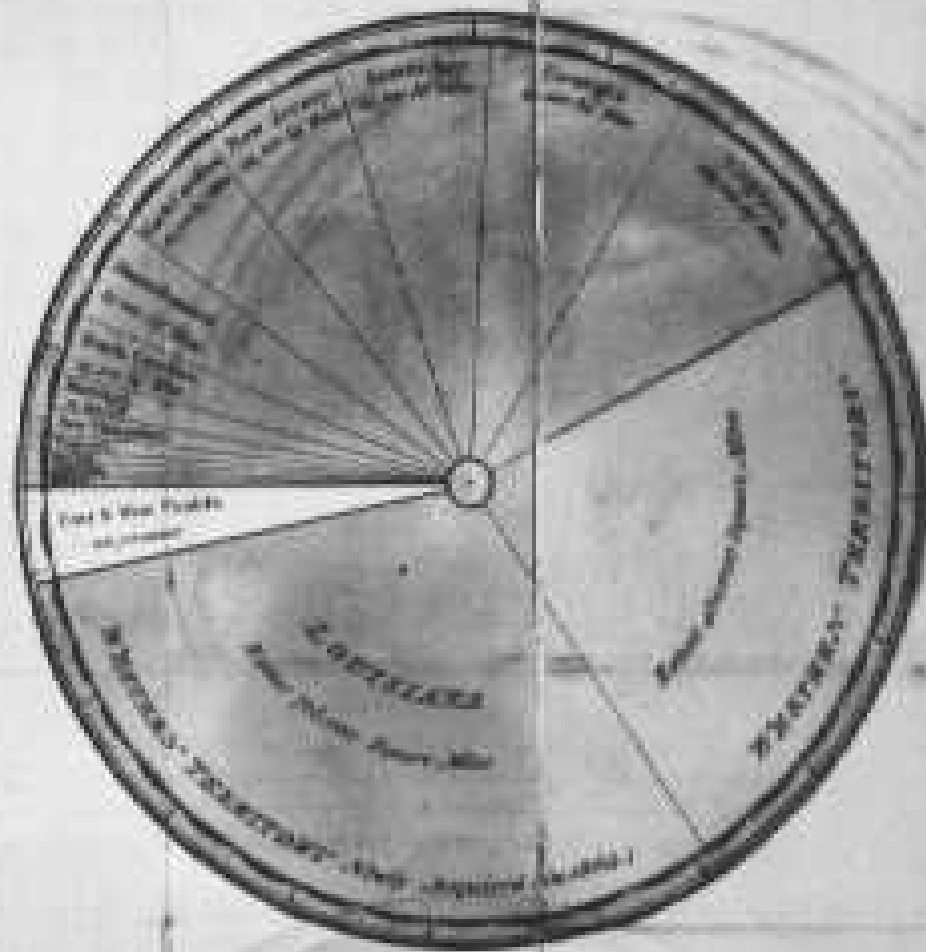


Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780



The Bottom line is divided into Years, the Right hand line into LI0,000 each. Published in the Advertiser 10th May 1846. By W^m Playfair. Made and Sold by M^r Wood, London.





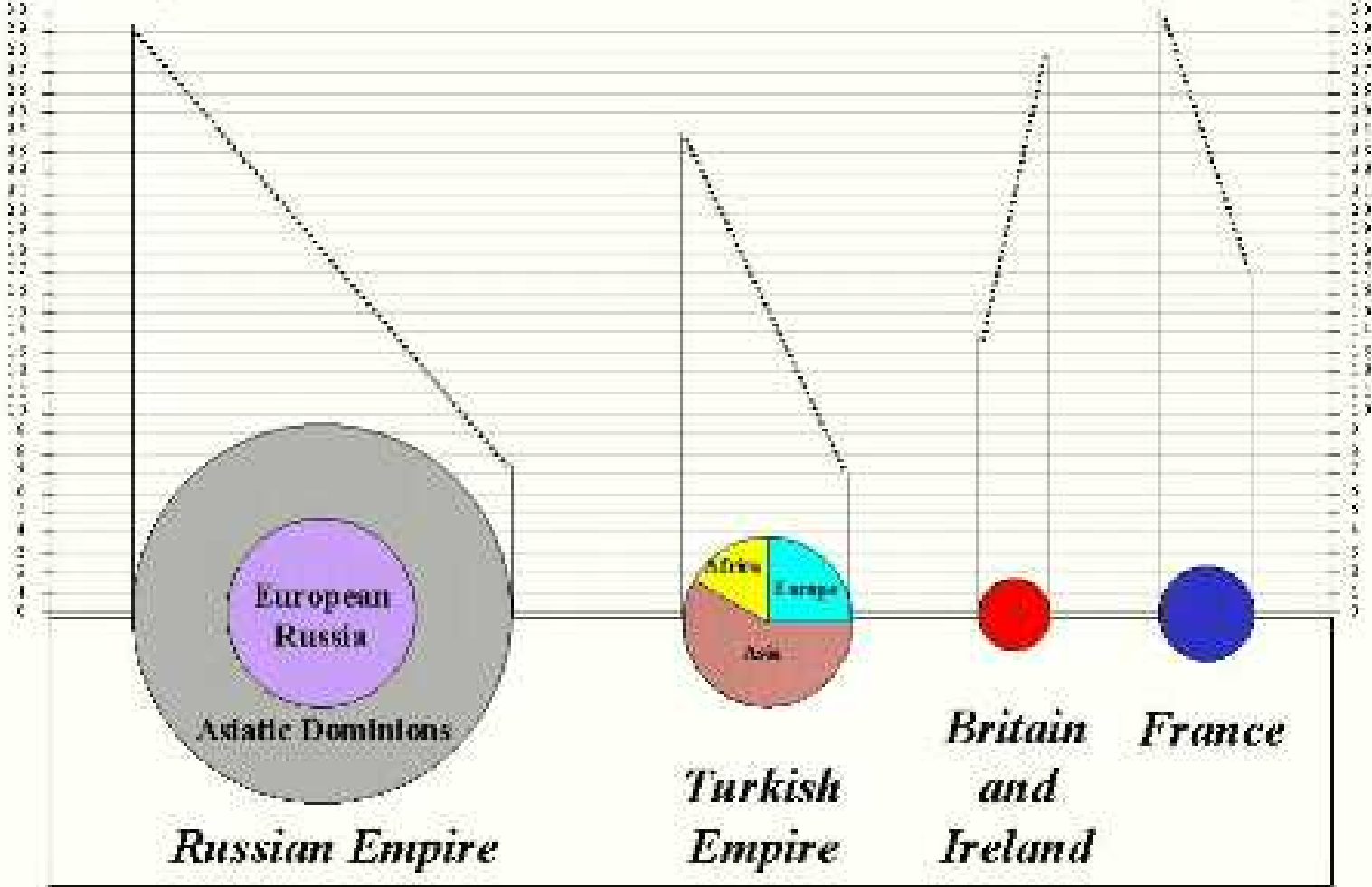
STATISTICAL REPRESENTATION OF THE UNITED STATES OF AMERICA.

BY W. F. FLEMMING.

The Statistical Bureau of the United States Department of Commerce and Labor.
First published in 1905. Revised in 1910.

**Population
(millions)**

**Tax
(£m)**

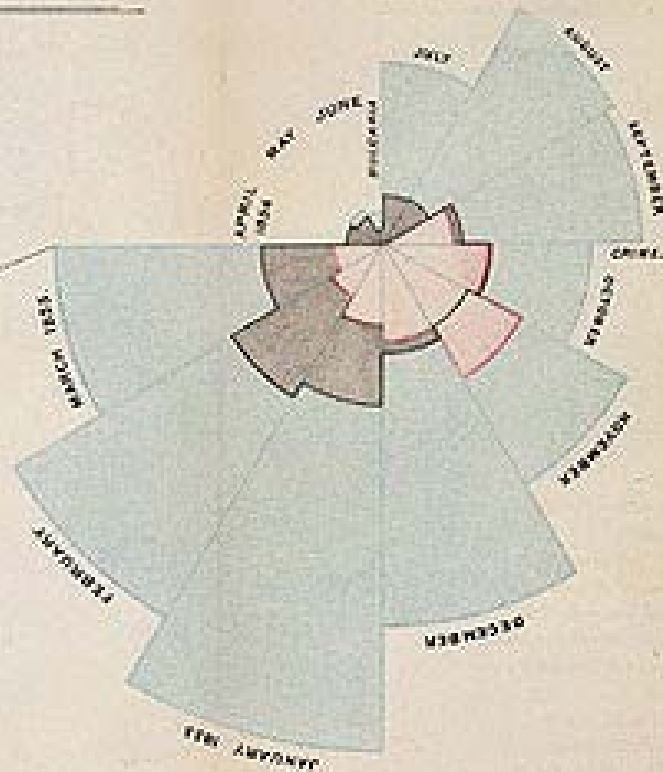
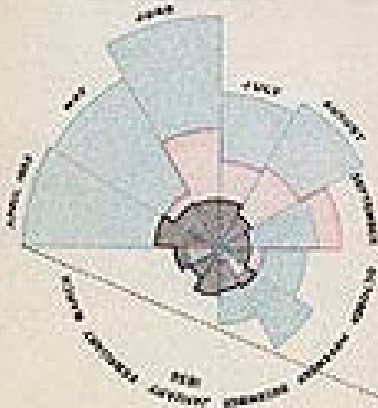


Florence Nightingale (1820-1910)

DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST.

II
APRIL 1855 to MARCH 1856.

I
APRIL 1854 to MARCH 1855.



The areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

The blue wedges measured from the centre of the circle represent area for area the deaths from preventable or mitigable zymotic diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.

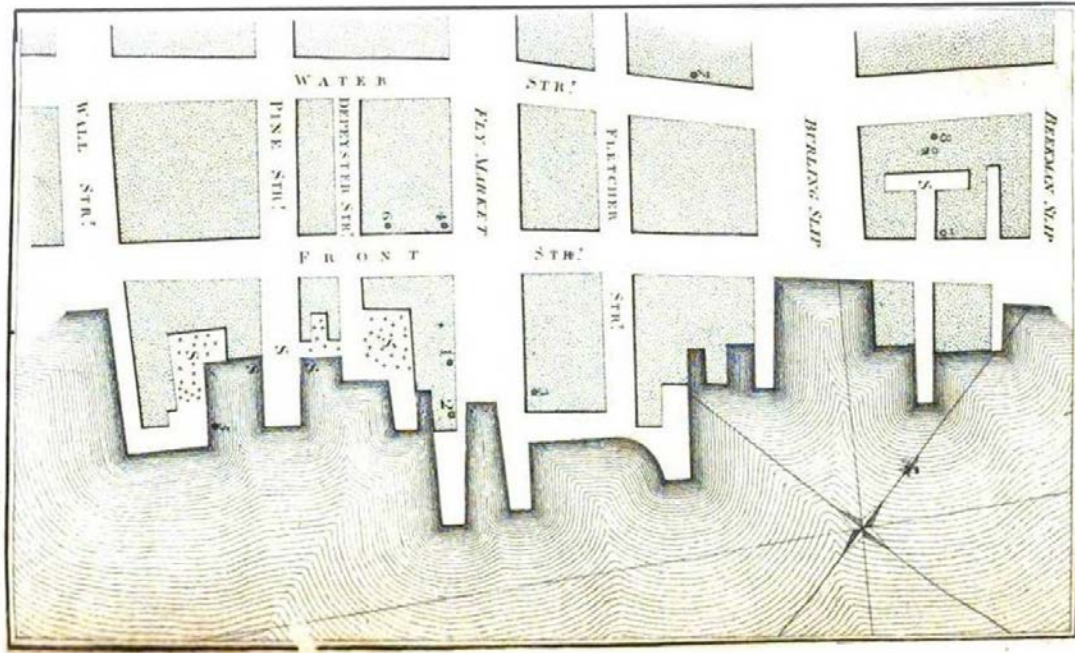
The black line across the red triangle in April 1854 marks the boundary of the deaths from all other causes during the month.

In October 1854, & April 1855 the black area coincides with the red, in January & February 1855 the blue coincides with the black.

The entire area may be compared by following the blue, the red & the black lines enclosing them.



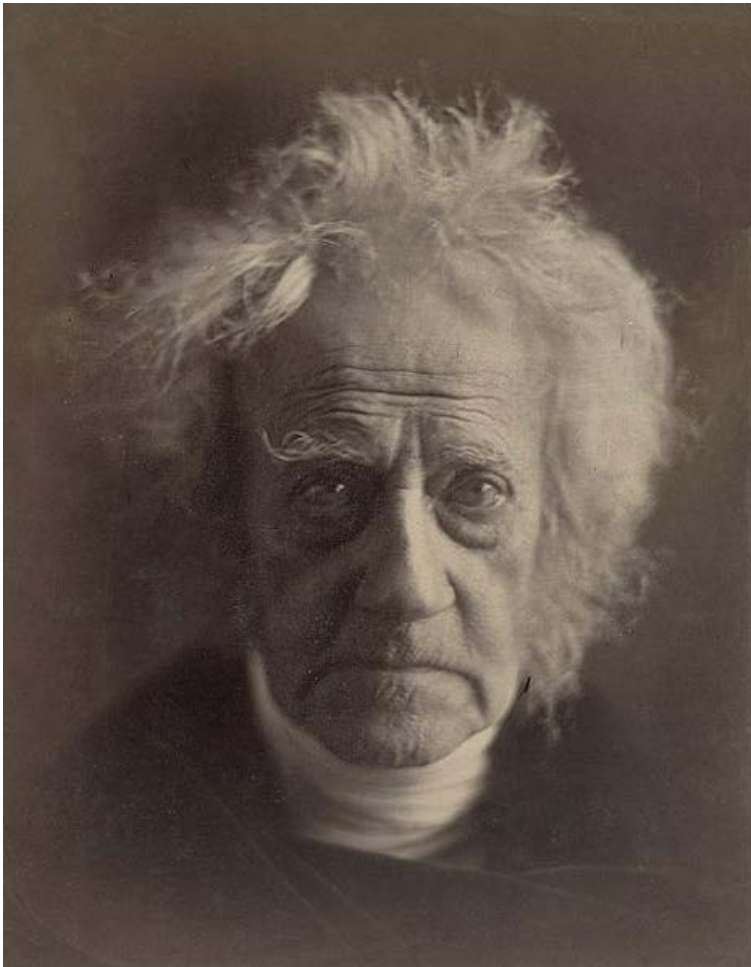
1798 First maps of the incidence of disease (yellow fever)



Using dots and circles to show individual occurrences in waterfront areas of New York

Valentine Seaman (1770-1817), USA

John Frederick W. Herschel (1792-1871)



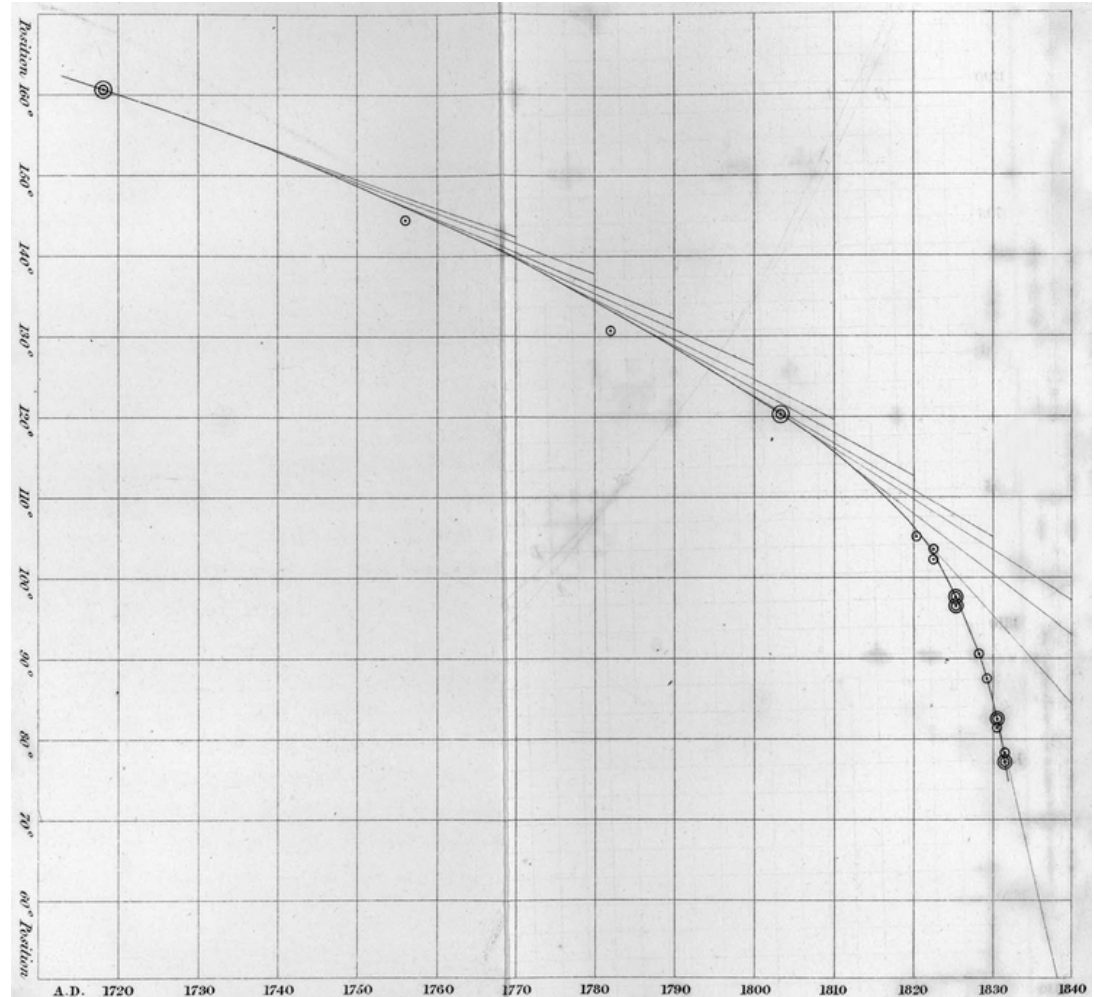
- Originated the use of the Julian day system
- Names the moons of Saturn and Uranus
- Made contributions to the science of photography
- Investigated color blindness
- Explored impact of ultraviolet



1832: Fitting a curve to a scatterplot

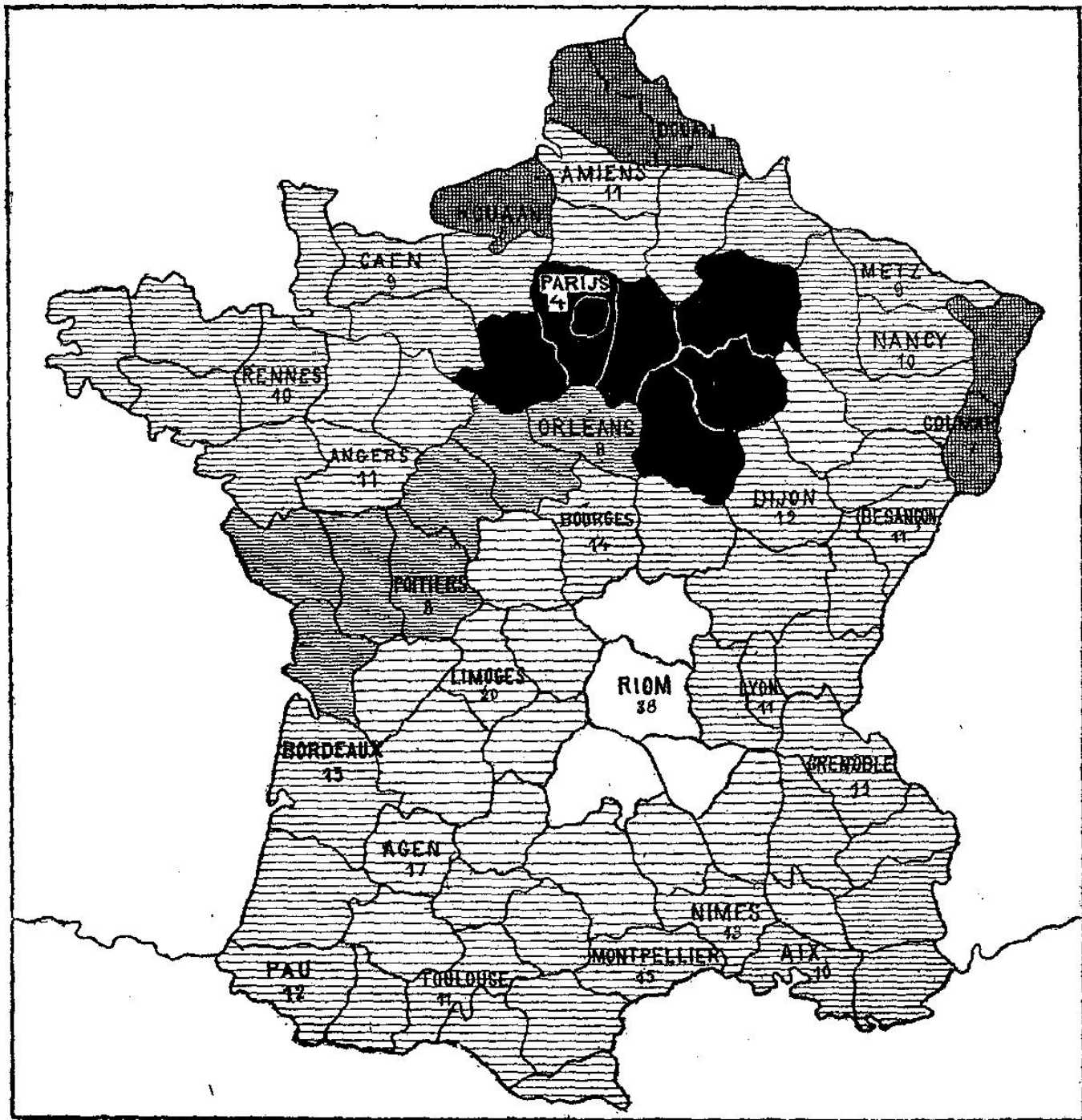
"The process by which I propose to accomplish this is one essentially graphical; by which term I understand not a mere substitution of geometrical construction and measurement for numerical calculation, but one which has for its object to perform that which no system of calculation can possibly do, by bringing in the aid of the eye and hand to guide the judgment, in a case where judgment only, and not calculation, can be of any avail." (p. 178)] -

**John Frederick W.
Herschel**



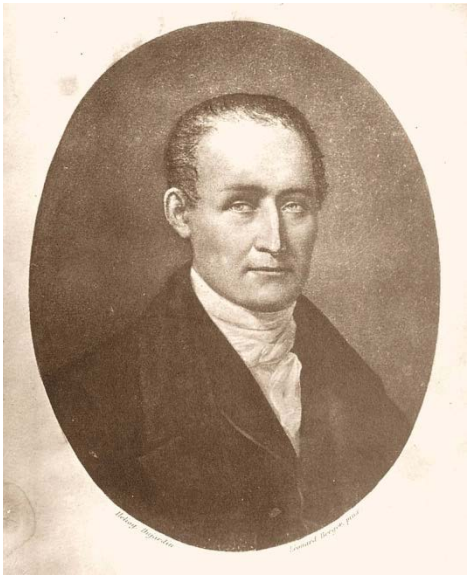
1819: First Choropleth-type Map

- Baron Pierre Charles Dupin 1784-1873
 - French
- Unclassed choropleth map of illiteracy
- Part of the moral statistics movement
- First “modern statistical map”



1827: First Successful Photograph

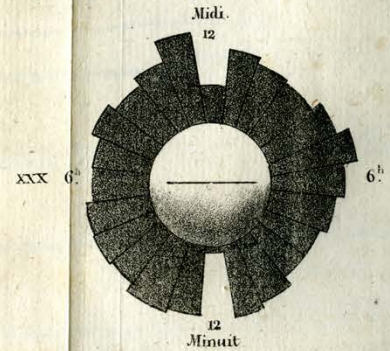
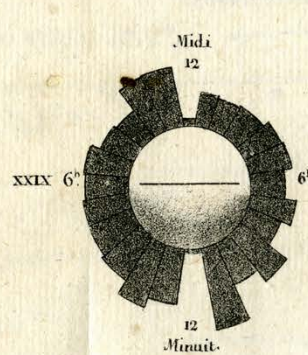
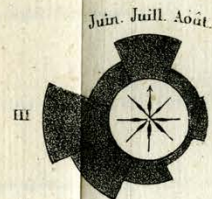
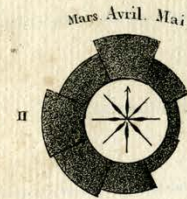
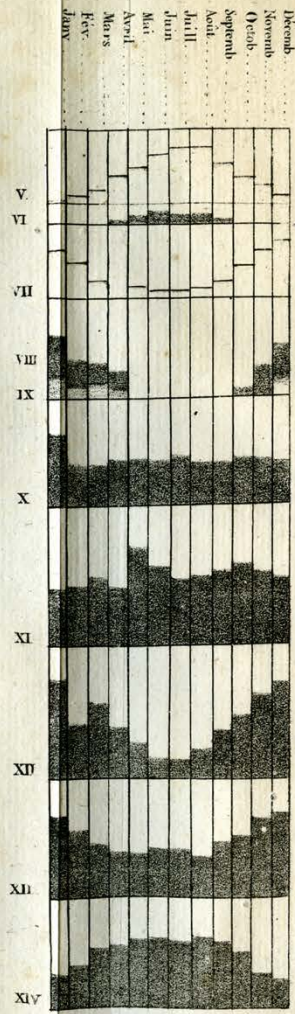
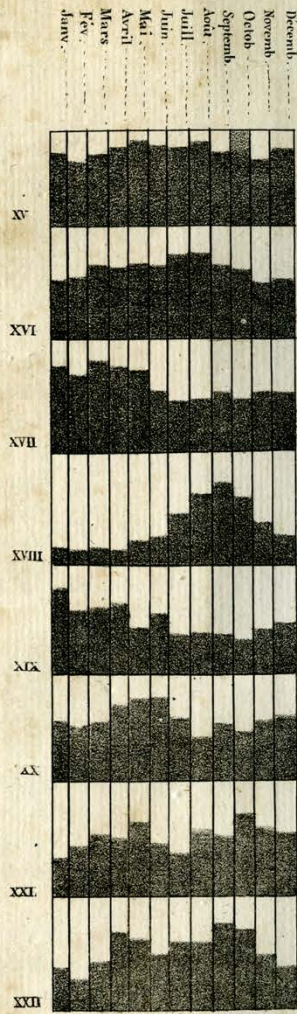
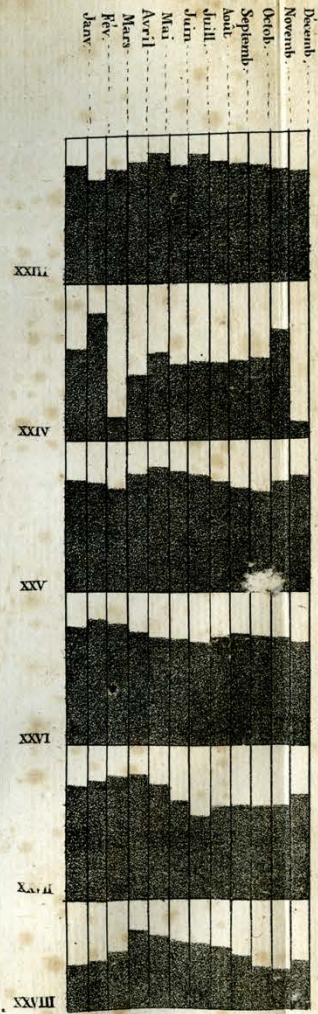
- 8-hour exposure
- Joseph Nicephore Niepce
 - French
 - Point de vue du Gras



1829: Polar-(Radar) charts

- Show frequency of cyclic phenomena
- Andre Michel Guerry 1802-1866
 - French
 - Lawyer and amateur statistician.
 - Together with Adolphe Quetelet founded moral statistics
 - Mapped crime and prostitution
 - Led to criminology, sociology and ultimately, modern social science.

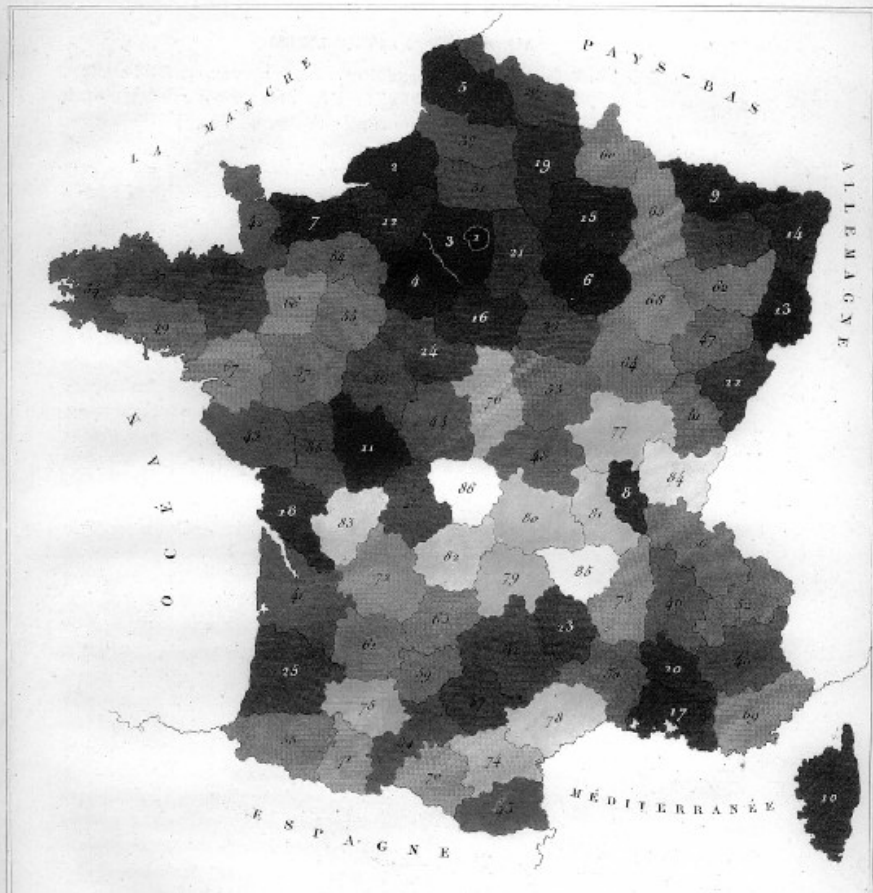
Liaison des variations météorologiques avec les phénomènes physiologiques.



CRIMES CONTRE LES PROPRIÉTÉS.

Statistique morale.

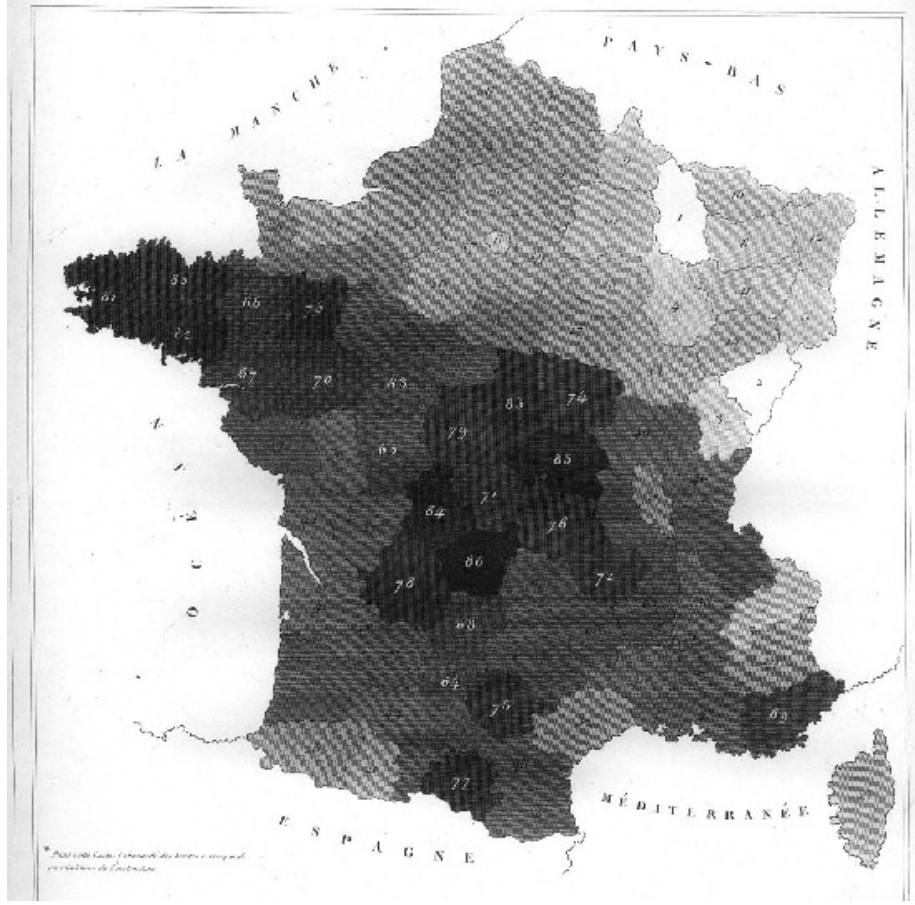
Pl. II



INSTRUCTION.

Statistique morale.

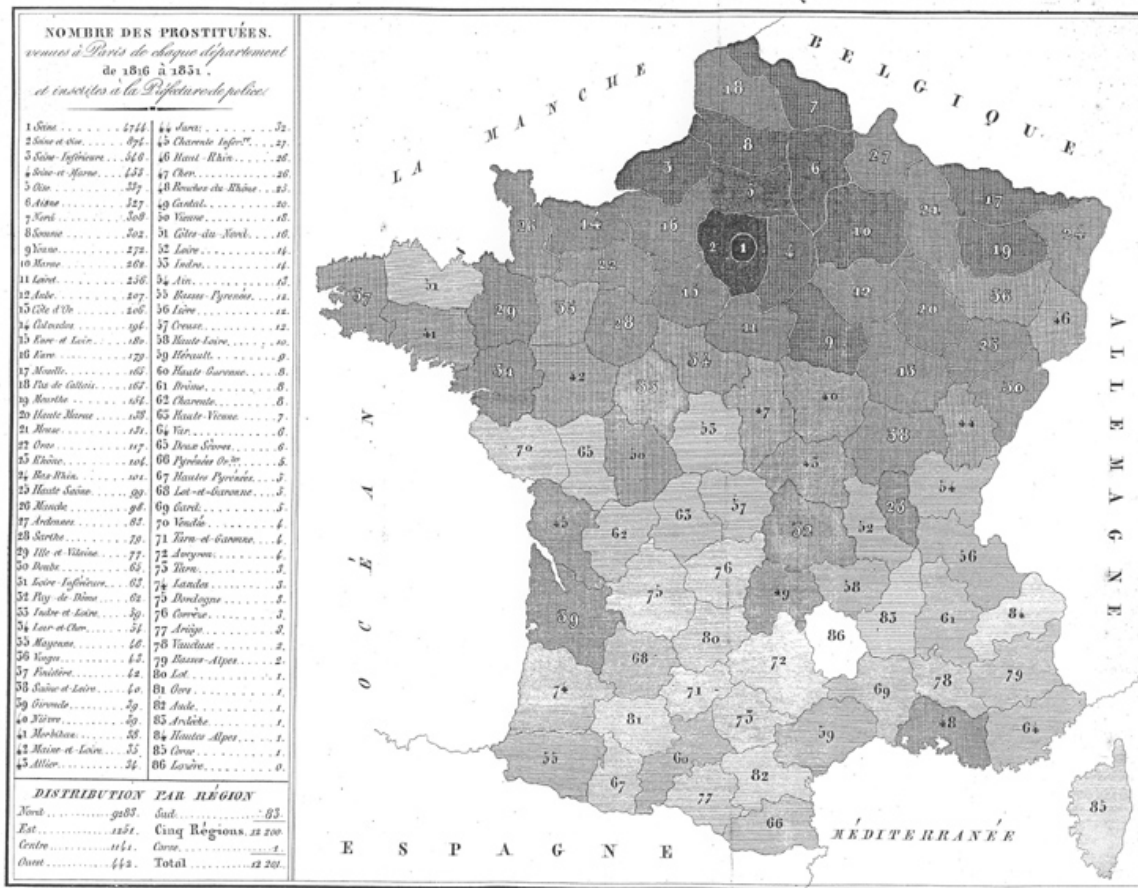
Pl. III



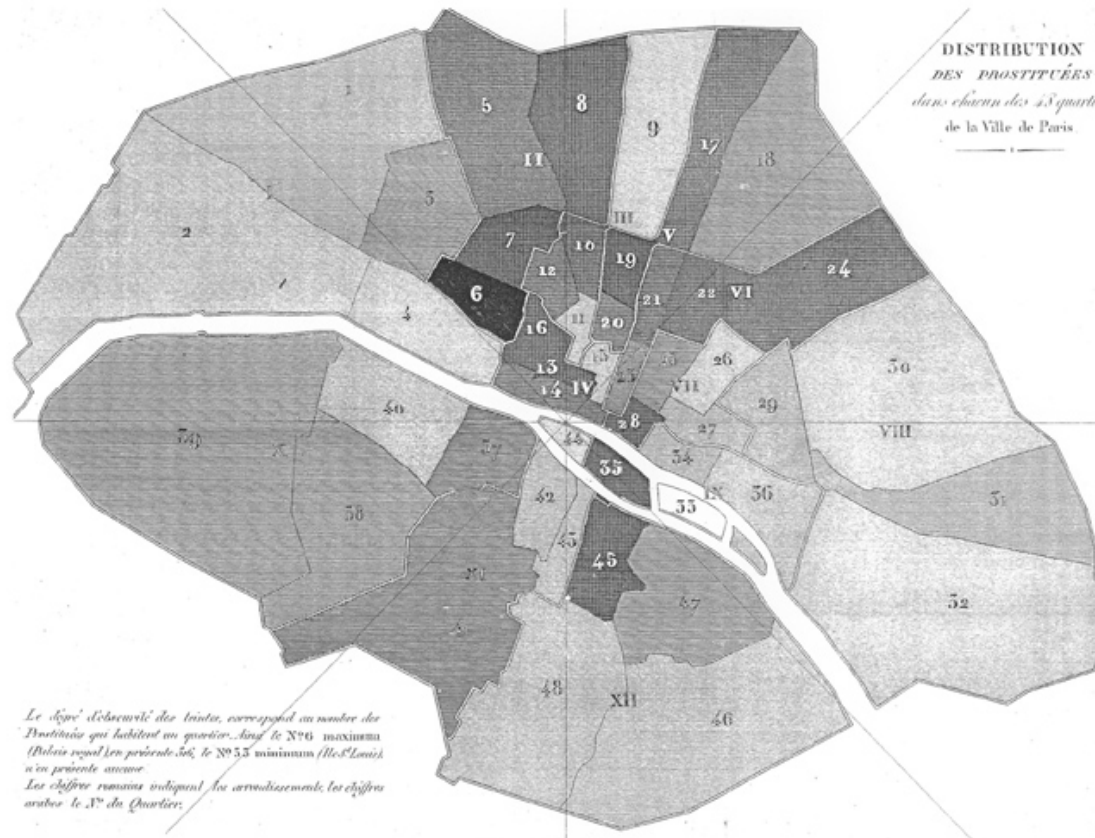
* Pour les départements où le nombre de crimes est nul, on a mis 0.

1836: Origins of Parisian Prostitutes

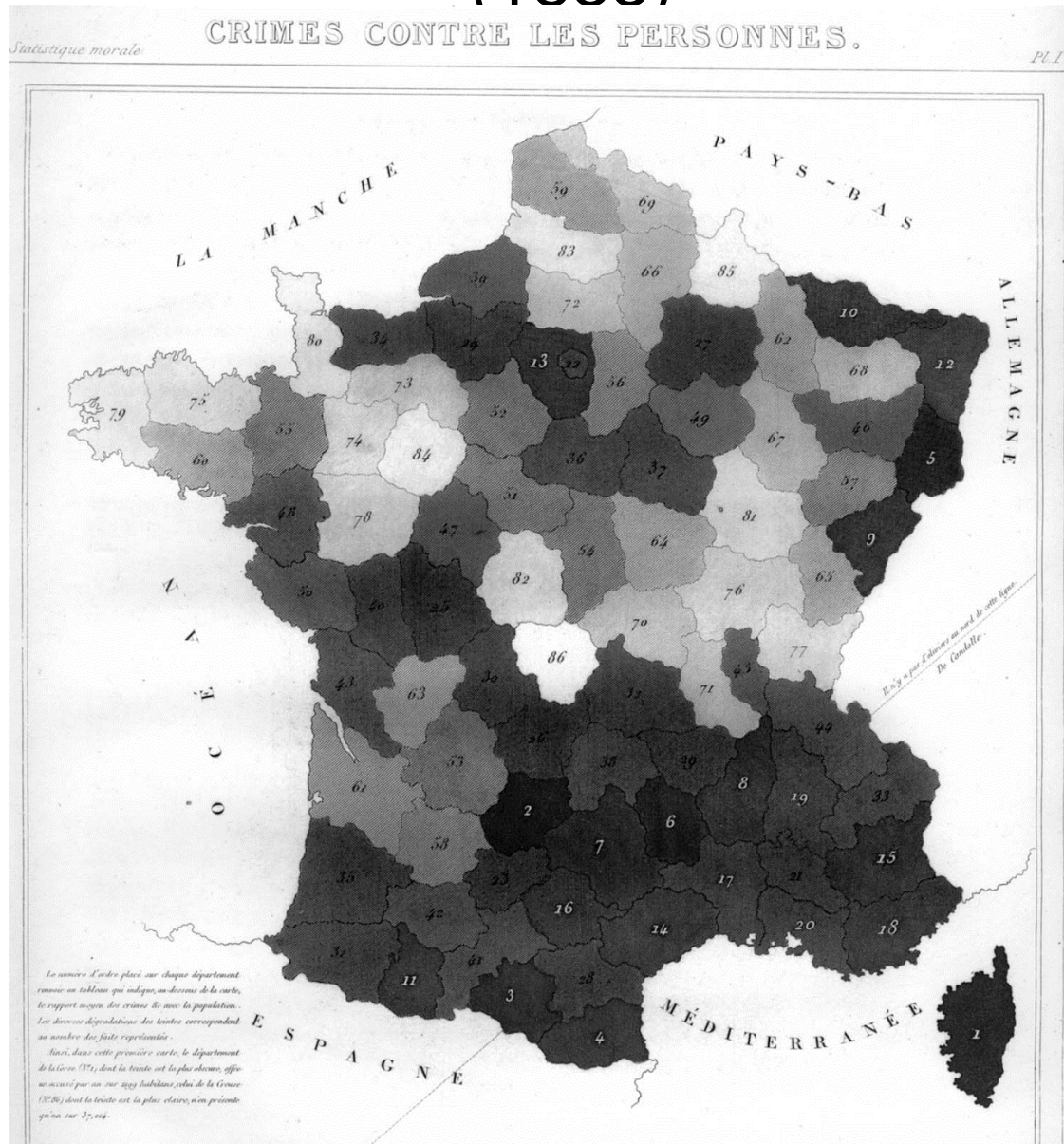
Alexandre Jean Baptiste Parent-Duchatelet (1790-1836), France



1836: Distribution of Parisian Prostitutes



Guerry's map of crimes against persons in France (1833)



1829: First Cartographic Small Multiples

- Andre Michel Guerry
- Crimes against persons compared to poverty
- Balbi, Adriano, and André-Michel Guerry. 1829. *Statistique comparée de l'état de l'instruction et du nombre des crimes dans les divers arrondissements des Académies et des Cours Royales de France*. Paris
- Also studied suicide, analyzed text reports

STATISTIQUE COMPARÉE

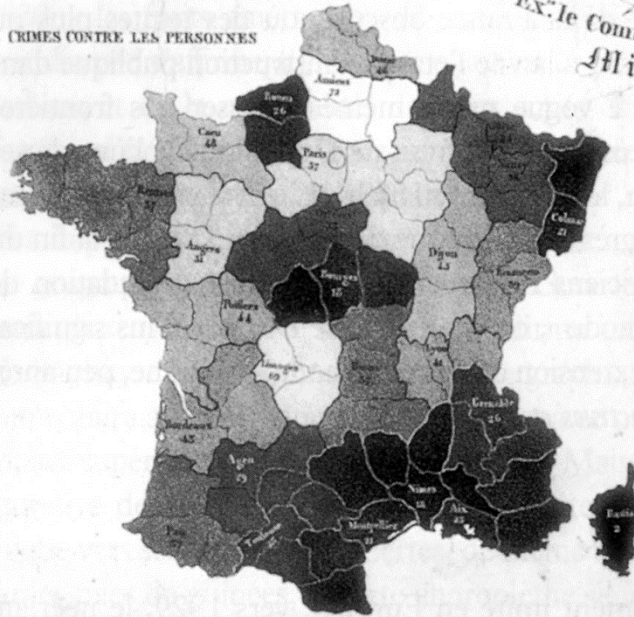
DE L'ÉTAT DE L'INSTRUCTION ET DU NOMBRE DES CRIMES

dans les divers Arrondissements des Académies et des Cours R^o de France

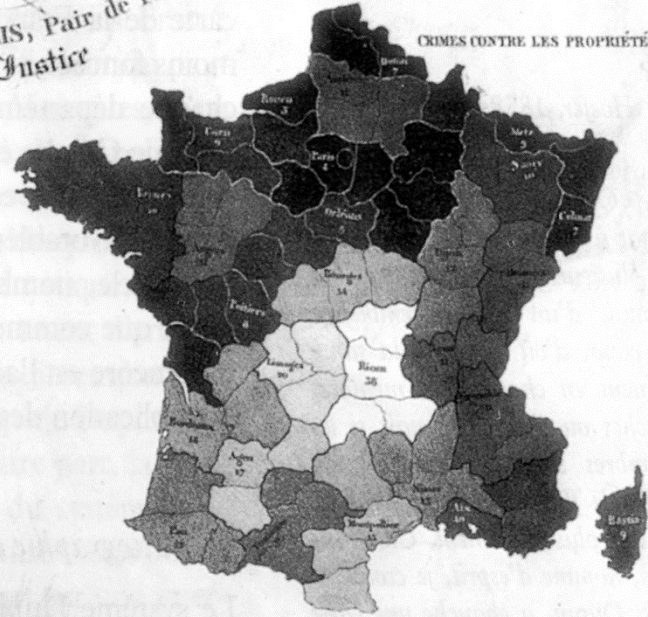
PAR A. BALBI & A. M. GUERRY, Avocat.

A Son Ex.^{te} le Comte DE PORTALIS, Pair de France,
Ministre de la Justice

CRIMES CONTRE LES PERSONNES



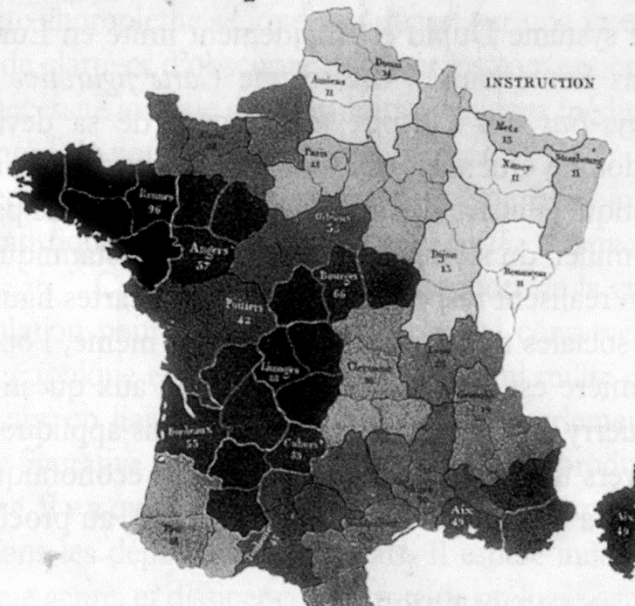
CRIMES CONTRE LES PROPRIÉTÉS



CRIMES

INSTRUCTION

Contre les personnes		Contre les propriétés		Contre les personnes et les propriétés		Analphabètes		Lettres	
Nombre	Par habitant	Nombre	Par habitant	Nombre	Par habitant	Nombre	Par habitant	Nombre	Par habitant
Bastia 2 368	10,8	Paris 37	1,1	Paris 37	1,1	Paris 37	1,1	Paris 37	1,1
Angers 31	0,9	Paris 35	1,0	Paris 35	1,0	Paris 35	1,0	Paris 35	1,0
Poitiers 44	1,3	Paris 30	0,9	Paris 30	0,9	Paris 30	0,9	Paris 30	0,9
Angers 31	0,9	Paris 26	0,8	Paris 26	0,8	Paris 26	0,8	Paris 26	0,8
Angers 31	0,9	Paris 21	0,6	Paris 21	0,6	Paris 21	0,6	Paris 21	0,6
Angers 31	0,9	Paris 15	0,4	Paris 15	0,4	Paris 15	0,4	Paris 15	0,4
Angers 31	0,9	Paris 10	0,3	Paris 10	0,3	Paris 10	0,3	Paris 10	0,3
Angers 31	0,9	Paris 5	0,1	Paris 5	0,1	Paris 5	0,1	Paris 5	0,1
Angers 31	0,9	Paris 2	0,0	Paris 2	0,0	Paris 2	0,0	Paris 2	0,0



Les deux premières cartes partent d'après le Compte général de l'Administration de la Justice... et d'après le dernier recensement, le rapport moyen du nombre des condamnés à la population dans les départements qui forment l'arrondissement de chaque Cour Royale. Les chiffres indiquent sur combien de mille habitants se rencontre un condamné. Ainsi pour les crimes contre les personnes, l'arrondissement de la Cour royale de Bastia en compte 1 sur 2000 celui de la Cour royale d'Amiens 1 sur 72,000.

La troisième carte, tirée par académies dans les arrondissements sont les mêmes que ceux des Cours royales, la exception de la Corse qui ressort de l'Académie d'Alais, offre d'après les derniers états officiels dressés au Ministère de l'Instruction publique et qui remontent à 1828, le rapport du nombre des écoliers maîtres à la population de chaque Académie.

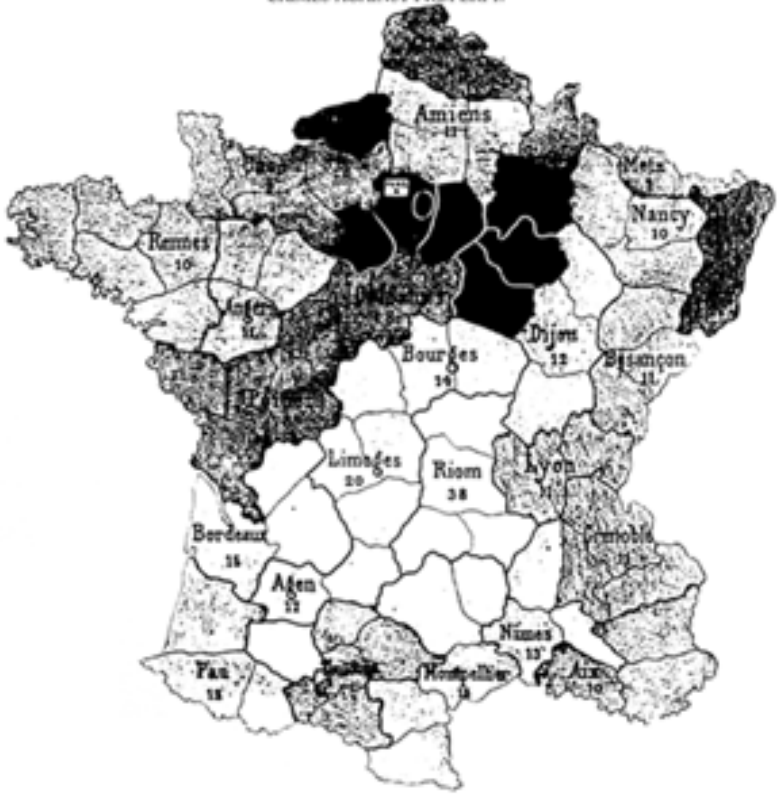
Les chiffres indiquent sur quel nombre d'habitants il y a un écolier. On voit que dans l'arrondissement de l'Académie de Rennes, il en trouve 1 sur 61 et 1 sur 2 dans les académies de Bourges d'Amiens et de Nancy.

— Prix 5 francs —

STATISTIQUE COMPARÉE Comparative Statistics
 du nombre des crimes dans les divers arrondissements
 des Cours Royales de France
 en 1825, 1826 et 1827 (Extrait de la Carte)
 par A. Balby et A. M. Guerry Avocat.
 for the number of crimes in the
 different arrondissements of the
 Royal Courts of France in 1825,
 1826 and 1827. (Extract from
 the Map) by A. Balby and A.M.
 Guerry Lawyer.

Fig. 1.

CRIMES CONTRE LES PROPRIÉTÉS.
 CRIMES AGAINST PROPERTY.



Les chiffres indiquent sur combien de mille habitants se rencontre un condamné.
 The figures indicate in how many thousand inhabitant is found a condemned person.

Fig. 2. Extract from the Tables of linear Arithmetic by William Playfair, Edition of Barrois, Paris, 1787
 Extrait des Tableaux d'Arithmétique linéaire de William Playfair... Edition de Barrois-Paris.1787.

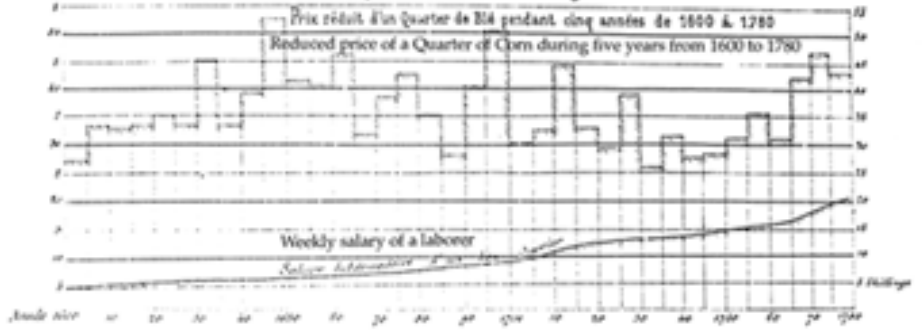
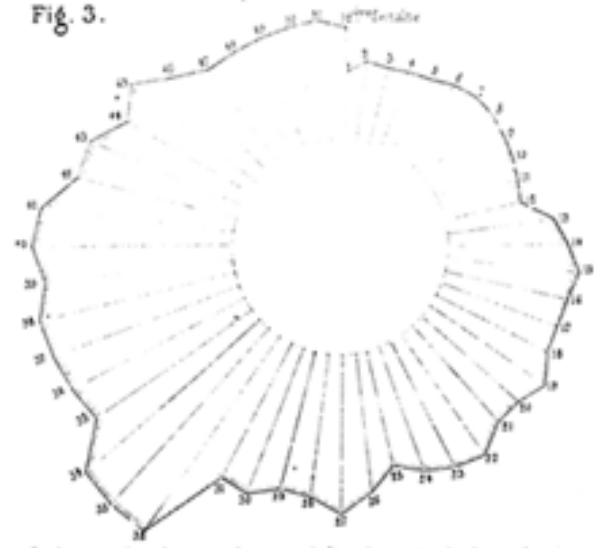


Table of the weekly Revenues of the Railways of the West in 1858.
 Tableau des Recettes hebdomadaires des Chemins de fer de l'Ouest en 1858.
 par M. MASSICART. by Mr. Massicart.

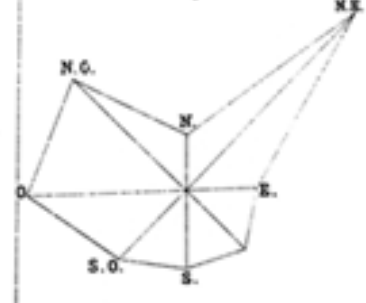
Fig. 3.



La longueur du prolongement des rayons indique la recette de chaque Semaine à raison d'un millimètre pour 14,000 Francs.
 The length of the extension of the rays indicates the revenue from each Week at the rate of one millimeter for 14,000 Francs.

Fig. 4.

Principal Winds which prevailed in
 Phare de Cordouan during the year 1842.
 Principaux Vents qui ont régné au
 Phare de Cordouan pendant l'année 1842.



Les longueurs des lignes à partir du Centre de la Rose de Vents ci-dessus sont proportionnelles aux nombres de jours pendant lesquels les Vents ont soufflé.
 The lengths of the lines from the Center of the Compass above are proportional to the numbers of days during which the Winds blew.

Adolphe Bravais et Charles de Moivre, A. P. P. Paris & Phila.

Émile Levasseur (1828-1911), France Early information graphic

Offshore companies

May be legal but can facilitate tax evasion



Country with low or zero tax rates for non residents and a degree of secrecy (Virgin Islands, Panama, Delaware, etc.) = Tax haven

= Tax haven

Specialised law firm



Fund holder seeks:
• anonymity
• to avoid taxes



Tax lawyer



manages without being identified

creates



Offshore firm

provides



"Nominees"

buys/sells



property



yachts

carries out



bank transactions

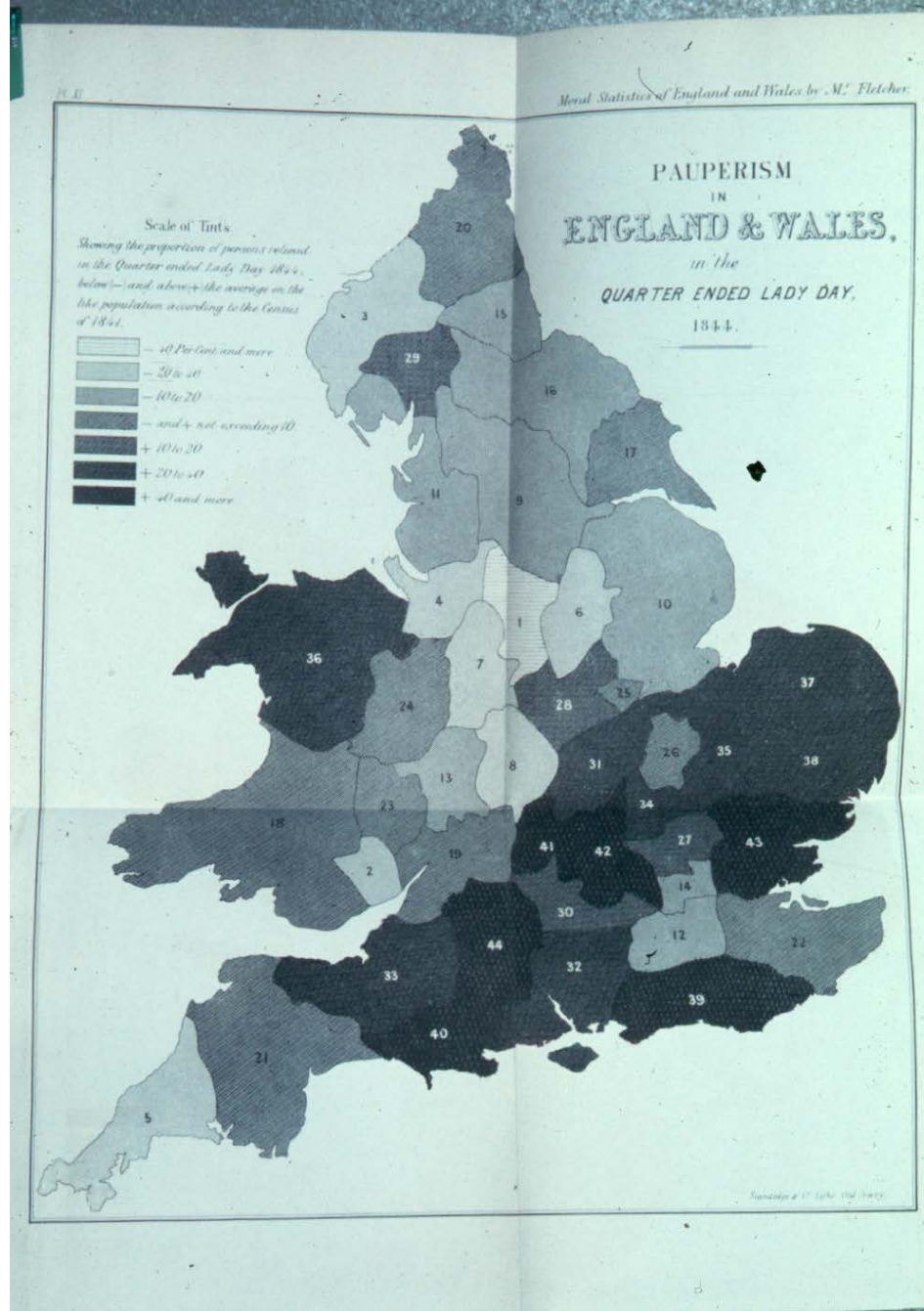
sets up shell companies



Shell companies bury the origins of the funds even more deeply

Joseph Fletcher 1844

- First “choropleth” map
- “Pauperism” in England & Wales



1837: First Flow Map

- Henry Drury Harness 1804-1883
 - Irish
 - Commander Royal Engineers at the siege and capture of Lucknow during the Indian Mutiny



John Snow's 1854 map of Cholera

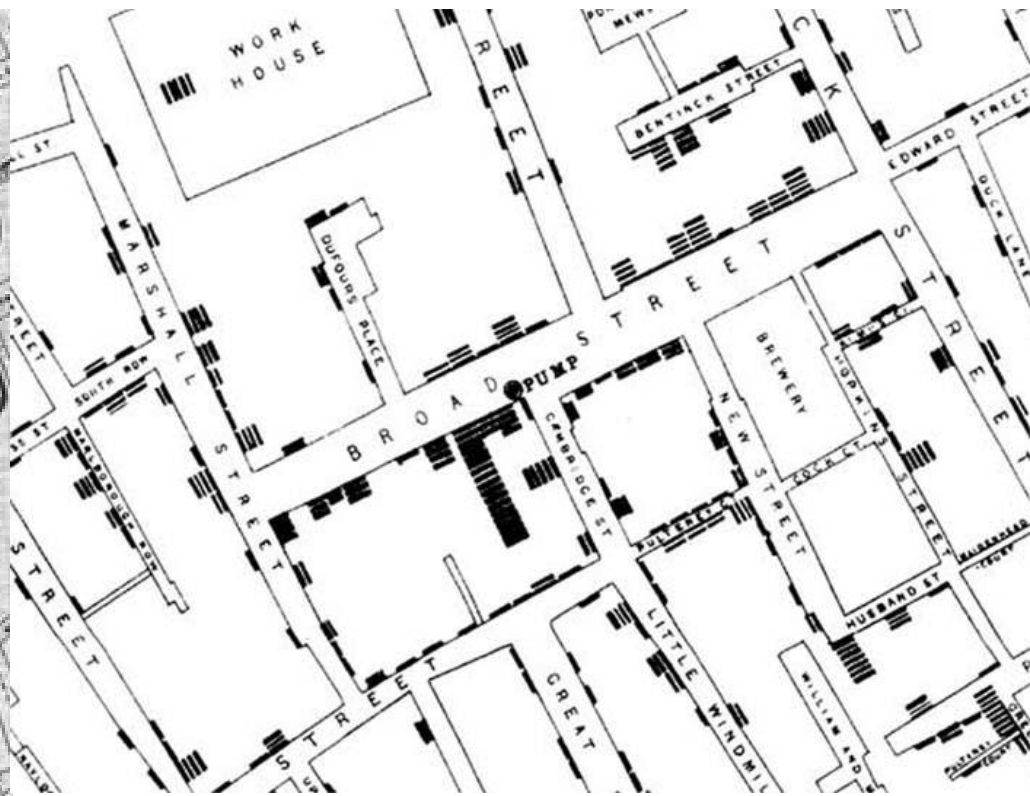
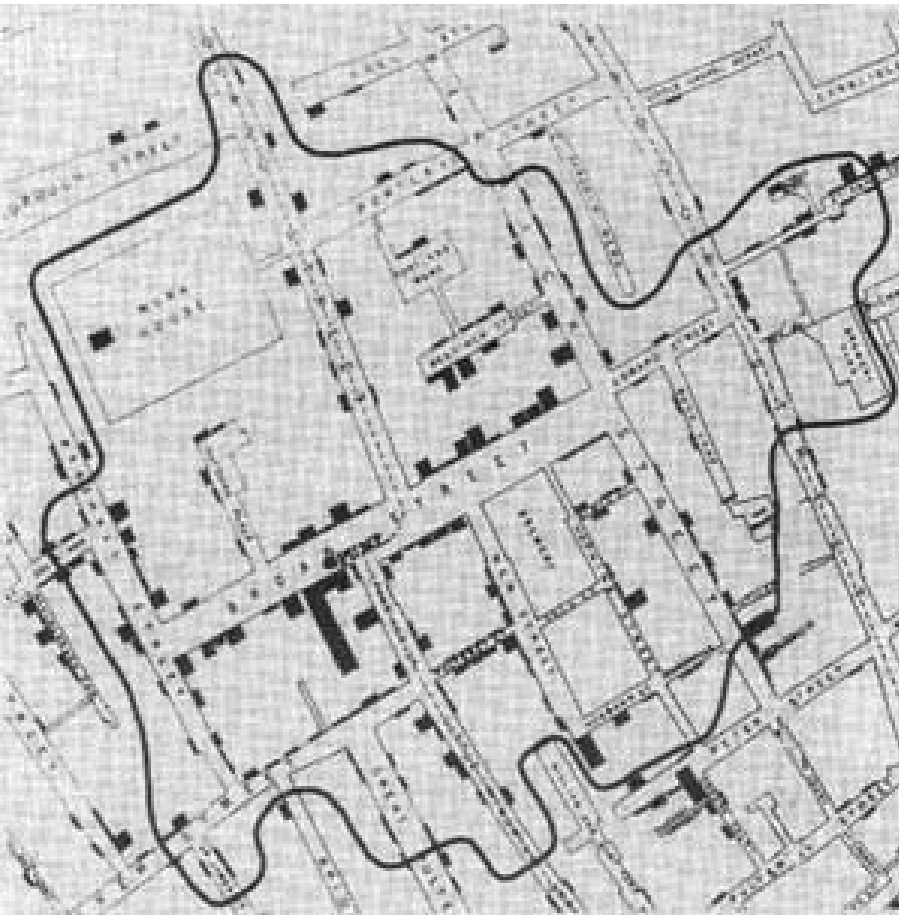
- Shows the frequency and spatial distribution of cholera cases in a London neighborhood
- Revealed the source was a contaminated water pump



The Broad Street Pump



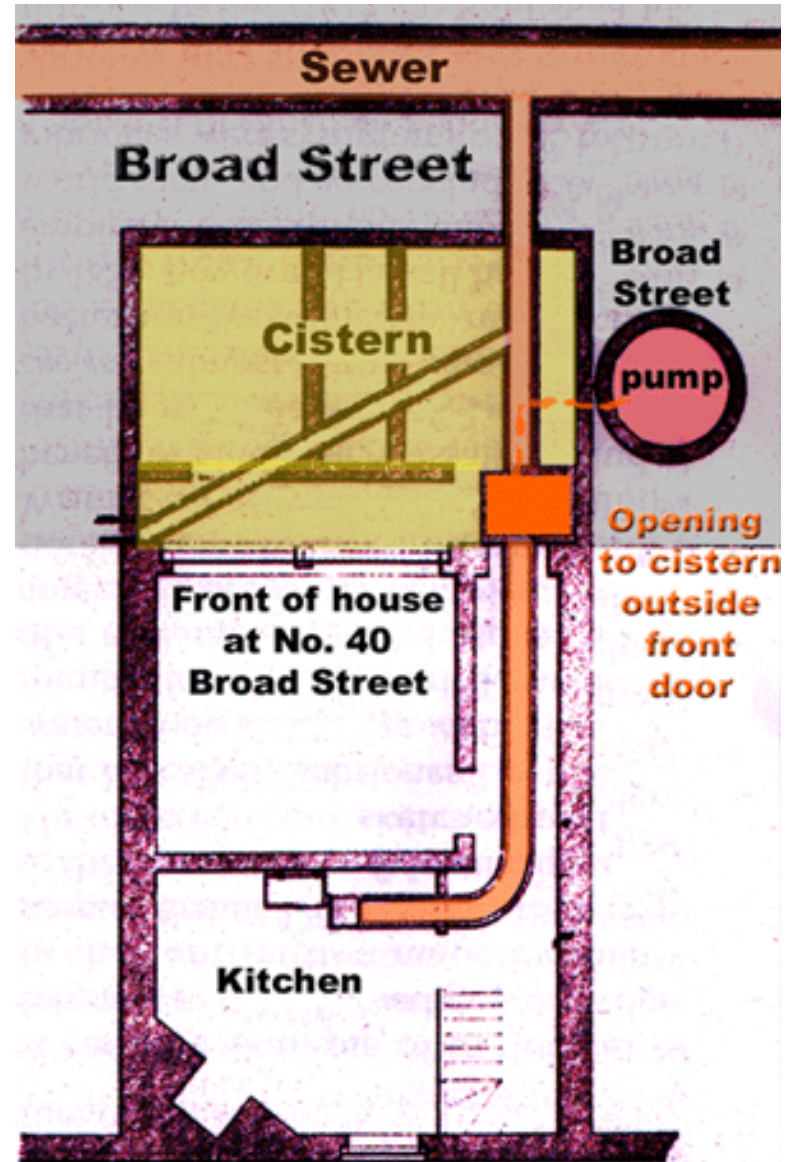
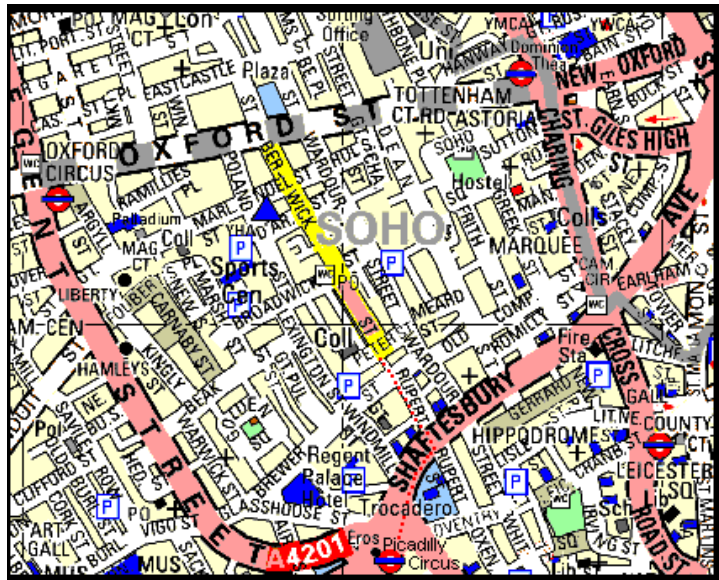
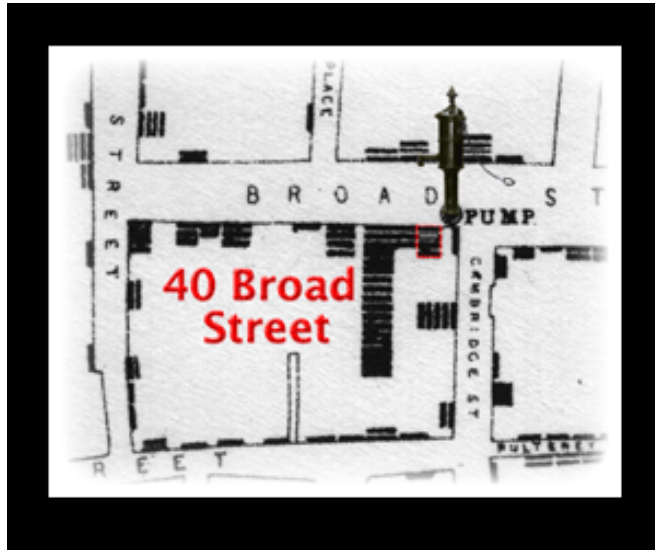
The Cholera Epidemic of 1854



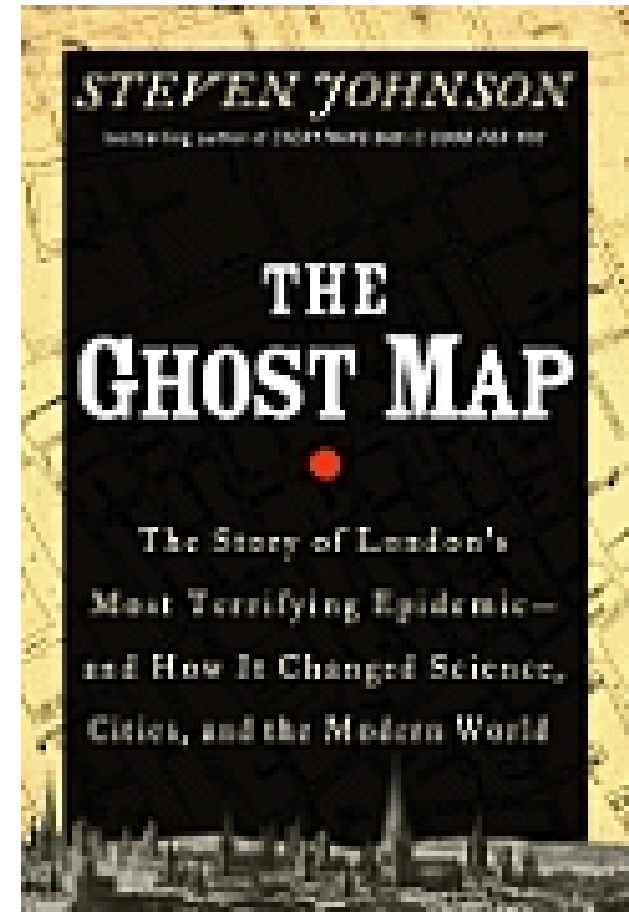
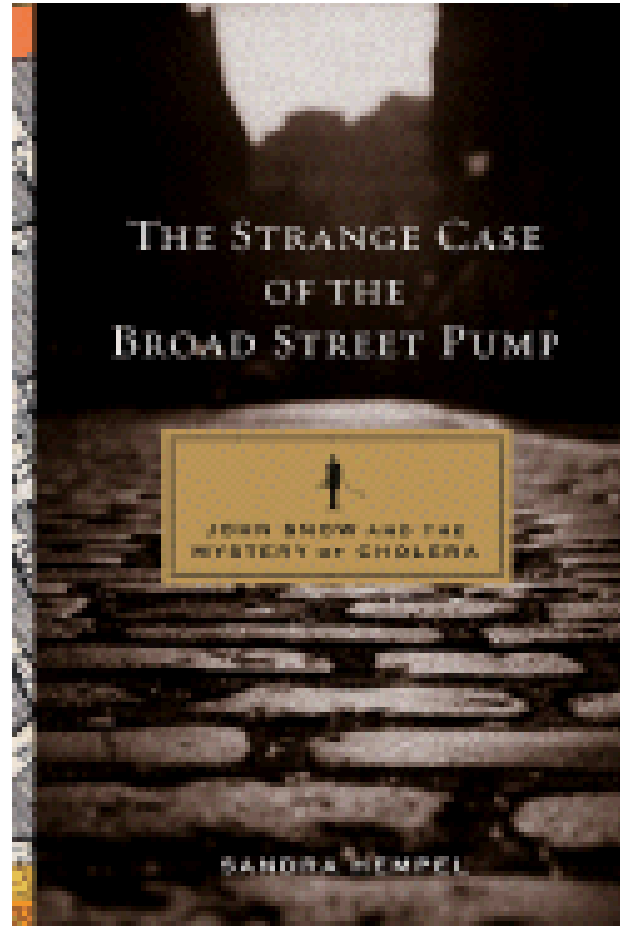
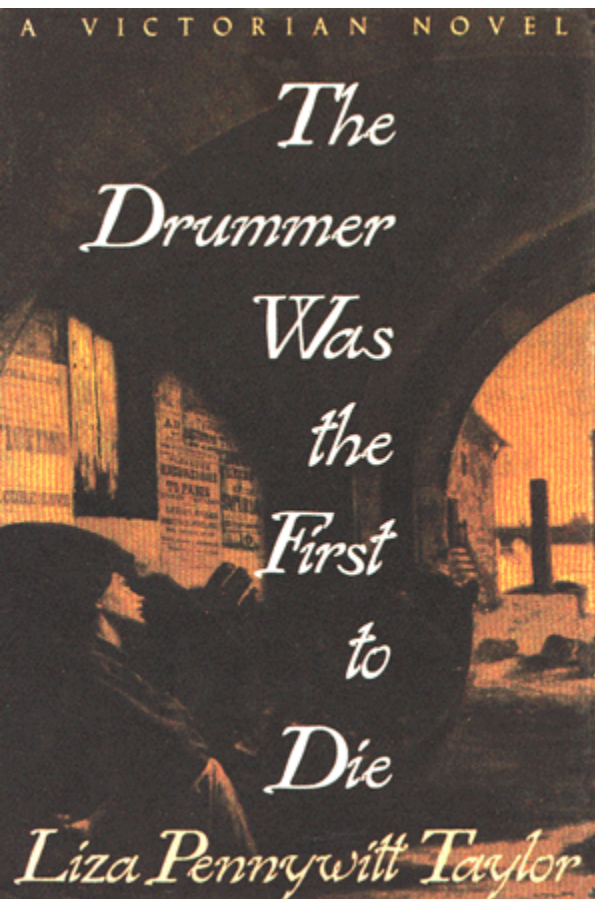
London Waterworks 1856



The Index Case



The Snow Map



Booth's Atlas of London 1898-99

See: <https://booth.lse.ac.uk/map/14/-0.1174/51.5064/53/0>

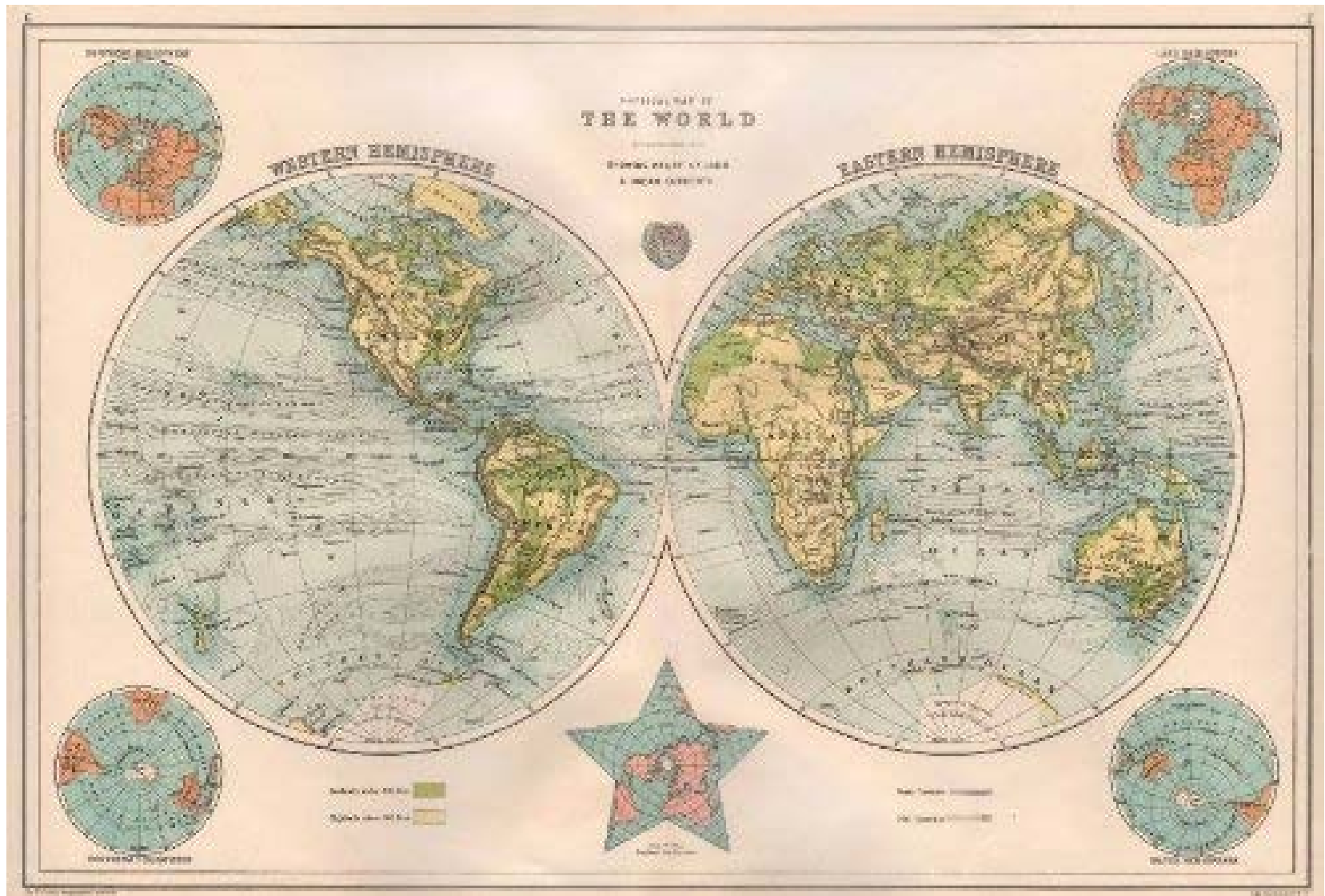


	BLACK: Lowest class. Vicious, semi-criminal.
	DARK BLUE: Very poor, casual. Chronic want.
	LIGHT BLUE: Poor. 18s. to 21s. a week for a moderate family
	PURPLE: Mixed. Some comfortable others poor
	PINK: Fairly comfortable. Good ordinary earnings.
	RED: Middle class. Well-to-do.
	YELLOW: Upper-middle and Upper classes. Wealthy.

Thematic Atlases

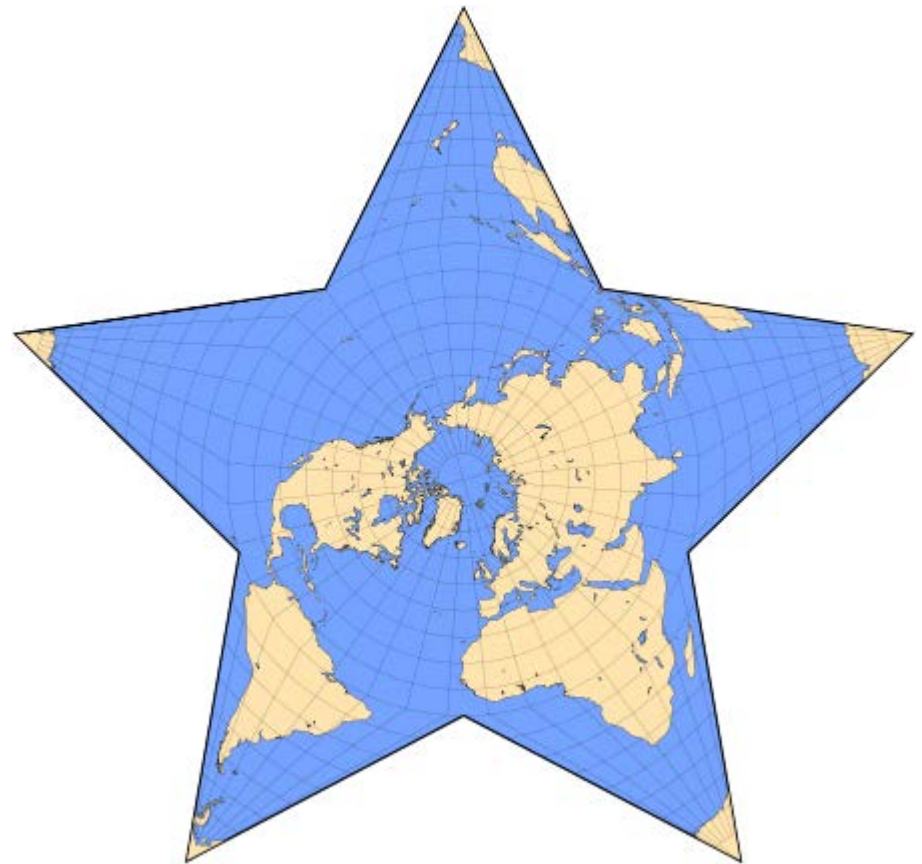
- Heinrich Berghaus (1797-1884), Germany
- Worked on Prussian trigonometrical survey in 1816, pioneer at Potsdam
- Physical atlas of the distribution of plants, animals, climate, etc.
- Contained tables, graphs, pictorial profiles of distributions over altitude
- Cultural and human themes
- *Physikalischer Atlas* (Gotha, 1838–1848)

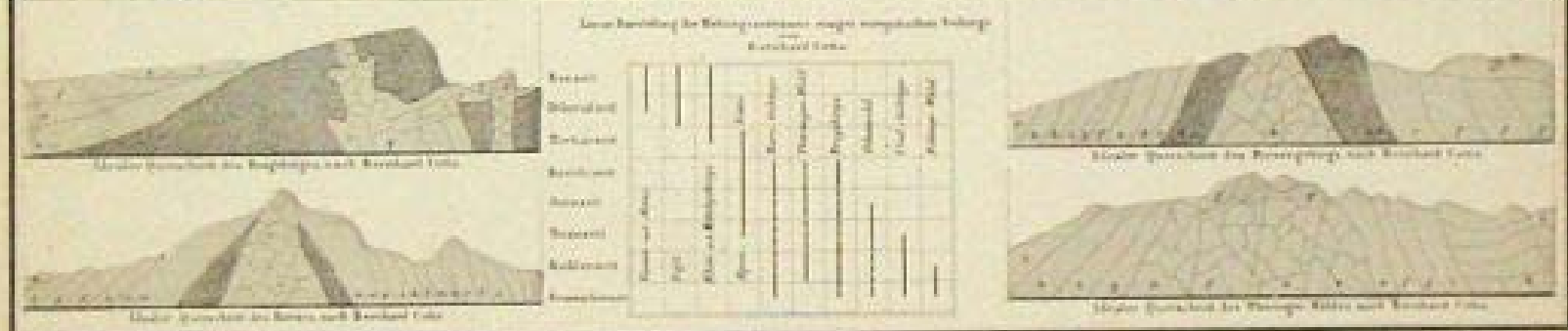
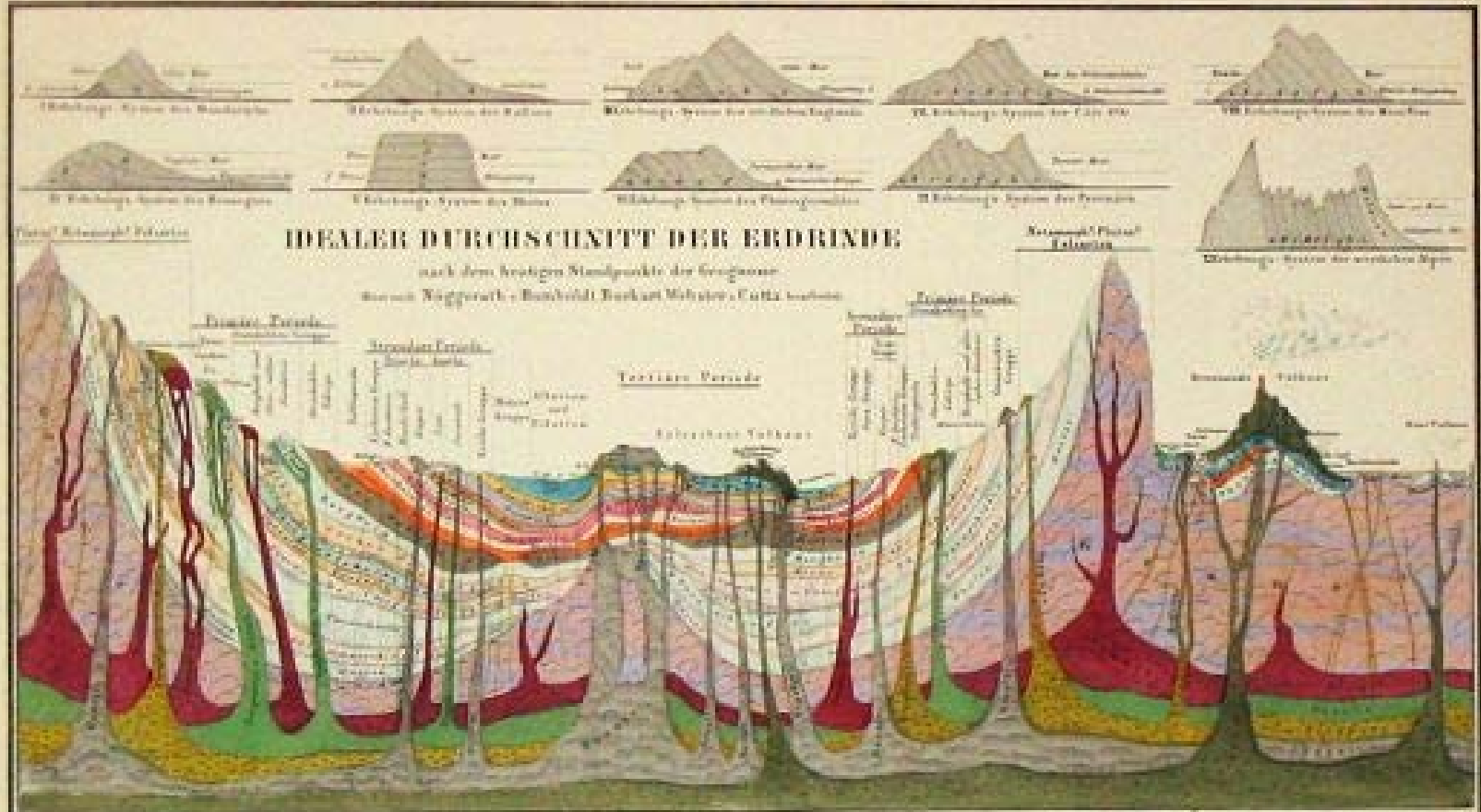
Berghaus star projection





AAG Newsletter

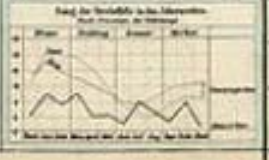
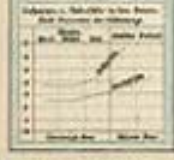
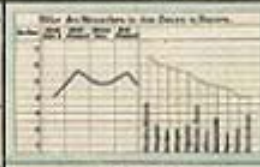




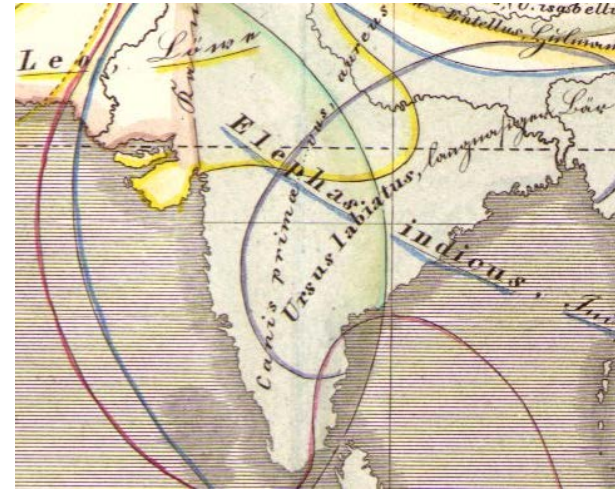
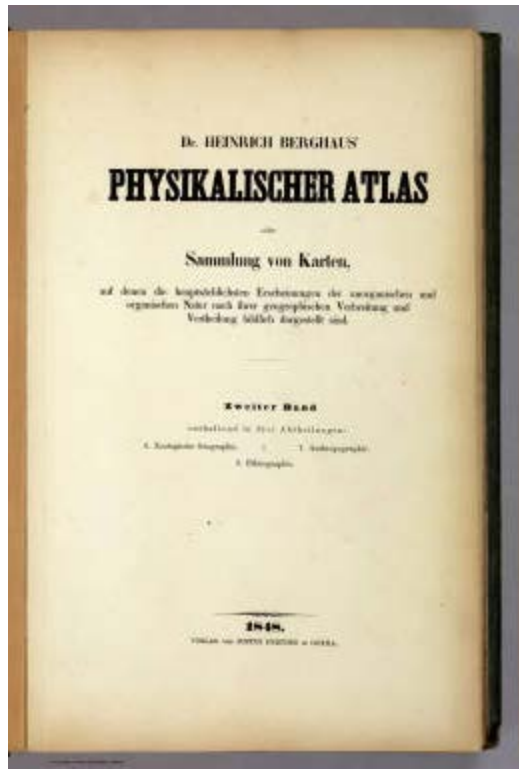
Verlag von Cotta Geognostische Karte v. Cotta Verlag von Cotta



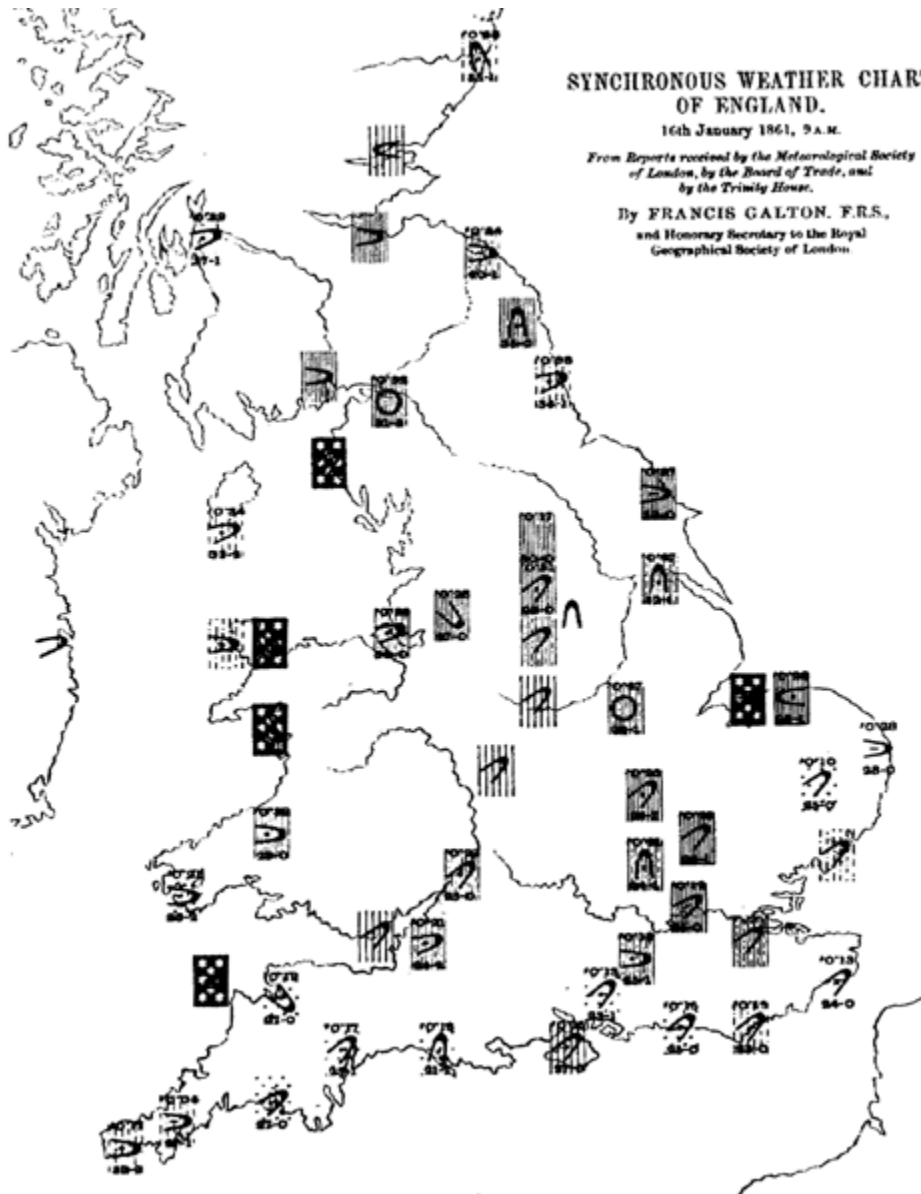
Geographische Verbreitung
der
MENSCHEN-RACEN.
Übersicht der
NUTZUNGSWEISE nach der VOLKSDICHTIGKEIT
in einer Ackerbaukultur, nach
NIVOS DE PÉDRE DE MONTEZ.



Physikalischer Atlas



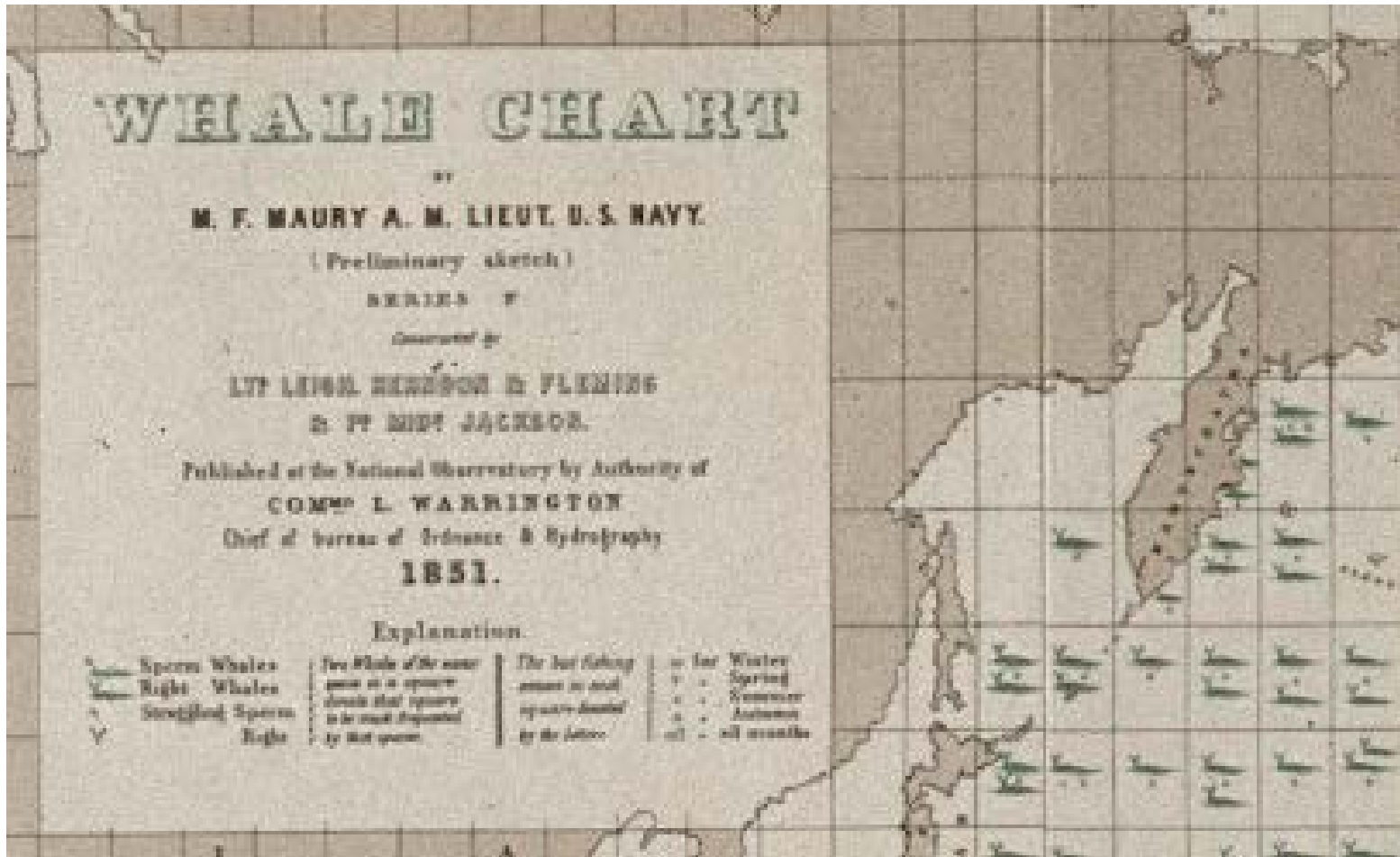
Francis Galton (1822-1911),



1861

The modern weather map, a chart showing area of similar air pressure and barometric changes by means of glyphs displayed on a map.

Maury's 1851 map of whale sightings



- US Navy
- Use of pictographic symbols of whales

Discovered by Whalers

WHALE CHART

M. F. MAURY A. M. LIEST, U. S. NAVY.

(Preliminary sketch)

SERIES V

NUMBER 9

LIEUTENANT MERRISON & FLEMING
& FITZ ROBERT JACKSON.

Published at the National Observatory by Authority of

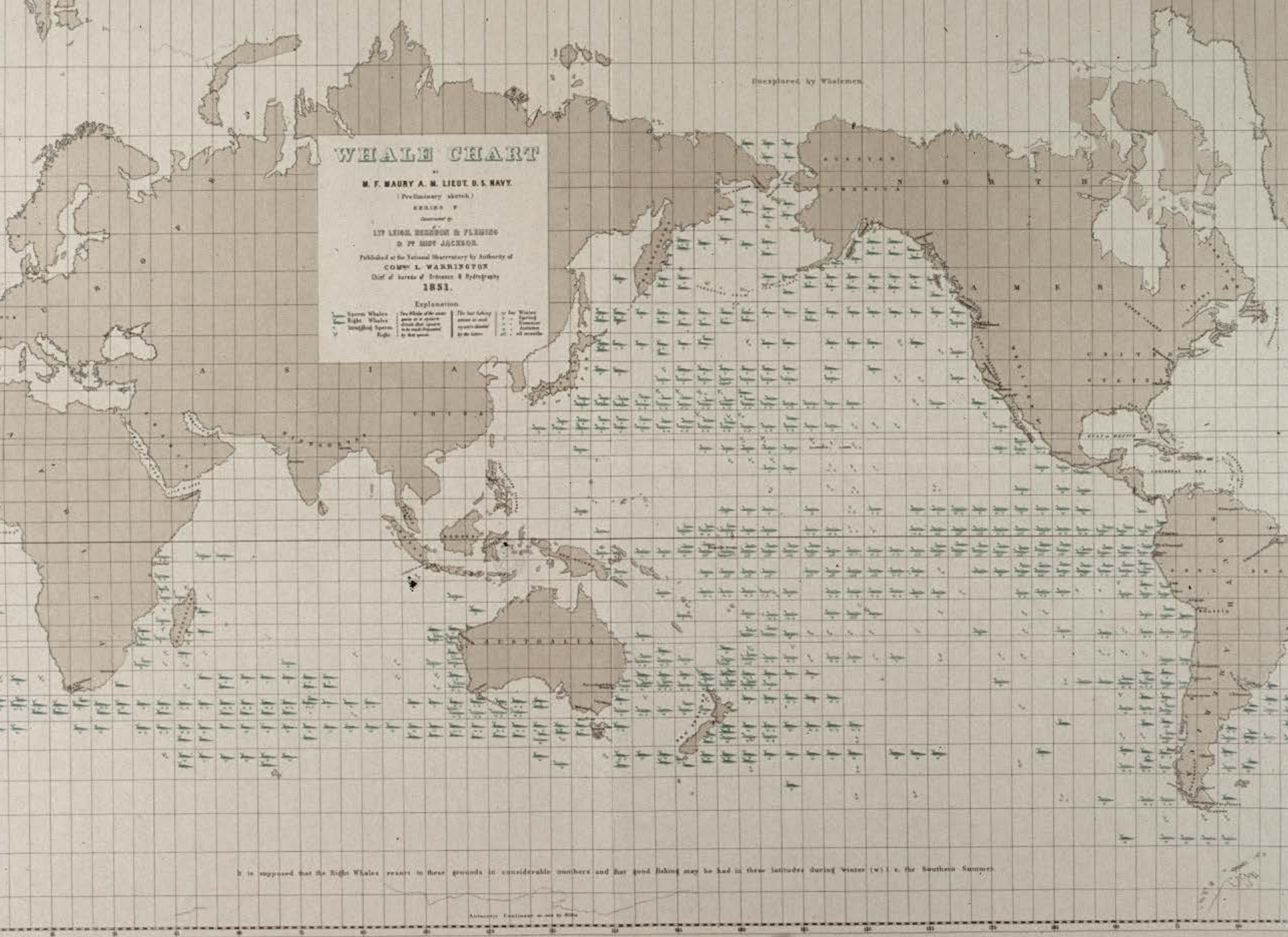
COMD' R. WASHINGTON

Chief of Bureau of Ordnance & Hydrography

1851.

Explanation

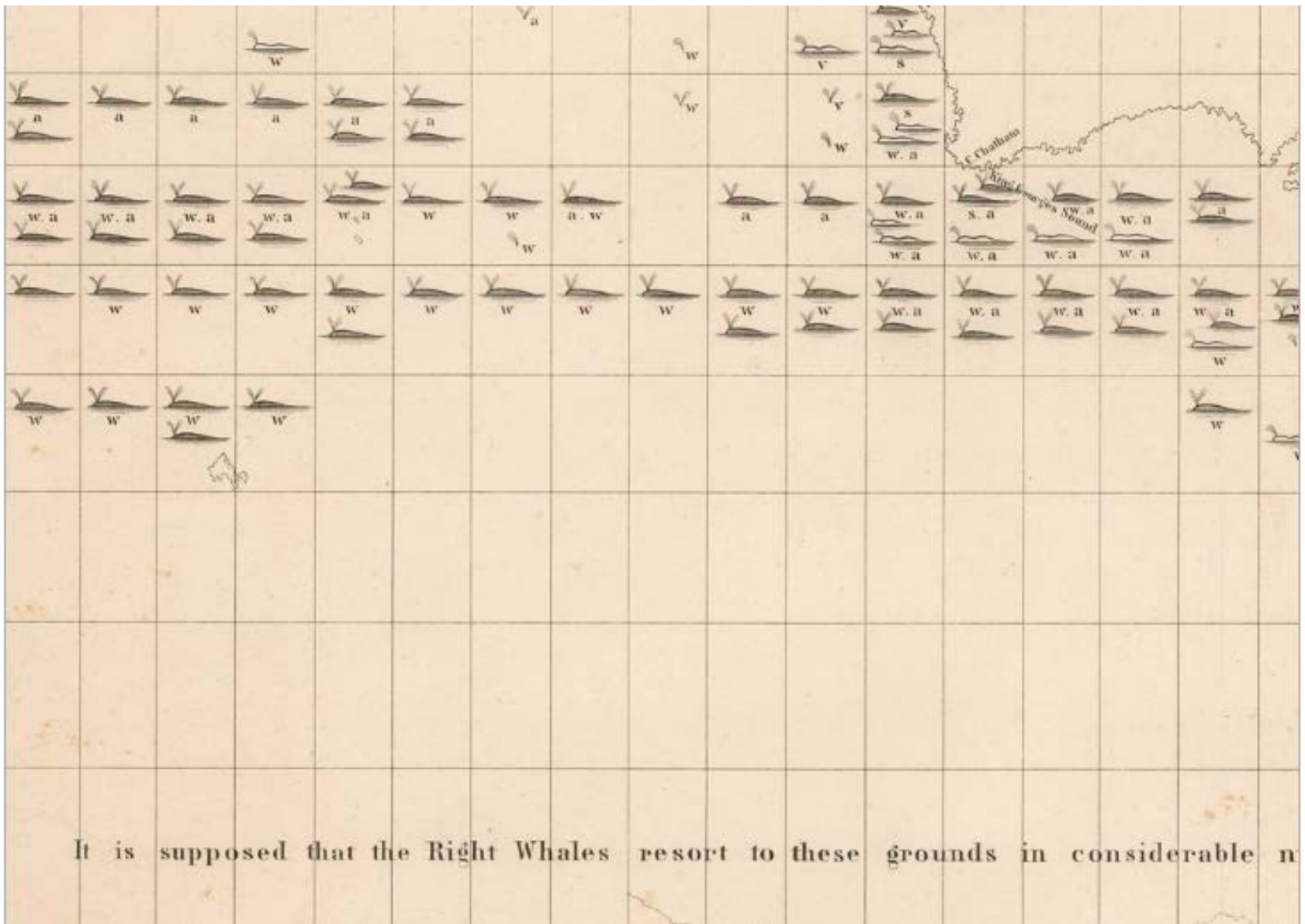
Open Whale	Two Whales at one	The best fishing	for Whales
Right Whale	seen in a group	ground in each	Spring
Knifed Open	to the eastward	month	Summer
Right	to the west	of the time	Autumn
			of the year



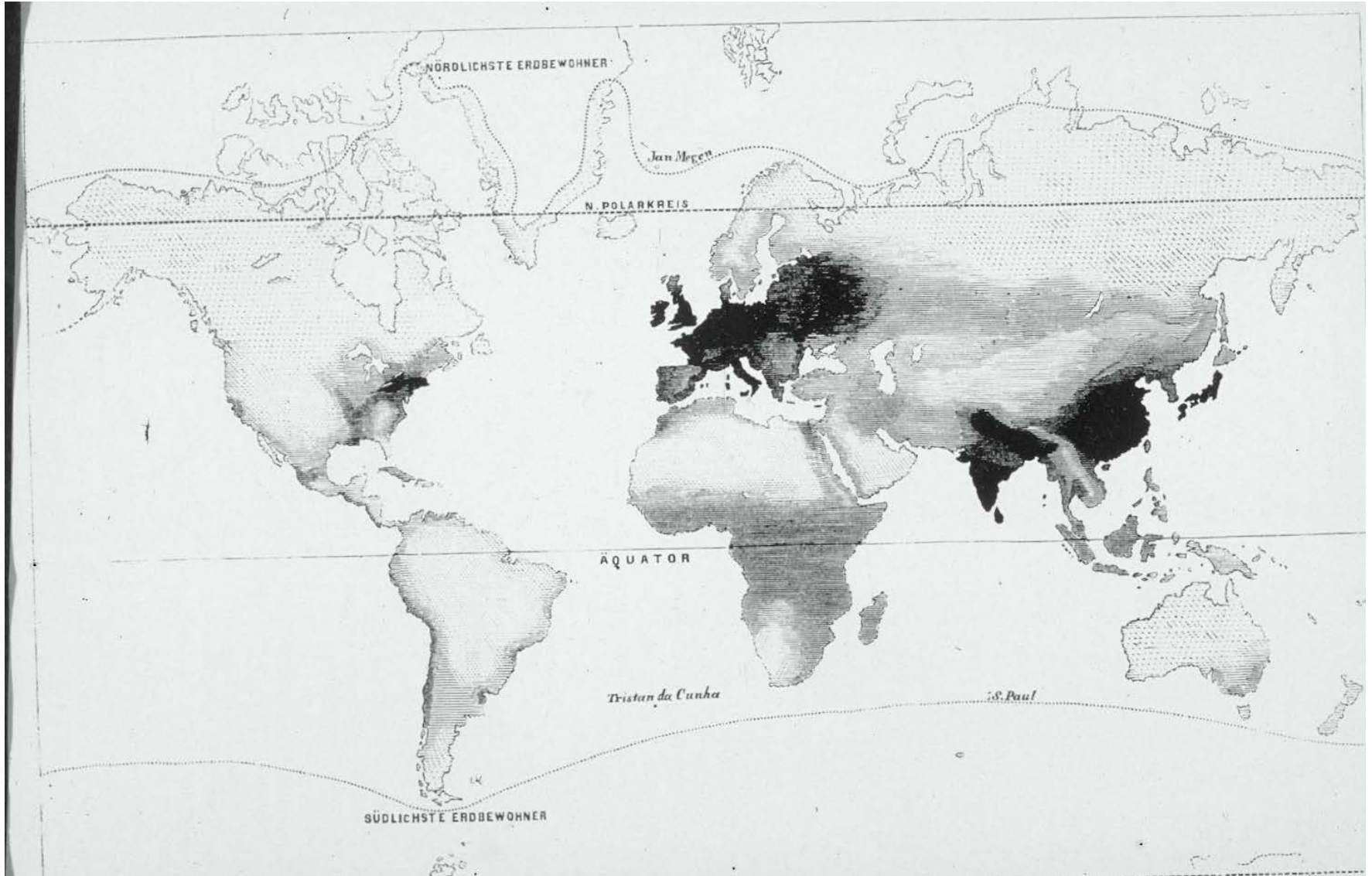
It is supposed that the Right Whales resort to these grounds in considerable numbers and that good fishing may be had in these latitudes during Winter (w) & the Southern Summer.

Antarctic Continent shown by Dotted

Symbols and text



Petermann's 1859 map of world population density



Minard's 1861 map of Napoleon's march to Moscow

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.
 Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les largeurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zones. Le rouge désigne les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M.M. Chiers, de Légar, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre. Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davoust qui avaient été détachés sur Minsk et Mohilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

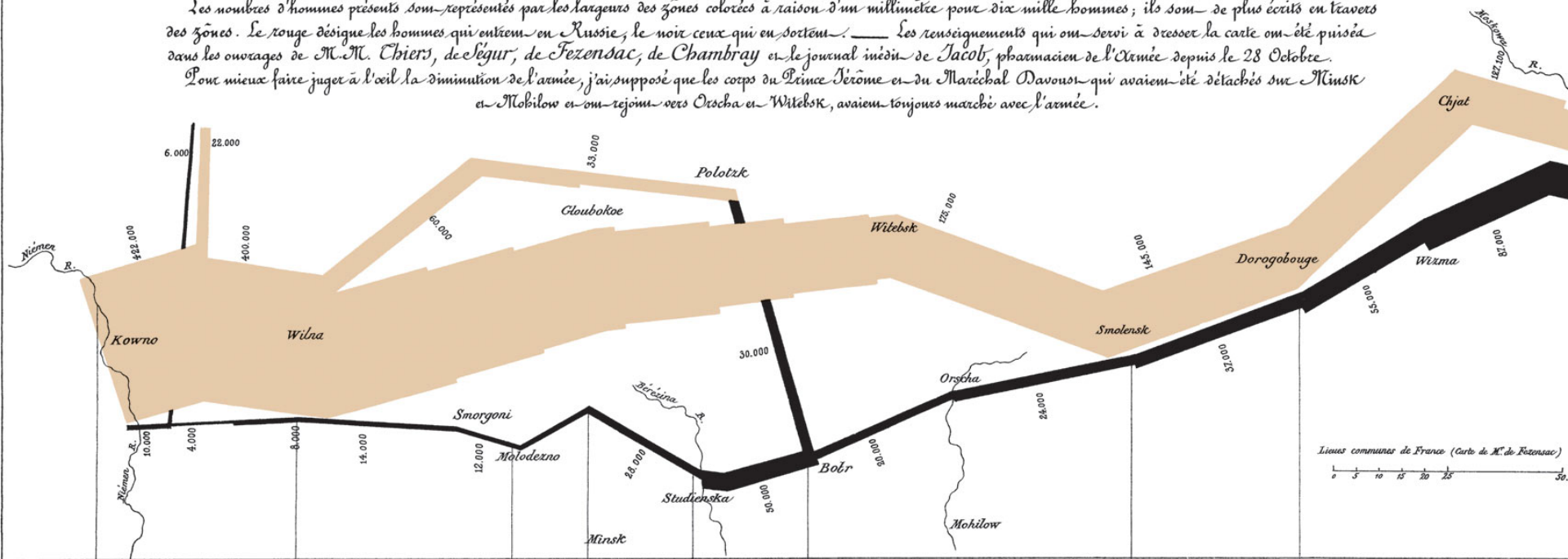
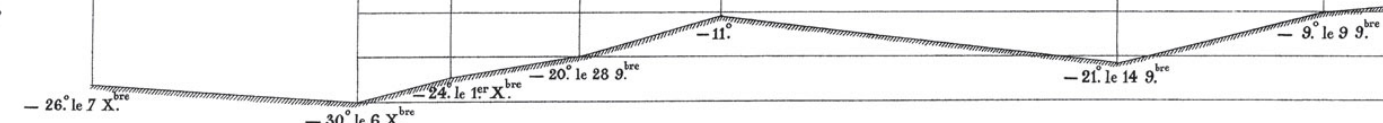
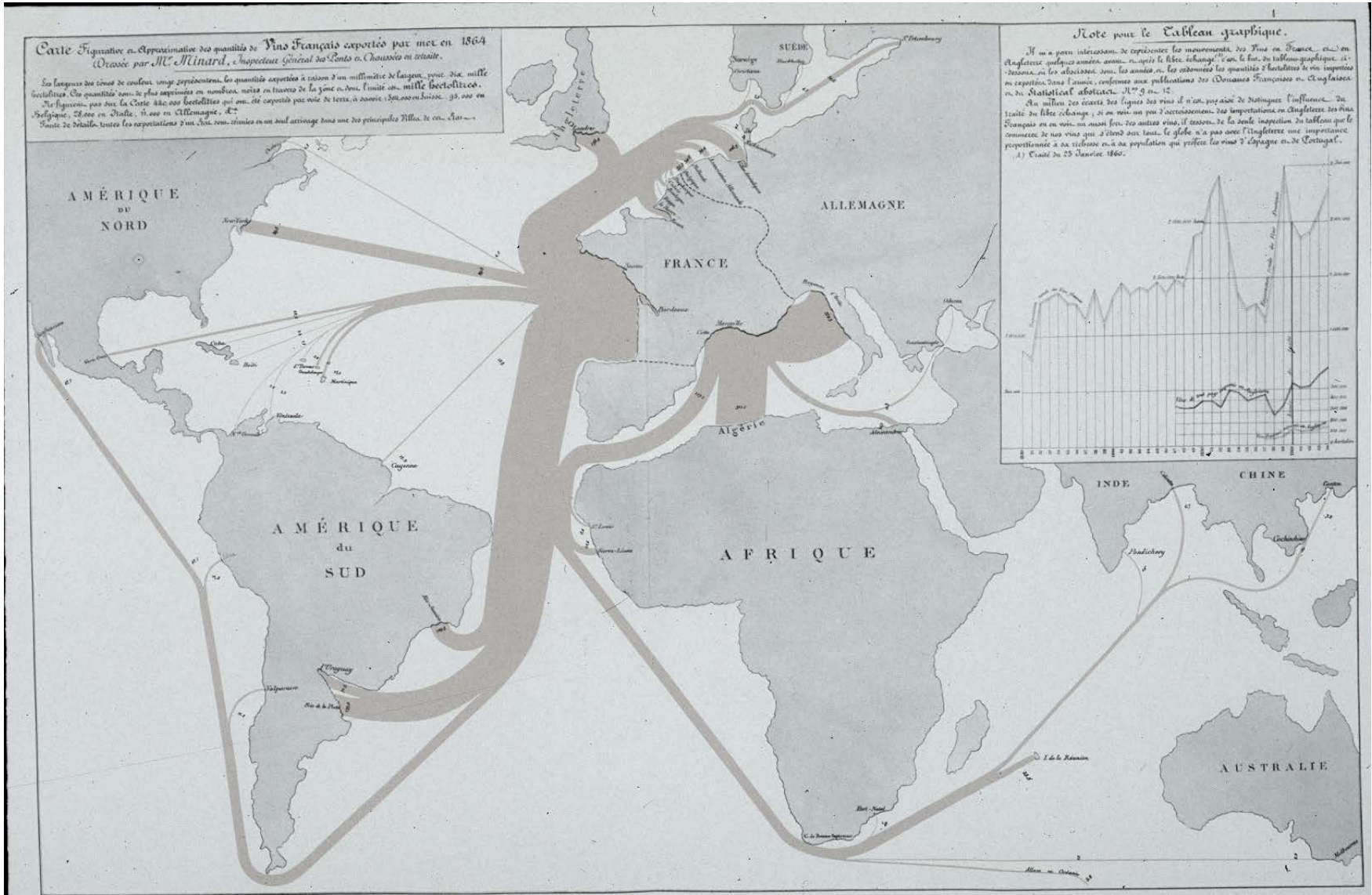


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.

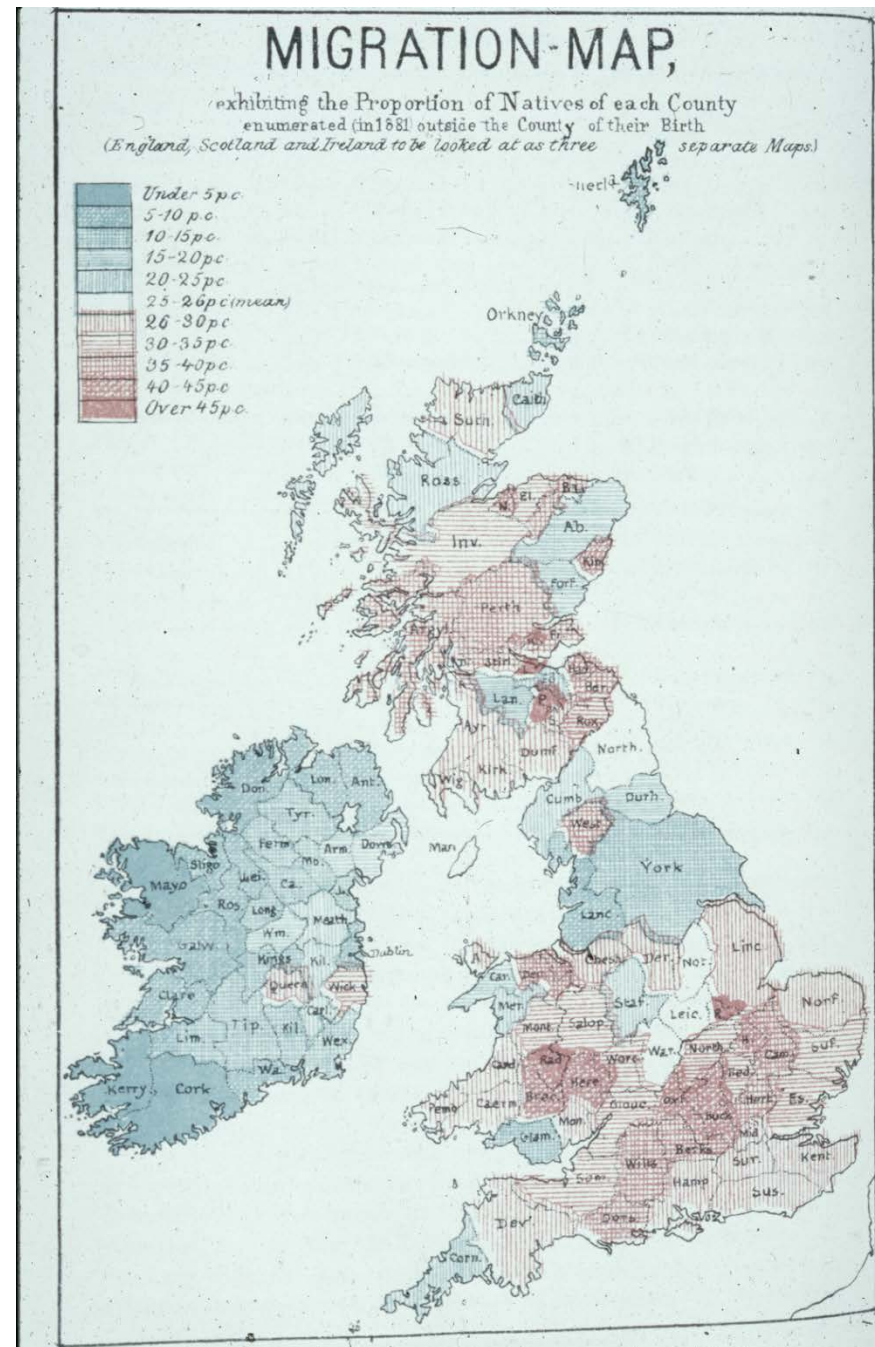
Les Cosaques passent au galop le Niemen, gelé.



Thematic map of wine exports from France, 1861 by C.J. Minard



Ethnography



Ethnographische Karte von Nordamerika.

Borghaus' Physikal. Atlas

37. Abtheilung, Ethnographie N° 47.



Geologische Karte
von
DEUTSCHLAND
und den umliegend Ländern
nach dem
Systeme von Eduard Suess
1850



Symbolik der geologischen Zeichen		Mengenmäßige Angaben	
Symbolik der geologischen Zeichen		Mengenmäßige Angaben	
1	Älteste Gesteine	1000	1000 Meter
2	Ältere Gesteine	2000	2000 Meter
3	Ältere Gesteine	3000	3000 Meter
4	Ältere Gesteine	4000	4000 Meter
5	Ältere Gesteine	5000	5000 Meter
6	Ältere Gesteine	6000	6000 Meter
7	Ältere Gesteine	7000	7000 Meter
8	Ältere Gesteine	8000	8000 Meter
9	Ältere Gesteine	9000	9000 Meter
10	Ältere Gesteine	10000	10000 Meter
11	Ältere Gesteine	11000	11000 Meter
12	Ältere Gesteine	12000	12000 Meter
13	Ältere Gesteine	13000	13000 Meter
14	Ältere Gesteine	14000	14000 Meter
15	Ältere Gesteine	15000	15000 Meter
16	Ältere Gesteine	16000	16000 Meter
17	Ältere Gesteine	17000	17000 Meter
18	Ältere Gesteine	18000	18000 Meter
19	Ältere Gesteine	19000	19000 Meter
20	Ältere Gesteine	20000	20000 Meter
21	Ältere Gesteine	21000	21000 Meter
22	Ältere Gesteine	22000	22000 Meter
23	Ältere Gesteine	23000	23000 Meter
24	Ältere Gesteine	24000	24000 Meter
25	Ältere Gesteine	25000	25000 Meter
26	Ältere Gesteine	26000	26000 Meter
27	Ältere Gesteine	27000	27000 Meter
28	Ältere Gesteine	28000	28000 Meter
29	Ältere Gesteine	29000	29000 Meter
30	Ältere Gesteine	30000	30000 Meter
31	Ältere Gesteine	31000	31000 Meter
32	Ältere Gesteine	32000	32000 Meter
33	Ältere Gesteine	33000	33000 Meter
34	Ältere Gesteine	34000	34000 Meter
35	Ältere Gesteine	35000	35000 Meter
36	Ältere Gesteine	36000	36000 Meter
37	Ältere Gesteine	37000	37000 Meter
38	Ältere Gesteine	38000	38000 Meter
39	Ältere Gesteine	39000	39000 Meter
40	Ältere Gesteine	40000	40000 Meter

Geodemographics

Applying geodemographics

Display in GML Group

Select GML Group

- Census Output Areas
- 1a Younger blue collar
- 1b Younger blue collar
- 1c Older blue collar
- 2a Traditional communities
- 2b Settled in the city
- 3a Village life
- 4a Prosperity younger families
- 4b Prosperity older families
- 4c Shopping centre
- 4d Working suburbs
- 5a Senior communities
- 5b Older suburbs
- 5c Public housing
- 6a Settled households
- 6b Least advantaged
- 6c Young families in tenured homes
- 6d Ripping households
- 7a Rural communities
- 7b Mid-Caribbean communities

Filter by Ward

View Profile

Help

Map in GML Group

Supergroup Descriptions

Supergroup 1: Blue collar communities

This supergroup with proportions that above the national average are:

- (1) % households that are tenured
- (2) % households resident in public sector rented accommodation

This supergroup with proportions that below the national average are:

- (1) % households which are flats
- (2) % people between 16 and 24 with higher education qualification

Supergroup 2: City living

This supergroup with proportions that above the national average are:

- (1) % people between 16 and 24 with higher education qualification
- (2) % households with one person who is not in employment
- (3) % people not born in the UK
- (4) % households resident in private/other rented accommodation
- (5) % households which are flats

This supergroup with proportions that below the national average are:

- (1) % households which are detached
- (2) % households with non-dependent children
- (3) % of resident population aged 5-14

Supergroup 3: Suburbia

This supergroup with proportions that above the national average are:

- (1) % households with 2 or more cars
- (2) % people aged 16-24 in employment who have moved from home
- (3) % people aged 16-24 in employment working in agriculture and fishing
- (4) % households which are detached

This supergroup with proportions that below the national average are:

- (1) Population density (number of people per hectare)

100 Pauline's Catholic Primary and Nursery School

West BRIDGFORD

See information: <http://www.localdata.org.uk/>

Summary

- Trip down the time line shows that information graphics has a very deep history
- Thematic cartography began early but has flourished since about 1800
- Some excellent web tools exist for discovering and interacting with historical maps