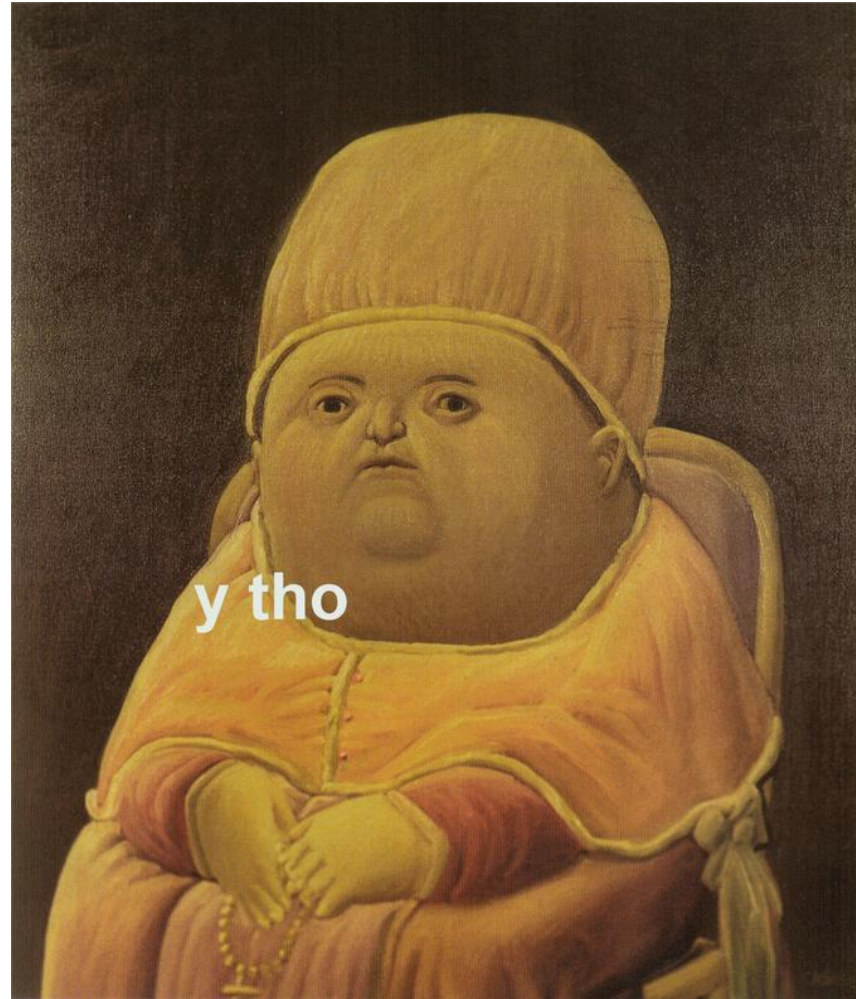


# **Vizualizace dat**

Vývoj vizualizace dat

22. 9. 2022

# Budeme řešit historii.



# **Protože ikonické příklady dokazují, jak efektivní vizualizace je.**

Vizualizace jako prostředek k řešení problému.

Vizualizace jako prostředek k ověřování hypotéz.

Vizualizace jako prostředek k přesvědčování.

Vizualizace jako zachránce životů.

# PLASTICS BREAKDOWN

WE USE TONS OF PLASTIC. IT'S IN EVERYTHING FROM PACKAGING TO TOYS, TO THE DASHBOARD IN YOUR CAR. MASSIVE AMOUNTS OF IT END UP IN THE OCEAN. IT CONTAINS TOXINS, AND ABSORBS MORE TOXINS. IT ENTANGLES AND KILLS SEA LIFE. IT CERTAINLY DOESN'T BIODEGRADE. BUT THERE ARE WAYS WE CAN HELP.



## BAD FOR THE OCEAN, BAD FOR US



54%

OF THE 120 MARINE MAMMAL SPECIES ON THE THREATENED LIST HAVE BEEN OBSERVED ENTANGLED IN OR INGESTING PLASTIC.



92.5% OF DEAD SEABIRDS (NORTHERN FULMARS) IN A STUDY HAD INGESTED PLASTIC IN AMOUNTS EQUAL TO 5% OF THEIR BODY WEIGHT.

AMERICANS USE ROUGHLY 100 BILLION PLASTIC BAGS PER YEAR. PLASTIC BAGS CAN TAKE 400 TO 1,000 YEARS TO DECOMPOSE, BUT THEIR

CHEMICAL RESIDUES REMAIN FOR YEARS AFTER.

CHEMICALS USED IN PLASTICS LIKE PHTHALATES AND FLAME RETARDANTS HAVE BEEN FOUND IN FISH, MOLLUSKS, SEA MAMMALS, AND OTHER SEA LIFE

### HOW BIG IS THE PROBLEM?

73.9 MILLION POUNDS OF PLASTIC ARE SPREAD THROUGHOUT THE WORLD'S GYRES.

### IT'S EXPENSIVE TOO...

AS OF 2009, SOUTHERN CALIFORNIA CITIES HAD SPENT OVER \$1.7 BILLION TO KEEP WATERWAYS FROM BEING OVER LEGAL TRASH LIMITS.

## HOW MUCH PLASTIC ENDS UP IN THE OCEAN?



CIRCULAR CURRENTS (GYRES) THOUSANDS OF MILES ACROSS COLLECT IMMENSE AMOUNTS OF PLASTIC IN ALL OF THE WORLD'S OCEANS.

MICROPLASTIC CONCENTRATIONS IN THE NORTH PACIFIC GYRE INCREASED 100X IN THE PAST 40 YEARS.

### CURRENTS CARRY THE PLASTIC EVERYWHERE.

RUBBER DUCKS LOST FROM A SHIPPING CONTAINER IN THE NORTH PACIFIC WERE FOUND NEAR SCOTLAND, IN THE NORTH ATLANTIC. TSUNAMI DEBRIS FROM JAPAN ARRIVED IN NORTH AMERICA, AFTER CROSSING THE LARGEST OCEAN ON EARTH IN JUST 10 MONTHS.

## PLASTIC IS MADE OF TOXINS

331

MILLION BARRELS OF PETROLEUM & NATURAL GAS LIQUIDS

WERE USED TO MAKE U.S. PLASTIC PRODUCTS, EQUAL TO ABOUT 5% OF THE NATIONAL PETROLEUM CONSUMPTION.

PLASTICS CONTAIN TOXIC CHEMICALS



PHTHALATES  
FLAME RETARDANTS  
BISPHENOL-A (BPA)

### FACT:



MORE TOXINS ADHERE AS PLASTIC BREAKS DOWN

IN PLASTIC FROM THE NORTH PACIFIC GYRE:



40% CONTAINED PESTICIDES LIKE DDT. 50% CONTAINED PCBs (BANNED BY U.S. CONGRESS IN 1979, FOR HAVING VARIOUS NEUROTOXIC EFFECTS). 80% CONTAINED PAHs (MAY BE HIGHLY CARCINOGENIC).

FLOATING TOXIC MICROPLASTICS ARE OFTEN INGESTED BY MARINE LIFE, WHICH IN TURN IS CONSUMED BY US.

WHAT CAN WE DO TO HELP?

USE LESS PLASTIC

8 OF THE TOP 10 ITEMS FOUND ON BEACHES DURING LAST YEAR'S INTERNATIONAL COASTAL CLEAN-UP DAY WERE PLASTICS RELATED TO EATING & DRINKING.



TO GO CUPS > REUSABLE MUGS & CUPS

PLASTIC BAGS > REUSABLE BAGS, NO BAG STRAWS > NO NEED UTENSILS > USE NON-PLASTIC

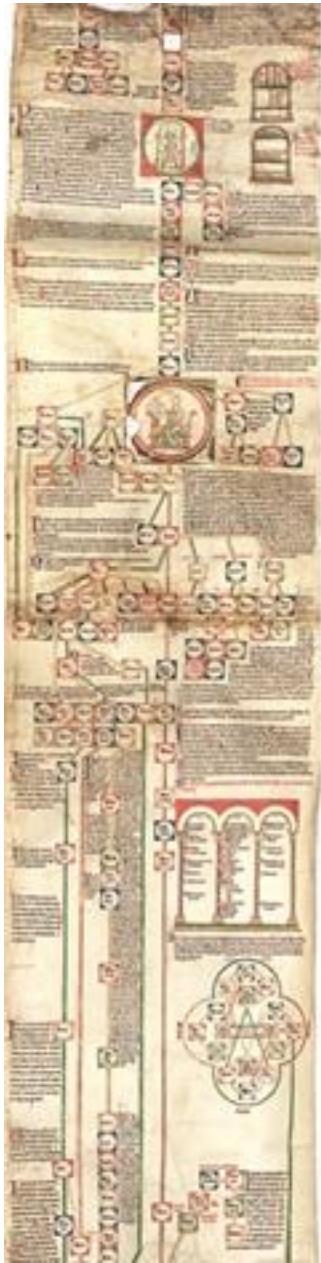
ELECTRONICS > REPAIR OR UPGRADE. RECYCLE THE OLD ITEM WHEN YOU NEED SOMETHING NEW.

BOTTLED WATER > REUSABLE WATER BOTTLE PACKAGING > BUY ITEMS WITH MINIMAL PACKAGING

CLOTHING > BUY NATURAL MATERIALS. SYNTHETIC FIBERS END UP IN THE OCEAN



RESEARCH PROVIDED BY OCEAN CONSERVANCY, 5 GYRES, AND OTHERS INFOGRAPHIC BY WWW.ABRAHAMTHINKIN.COM FOR ONE WORLD ONE OCEAN | 2012



**BABYLON.**

**MEDIA AND PERSIA.**

**GRECIA.**

**PAGAN ROME.**

**THE TEN KINGDOMS.**

**PAPAL ROME.**

**MAHOMETANS.**

**GOD'S EVERLASTING KINGDOM.**

**677**    **2520**    **7**  
**677**    **84**  
**1843.**    **30**

**538**    **2300**    **2520.**  
**457**    **457**  
**1843.**

**332**

**164**  
**158**

**1335**    **490**    **3½**  
**1290**    **508**    **12**  
**45.**    **538**    **42**  
**606**    **1260.**  
**1299**    **606**    **30**  
**1449**    **1299**    **1260.**

**1798**    **508**  
**45**    **1335**  
**1843.**    **1843.**

**A CHRONOLOGICAL CHART**  
**OF THE**  
**VISIONS OF DANIEL & JOHN.**

Illustrations include: a man with a beard and long hair labeled 'MEDIA AND PERSIA'; various animals (lion, eagle, bull, ram, goat, scorpion); a crucifix; and figures on horseback labeled 'MAHOMETANS'. The page is filled with small text blocks and numbers, likely representing dates or durations associated with the visions.

## Chapter

Handbook of Data Visualization

Part of the series Springer Handbooks Comp.Statistics pp 15-56

# A Brief History of Data Visualization

Michael Friendly

Buy chapter

\$29.95 / €24.95 / £19.95 \*

Buy eBook

\$379.00 / €296.31 / £251.50\*

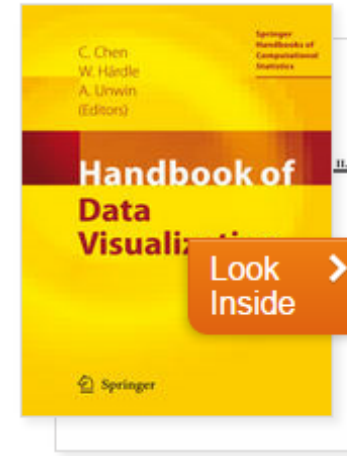


Get Access

\* Final gross prices may vary according to local VAT.

## Abstract

It is common to think of statistical graphics and data visualization as relatively modern developments in statistics. In fact, the graphic representation of quantitative information has deep roots. These roots reach into the histories of the earliest map making and visual depiction, and later into thematic cartography, statistics and statistical graphics, medicine and other fields. Along the way, developments in technologies (printing, reproduction), mathematical theory and practice, and empirical observation and recording enabled the wider use of graphics and new advances in form and content.



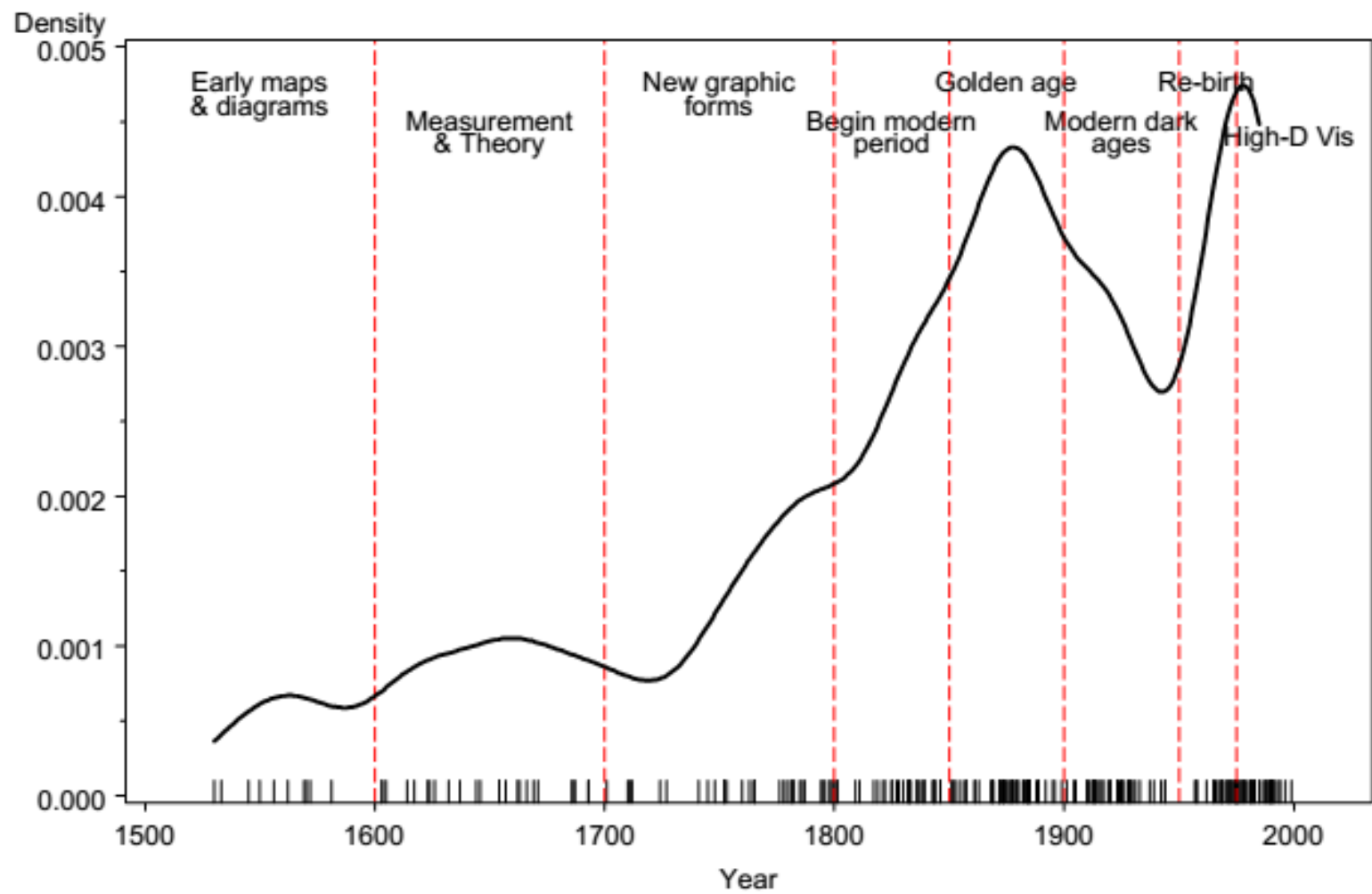
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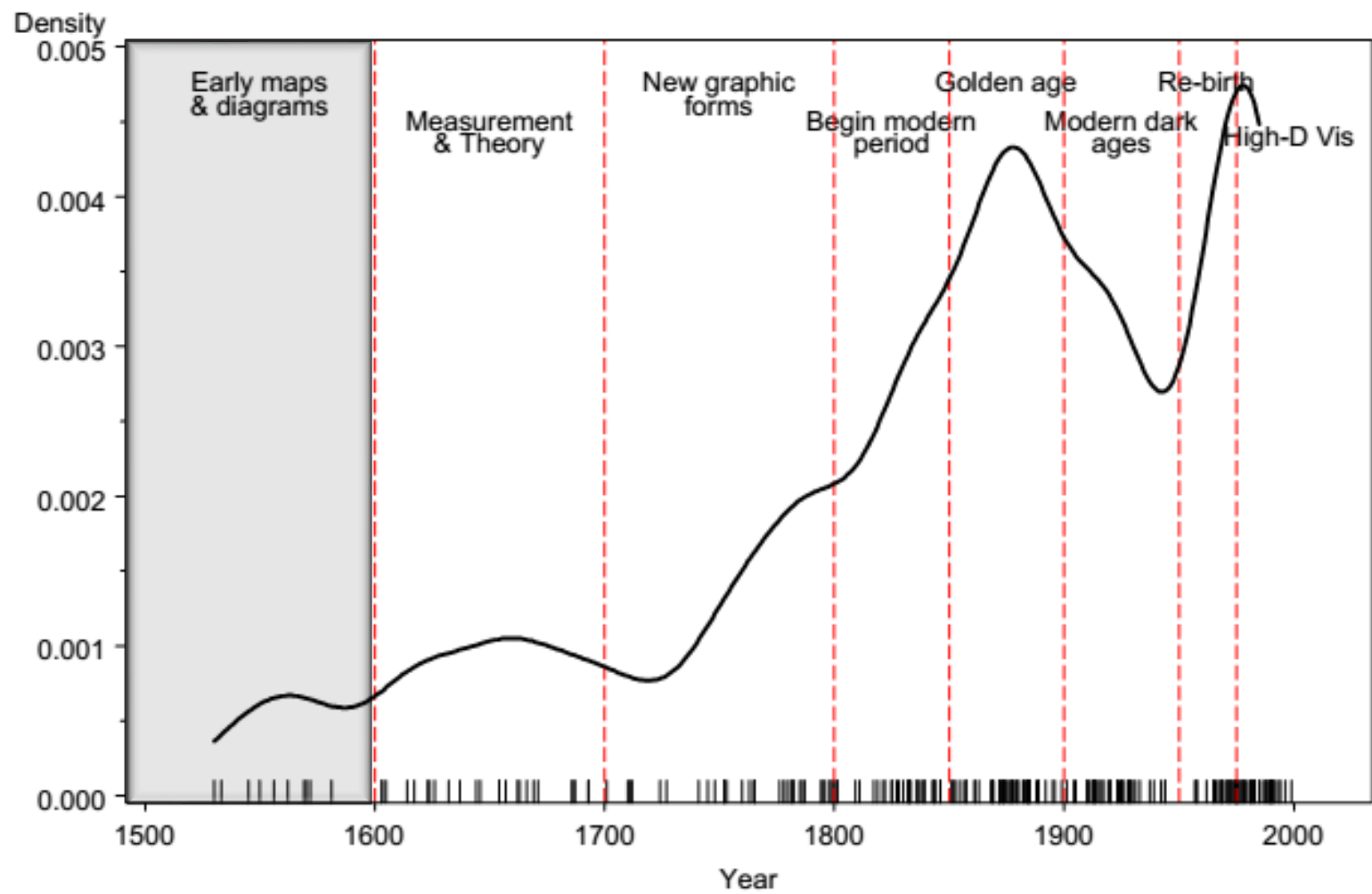
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	Mentions	2
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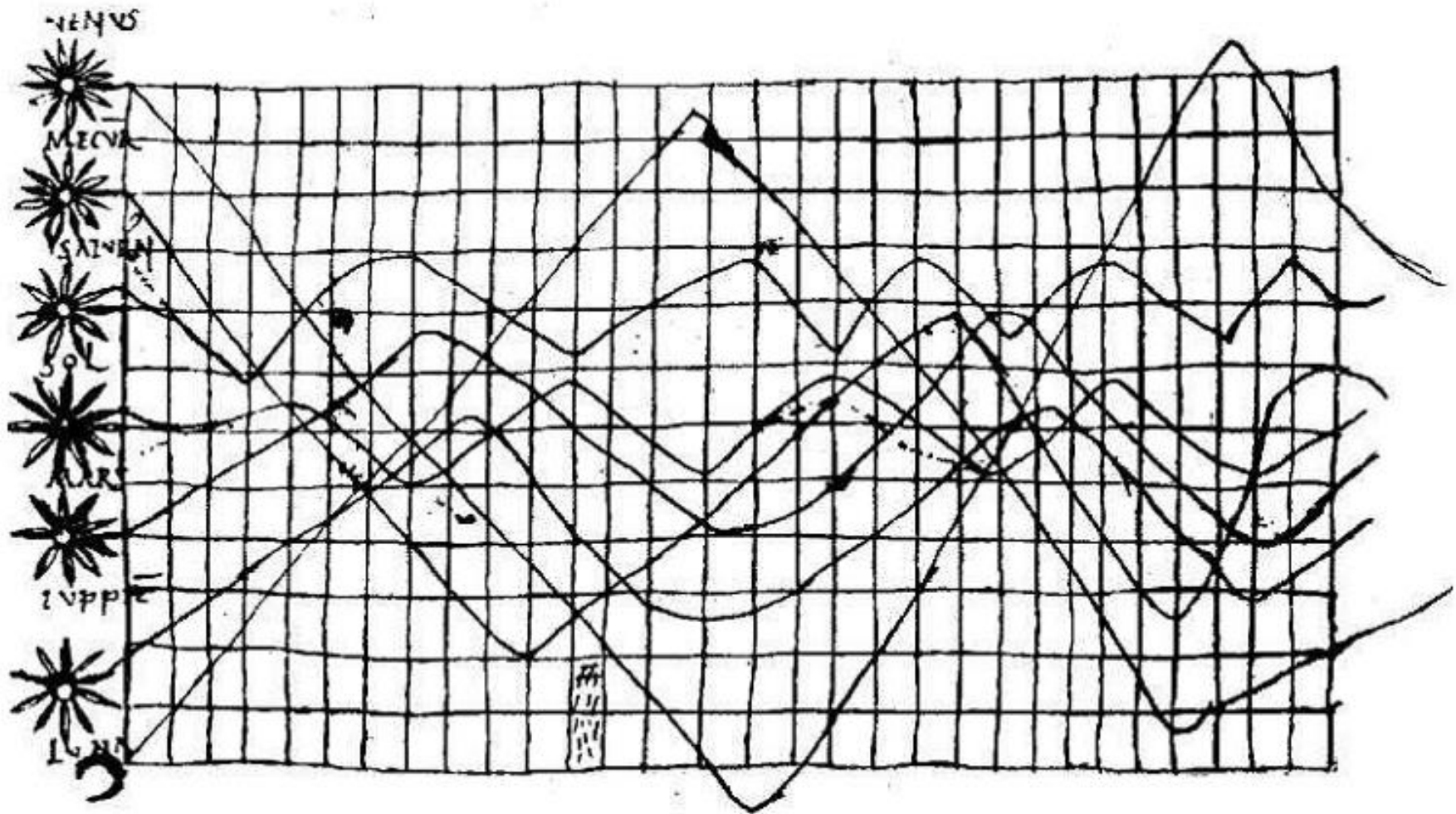
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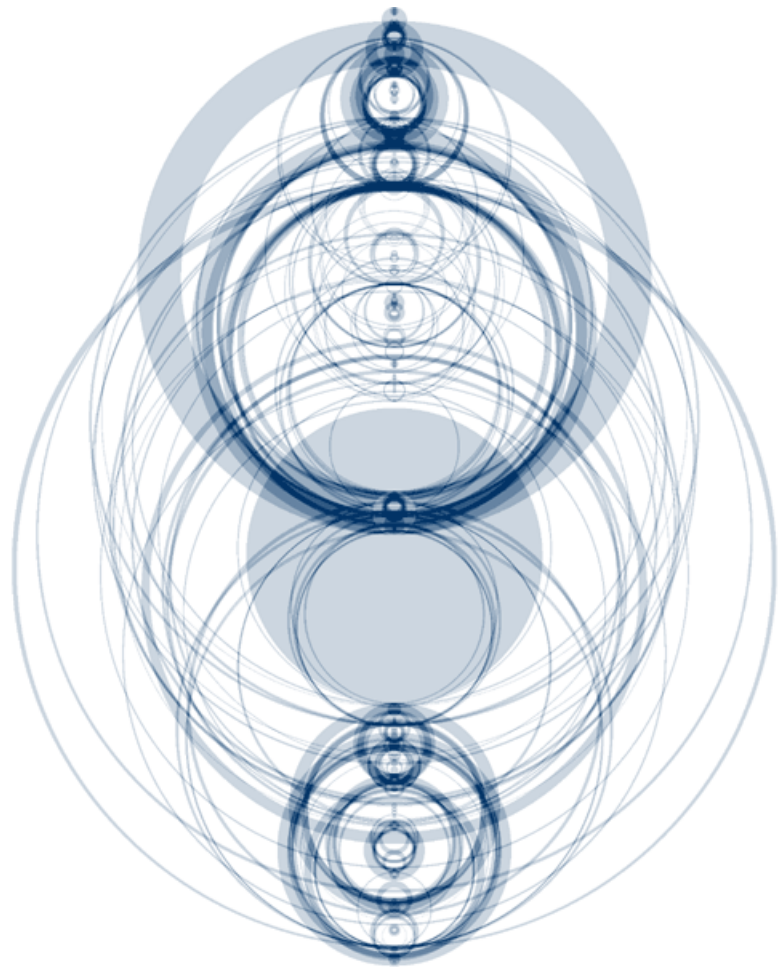
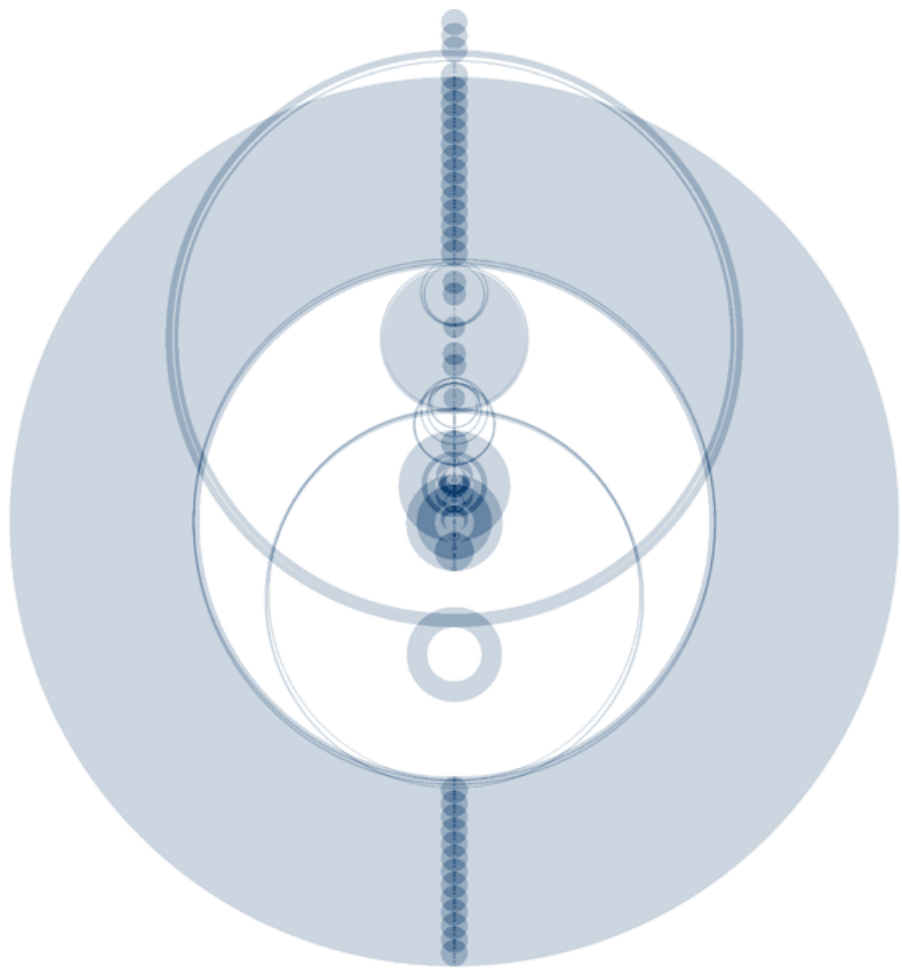
















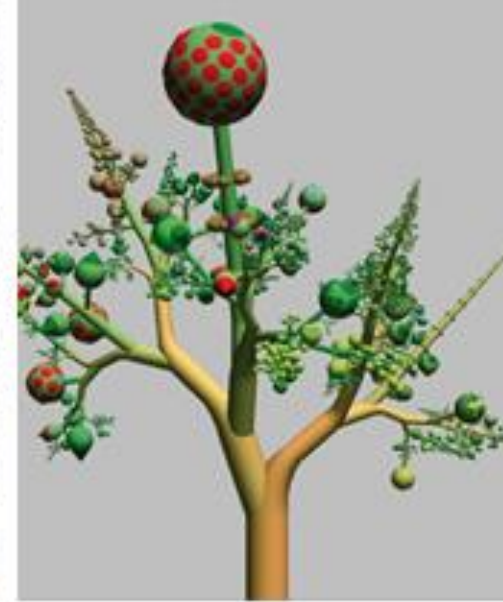
1202



1478

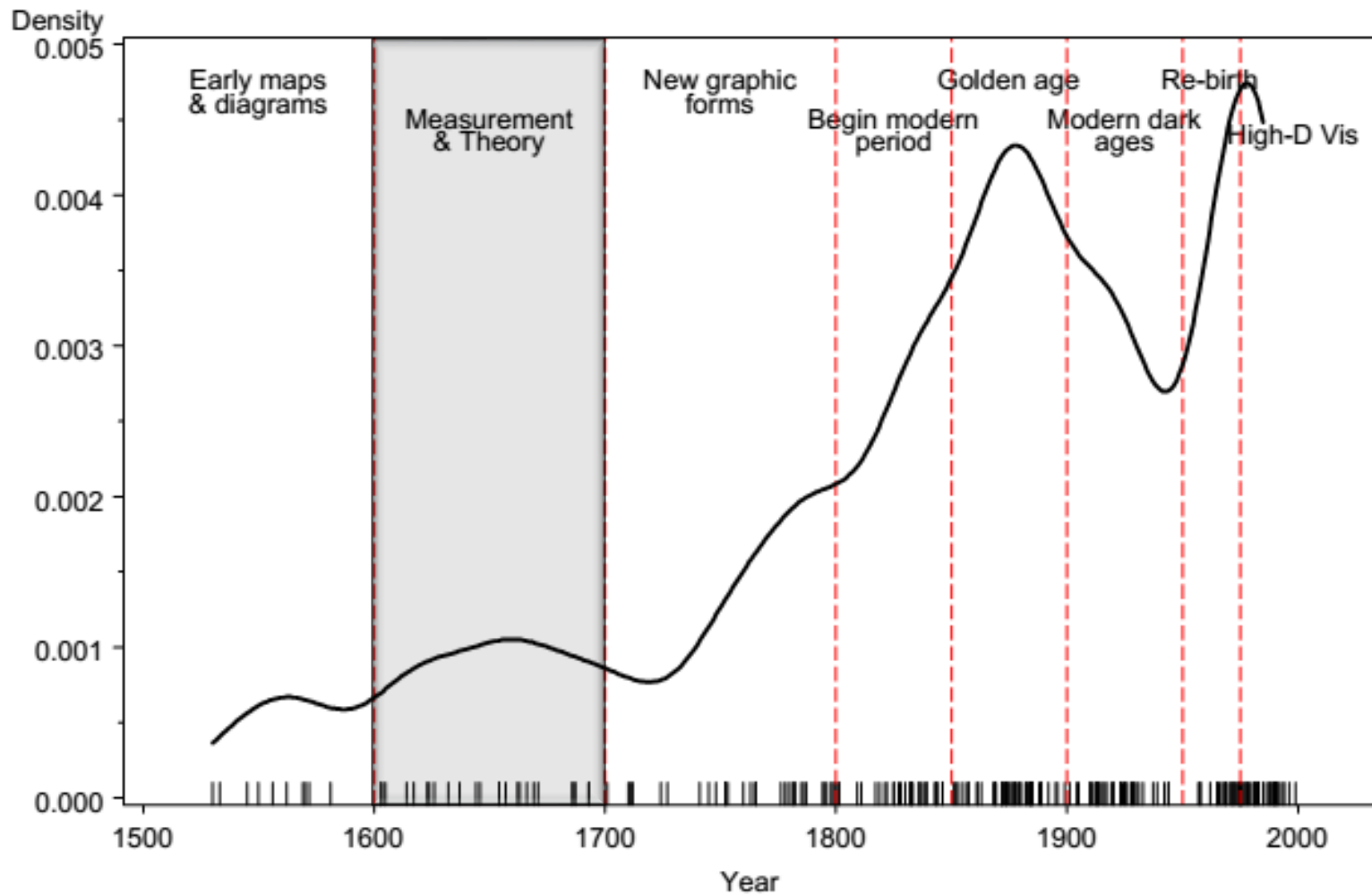


1780



2001

[visualcomplexity.com](http://visualcomplexity.com)



analytická geometrie

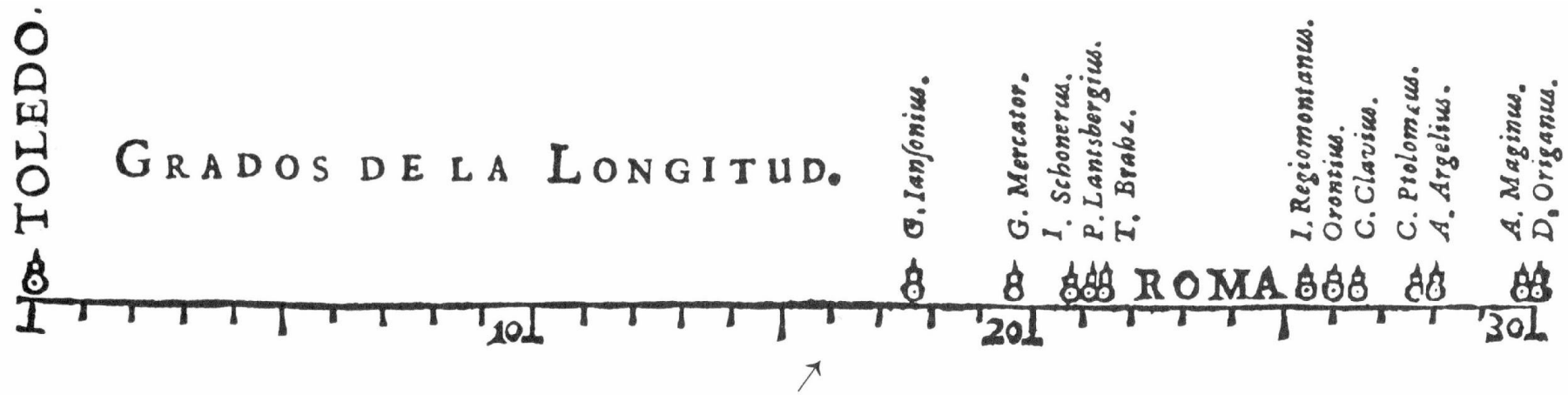
souřadnicový systém

počátky sběru dat

měření času, prostor

# Michael Florent van Langren

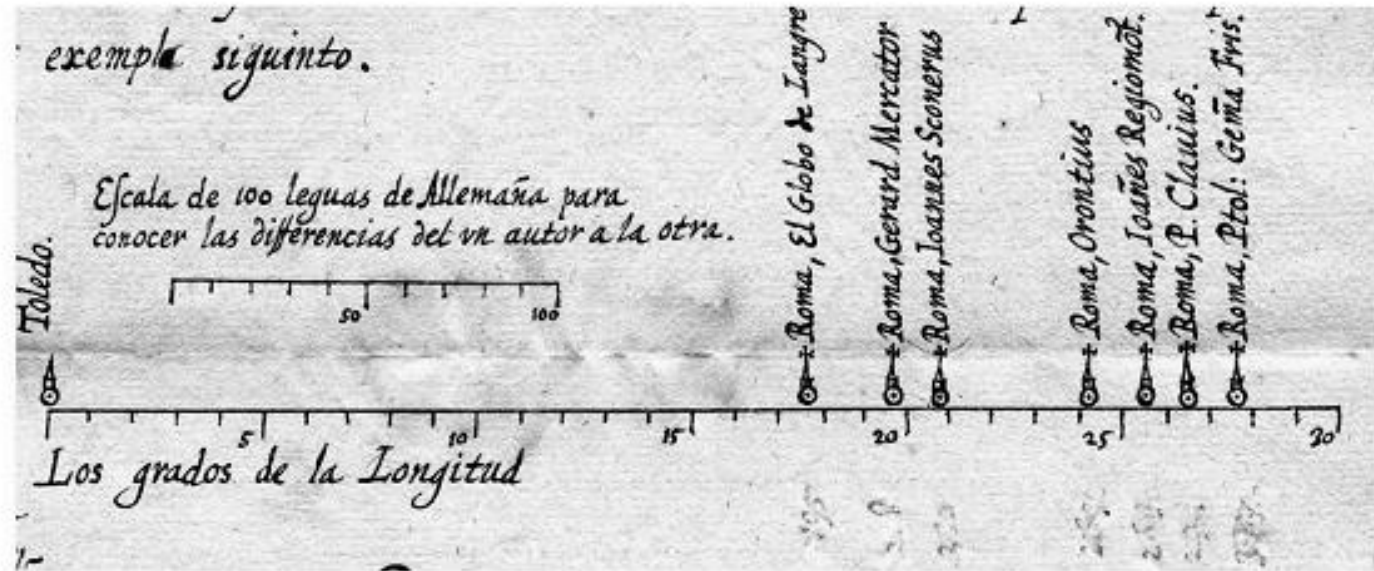
*Rozdíly v odhadech zeměpisné délky*



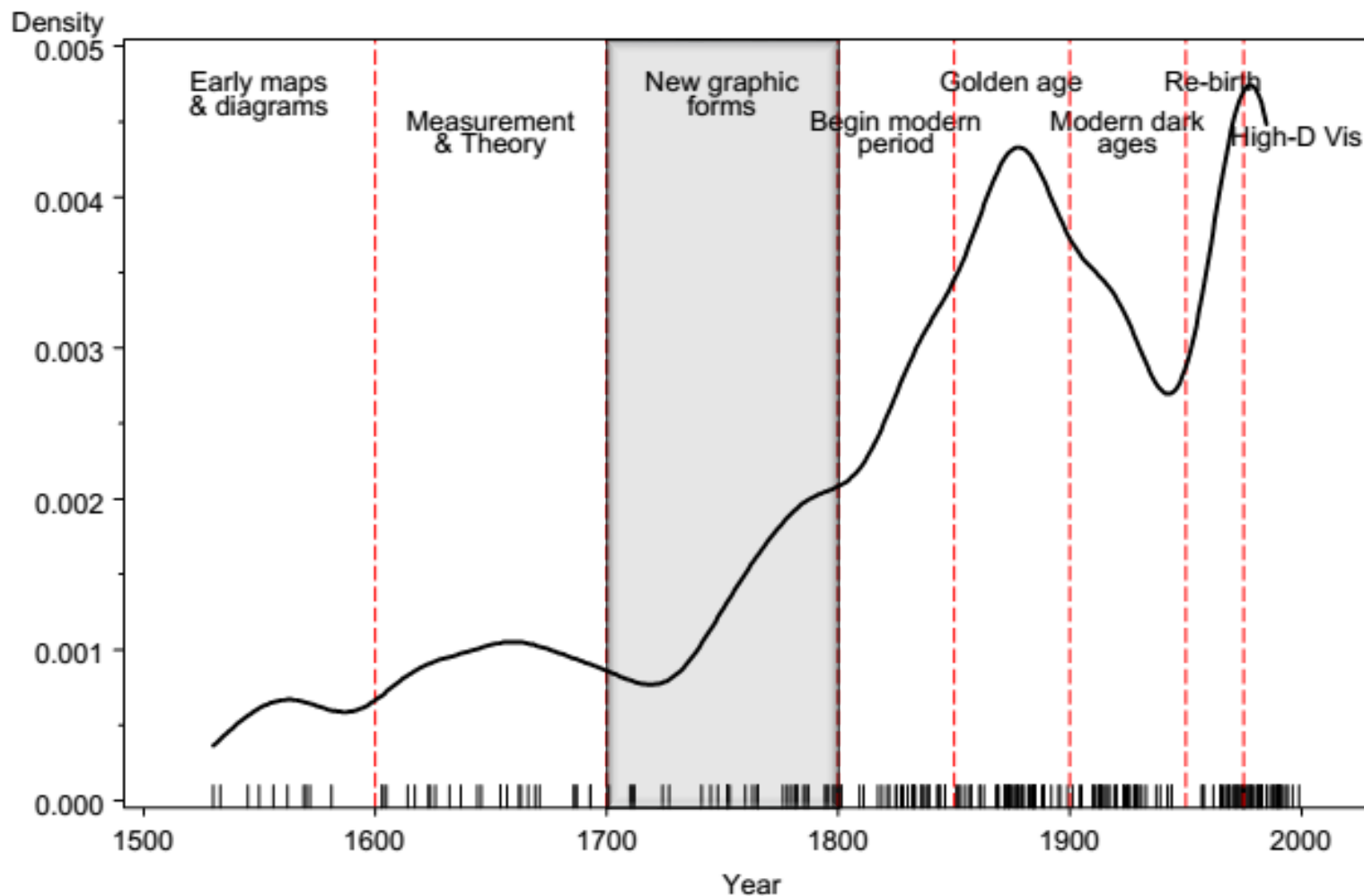
# Michael Florent van Langren

*Rozdíly v odhadech zeměpisné délky*

Las distancias de  
Roma y Toledo segun  
los autores. Leg. de Ale.  
El Globo — 195  
Gerð. Mercat — 210  
Ioan sconer — 230  
Orontius — 269  
Ioan Regiōt — 283  
P. Clavius — 294  
Ptolomeus — 307







technologická vylepšení

systematický sběr dat

nové metafory

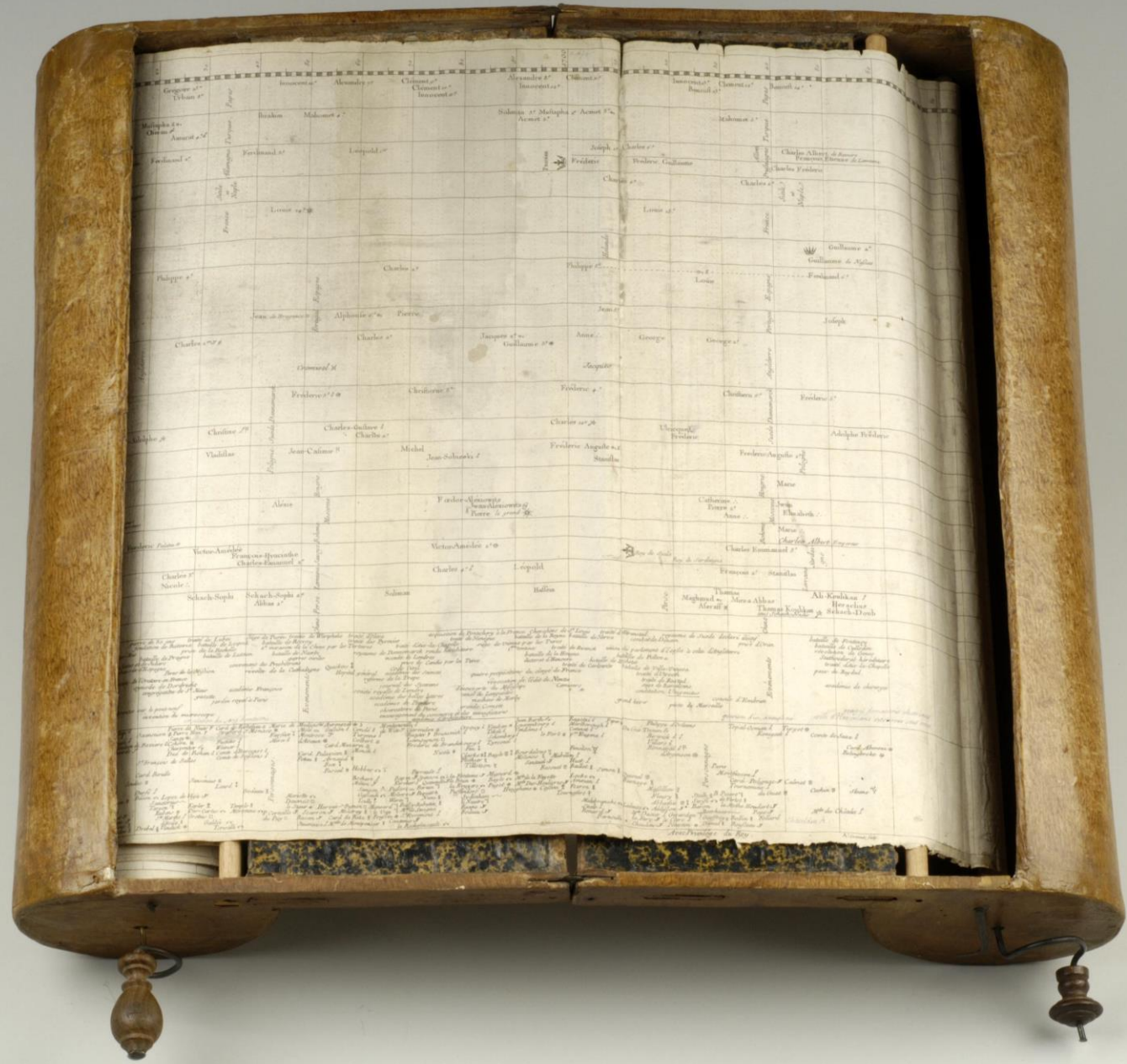
data nad mapou

1753

# Jacques Barbeu-Dubourg

*Časová osa*







*EXPLICATION des Signes employés*

Amiral.....	Y
Anatomiste.....	A
Artiste.....	F
Assassin, Assassiné.....	A †
Astronome.....	☉
Belliqueux.....	♂
Botaniste, Naturaliste.....	♀
Chymiste.....	⚗
Collegues, Associés.....	X
Conquerant.....	✠
Cruel.....	♁
Débauché.....	V
Deposé, Chassé, Retiré.....	o, o, o
Evêque.....	P
Empoisonneur Empoisonné.....	☠, A
Fainéant.....	⊙
Femme.....	∴
Fou, Inconstant.....	H, H
Generux, bienfaisant.....	♥
Géographe.....	^
Géometre.....	⊙
Grand.....	☀
Heretique, Errant, Schismatique.....	o, o, o
Haineux.....	⊙
Historien, Chronologiste.....	X, X
Impie Idolatre.....	T, †
Imposteur, faux Prophete.....	R, ♂
Interregne.....	○
Incertain.....	*
Jurisconsulte.....	□
Juste.....	≡
Legislateur.....	□

*dans la Carte Chronographique.*

Ligne de vie.....	-----
Malheureux.....	Y
Martyr.....	☠
Mechant, Injuste.....	M
Medecin.....	⚕
Ministre.....	4
Moine.....	⚔
Muricier.....	⚔
Orateur, Rethaur.....	⊕, ⊕
Peintre.....	⊗
Philosophe, Sage.....	⊗, ⊗
Pilote, Marin.....	⚓
Poete.....	☞
Prisonnier.....	⊞
Prophete.....	✠
Prudent, Ruse.....	●, ●
Puni, mis à mort.....	⊗, ⊗
Rebelle.....	✠
Retabli, Rappelé.....	h
Riche, Avaré.....	), C
Roy, Empereur.....	☑, ☑
Royaume.....	☑
Republique.....	☑
Ruine.....	⚔
Saint.....	†
Savant.....	ℓ
Souverain pontife.....	✠
Suicide, homicide de soi même.....	↔
Scrupuleux, Superstitieux.....	⊗, ⊗
Souveraineté.....	☑
Theologien.....	⊗
Tué à la guerre.....	♁
Usurpateur, Tyran.....	✠, ✠



L. CUI GUET.

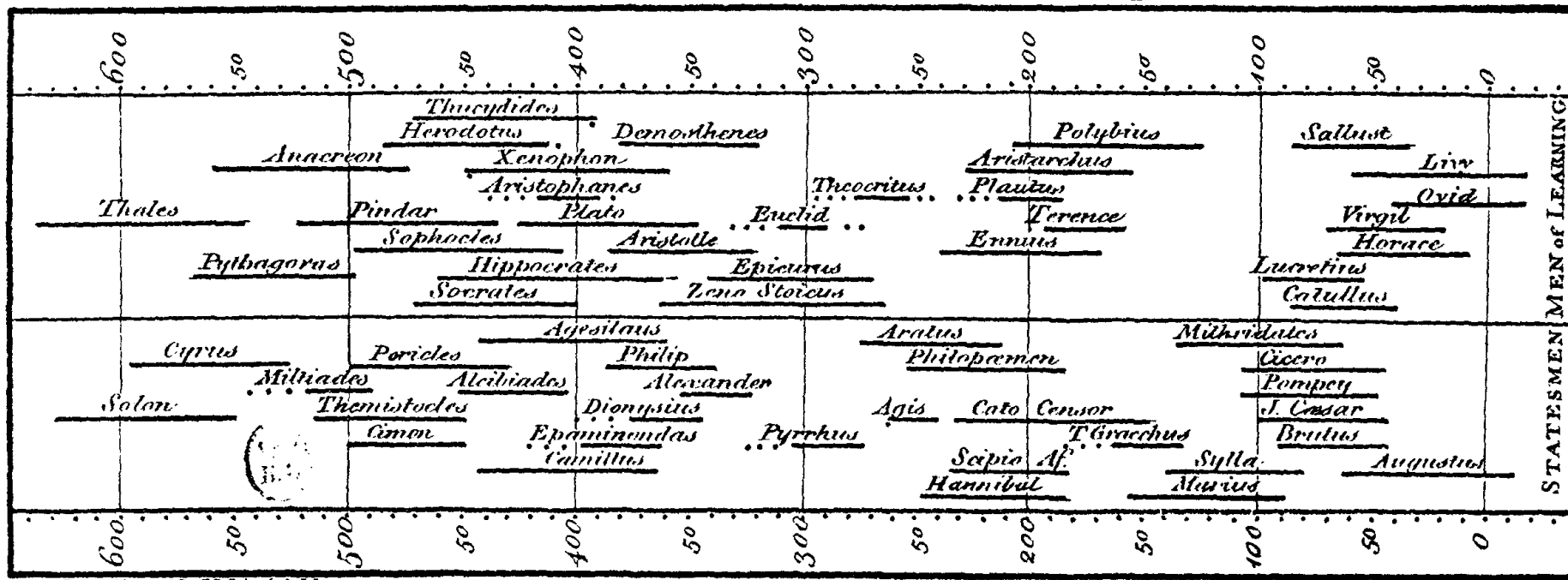
E. Deschamps

1765

# Joseph Priestly

## Časová osa

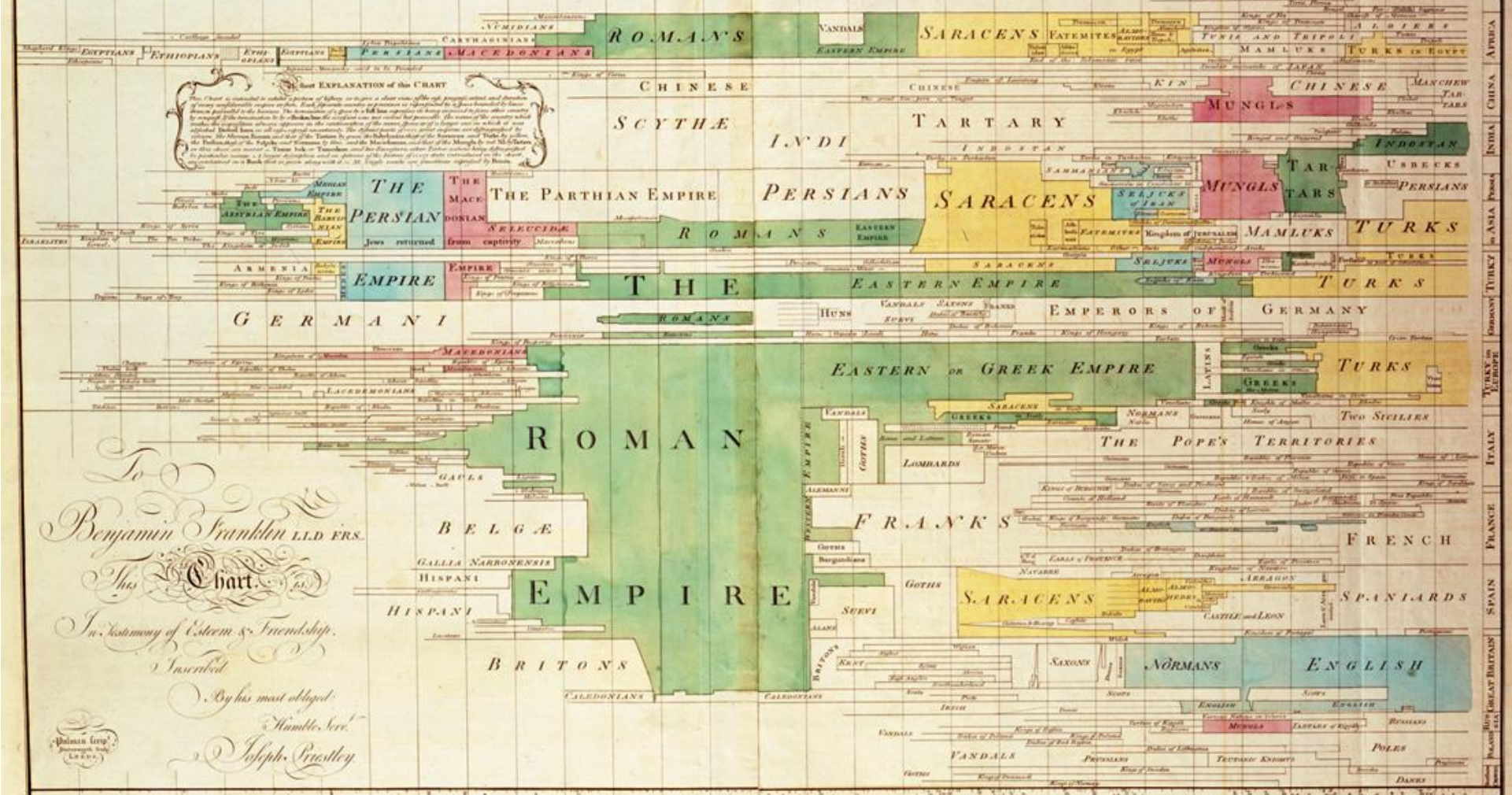
... zobrazení nejistoty ...



J. Priestley L.L.D. F.R.S. inv. et del.

Alamini in hactenus rarioribus scriptis  
Præcipue usum. Hæretic.

# A NEW CHART OF HISTORY.



To  
*Benjamin Franklin* LL.D. & Co.  
 This Chart  
 In testimony of Esteem & Friendship.  
 Inscribed  
 By his most obliged  
 Humble Serv<sup>t</sup>  
*Joseph Priestley*

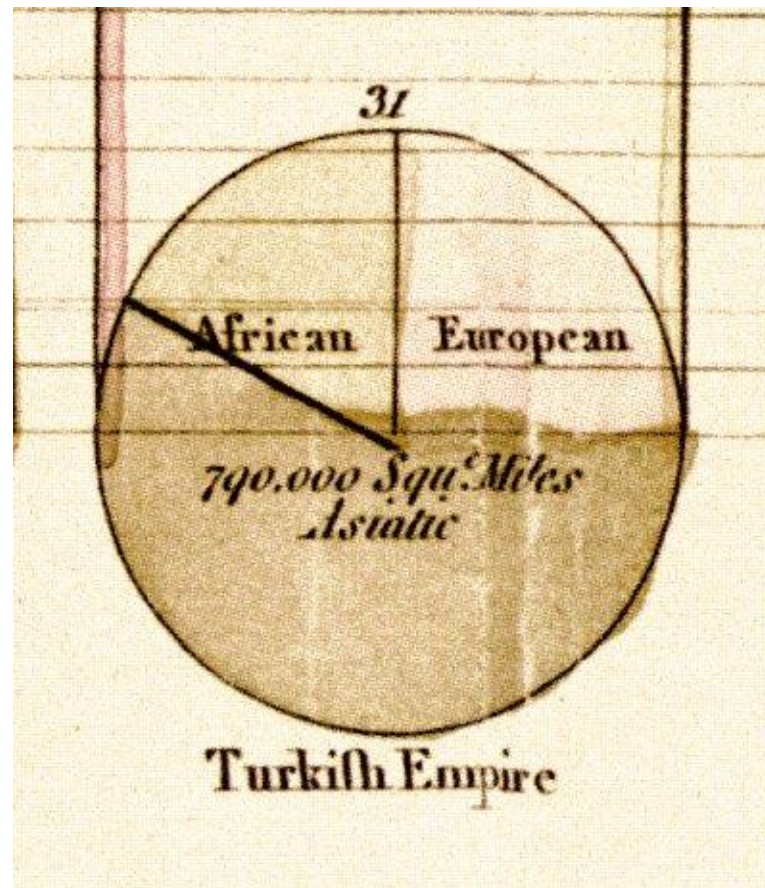




1780+

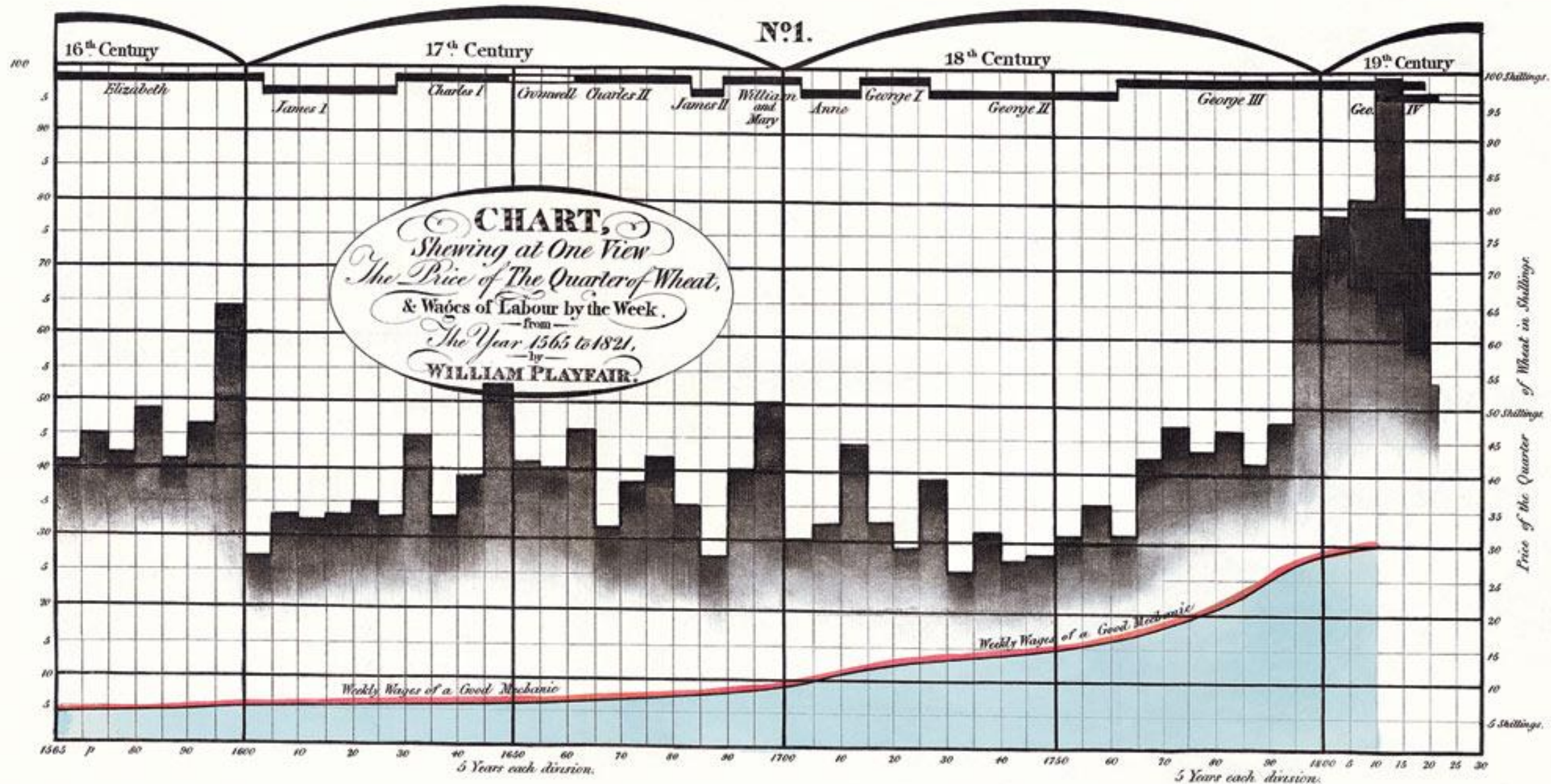
# William Playfair

*Skoro všechny základní statistické grafy*

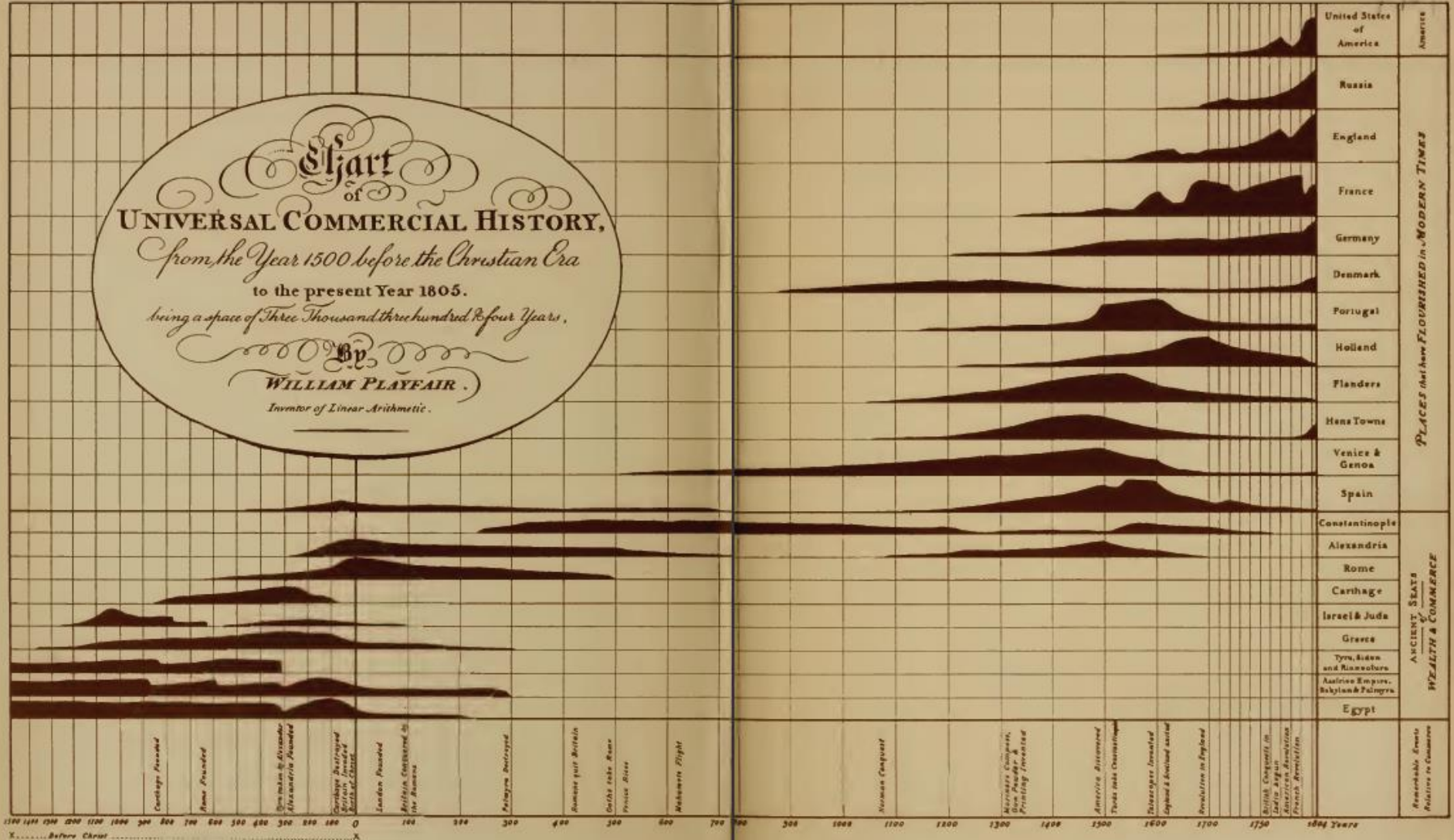


**Chart**  
 Representing the  
*Extent Population & Revenue*  
 of the  
**PRINCIPAL NATIONS in EUROPE**  
 in 1804 by  
*W. Playfair.*



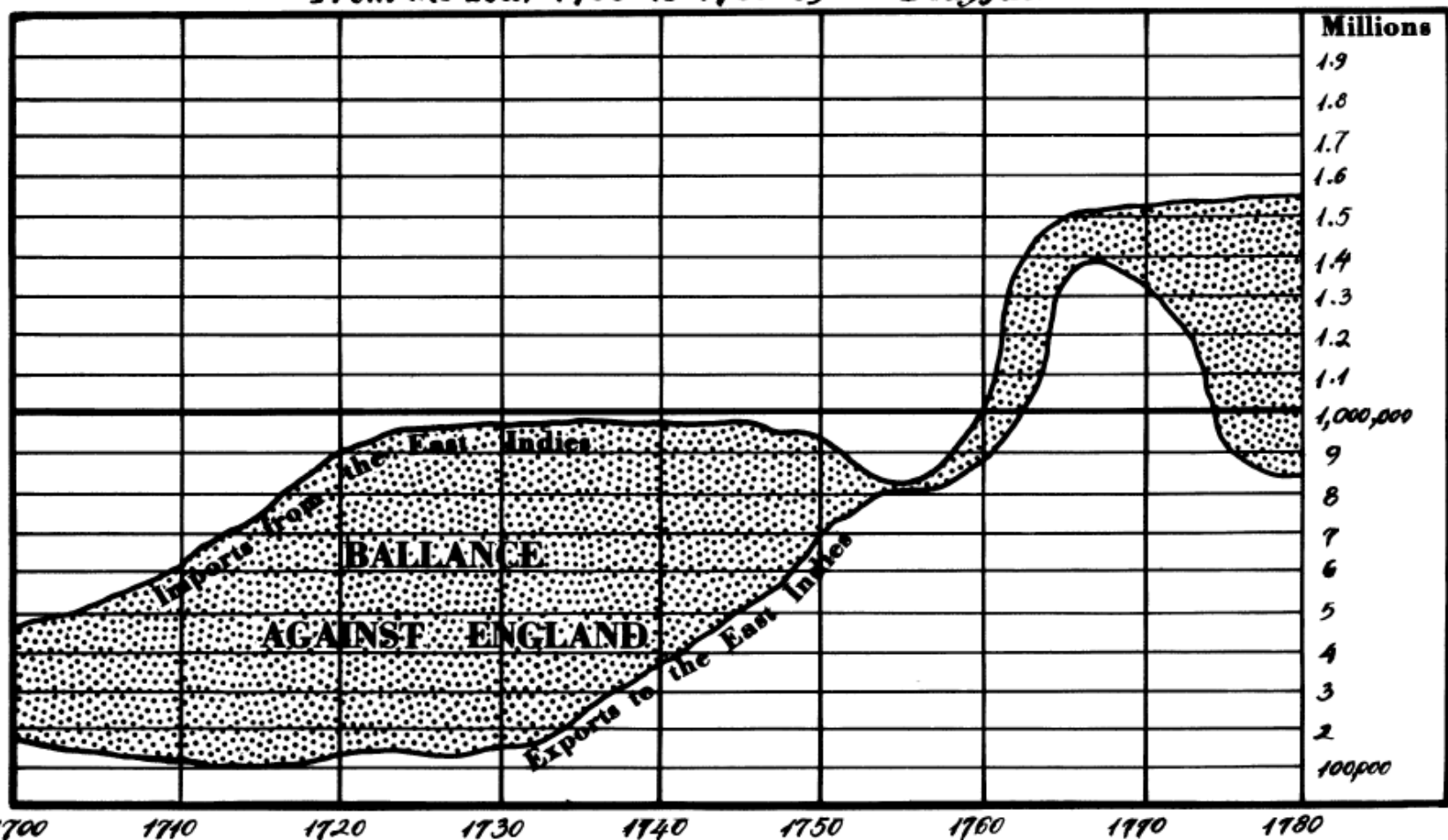


**Start**  
 of  
**UNIVERSAL COMMERCIAL HISTORY.**  
*From the Year 1500 before the Christian Era*  
 to the present Year 1805.  
*being a space of Three Thousand three hundred & four Years,*  
 By  
**WILLIAM PLAYFAIR.**  
*Inventor of Linear Arithmetic.*

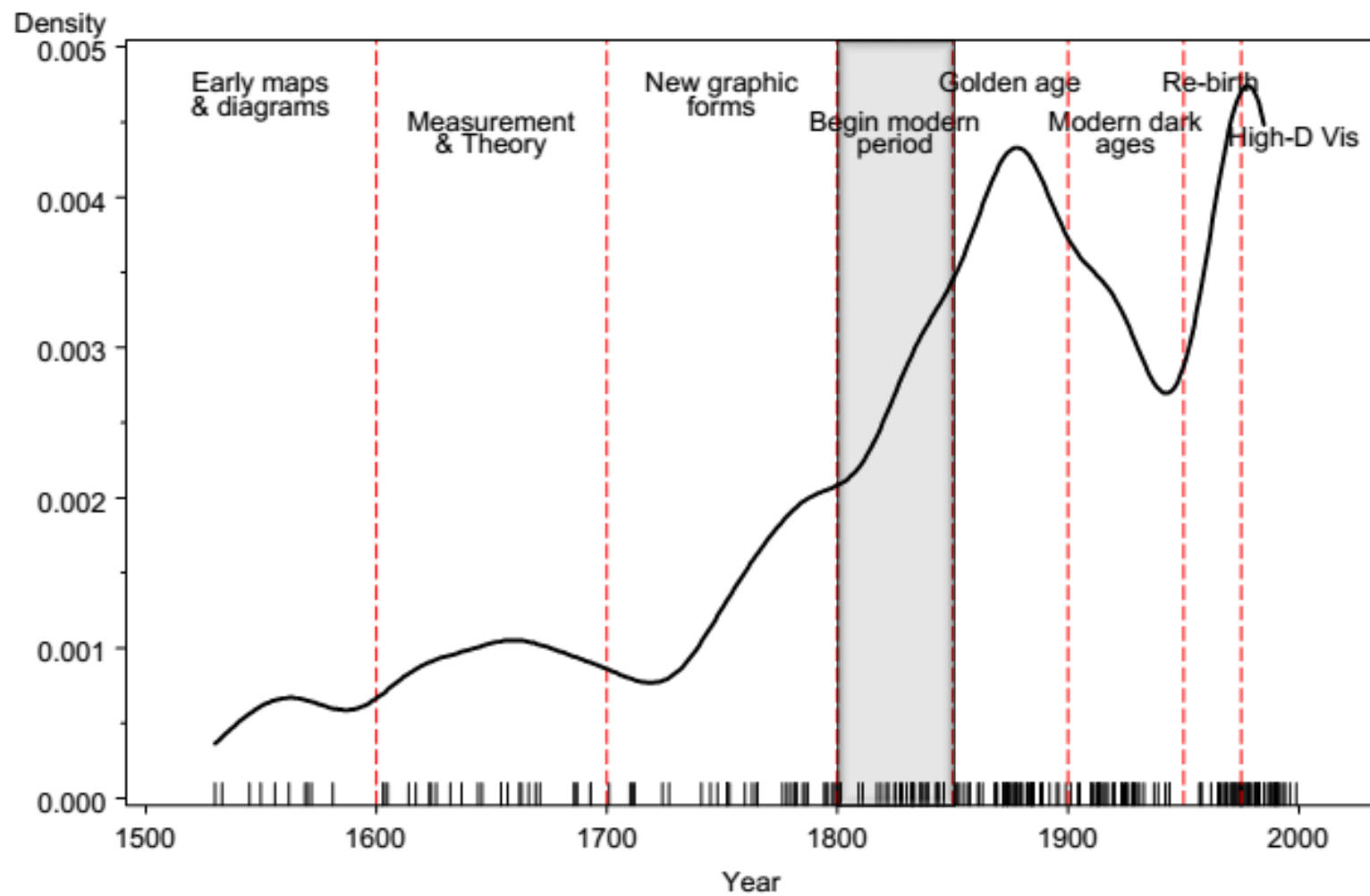


From Frontispiece of Book by WILLIAM PLAYFAIR, An Inquiry Into the Permanent Causes of the Decline and Fall of Powerful and Wealthy Nations, London, 1805.

**CHART of EXPORTS and IMPORTS to and from the EAST INDIES**  
*From the Year 1700 to 1780 by W. Playfair*



*The Bottom Line is Divided into Years the Right hand Line into HUNDRED THOUSAND POUNDS*  
*King of the Kings is force Page 31<sup>st</sup> Published in the Act Divine 16<sup>th</sup> Aug. 1785*



všechny základy máme

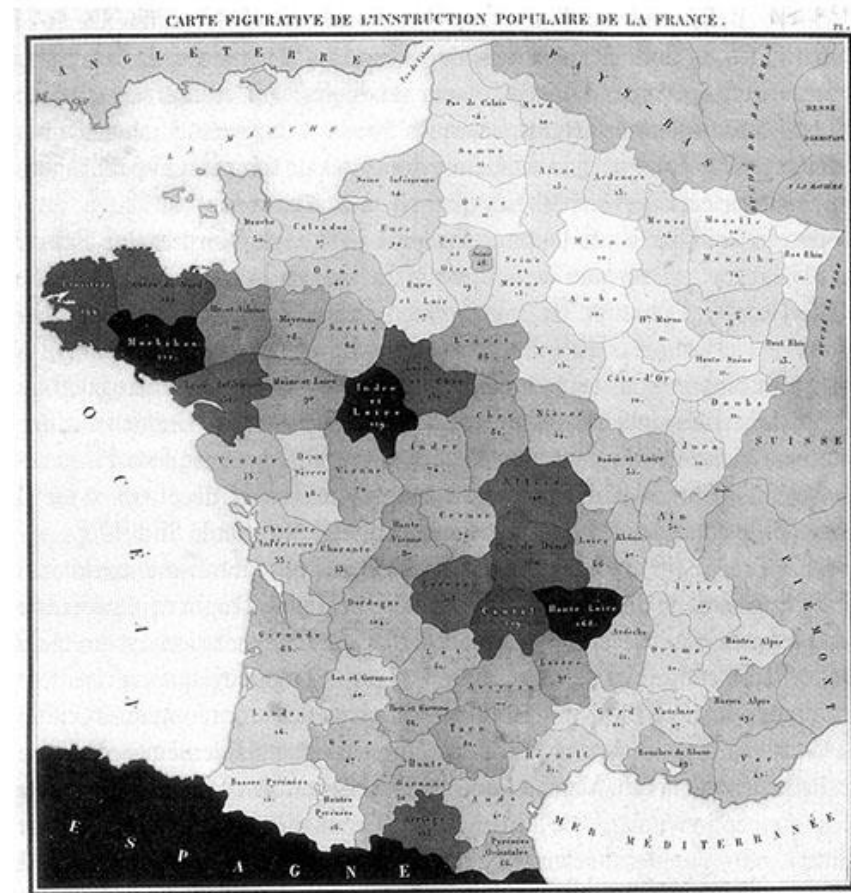
statistické atlasy

pokročilé metaforý

1826

# Charles Dupin

*První choropleth (kartogram)*





1833

# André-Michel Guerry

*Essai sur la statistique morale de la France.*

„Let us now compare this map with the one for crimes against persons. The maximum crime rate is in Corsica. Is this because there is greater ignorance there? Our map supplies evidence to the contrary. Further, the minimum occurs in the western and central provinces. Can it be said that the highest level of education prevails there?“

„Clearly, the relationship people talk about does not exist.“



1833 / 1854

# Robert Baker, John Snow

*Mapy cholery (dot mapa)*



1833 / 1854

# Robert Baker, John Snow

*Mapy cholery (dot mapa)*

„We are of the opinion that the streets in which malignant cholera prevailed most severely, were those in which the drainage was most imperfect; and that the state of the general health of the inhabitants would be greatly improved, and the probability of a future visitation from such malignant epidemics diminished, by a general and efficient system of drainage, sewerage and paving, and the enforcement of better regulations as to the cleanliness of the streets.“



MICROCOSM dedicated to the London Water Companies  
BRING FORTH ALL MONSTROUS, ALL PRODIGIOUS THINGS,  
HYDRAS AND GORGONS, AND CHIMÆRAS DIRE.



A MONSTER SOUP commonly called THAMES WATER, being a correct representation of that precious stuff doled out to us

an oilman, aged 30, "Asiatic cholera". *Southwark & Vauxhall.*

At the same house, Aug. 1, the son of an oilman, aged 8 weeks, "cholera maligna 3 days". *Southwark and Vauxhall.*

At 6, Brown's Terrace, Wyndham Road, Aug. 3, the son of a labourer, aged 3 months, "infantile cholera 6 days" . . . . . *Southwark and Vauxhall.*

At 27, Thomas Street, Wyndham Road, Aug. 4, the widow of a labourer, aged 68, "diarrhœa 6 days, cholera 4 days" . . . . . *Southwark and Vauxhall.*

At 7, Rosemary Terrace, Southampton Street, Aug. 5, the son of a labourer, aged 7 years, "Asiatic cholera 15 hours" . . . . . *Southwark and Vauxhall.*

At 5, Chatham Place, Windmill Lane, August 3rd, a plumber, aged 60, "diarrhœa 2 days, cholera 2 days".  
*Southwark and Vauxhall.*

At 7, Gloucester Pl., Old Kent Rd., Aug. 4, a carman, aged 19, "Asiatic cholera 15 hours" . . . . . *Lambeth.*

ROTHERHITHE. *Rotherhithe.*

At 2, Albert Place, Union Road, July 8, the wife of a coffee-shopkeeper, aged 32, "cholera 30 hours" .  
*Southwark and Vauxhall.*

At 7, Spread Eagle Court, July 22nd, the wife of a labourer, aged 25, "cholera 12 hours". *Southwark & Vauxhall.*

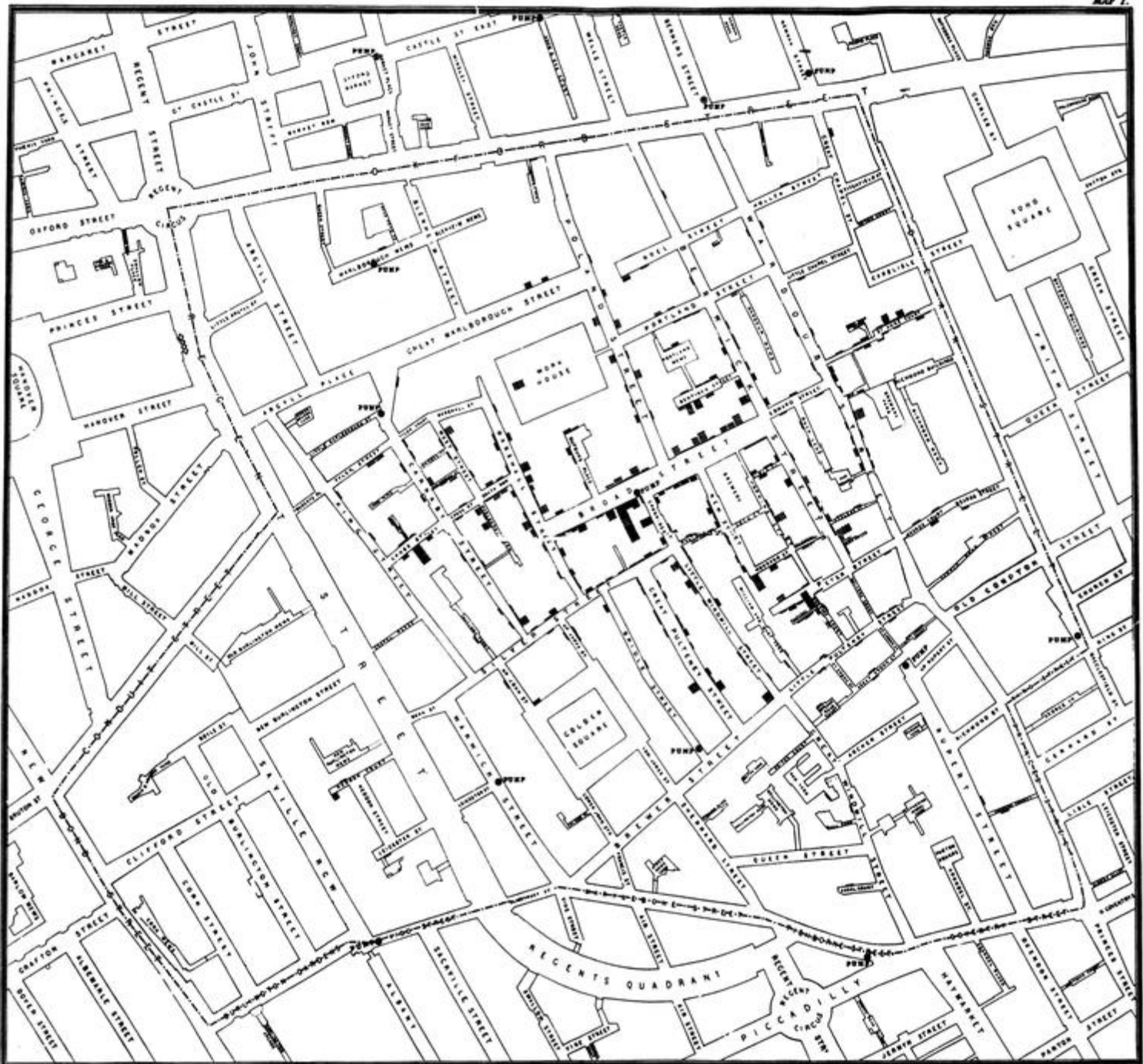
At 19, Spread Eagle Court, July 24th, the daughter of a labourer, aged 1 year and 9 months, "cholera 20 hours" . . . . . *Southwark and Vauxhall.*

At 4, John's Place, July 25th, a blacksmith, aged 41, "cholera 10 hours". *Water pumped from beneath the Thames Tunnel, by the Engine of the Thames Tunnel Company.*

At 1, John's Place, July 27th, the wife of a biscuit baker, aged 45, "cholera 26 hours" . . . . . *Same as above.*

At 5, John's Place, July 25, the son of a baker, aged 4 years, "cholera 24 hours" . . . . . *Same as above.*









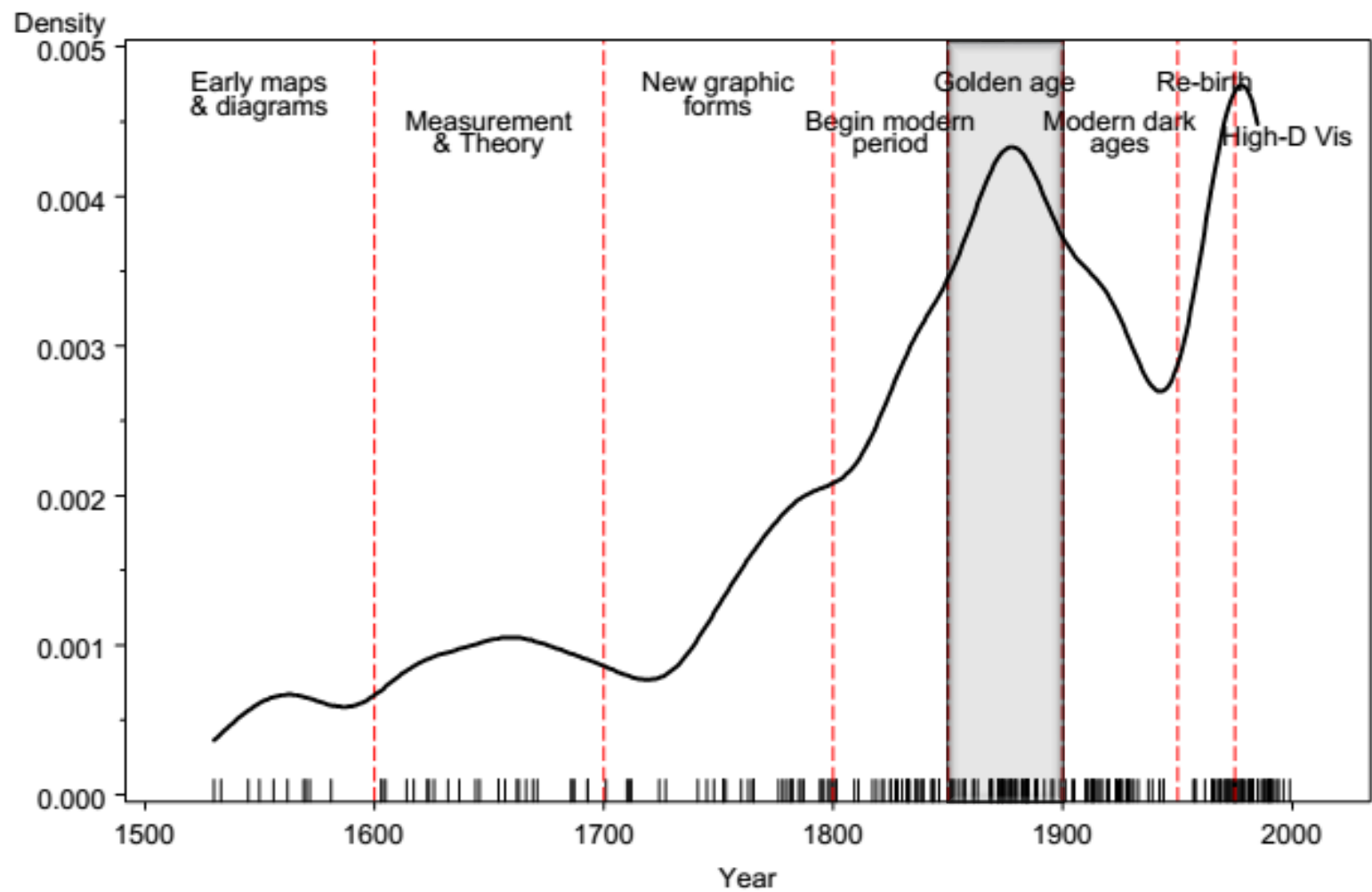
# SNOW

Epidemiology begins.



Based on a true story.

THE UNIVERSITY OF SOUTHERN CALIFORNIA AND RELATIVE RISK PRODUCTIONS IN ASSOCIATION WITH THE ALFRED P. SLOAN FOUNDATION PRESENT CHUCK McCOLLUM REBECCA SPICHER DARIN SINGLETON  
GREGORY GIFFORD GILES ANTHONY MARK BARROW AND MORRISON KEOHLE IN "SNOW" MUSIC BY BARRETT YERETSJIAN MARTIN CHRISTOPHER SOUND BY AARON COVINGTON JONATHAN DEUTSCH  
EDITED BY NATE HARRISON 1ST ASSISTANT DIRECTOR AREK BAGROUDARIAN MAKEUP & HAIR BY STEVE WEBER COSTUME DESIGNER BY PHOEBE BOYNTON PRODUCTION DESIGNER BY ELLEN DORRIS  
CINEMATOGRAPHY BY ELIZABETH YARWOOD PRODUCED BY JONATHAN HAY JOHN PAUL HENDERSON JAY NEW WRITTEN BY ISAAC ERGAS AND JAY NEW DIRECTED BY ISAAC ERGAS



oficiální statistické úřady

plnobarevné atlasy

zlatý věk

●  
1869

# Charles Joseph Minard

*Napoleonův pochod na Rusko a zpět*

\* \* \* \* \*

„Probably the best statistical graphic ever drawn.“

- *Edward Tufte*

# 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 ont été 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 Ségur, 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 Davout, qui avaient été détachés sur Minsk et Mohilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

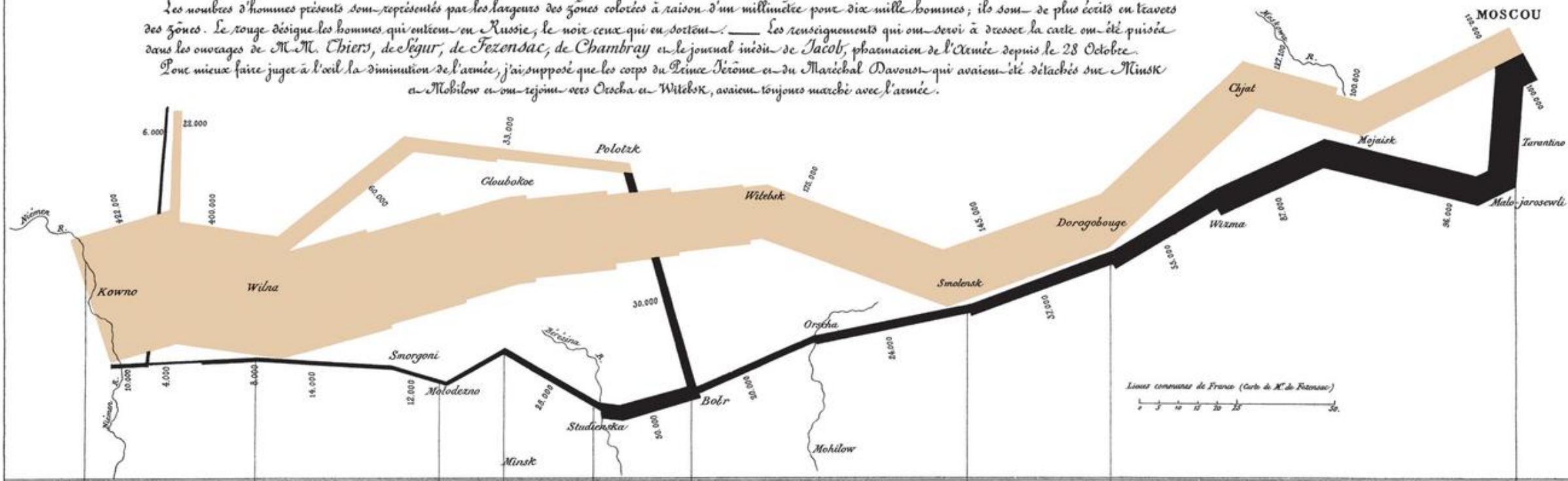
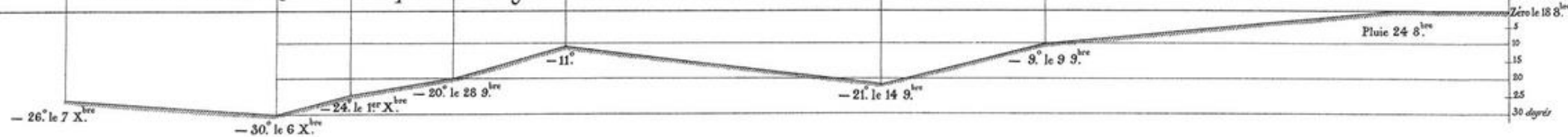


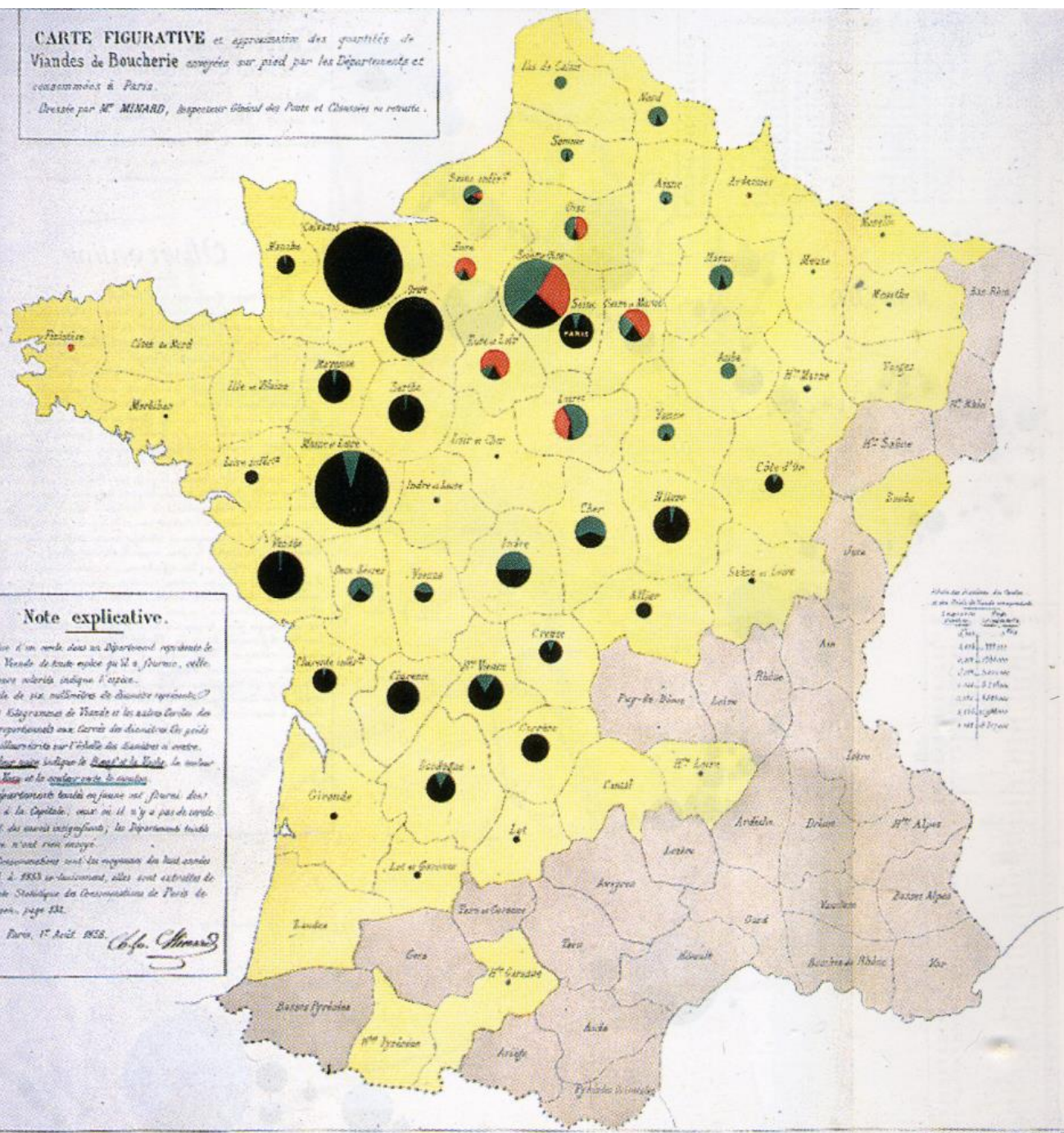
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



Les Cosaques passent au galop le Niemen gelé.

**CARTE FIGURATIVE** et approximation des quantités de  
Viandes de Boucherie consommées sur pied par les Départements et  
consommées à Paris.

Dressée par M<sup>r</sup> MINARD, Inspecteur Général des Ponts et Chaussées en retraite.



**Note explicative.**

La surface d'un cercle dans un Département représente le poids de Viande de Bœuf consommée par lui à Paris, celle du Secteur coloré indique l'espèce.  
Un cercle de six millimètres de diamètre représente 555 000 kilogrammes de Viande et les autres cercles des poids proportionnels aux cercles des diamètres ci-dessus.  
La couleur rouge indique le Bœuf et le Vert, le vert clair le Mouton et le noir, le porc.  
Les Départements tachés en jaune ont fourni des Bœufs à la Capitale, ceux où il n'y a pas de cercle ont fait des envois insignifiants, les Départements tachés en blanc n'ont rien envoyé.  
Les Consommations sont les moyennes des huit années de 1845 à 1853 inclusives, elles sont extraites de l'Annuaire Statistique des Consommations de Paris de M<sup>r</sup> Boyer, page 132.

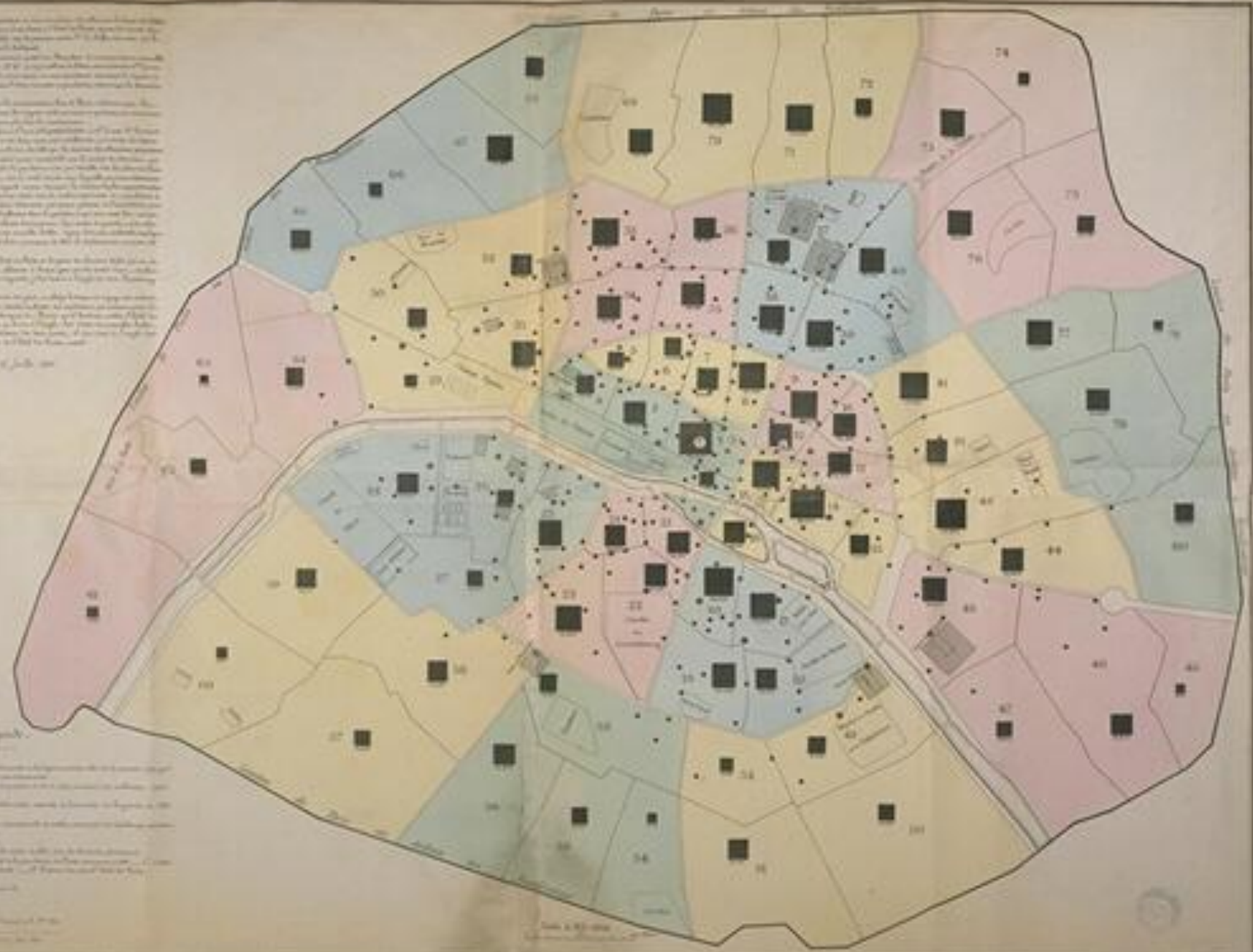
Paris, 17 Août 1858. *Ch. Minard*

Tableau des Quantités de Viandes  
et des Poids de Bœuf consommés

Quantité	Poids
1000	555 000 kg
2000	1 110 000 kg
3000	1 665 000 kg
4000	2 220 000 kg
5000	2 775 000 kg
6000	3 330 000 kg
7000	3 885 000 kg
8000	4 440 000 kg
9000	4 995 000 kg
10000	5 550 000 kg

La Commune de Paris, par ses Représentans, a cru devoir, par un acte de sa sagesse & de sa justice, partager la ville en sections, pour faciliter la communication de ses vœux à la Nation, & pour rendre plus prompt & plus exact le service de la police. Elle a donc, le 20 Mars 1790, divisé la ville en 48 sections, qui ont été nommées d'après les noms de ses anciens quartiers, & qui ont été numérotées de 1 à 48. Cette division a été faite d'après le plan ci-joint, & elle a été confirmée par la Convention Nationale, le 20 Mars 1790.

Paris, le 20 Mars 1790.



Le Comité de la Commune de Paris, le 20 Mars 1790.

1. Section de la Madeleine  
2. Section de la Cité  
3. Section de la Cité  
4. Section de la Cité  
5. Section de la Cité  
6. Section de la Cité  
7. Section de la Cité  
8. Section de la Cité  
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44. Section de la Cité  
45. Section de la Cité  
46. Section de la Cité  
47. Section de la Cité  
48. Section de la Cité

1858

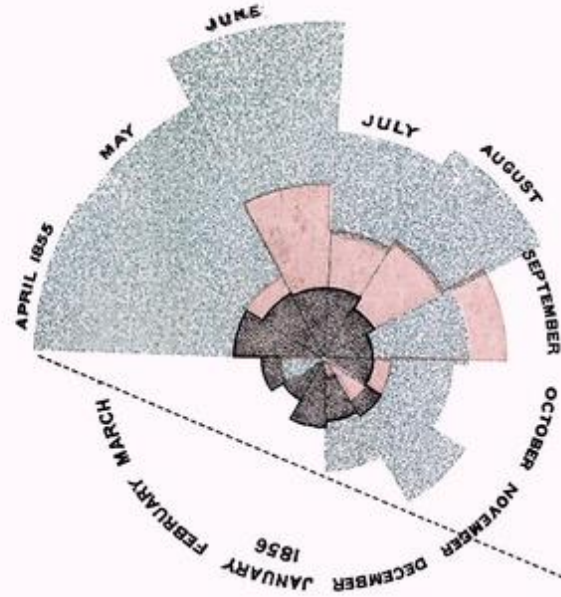
# Florence Nightingale



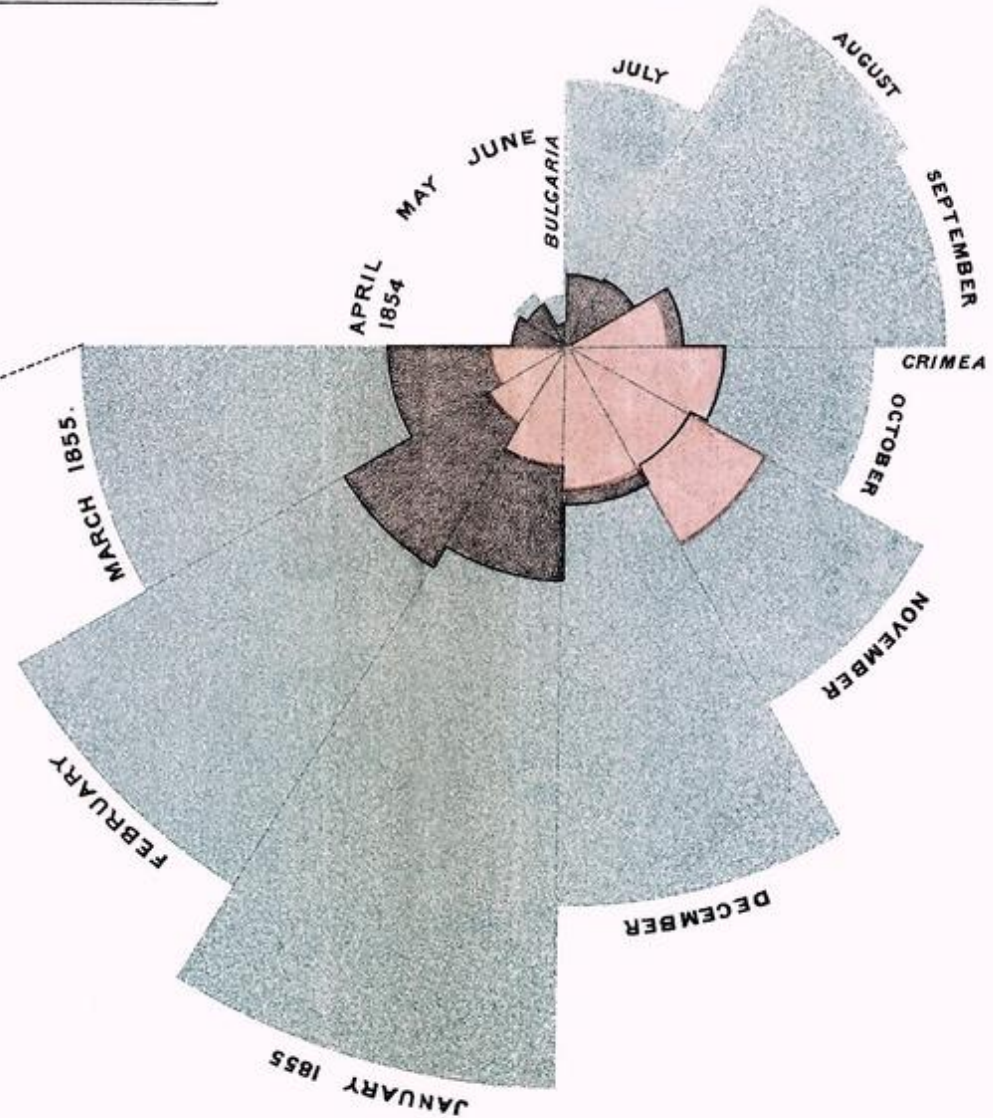


## DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST.

2.  
APRIL 1855 TO MARCH 1856.



1.  
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 Preventible 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.*

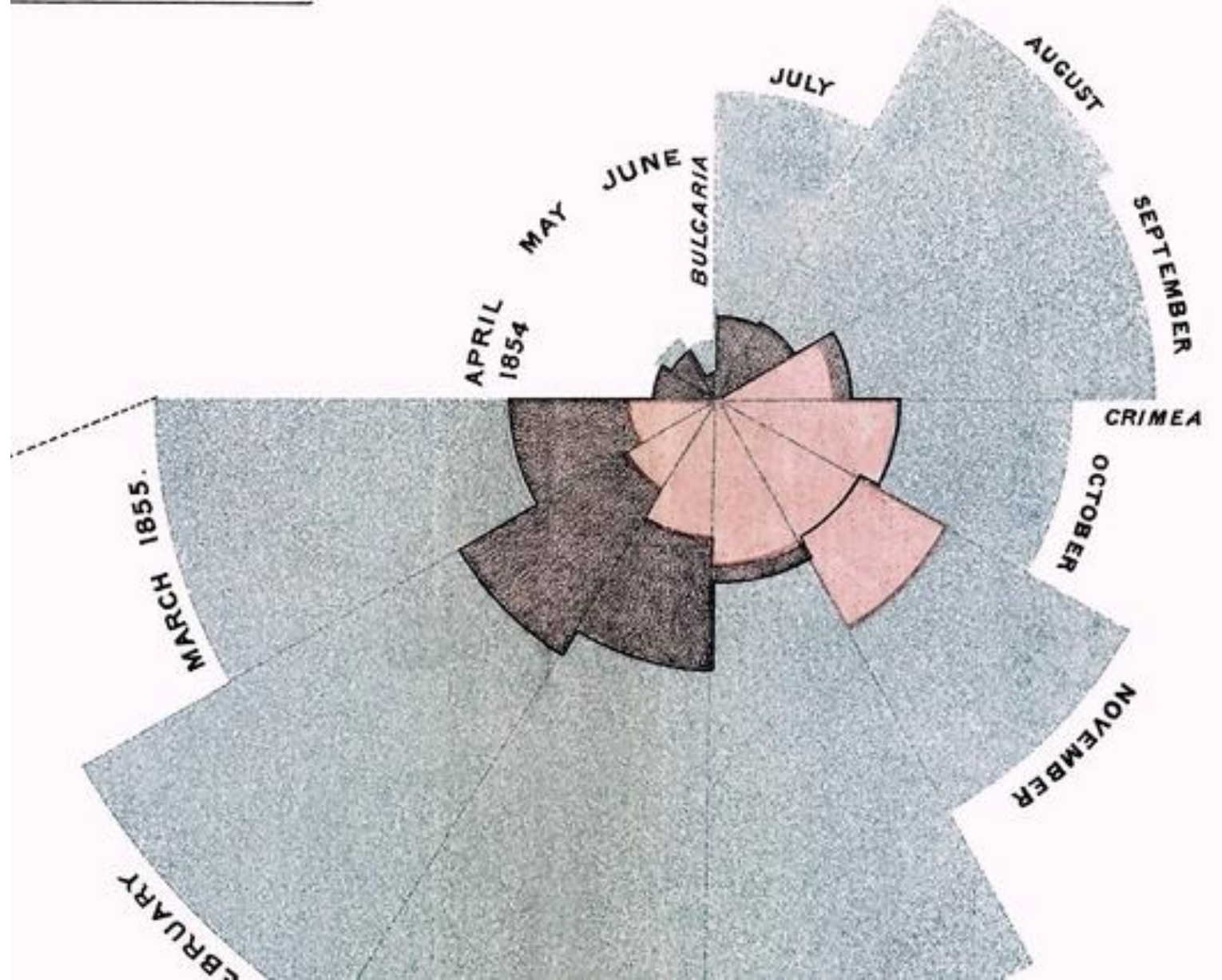
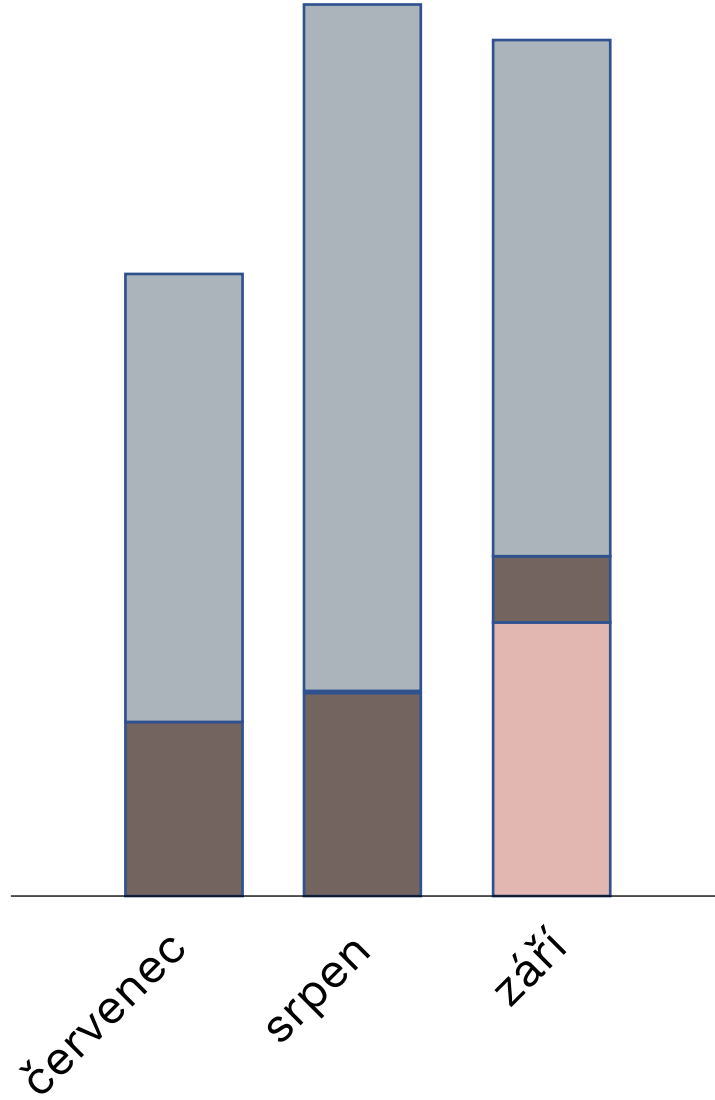
*The black line across the red triangle in Nov<sup>r</sup> 1854 marks the boundary of the deaths from all other causes during the month.*

*In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.*

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

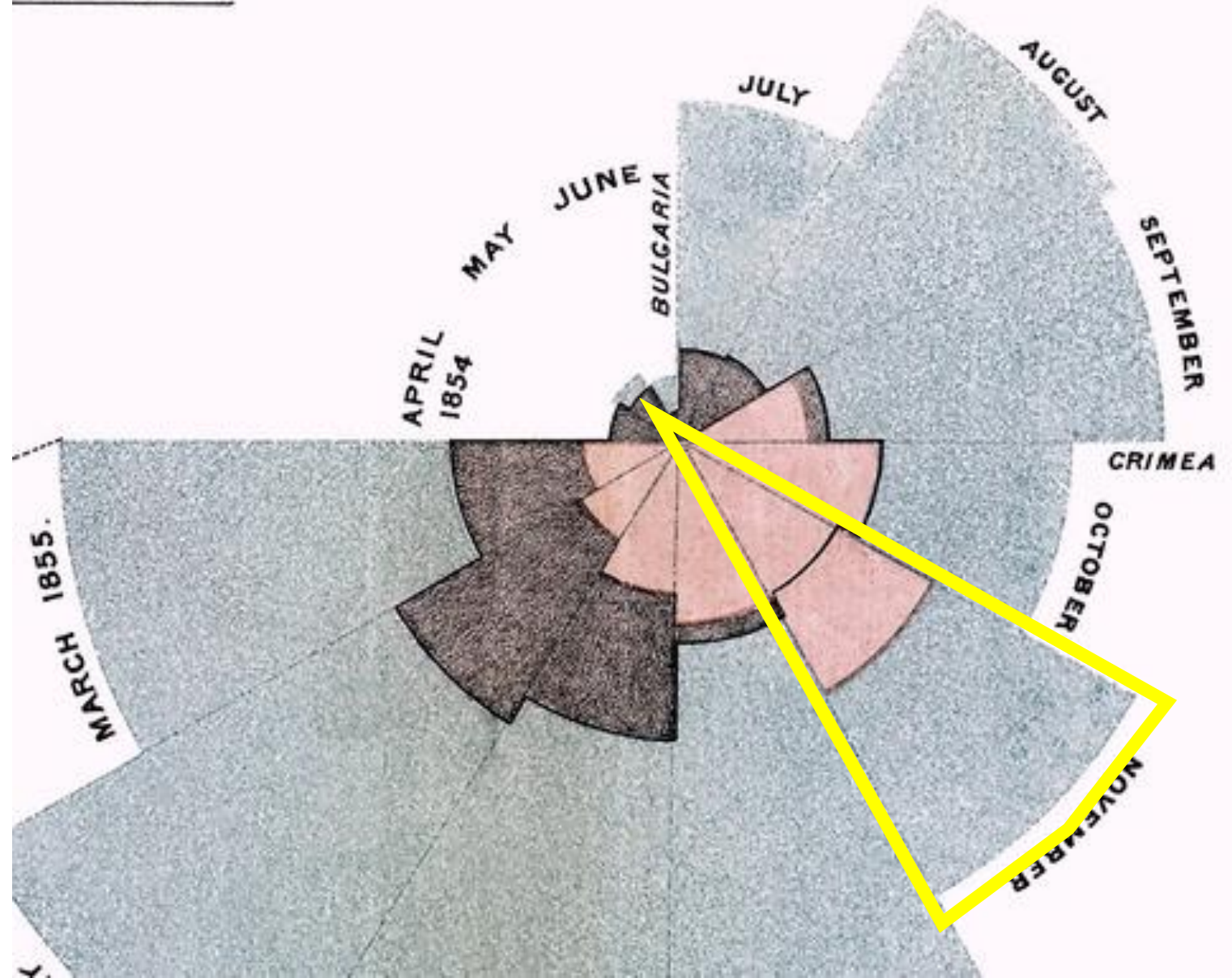
# AUSES OF MORTALITY Y IN THE EAST.

1.  
APRIL 1854 TO MARCH 1855.



# LES OF MORTALITY THE EAST.

1.  
APRIL 1854 TO MARCH 1855.



listopad

1860+

# William Farr

## TEMPERATURE AND MORTALITY OF LONDON For every week of 11 years (1840-50).



Circular Diagrams showing the relative Mortality and the mean temperature in each week of the 11 Years 1840-50. The distance between each circle represents either 100 deaths or 10° of temperature; the radii represent the weeks of the year the numbers of which are arranged round the outside circle from 1 to 52. Besides these circles, there are two others: the one running outside the yellow colour and inside the black; the other outside

the blue and inside the red colour represent respectively the average weekly deaths of the ten Years 1840-49 corrected for increase of Population, and the mean temperature (68°) of the 79 years 1771-1849. The outer irregular line represents the Deaths, and the inner irregular line the mean temperature in each week of the year. The black colour denotes the extent by which the weekly

deaths exceed the average (Excessive Mortality) and the yellow colour denotes the extent by which the weekly deaths are below the average (Subalibrity). The red colour denotes the extent by which the mean temperature of the week exceeds the mean temperature of the 79 years (Heat), and the blue (Cold) the extent by which the mean weekly temperature is below the mean temperature of the 79 years. Thus, in the year 1846 the number of deaths registered in the 25th week was 365, the

average weekly number for the 10 years was 1620 the deaths were therefore 217 below the average, which difference is shown by the width of the yellow colour. The mean temperature for the same week was 69°·5, while the average mean for the 79 years was only 48°·4, so that the mean temperature of that week was 21° above the average mean, which excess is shown by the width of the red colour.

1879

Luigi Perozzo

# NUMERO ASSOLUTO dei NATI VIVI

## MASCHI

loro superstiti classificati per età  
secondo i risultati dei Censimenti

### in SVEZIA 1750-1875

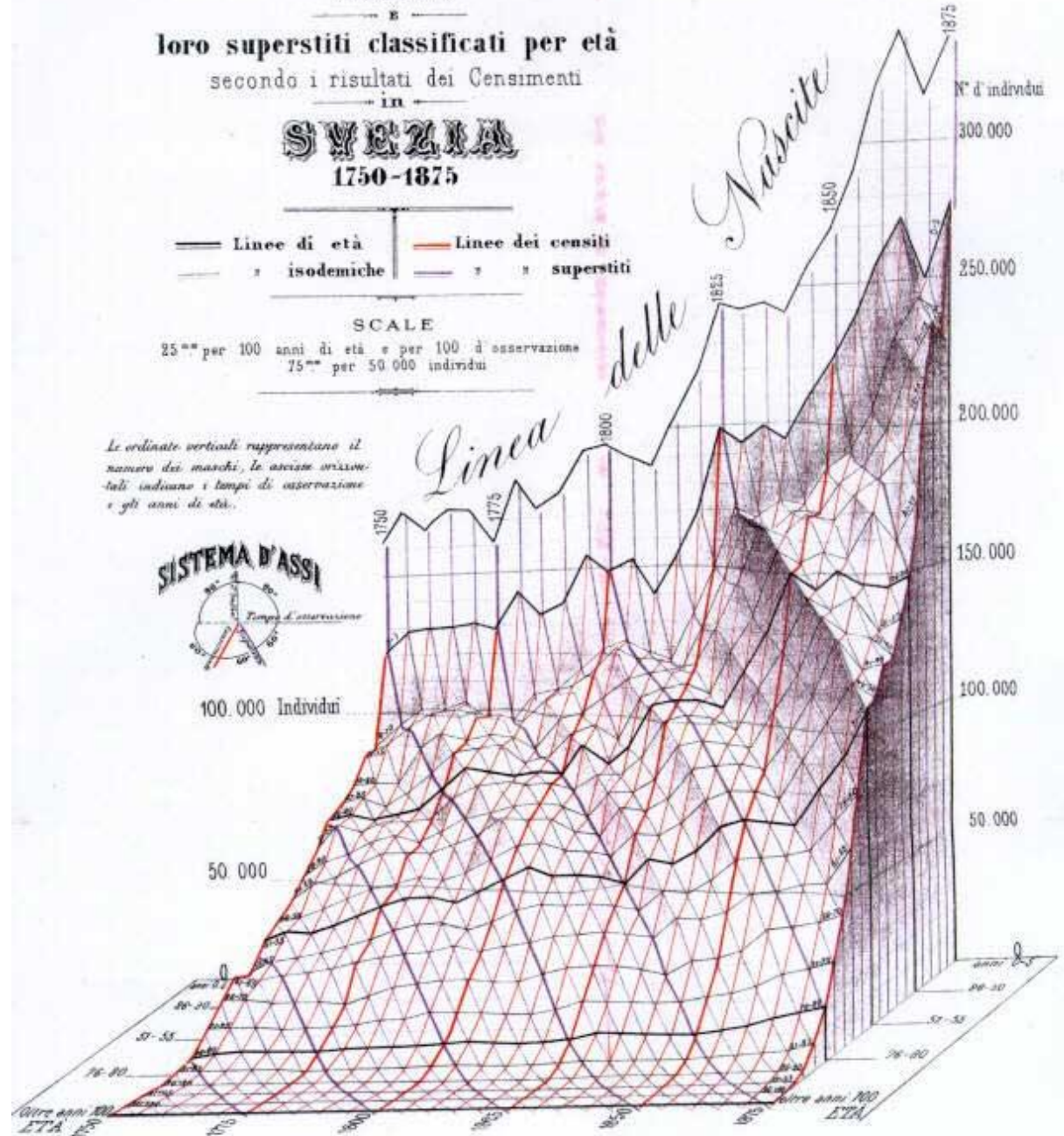
— Linee di età	— Linee dei censiti
— " isodemiche	— " superstiti

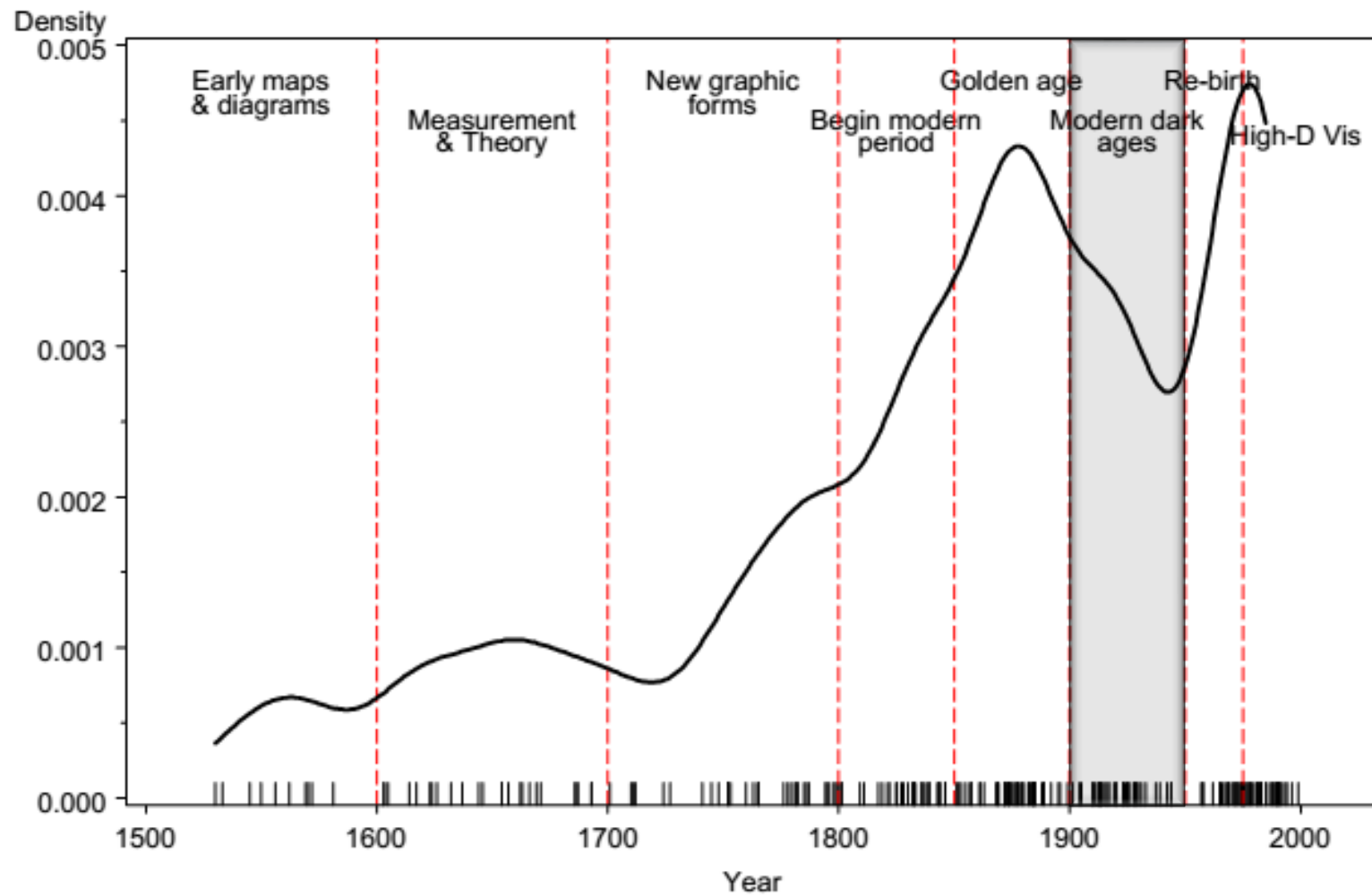
SCALE

25<sup>mm</sup> per 100 anni di età e per 100 d'osservazione  
75<sup>mm</sup> per 50.000 individui

Le ordinate verticali rappresentano il numero dei maschi, le ascisse orizzontali indicano i tempi di osservazione e gli anni di età.

#### SISTEMA D'ASSI

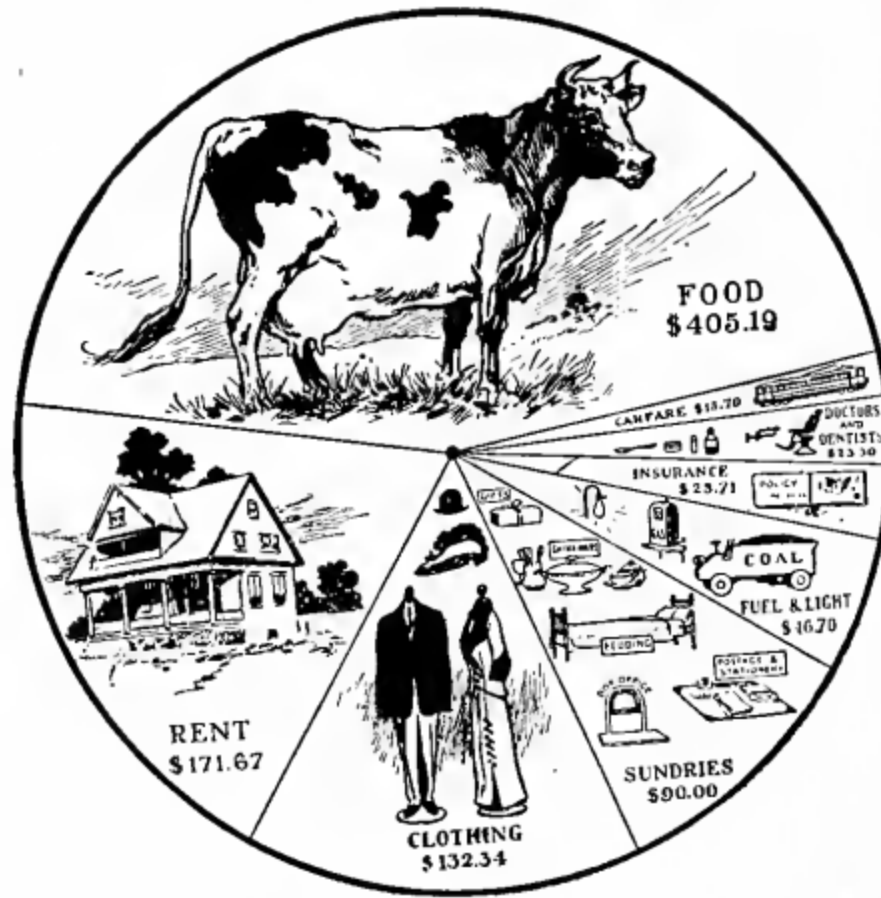




nová statistická škola

tabulka je víc než graf

pokřivenost x přesnost

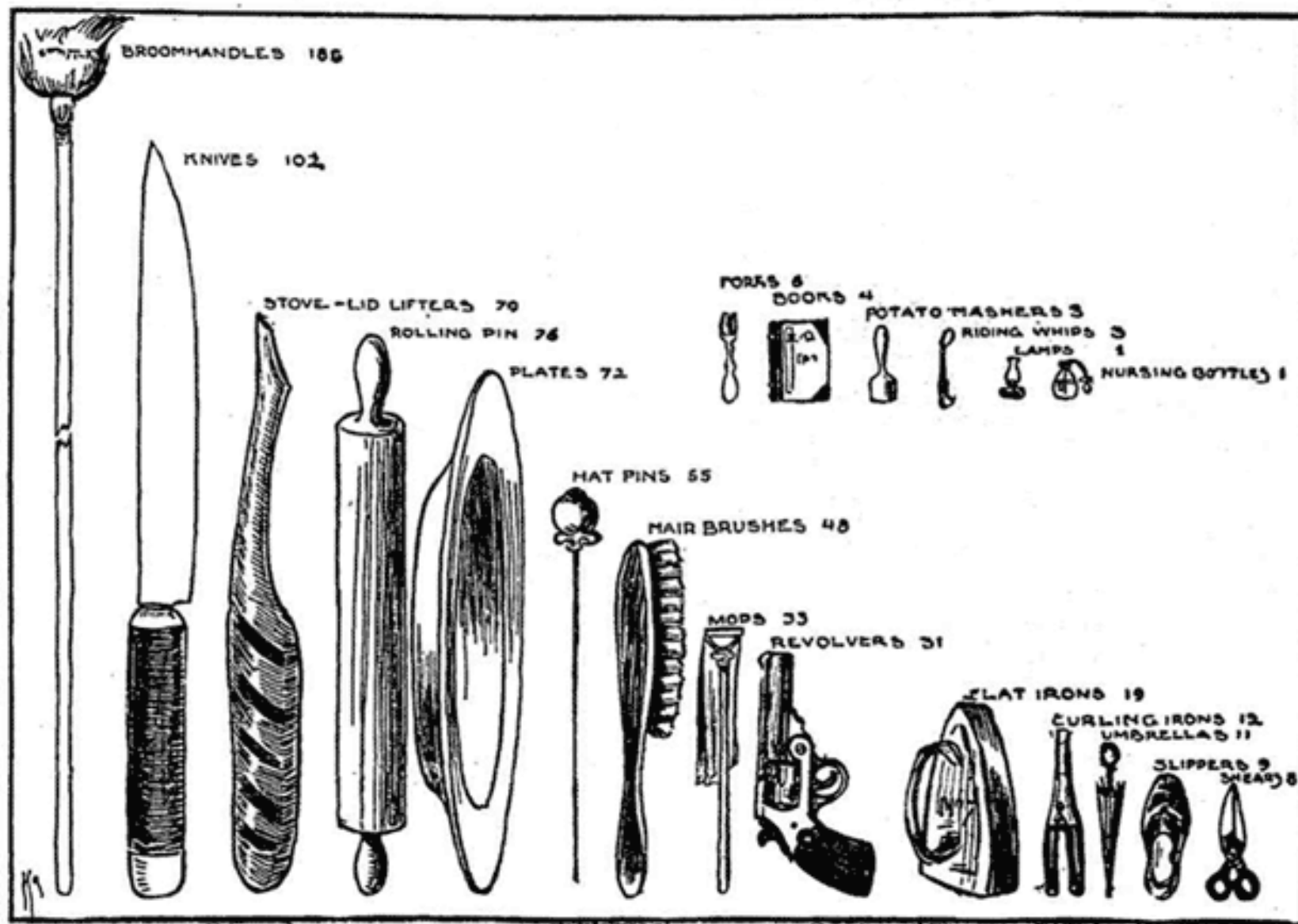


*The Survey*

**Fig. 3. Disposition of a Family Income of from \$900 to \$1000**

This cut shows an attempt to put figures in popular form. The eye is likely to judge by the size of the pictures rather than by the angles of the sectors

DIAGRAM SHOWING RELATIVE POPULARITY OF WOMEN'S WEAPONS.





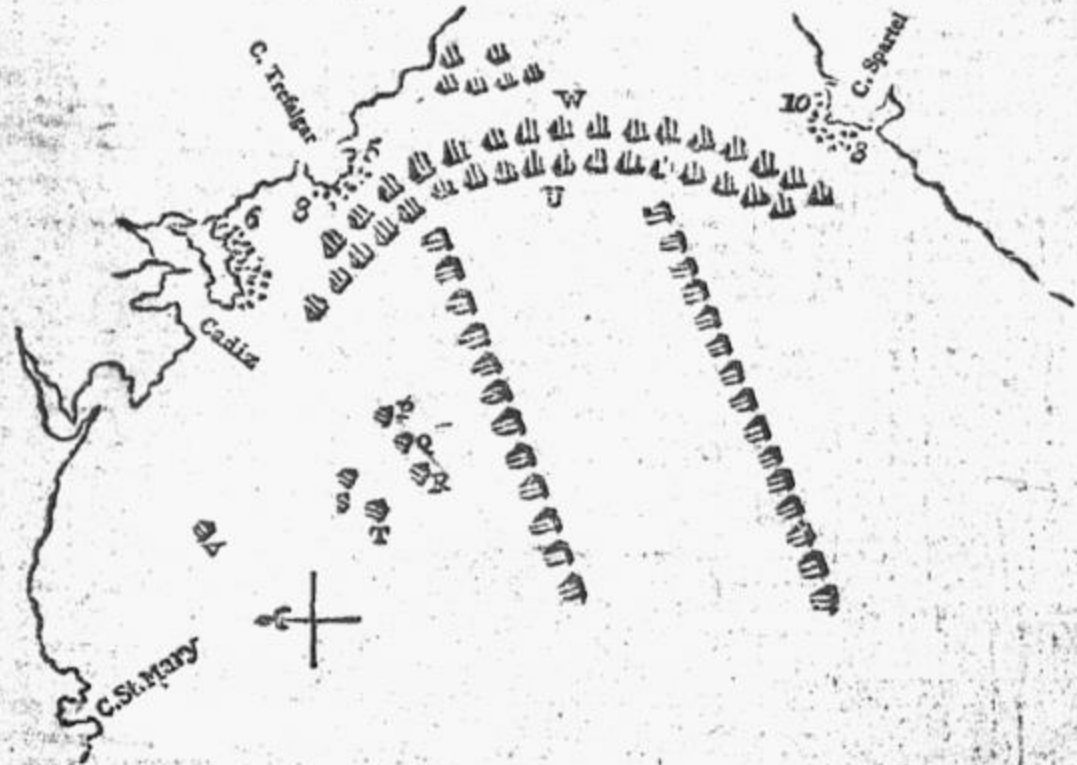
[From a London Paper]

# P L A N

OF THE

## BRILLIANT ACTION OFF TREFALGAR,

REVISED BY AN OFFICER WHO CAME HOME WITH THE  
VICTORIOUS DISPATCHES.



**BRITISH FLEET:**

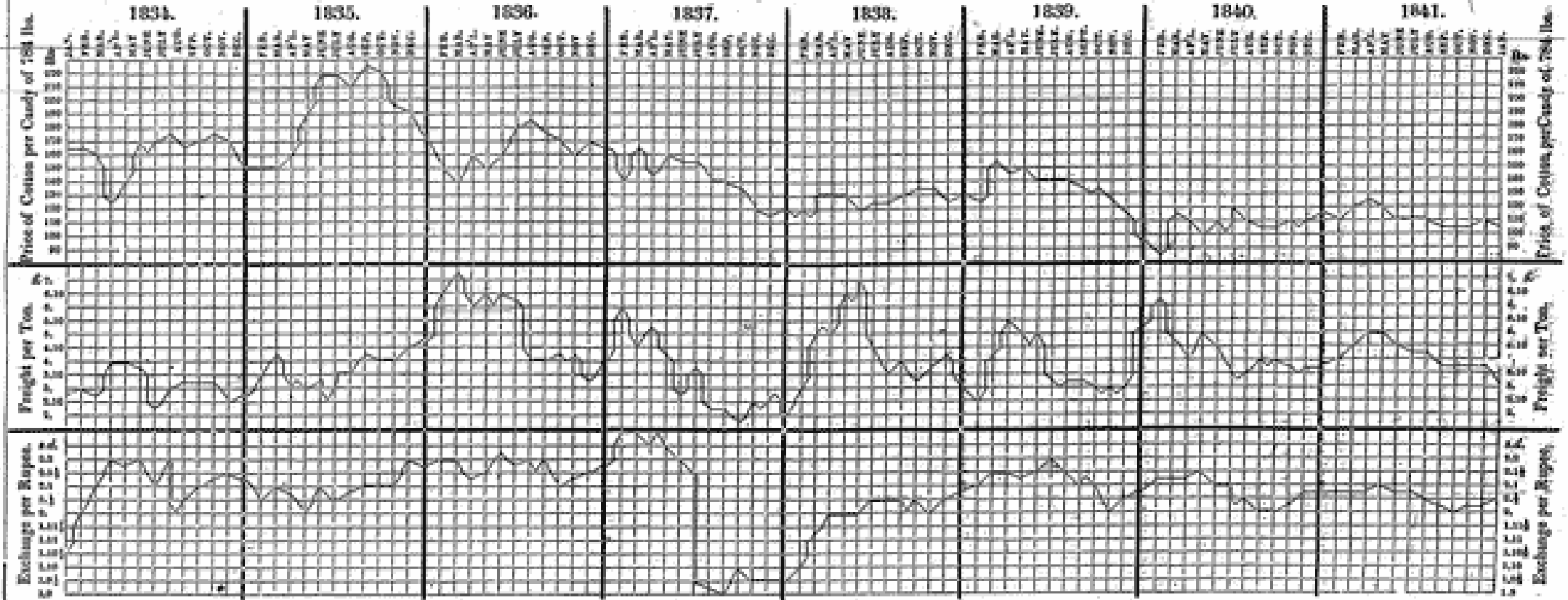
	Guns.	Commanders.
Victory	100	Admiral Lord NELSON, Capt. T. M. HARDY.
Temeraire	98	— E. HARVEY.
Neptune	98	— T. F. FAIRMAULT.
Conqueror	74	— I. FEELEW.
Leviathan	74	— H. W. BAYNING.
Ajax	74	— J. PILFORD.
Orion	74	— E. CODRINGTON.
Agamemnon	74	— Sir E. HERR.
Minotaur	74	— C. J. M. MANSFIELD.
Spartiate	74	— Sir F. LAPORRY.
Britannia	100	Rear Admiral Earl of NORTHBROOK.

**THE COMBINED FLEET.**

	Guns.	Commanders.
Santissima Trinidad	140	Admiral Don Isaac de Morra D'Aiña; Capt. Don Franc. De Walave.
Prince of Austria	120	Admiral Gravina, Commander in Chief; Captain Don Rafael D'Hoia.
Argonaut	80	Adm. Sig. D. Comingo Gaedat- harras; Captain Count D. S. Antonio Pavez.
Neptuno	80	Commodore Don Baatzer; Capt Don Cazelana Valdez.
Santa Anna	120	Son Susto

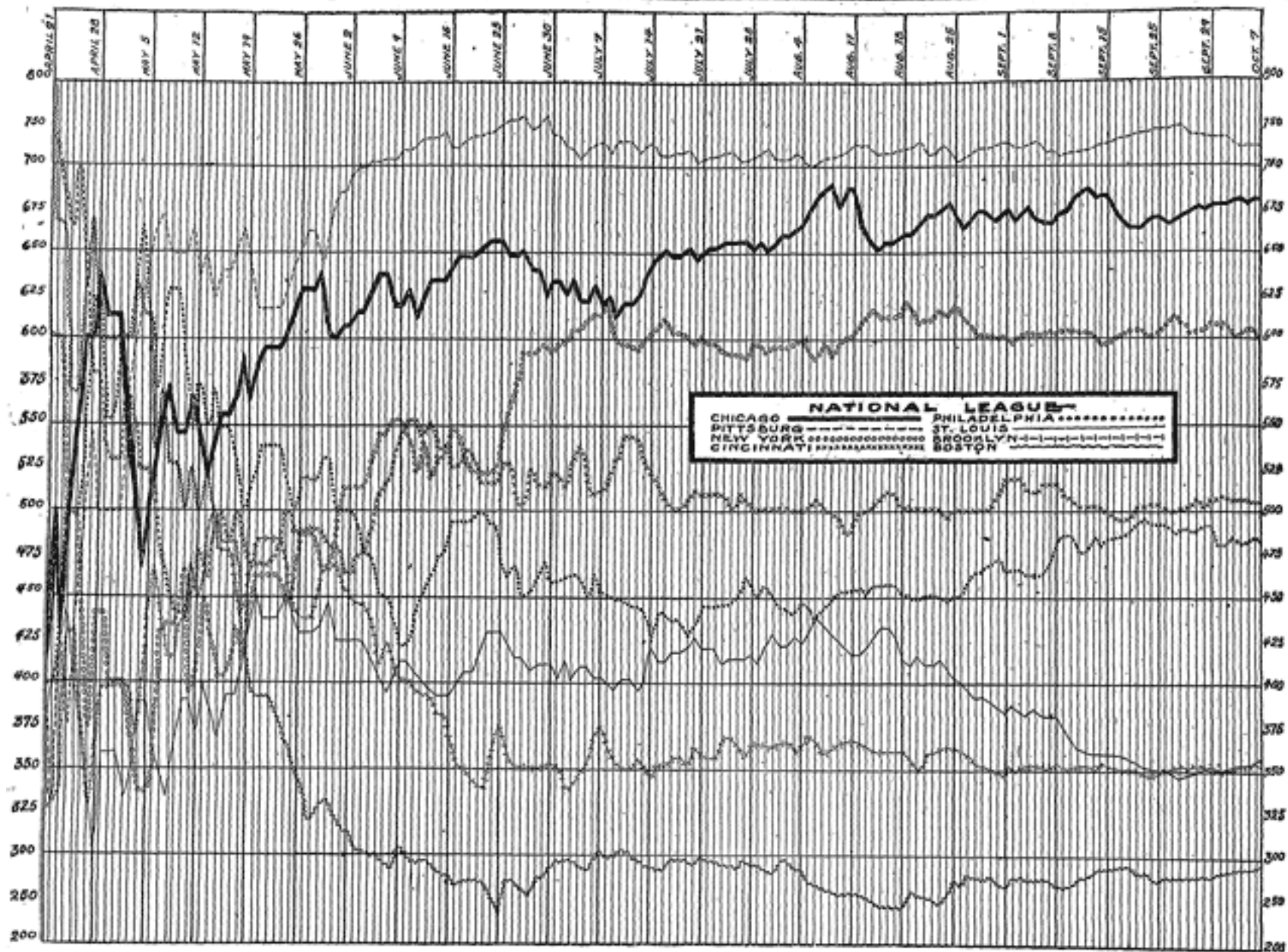
### CHART

OF THE FLUCTUATIONS OF THE PRICE OF COTTON (BROACH), THE RATES OF FREIGHT TO GREAT BRITAIN, AND OF EXCHANGE ON LONDON,  
AT BOMBAY DURING THE LAST EIGHT YEARS.

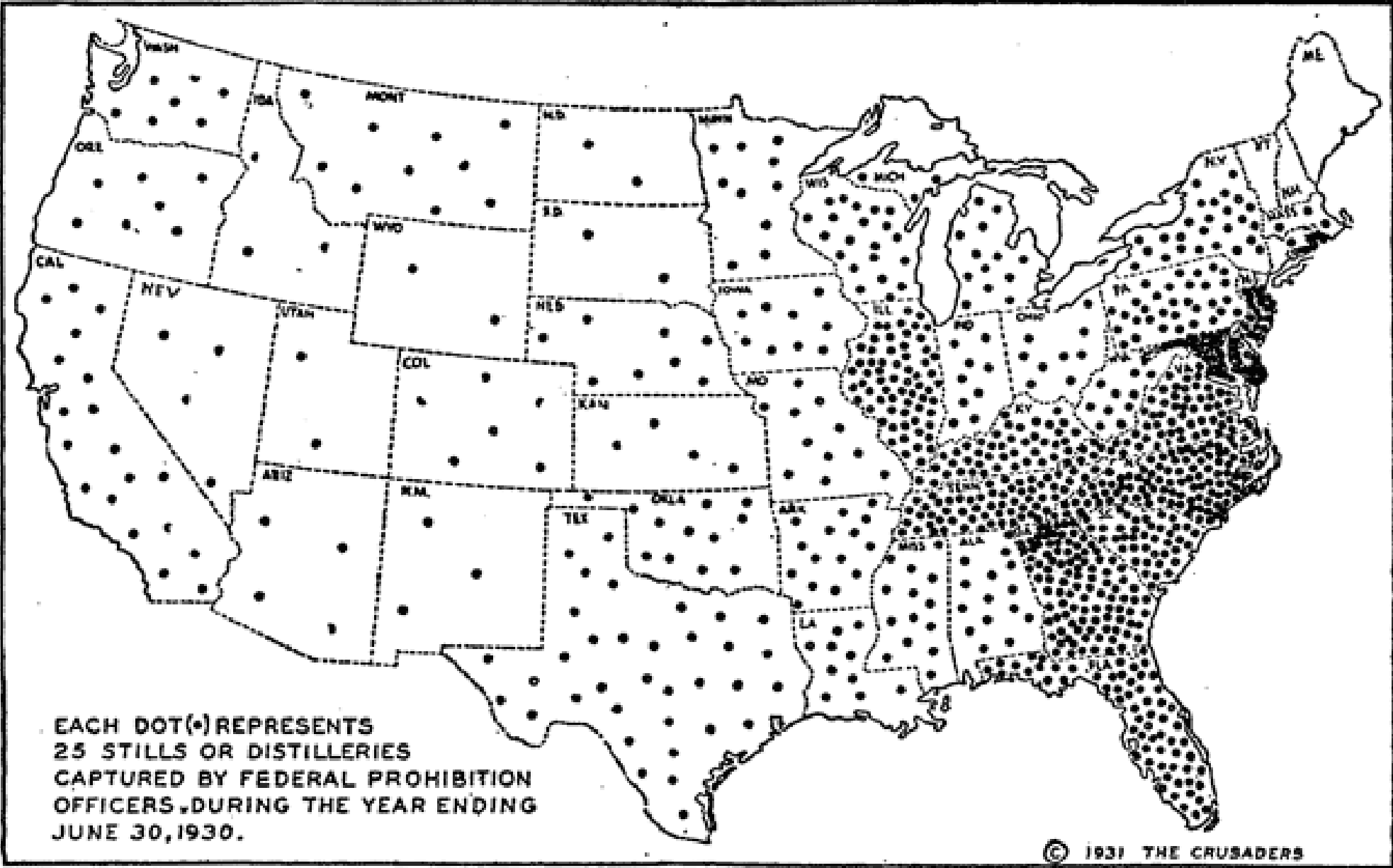


\* For the setting up of the above in movable types we are indebted to Mr. Webster of the American Mission Press, Bombay.

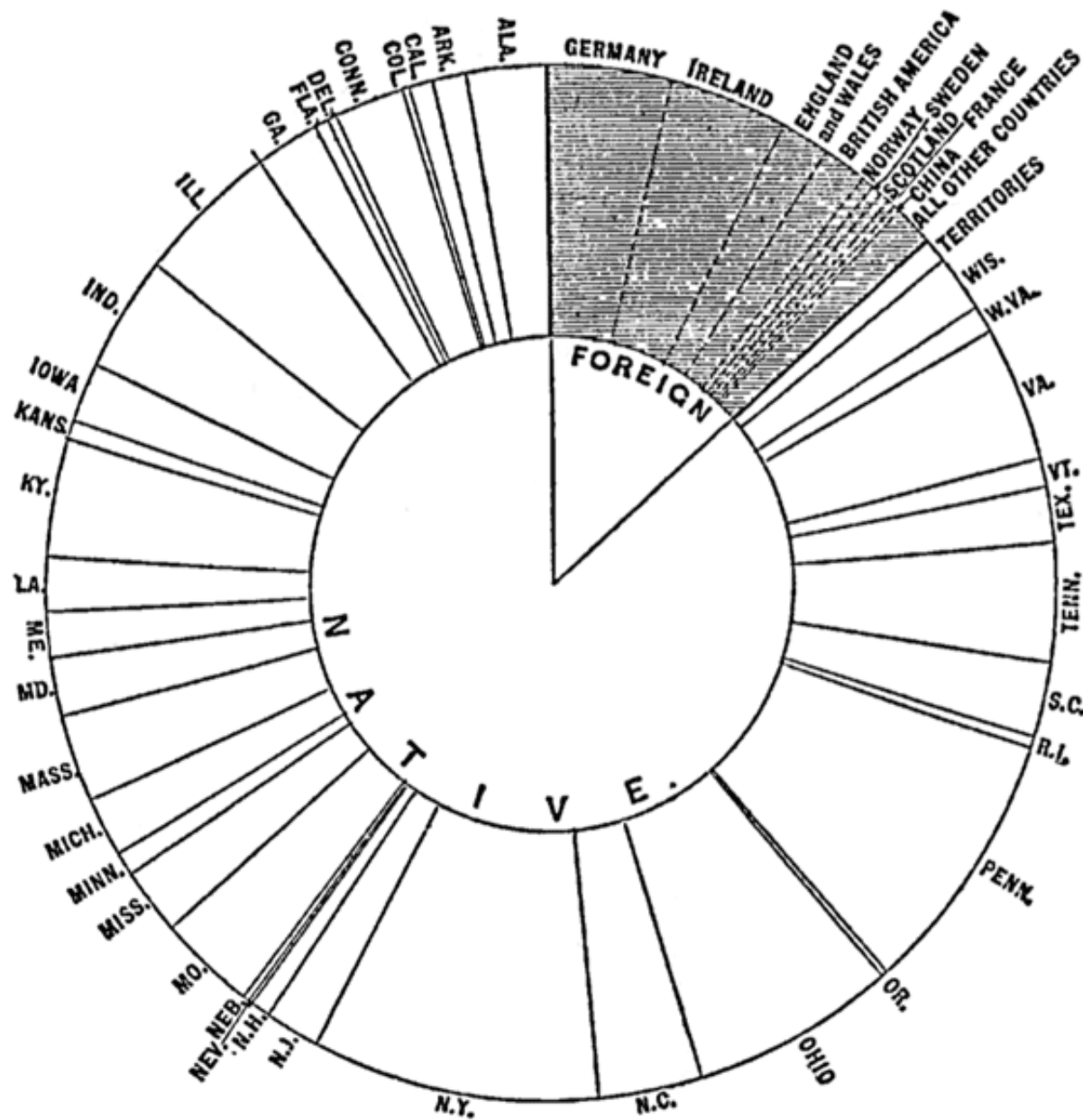
Diagram Showing Daily Fluctuations in the National League Pennant Race of 1909.



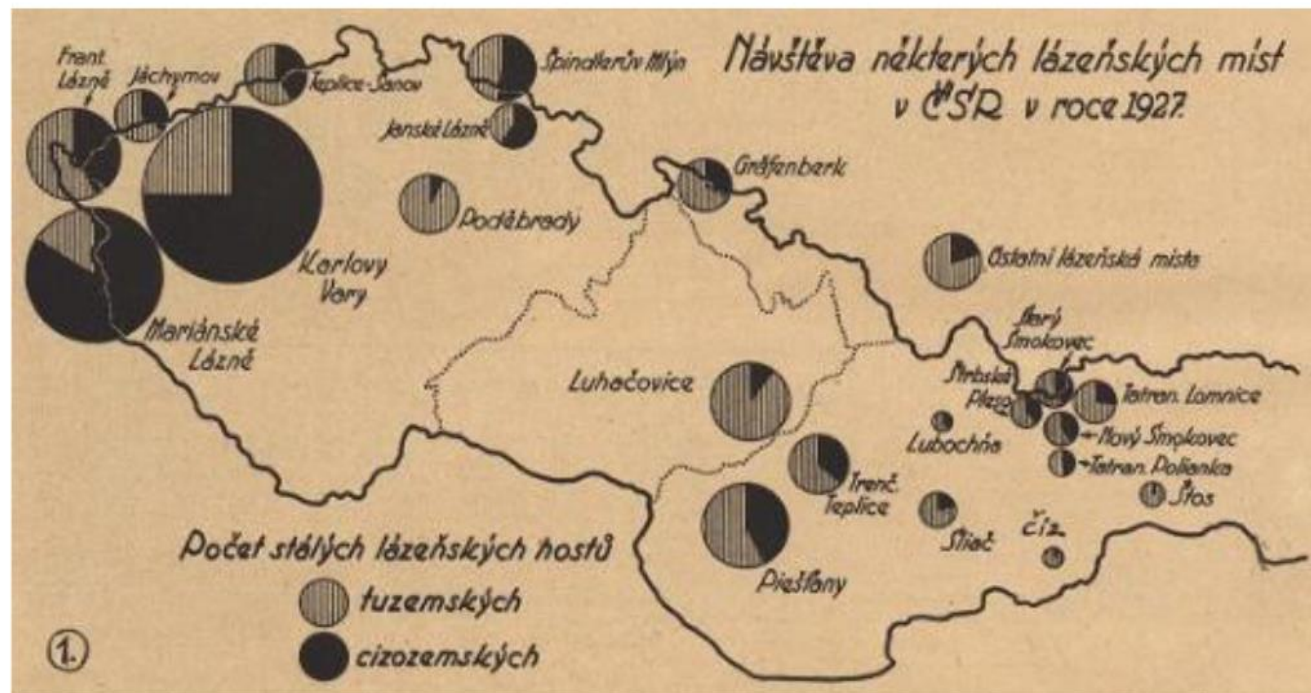
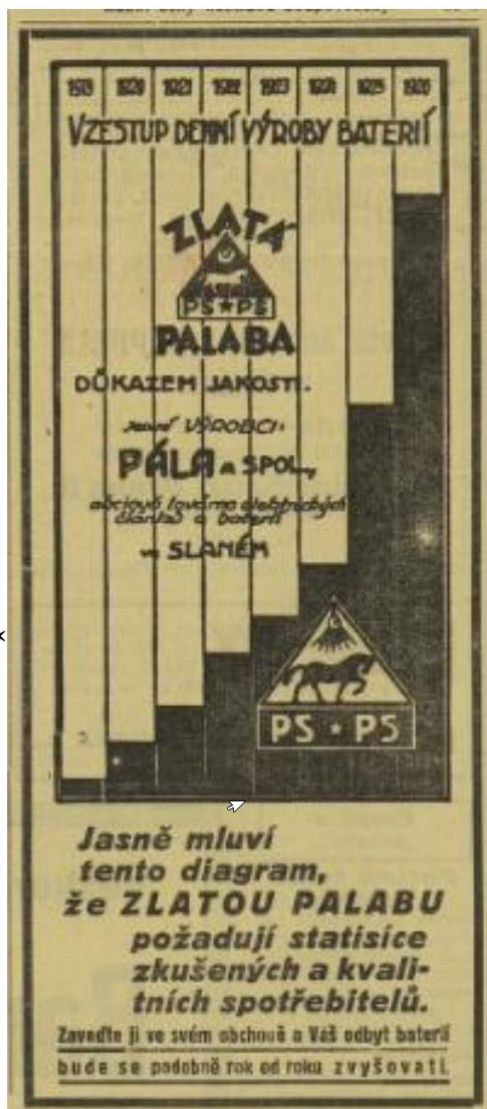
# CRUSADERS' MAP OF YEAR'S STILL SEIZURES.



# POPULATION ACCURATELY MEASURED.



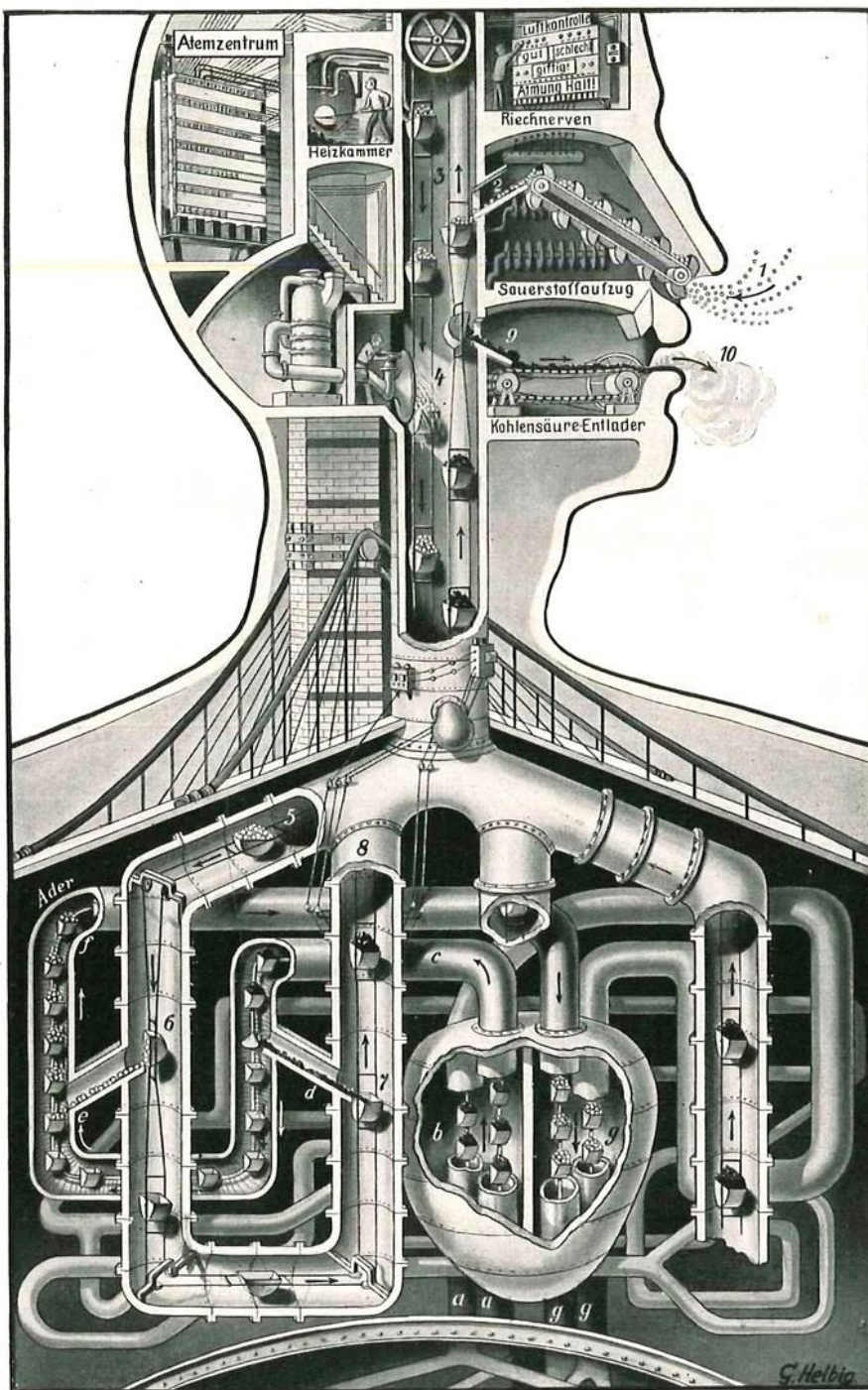
Obrázek 13 Vzestup denní výroby baterií (Český Lloyd, 1926)



Obrázek 15 Návštěvnost československých lázní 2 (Pestrý týden, 1928)

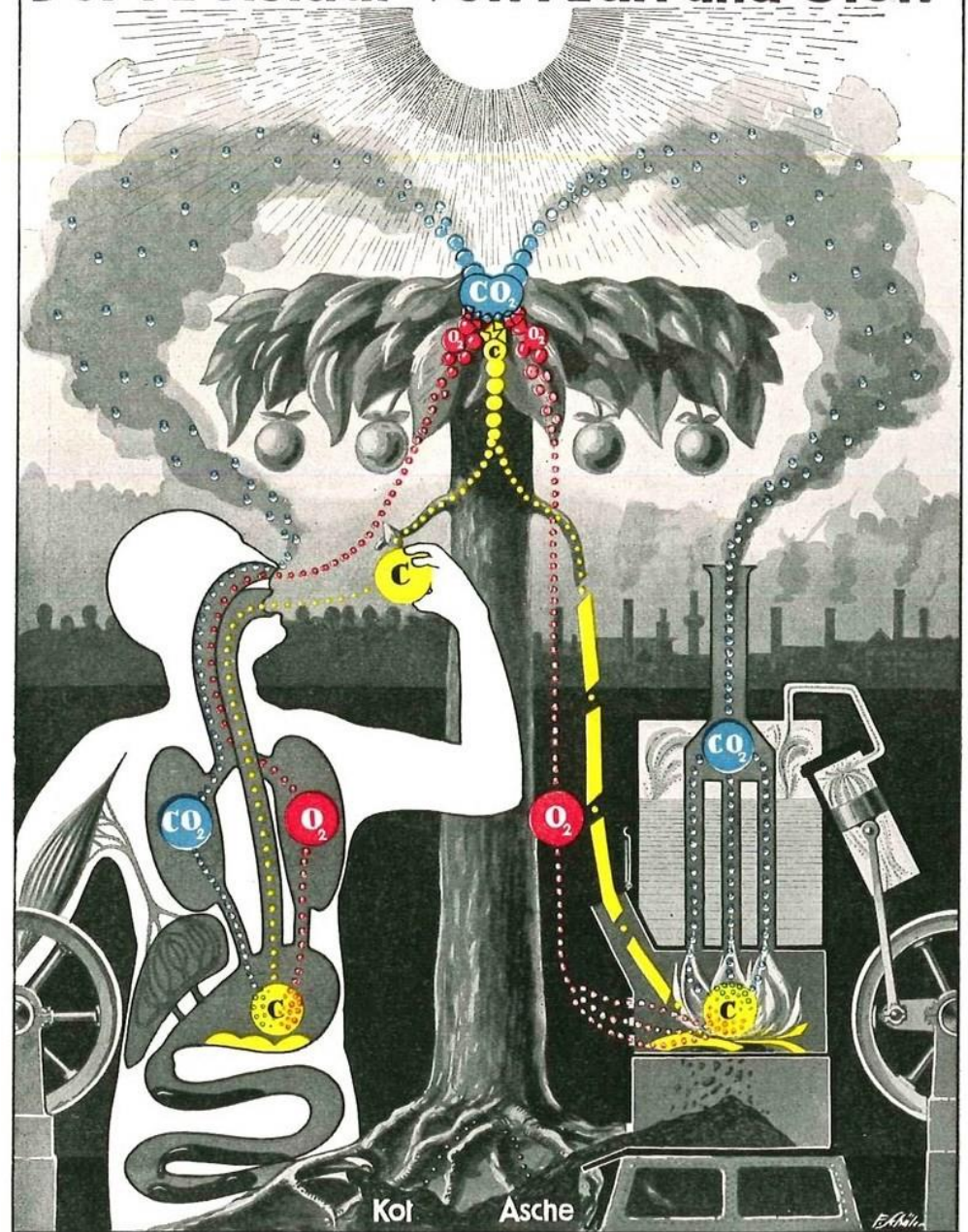
1910+

Fritz Kahn



Die Atmung des Menschen

# Der Kreislauf von Kraft und Stoff



Der Kreislauf von Kraft und Stoff

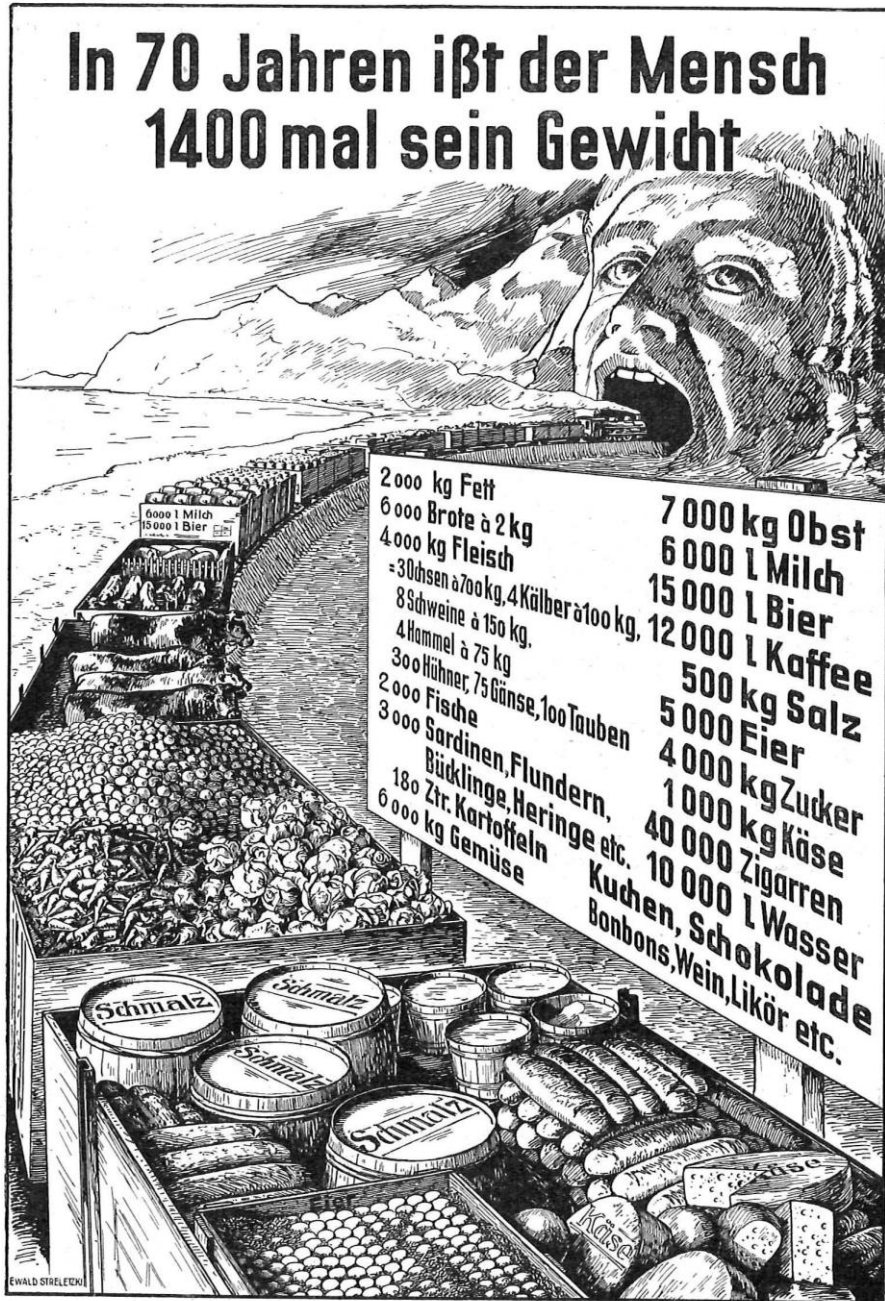
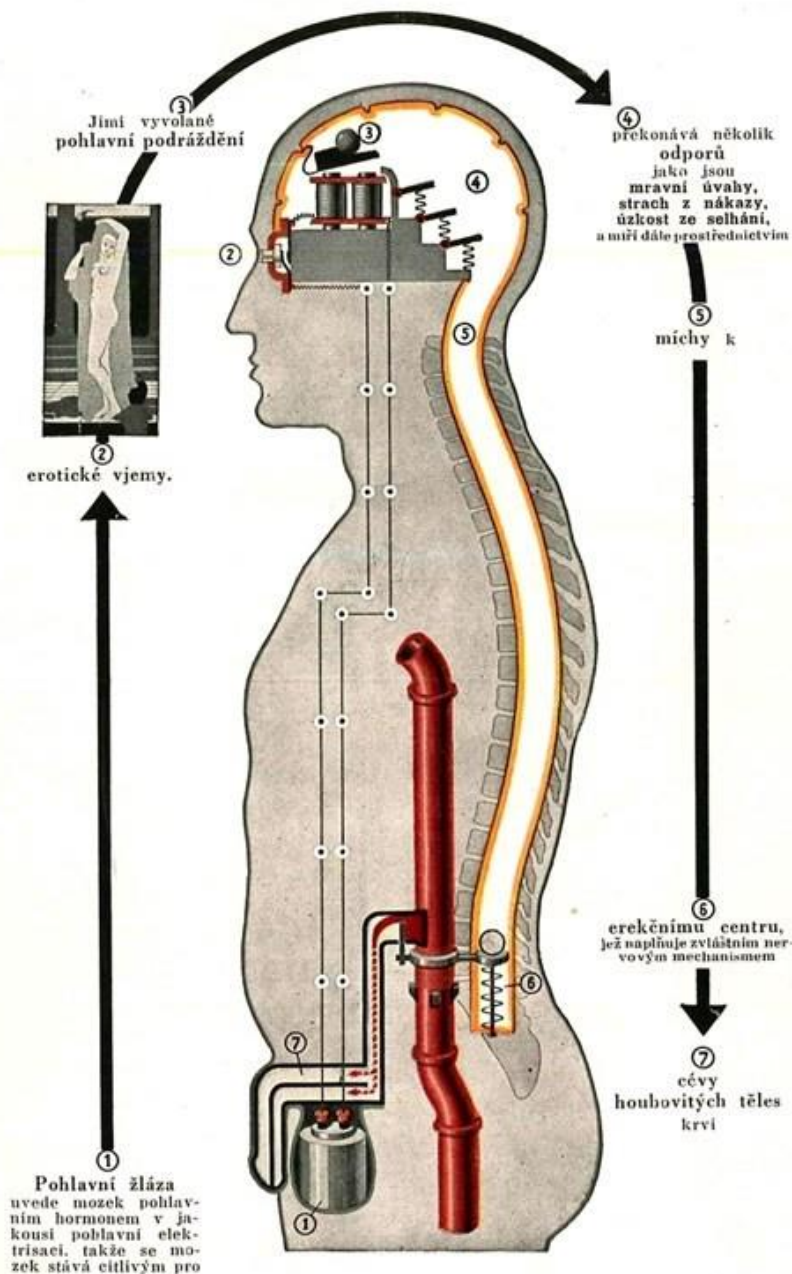


Abb. 161.



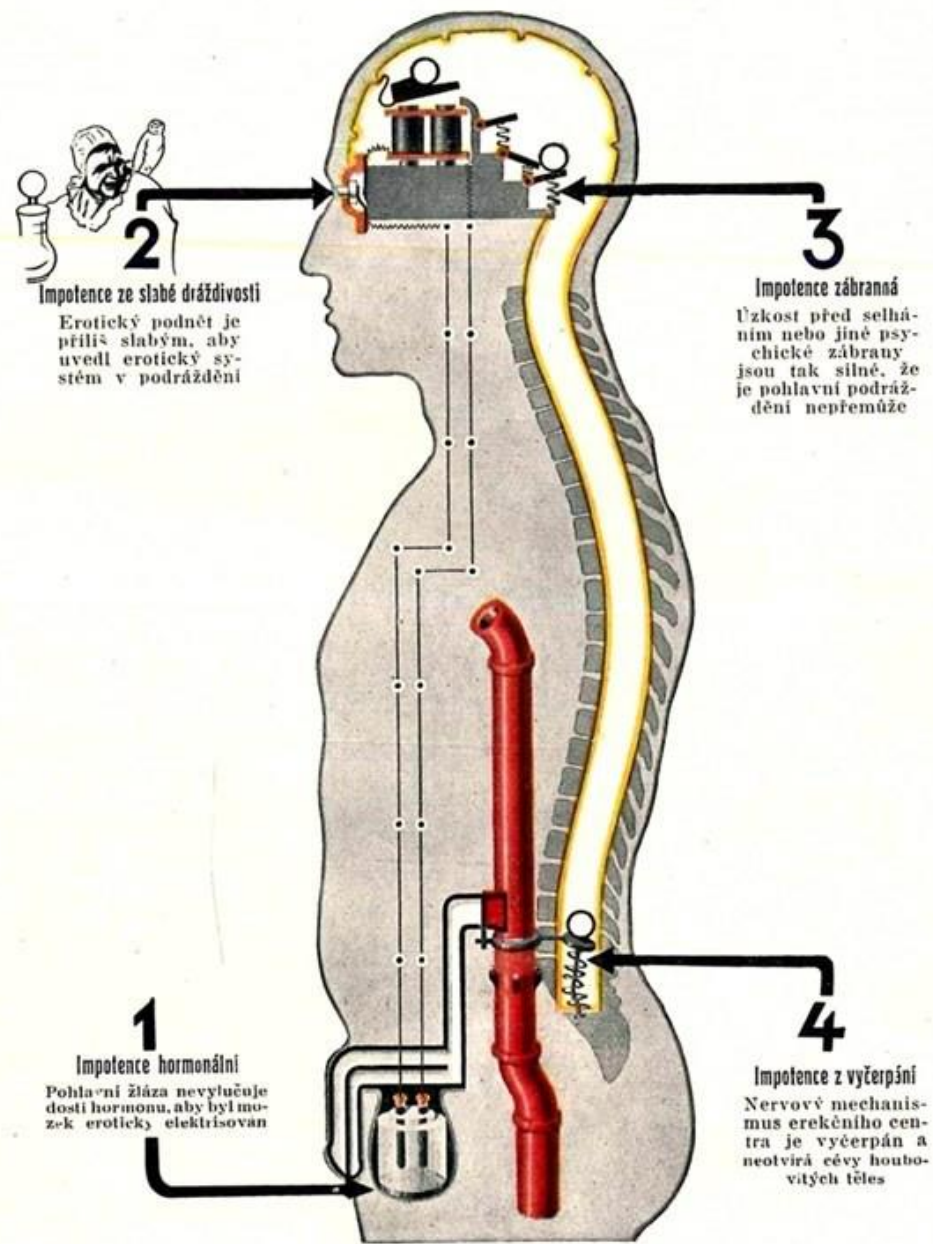
Bildliche Darstellung der Vorgänge, die sich zwischen der Geruchsempfindung und dem „reflektorischen“ Speichelfluß im Kopf des Menschen abspielen





Obr. 9. Erekcce

Technicko-schematické znázornění mužského erekčního systému  
Blíže vysvětlení v textu

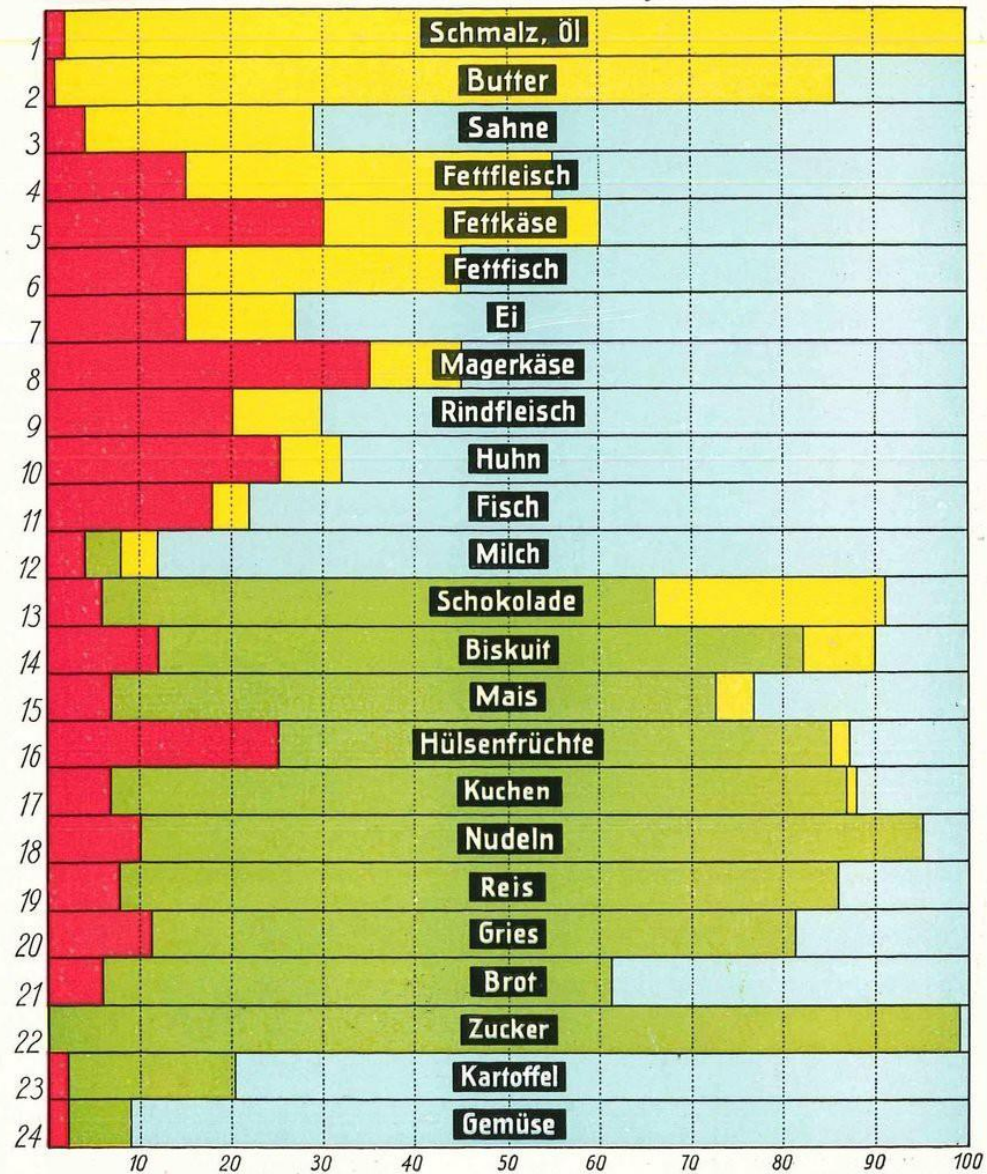


Obr. 37. Nejdůležitější formy impotence  
v technicko-schematickém znázornění

# Gehalt der wichtigsten Nahrungsmittel

an

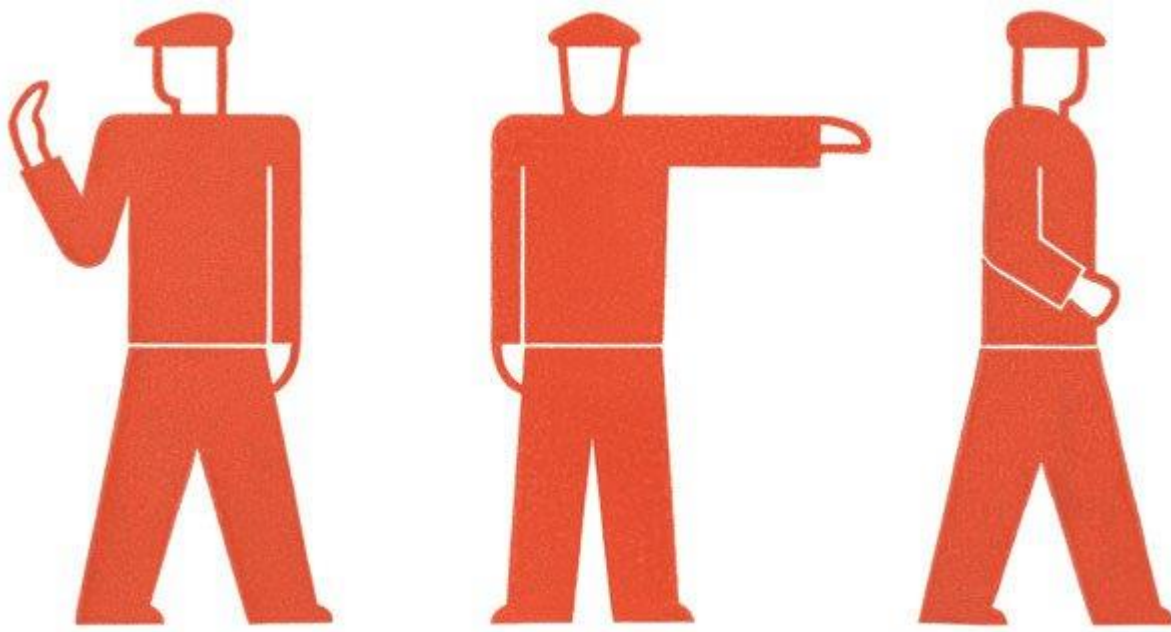
■ Eiweiss 
 ■ Fett 
 ■ Kohlenhydraten 
 ■ Wasser



1-3 Fett-Spender, 4-11 Fett-Eiweiss-Spender, 12-15 Fett-Eiweiss-Kohlenhydrat-Spender,  
 16-21 Eiweiss-Kohlenhydrat-Spender, 22-24 Kohlenhydrat-Spender.

1910+

# Otto Neurath



## **ISOTYPE**

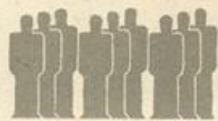
„Neurth věřil, že složité společenské jevy může pomocí obrazů pochopit i analfabet. Verbální jazyk byl pro něj nežádoucí médium, které je v rozporu s myšlenkou internacionalismu. Pod heslem „slova rozdělují, obrazy spojují“ vzniklo moderní obrazové písmo, univerzální znaková řeč symbolů, jehož prostřednictvím Neurath komunikoval složité statistické údaje.“ Kateřina Nováčková — Piktogram Revival (Designum 1/2008, s. 62–65)

# Population and Live Stock

## Great Britain



## United States



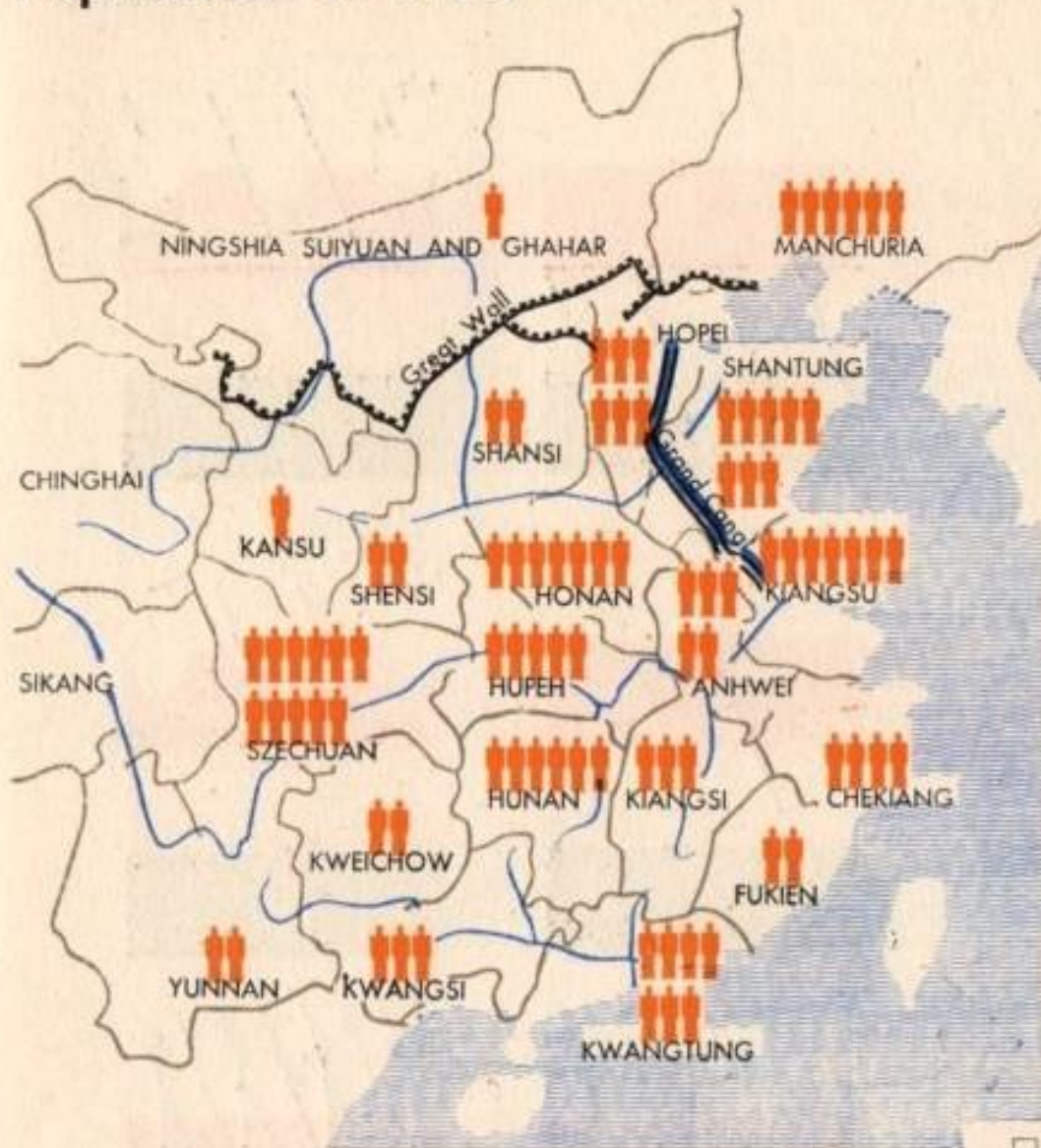
Each grey figure represents 5 million population  
 Each complete red symbol represents 5 million cattle  
 Each complete black symbol represents 5 million pigs  
 Each complete blue symbol represents 5 million sheep

Average for 1935 - 1939

There are more cattle and pigs per head of population in America than Britain, but sheep—only 5 in U.S. for every 9 in Britain—are a different story, and provide the tender home-grown leg of mutton prized by the British.



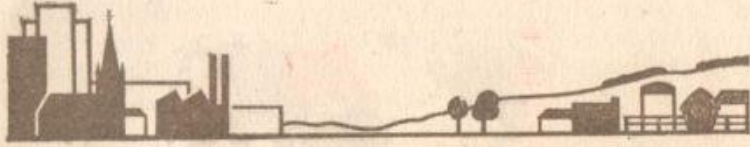
# Population in 1936



Each symbol represents 5 million people



## Urbanization in the West



### United States



### Great Britain



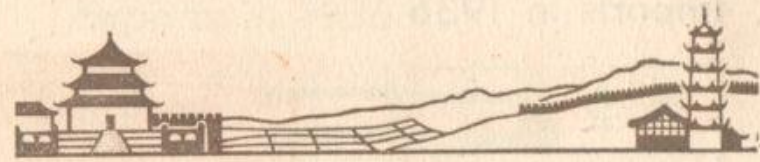
### France



Each row of man symbols represents 45 million population  
red: in cities of 100,000 inhabitants and more

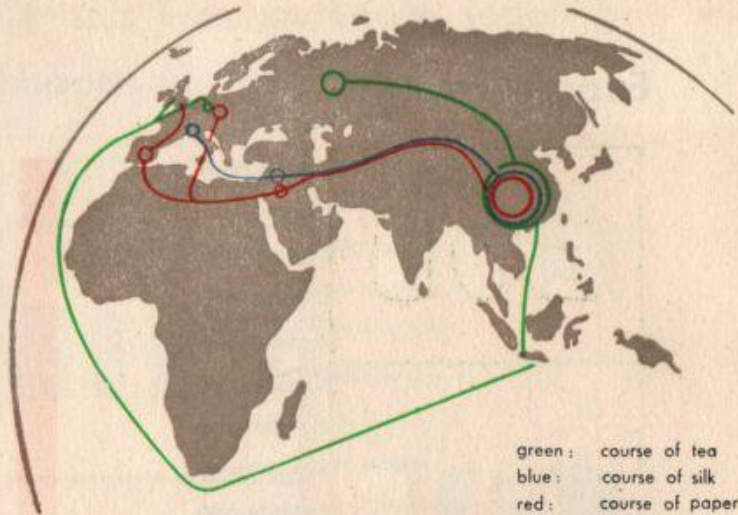


## Urbanization in China

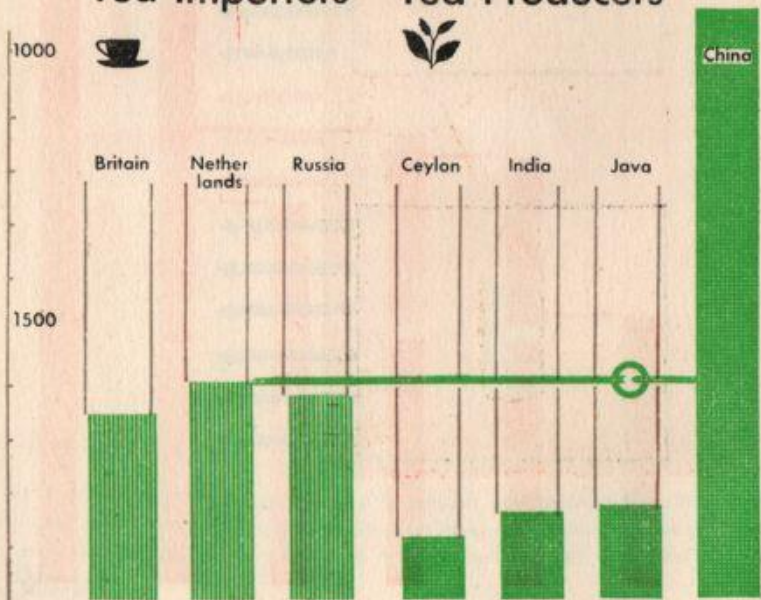


### China





### Tea Importers      Tea Producers



### Silk and Paper Manufacture

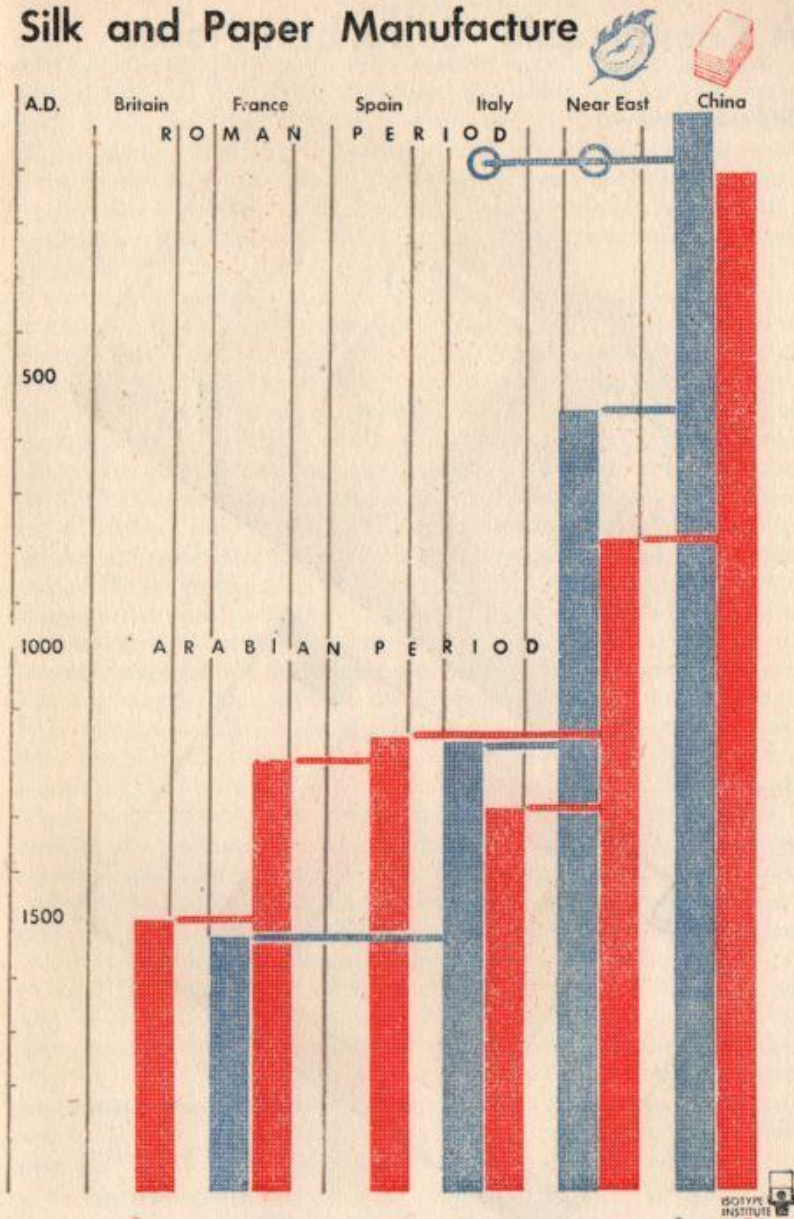
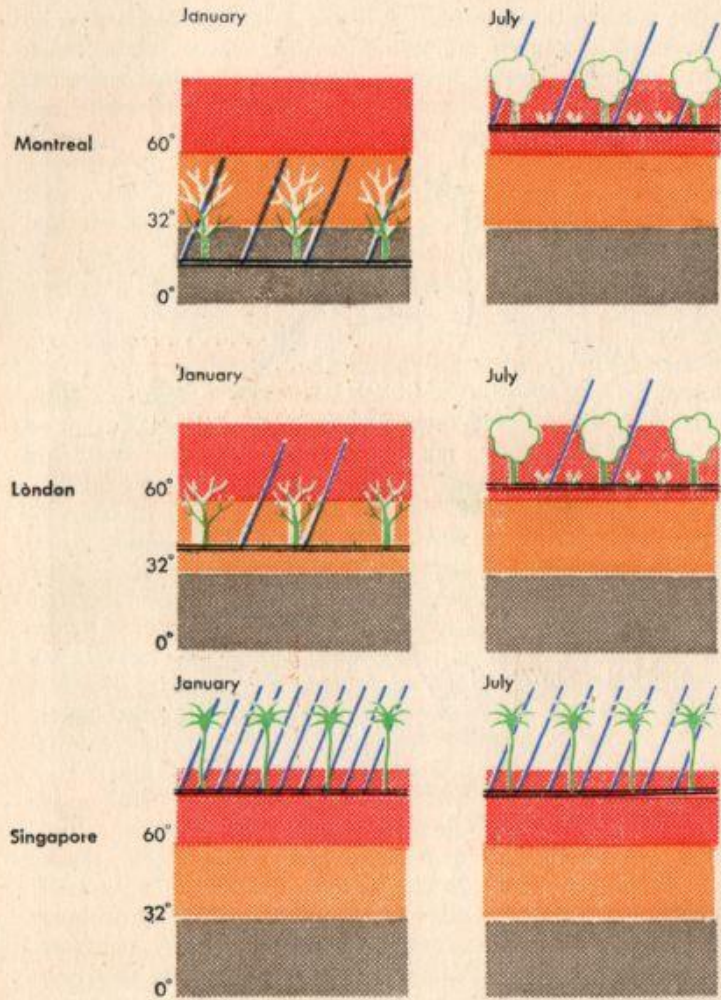
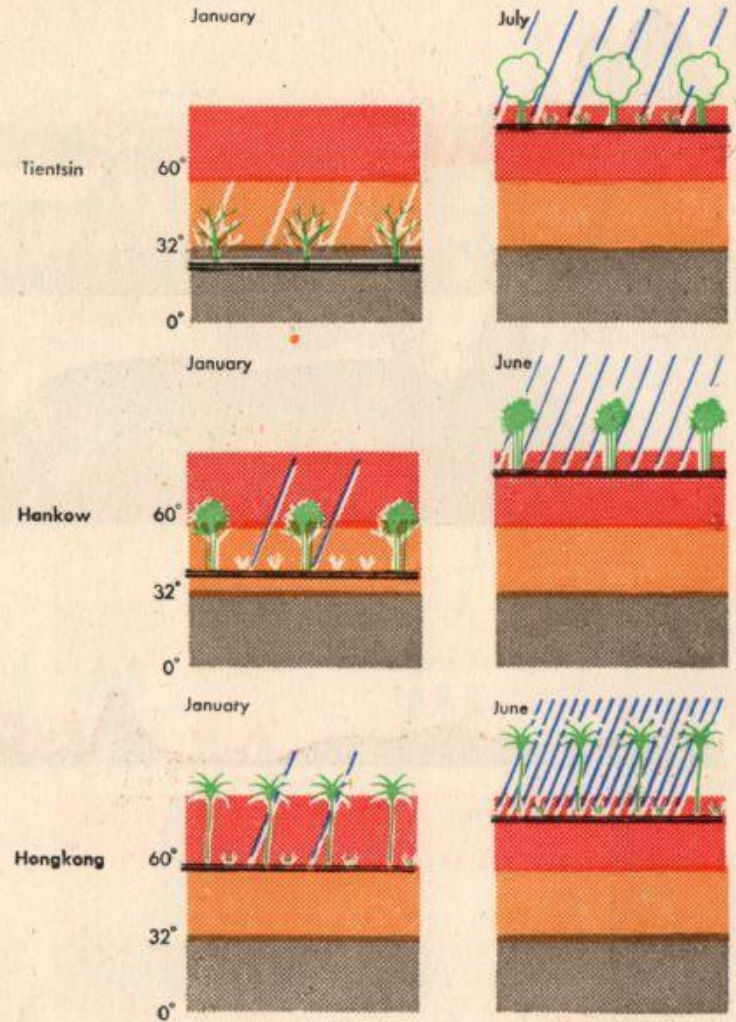


CHART 3

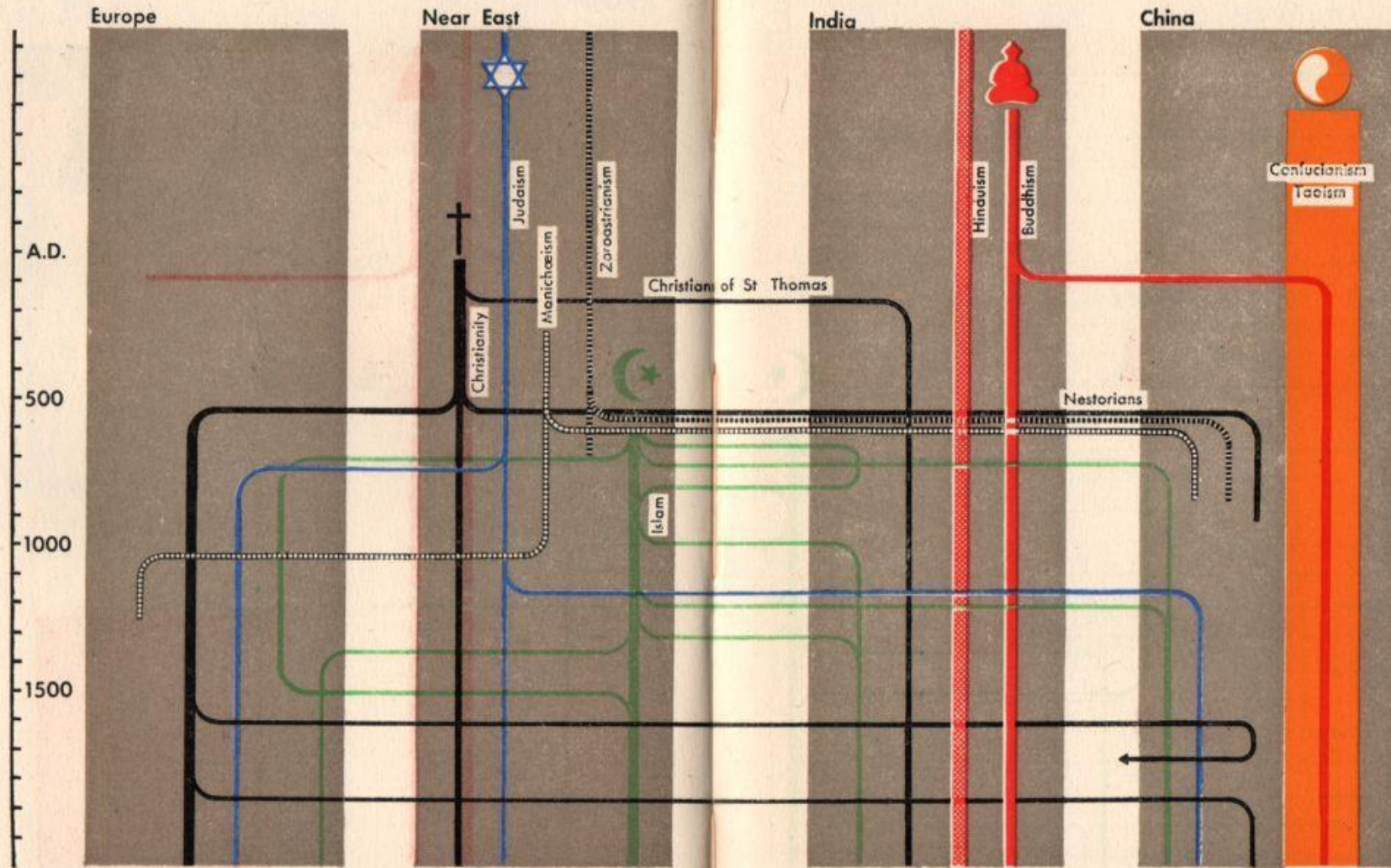
# Climate in the British Commonwealth



# Climate in China



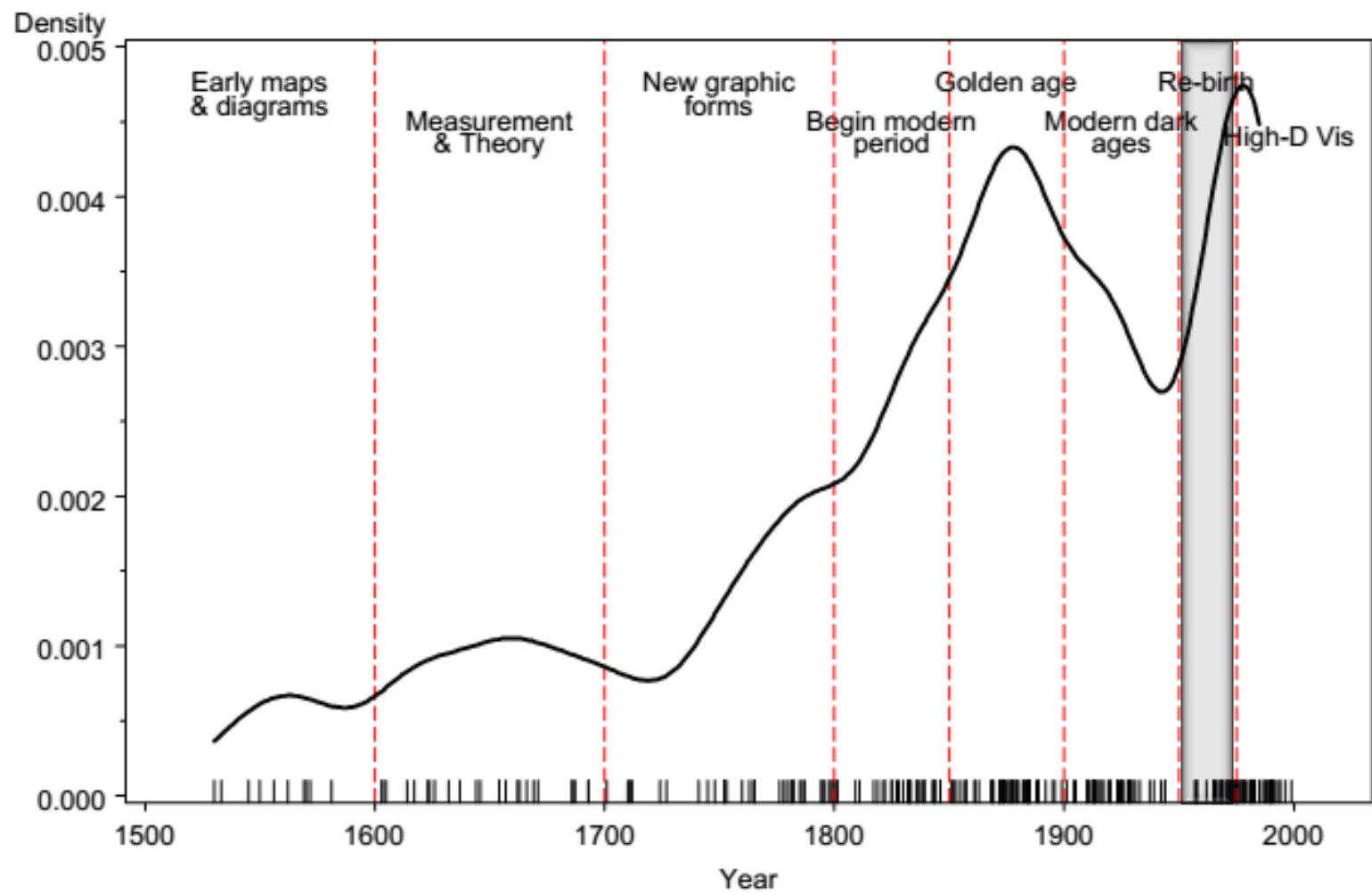
# Religious Contacts between West and East



ISOTYPE INSTITUTE

CHART 13

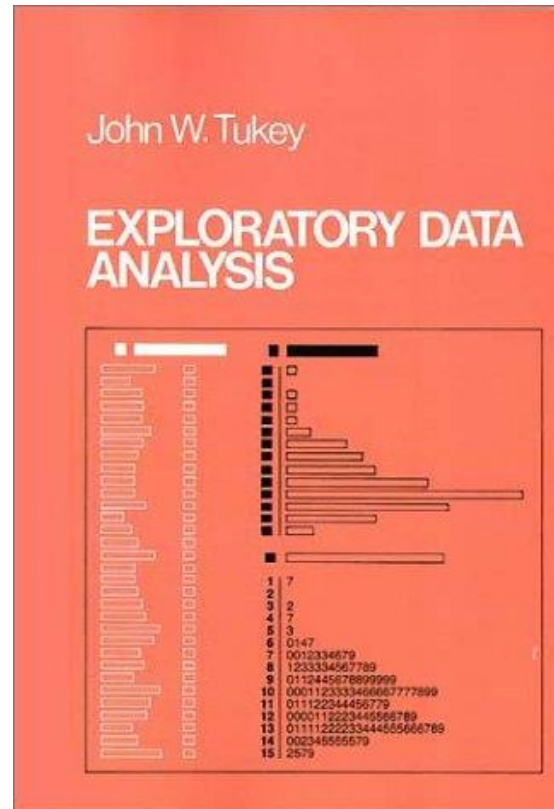


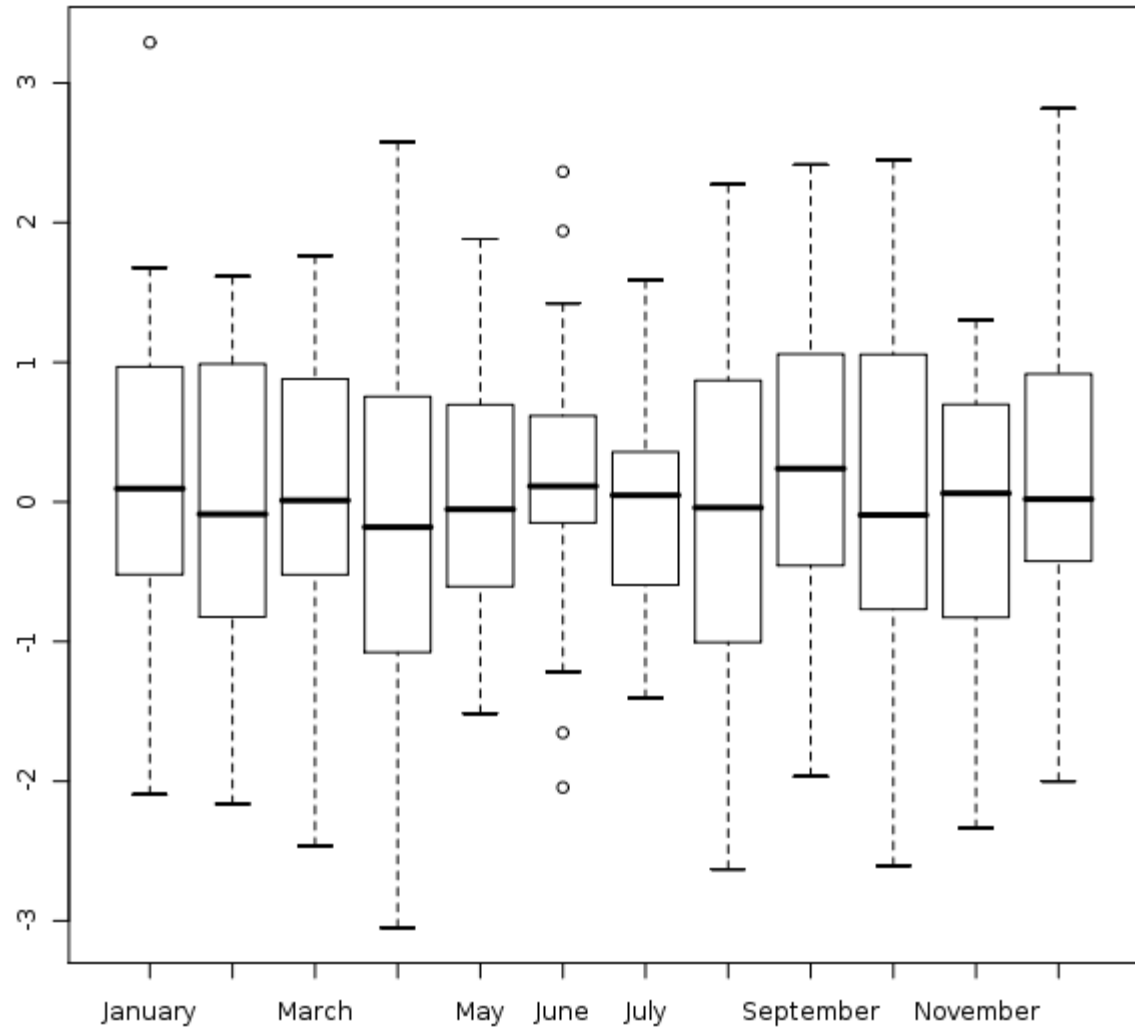


1962

# John Turkey

*Exploratory Data Analysis*

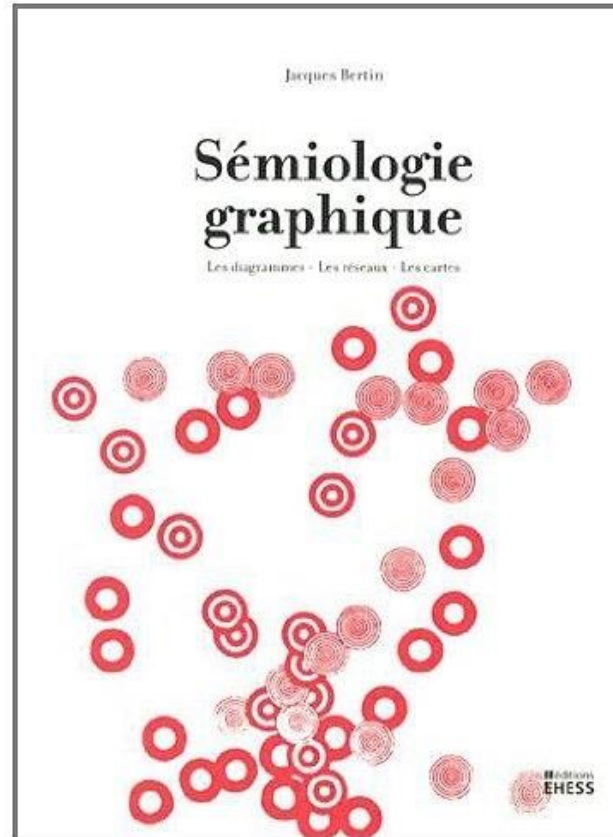




1967

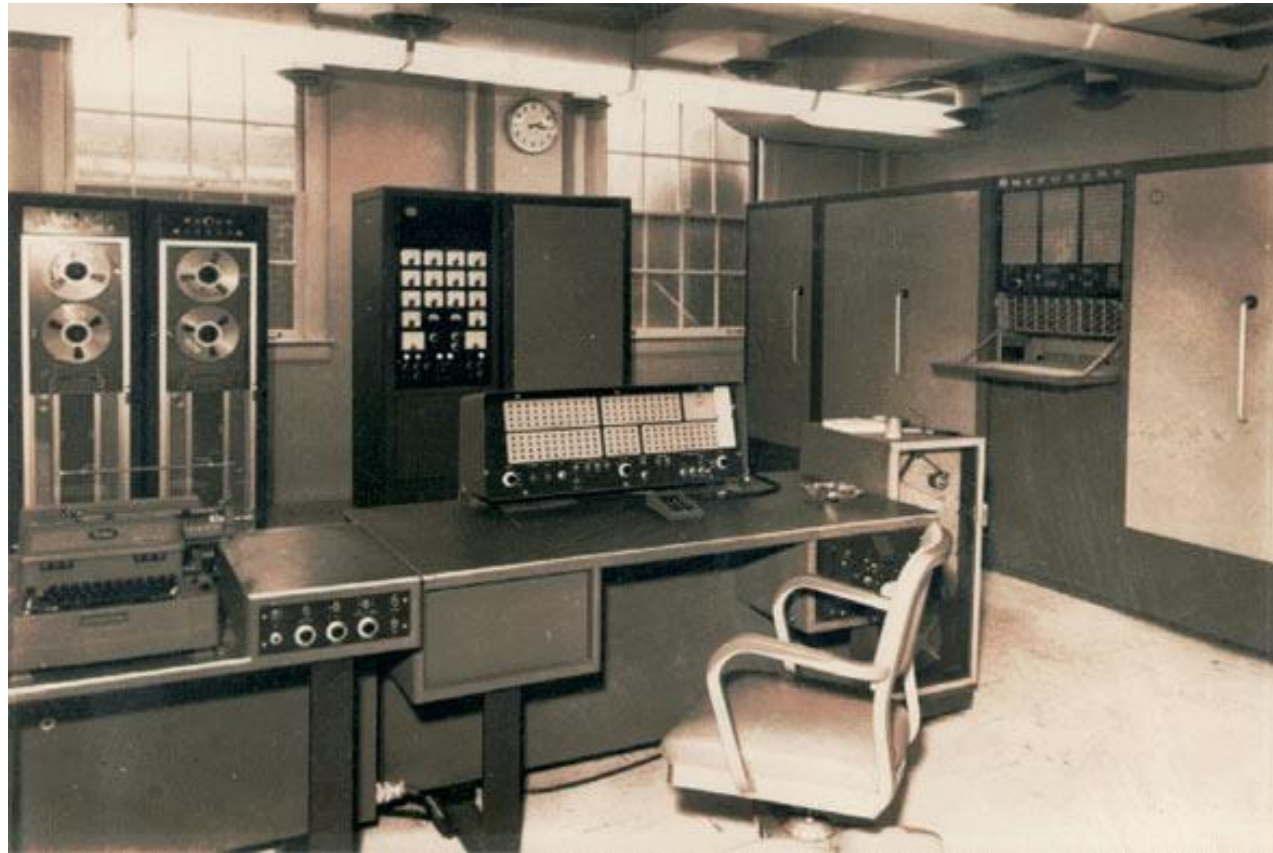
Jacques Bertin

*Sémiologie Graphique*

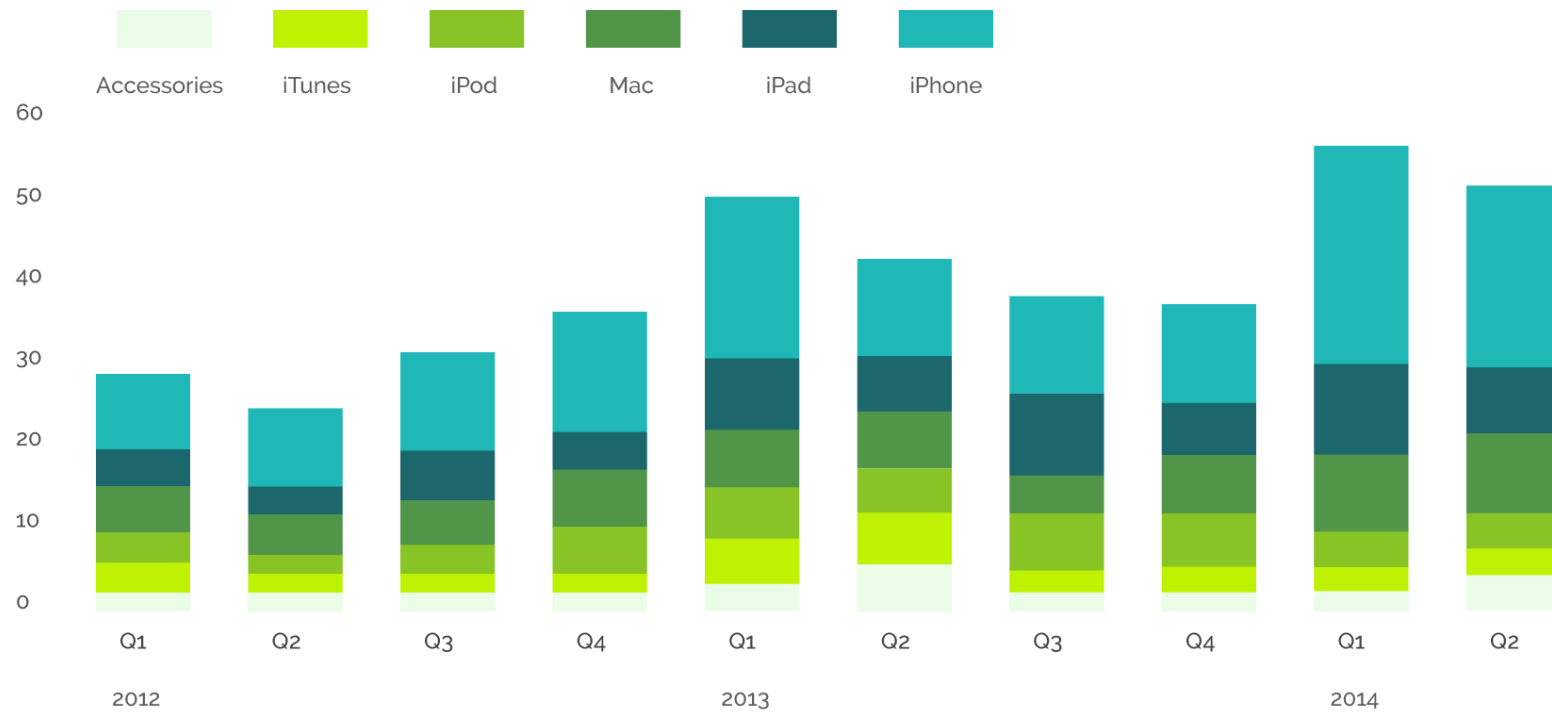


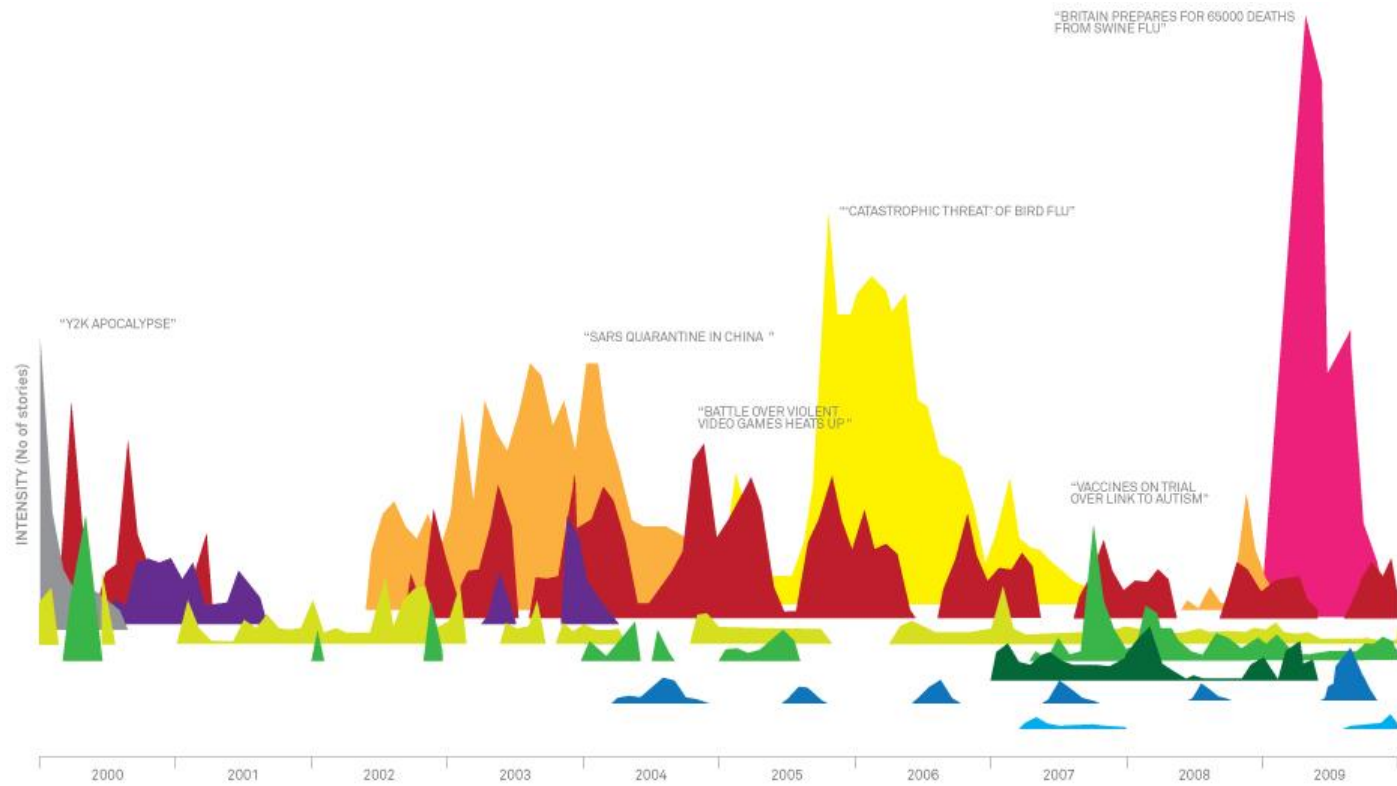
1950+

# Počítače



## HOW APPLE'S SALES STACK UP

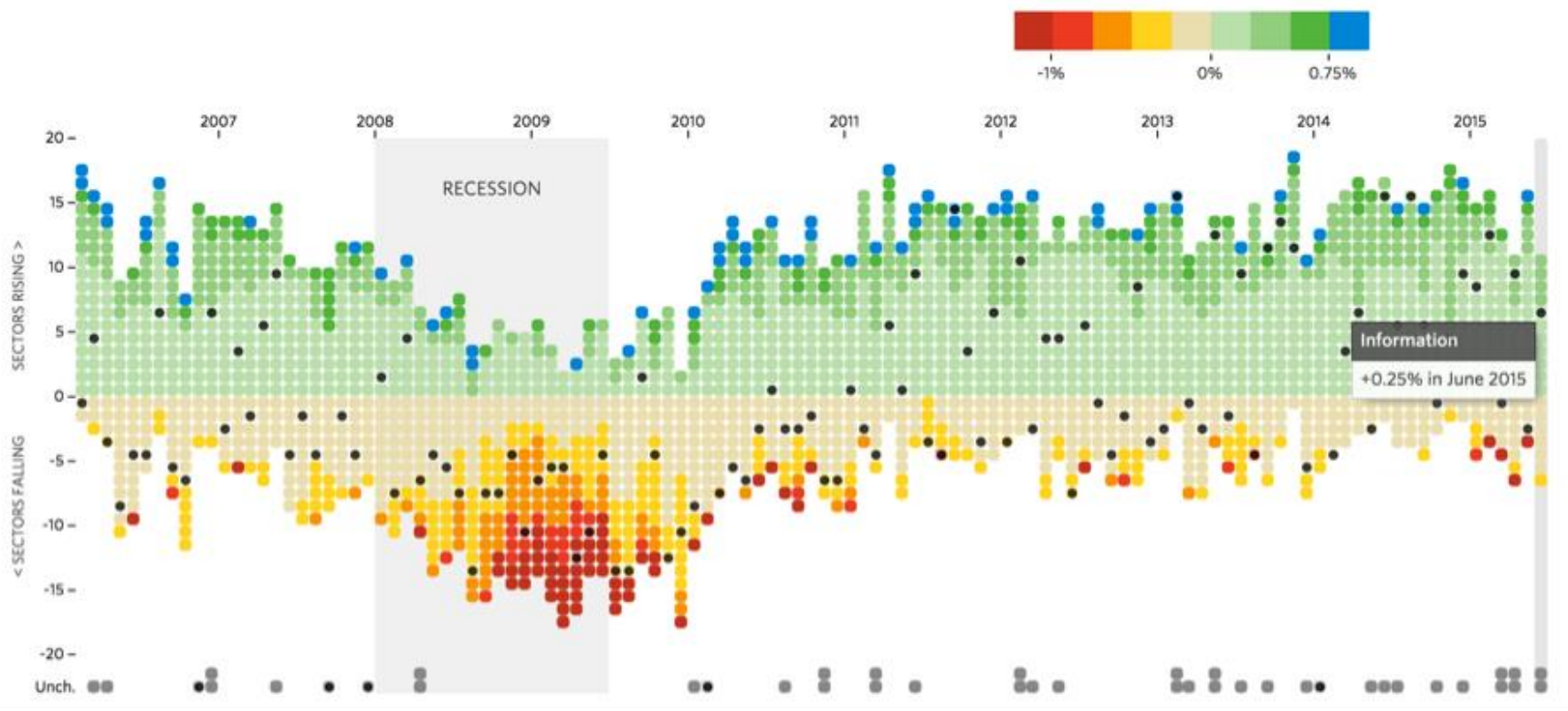




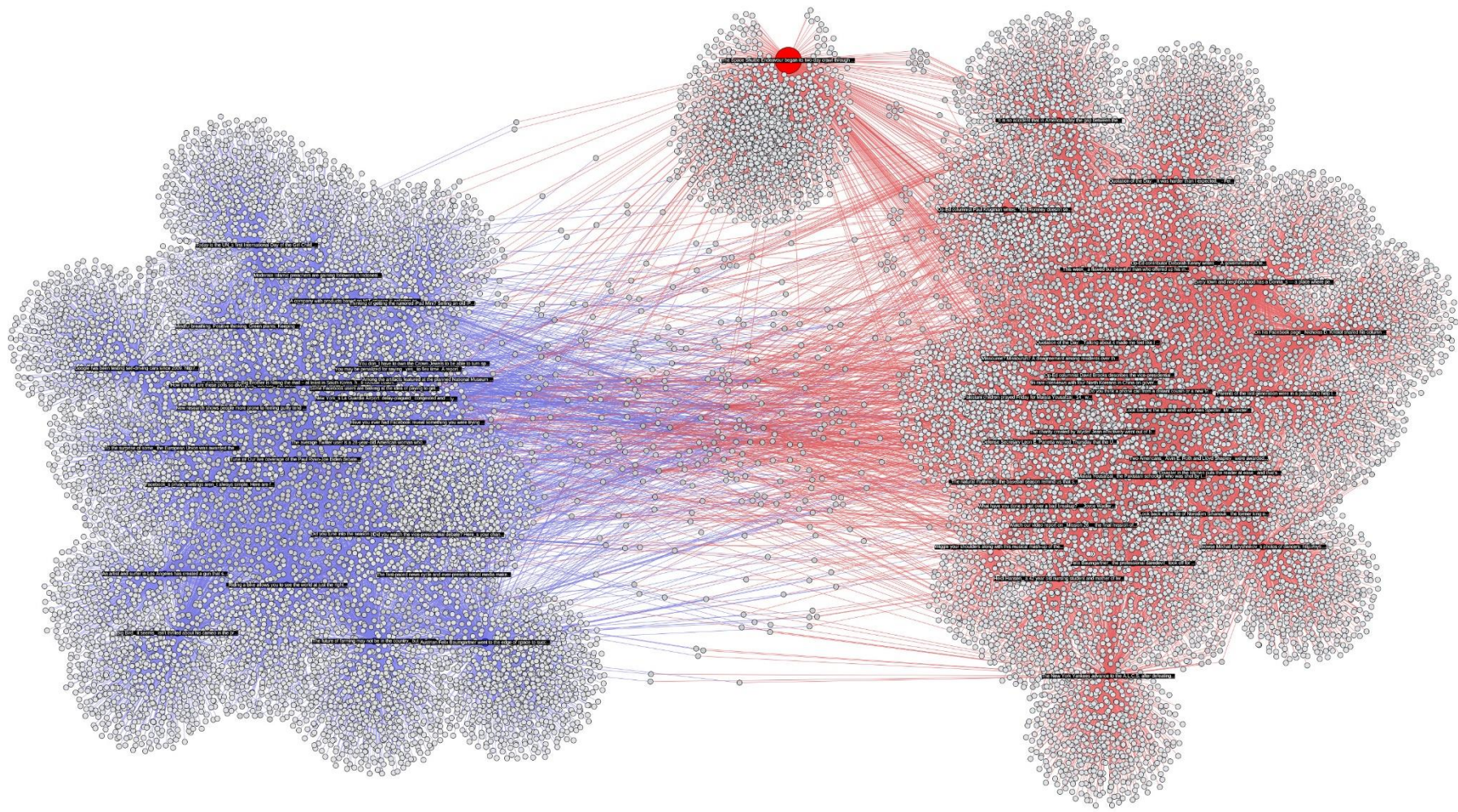
Story (worldwide deaths)

- |                               |                           |                                 |                   |
|-------------------------------|---------------------------|---------------------------------|-------------------|
| ▲ Killer Wasps (1000)         | ▲ Autism Vaccinations (0) | ▲ Mad Cow Disease (204)         | ▲ Bird Flu (262)  |
| ▲ Killer Wifi (0)             | ▲ Asteroid Collision (0)  | ▲ Violent Video Games (Unknown) | ▲ Swine Flu (702) |
| ▲ Mobile Phones & Tumours (0) | ▲ Millenium Bug (0)       | ▲ SARS (774)                    |                   |

**Mountains Out of Molehills**  
A timeline of global media scare stories.







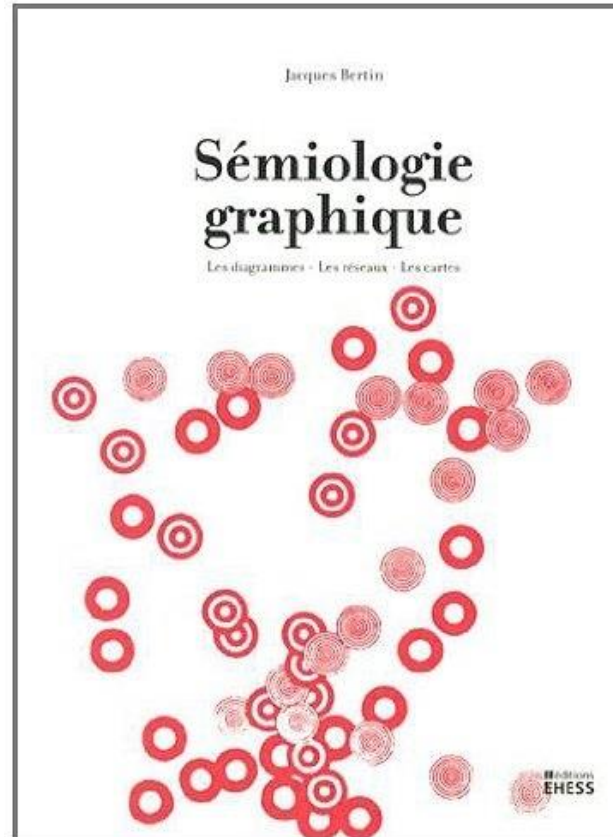
<http://datavis.ca/milestones/>



1967

Jacques Bertin

*Sémiologie Graphique*



Co je dnes vizualizace?

# Vizualizace dnes

- otevírání pole širokému spektru lidí (ve smyslu tvorby)
- stabilní **oblast studia** v akademické sféře
- vznikají samostatné studijní obory
- otevřené vzdělávání v oblasti - MOOC
- zmatení pojmů a představ (*nejen v umění*)



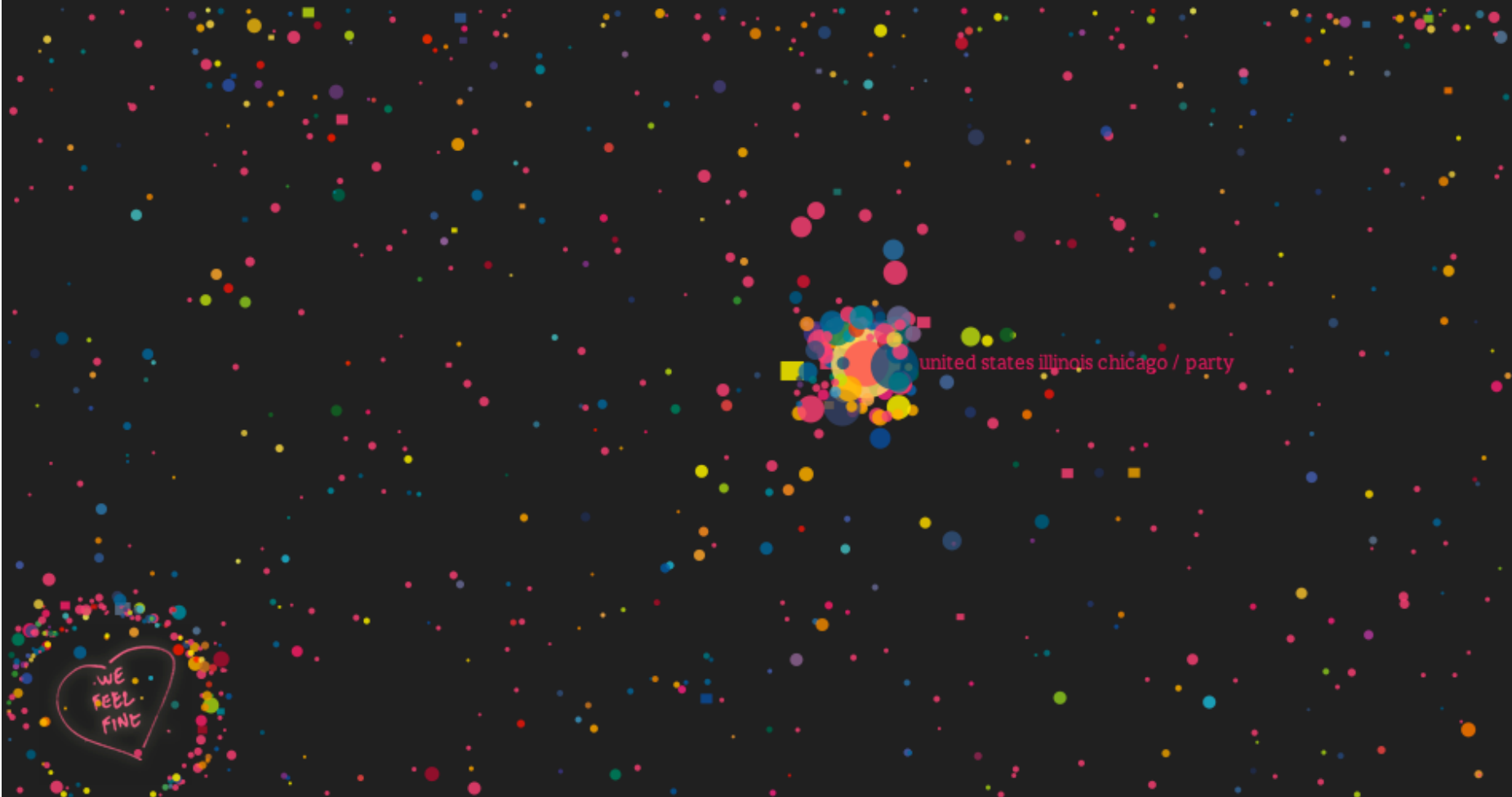


Sumedicina infects parts of the population worldwide and makes profit with the sale of the serum.

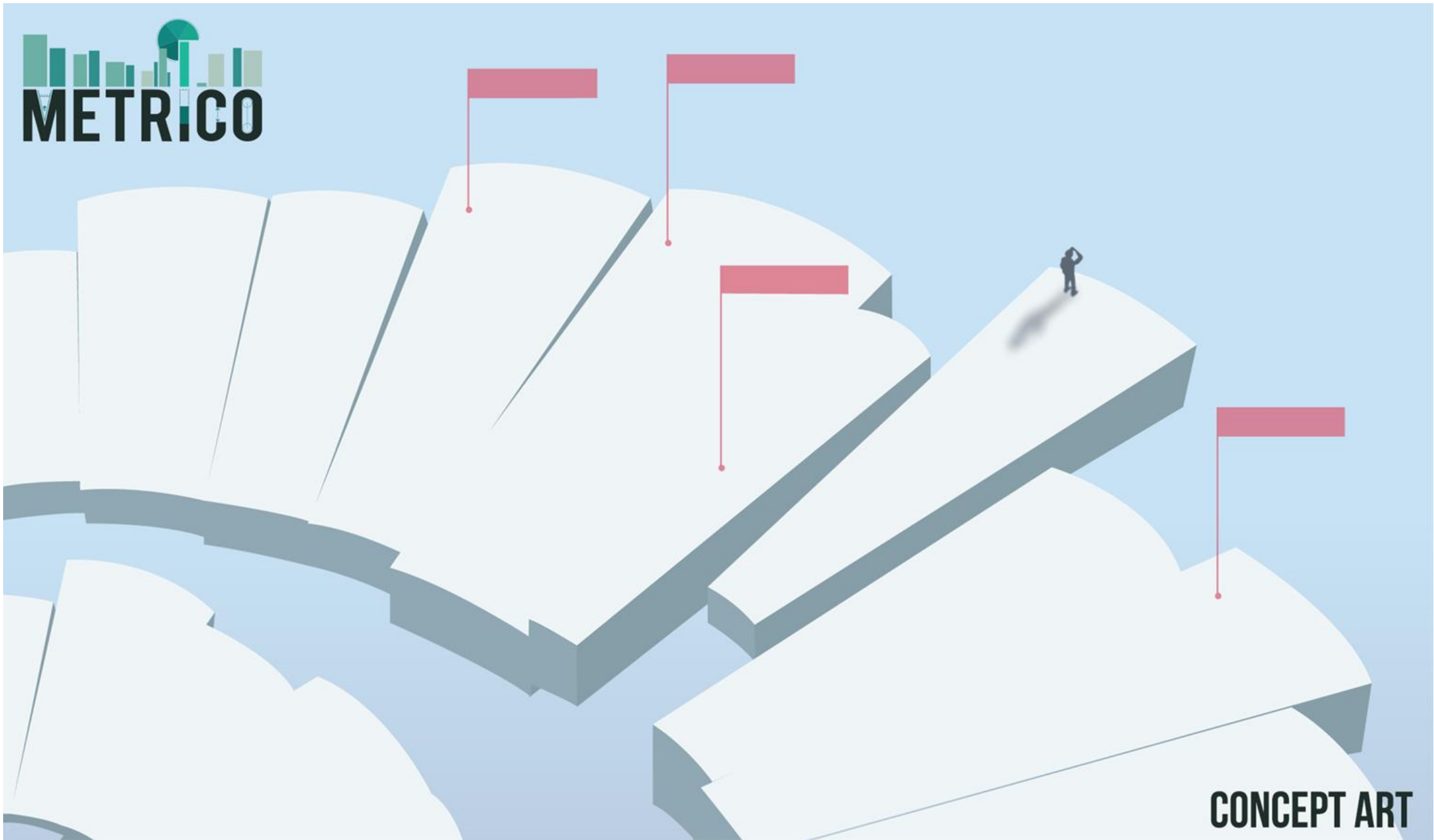


i seriously hope youre not upset that i passed on drinks at her club gig that night i desperately wanted to meet you there though i feel like you should have enough insight to realize i cant afford to drive into the city and party whenever i feel like it and put my health at risk

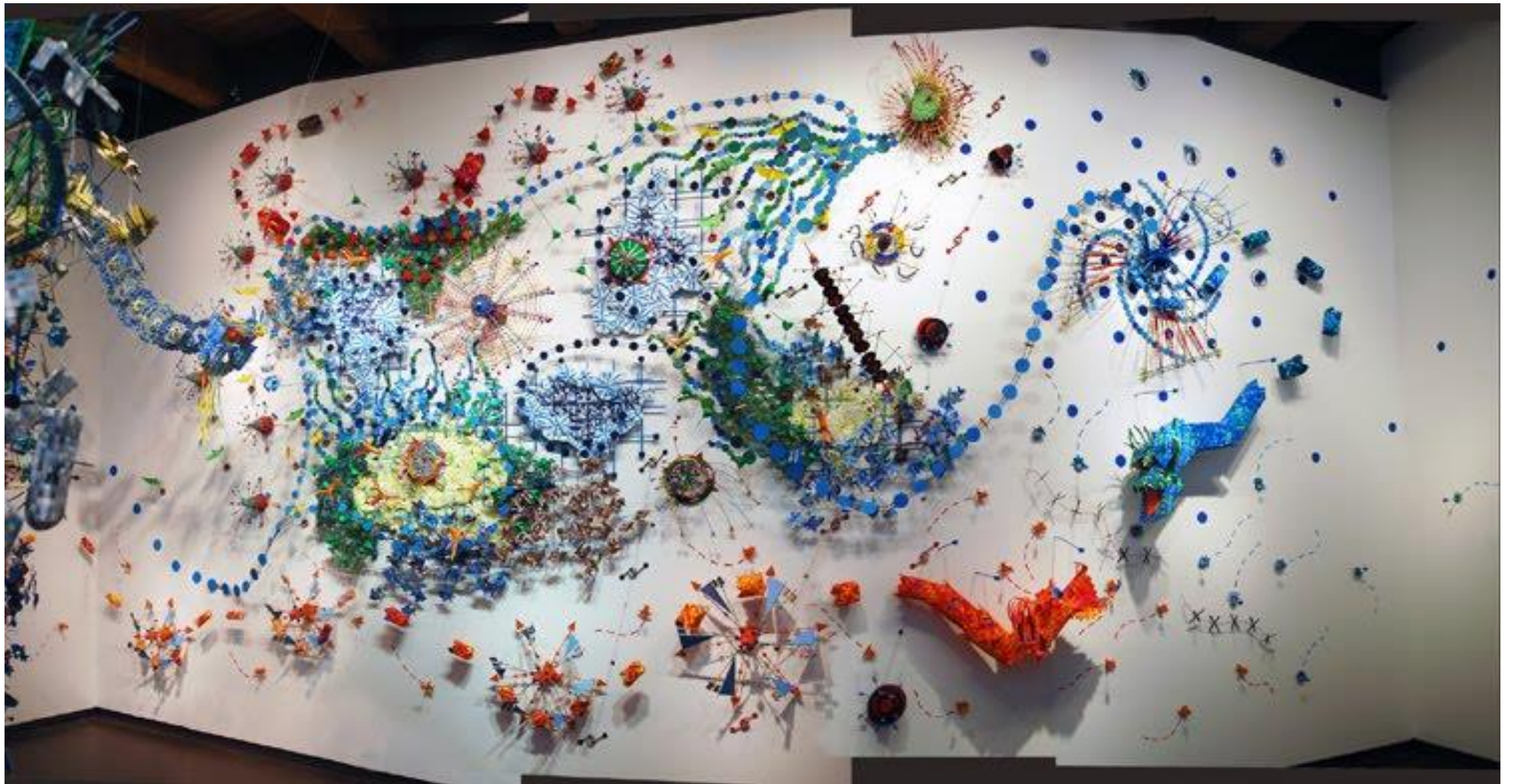
39 mins ago / from a 106 year old in chicago illinois united states when it was cloudy





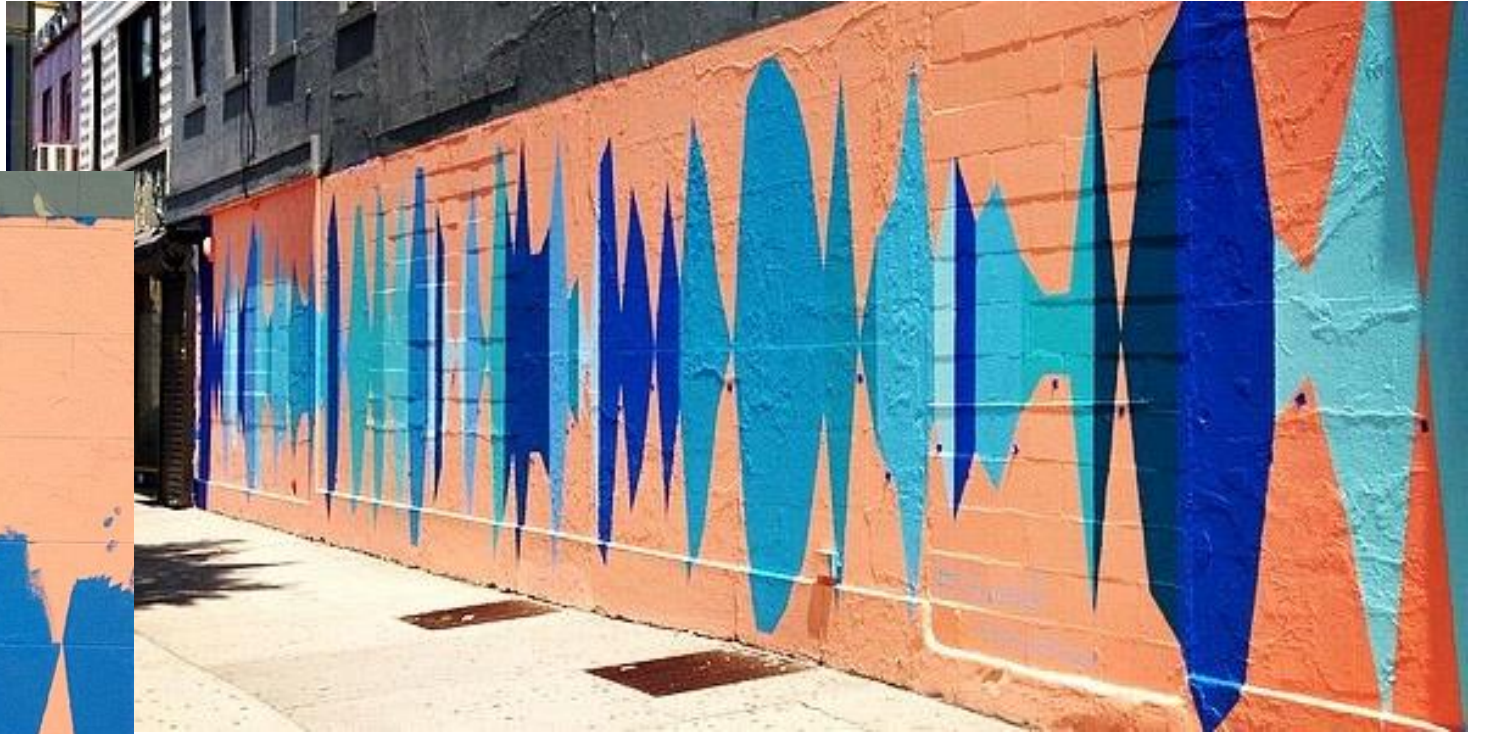


**CONCEPT ART**











## WEATHER

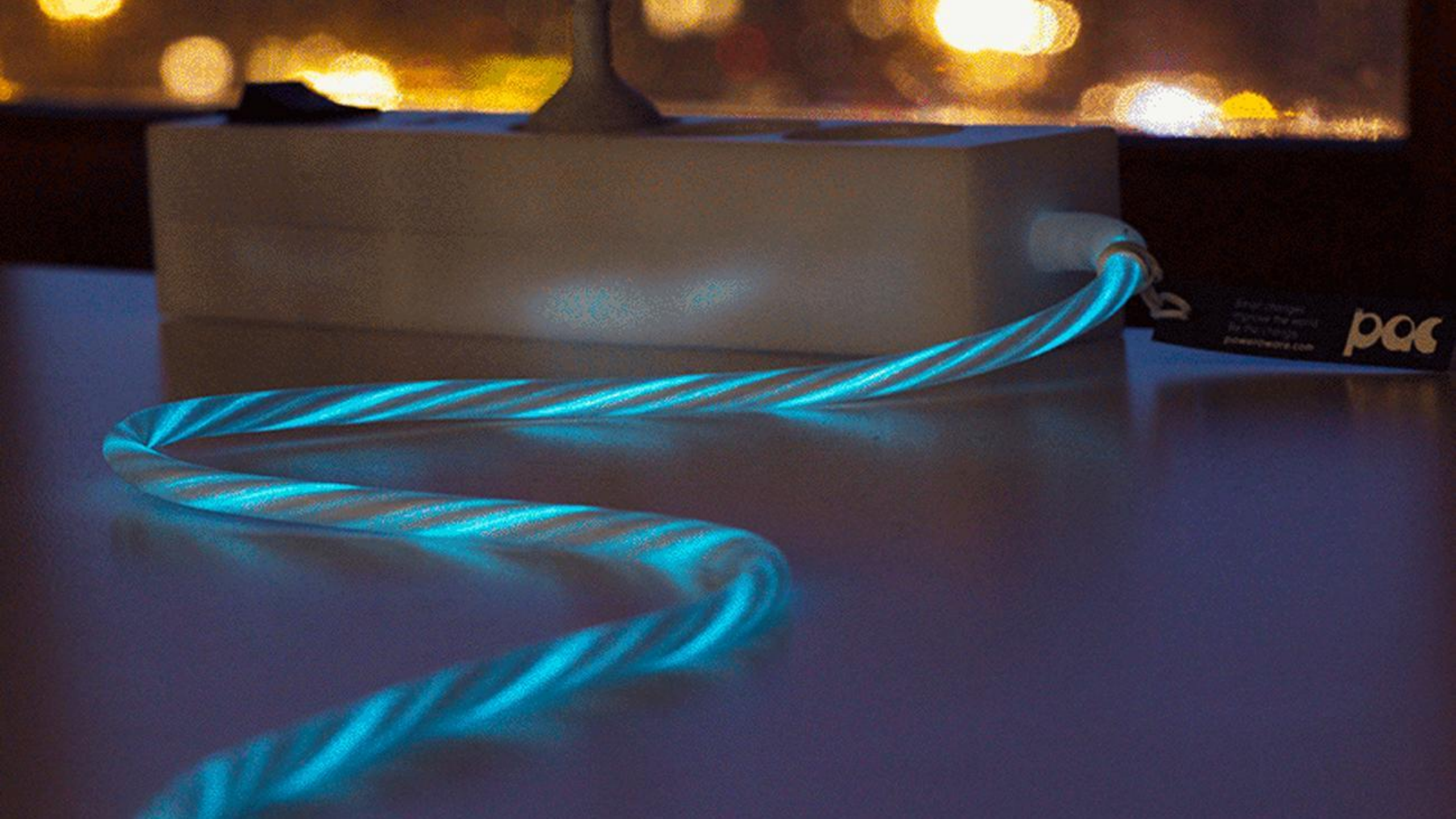
Today's high temperature. Pulses if precipitation is likely. After 6pm shows tomorrow's forecast.



-10s 10s 20s 30s 40s 50s 60s 70s 80s 90s 100s

ambient





Single-charger  
power the world  
by the way  
powerwire.com

power





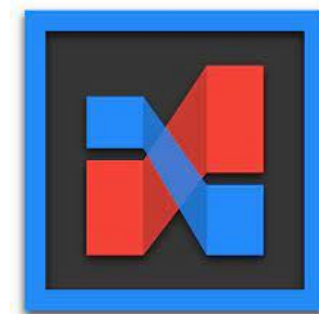


# Objem a dostupnost dat

- data smog - přehlčení daty
- big data - krása, ale co s tím
- nefunguje bez “*information taming*” technologií
  
- široká dostupnost všem
- open data hnutí

# Dostupnost nástrojů

- Demokratizace, laicizace
- Naklikávačky
- Tableau; D3.js,...
- Gephi, NodeXL - sítě
- ImagePlot, Voyant Tools - digital humanities
- Quadrigram, R, Processing
- [VDEs](#)



# Komunita a spolupráce

- Sdílení
- Inspirace
- Podpora
- [DVS](#)



DATA  
VISUALIZATION  
SOCIETY

# Otevřené vzdělávání

- Knihy zacílené na “*nevědce*”.
- Nathan Yau - Data Points
- Nathan Yau - Visualize This!
- MOOC a kurzy



# Příště...

- Vizualizace 101
- Absolutní základy vizuálního zobrazování dat
- Z čeho se každá vizualizace dat skládá?
- Jak se tvoří nové vizuální metafory?
- Tvoříme nové vizuální metafory...

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