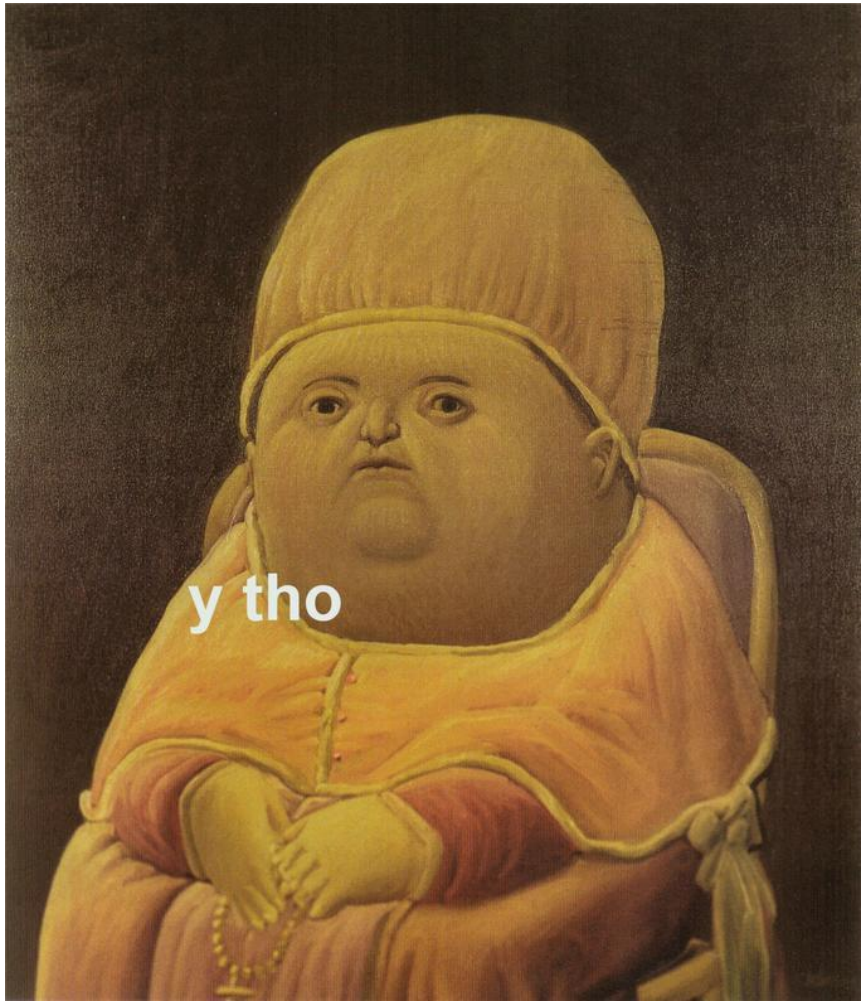
Vizualizace dat

Vývoj vizualizace dat

2. října 2024 | 10:00

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.

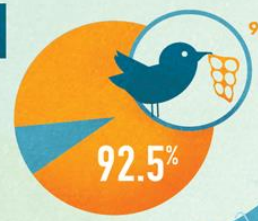
PLASTICS
BREAKDOWN

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.

ONEWORLD ONEOCEAN

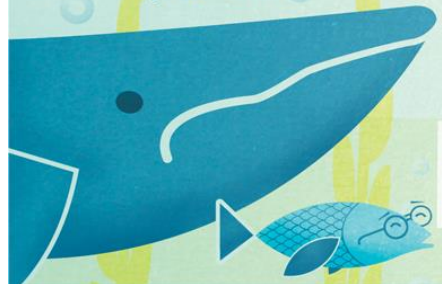
BAD FOR THE OCEAN, BAD FOR US

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.



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 WATER-WAYS FROM BEING OVER LEGAL TRASH LIMITS.

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

HOW MUCH PLASTIC ENDS UP IN THE OCEAN?

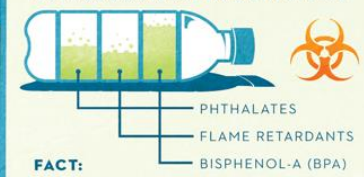
CIRCULAR CURRENTS **(GYRES)** THOUSANDS OF MILES ACROSS COLLECT IMMENSE AMOUNTS OF PLASTIC IN ALL OF THE WORLD'S OCEANS.
MICROPLASTIC CONCENTRATIONS IN THE NORTH PACIFIC GYRE **INCREASED 100X IN THE PAST 40 YEARS.**

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



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.

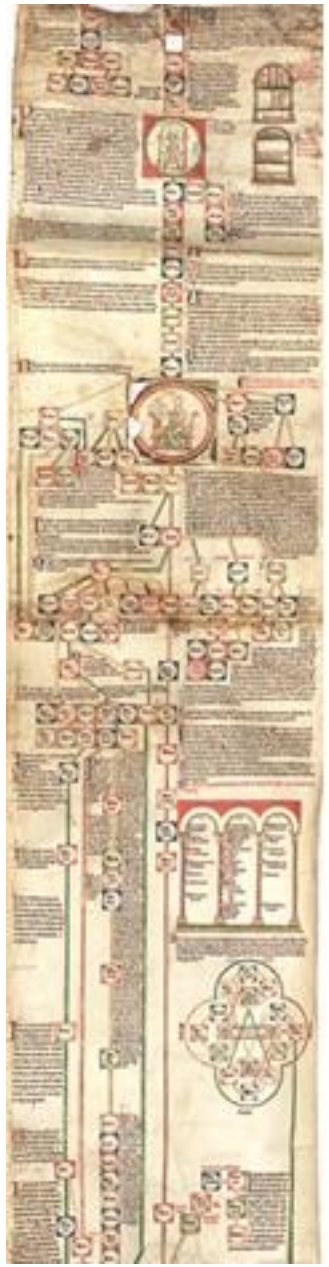
RESEARCH PROVIDED BY OCEAN CONSERVANCY, 5 GYRES, AND OTHERS INFOGRAPHIC BY WWW.ABRAHAMTHINKIN.COM FOR ONE WORLD ONE OCEAN | 2012

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.

PLASTIC BAGS > REUSABLE BAGS, NO BAG **STRAWS >** NO NEED **UTENSILS >** USE NON-PLASTIC
TO GO CUPS > REUSABLE MUGS & CUPS **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

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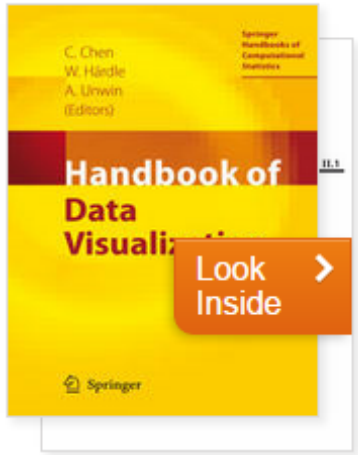
1843. GOD'S EVERLASTING KINGDOM

Chapter
Handbook of Data Visualization
Part of the series Springer Handbooks Comp.Statistics pp 15-56

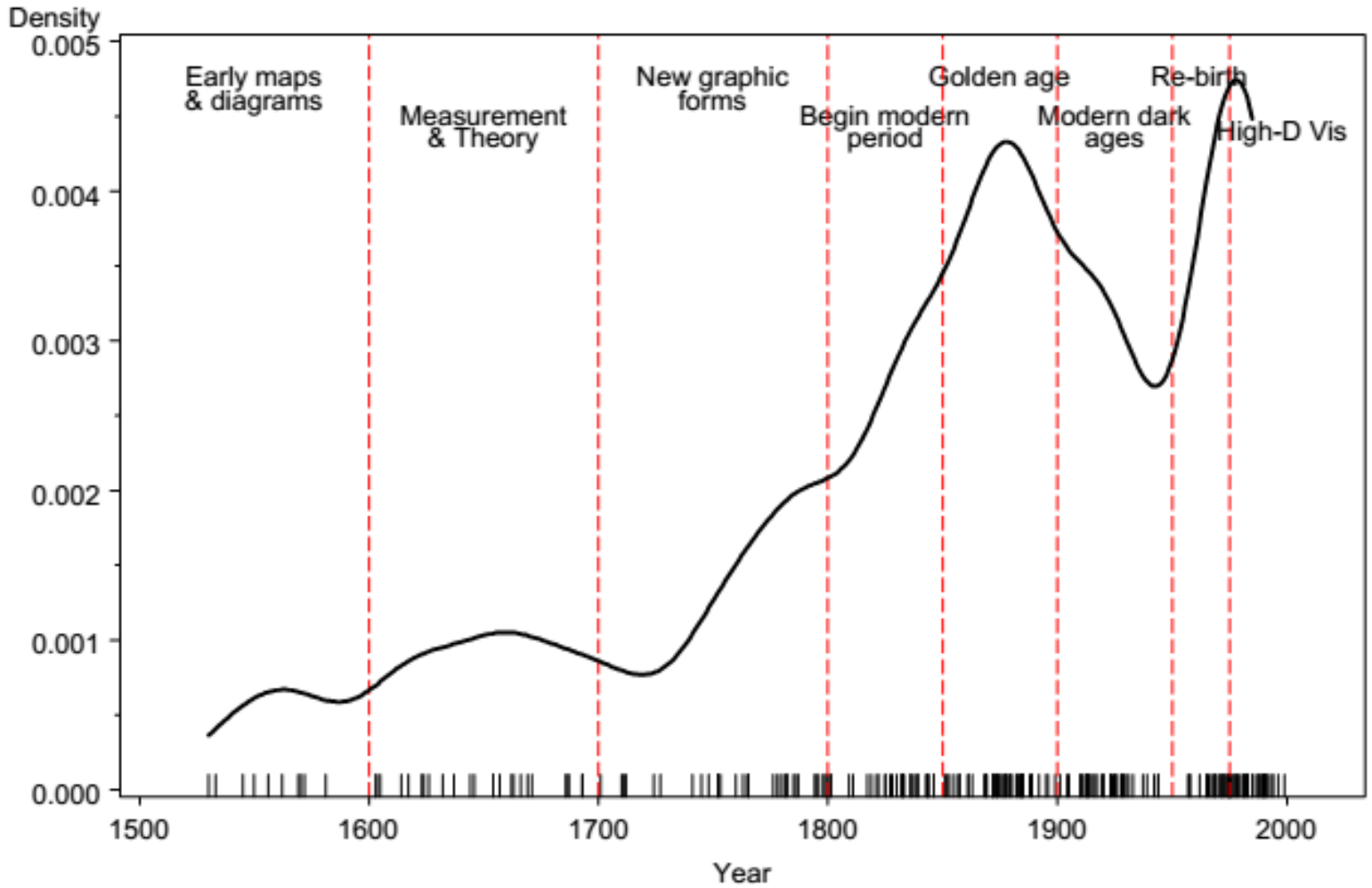
A Brief History of Data Visualization

Michael Friendly



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 earliestmap 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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Measurement & Theory
New graphic forms
Begin modern period
Golden age
Modern dark ages
Re-birth
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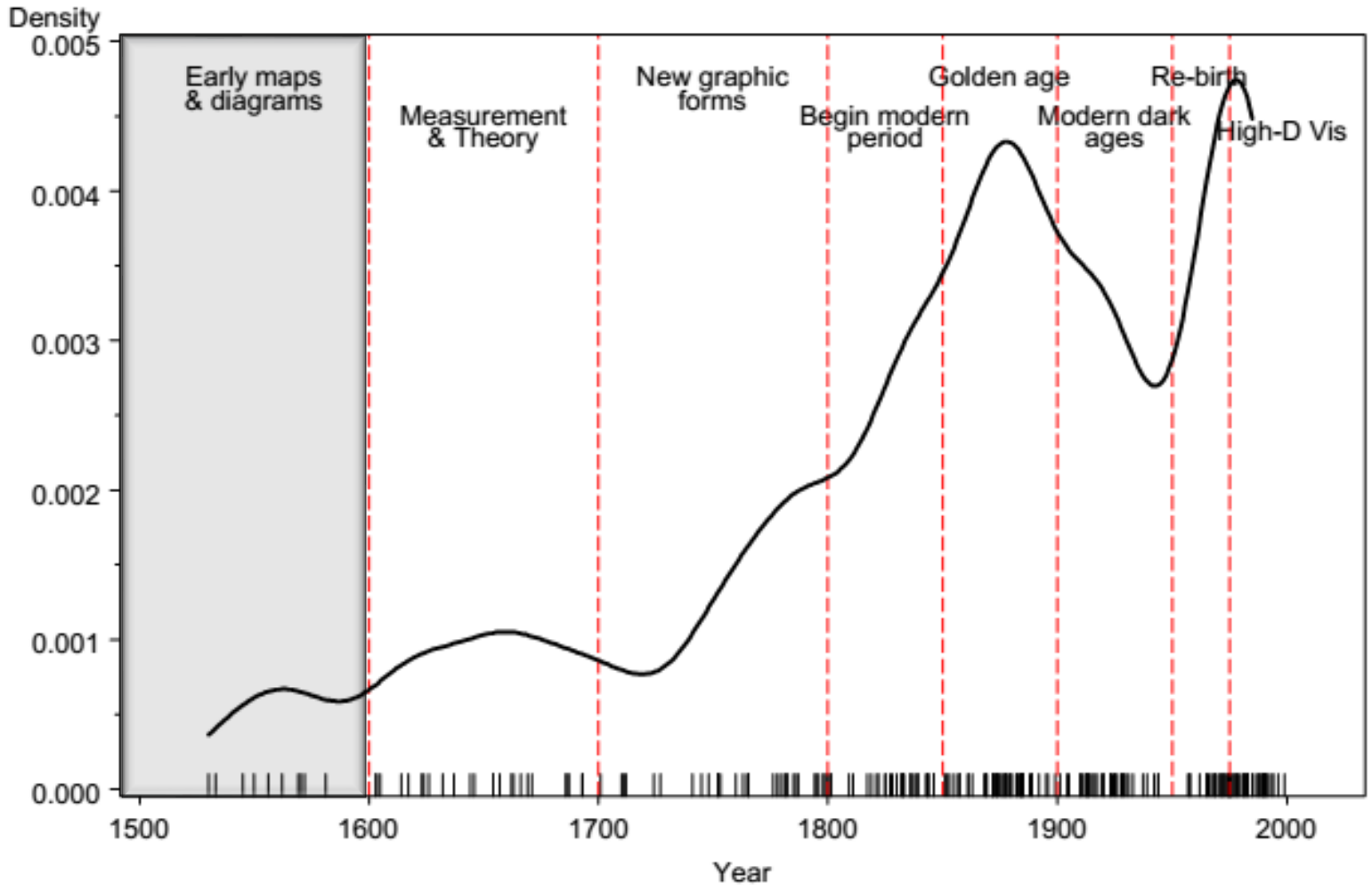
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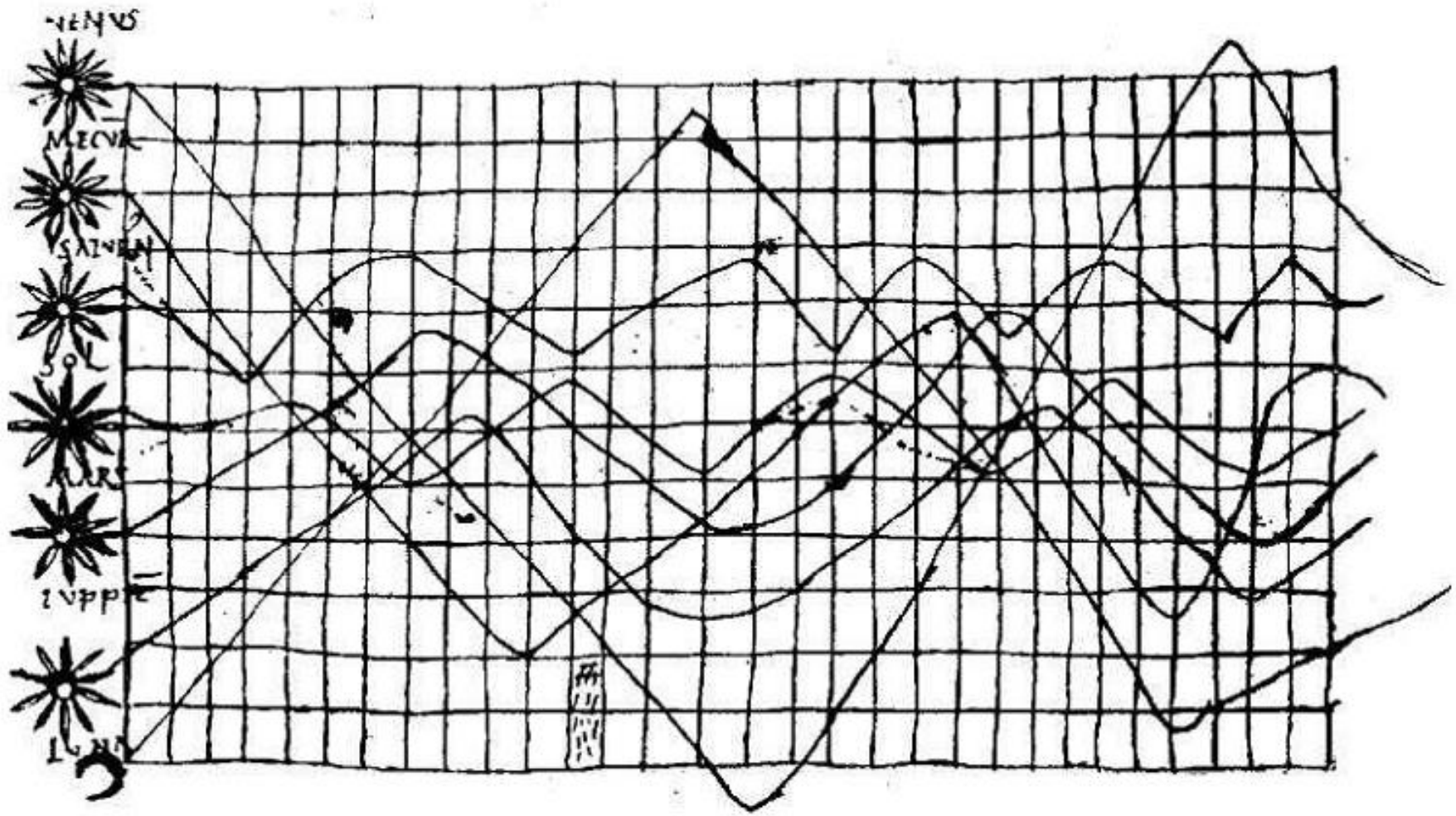
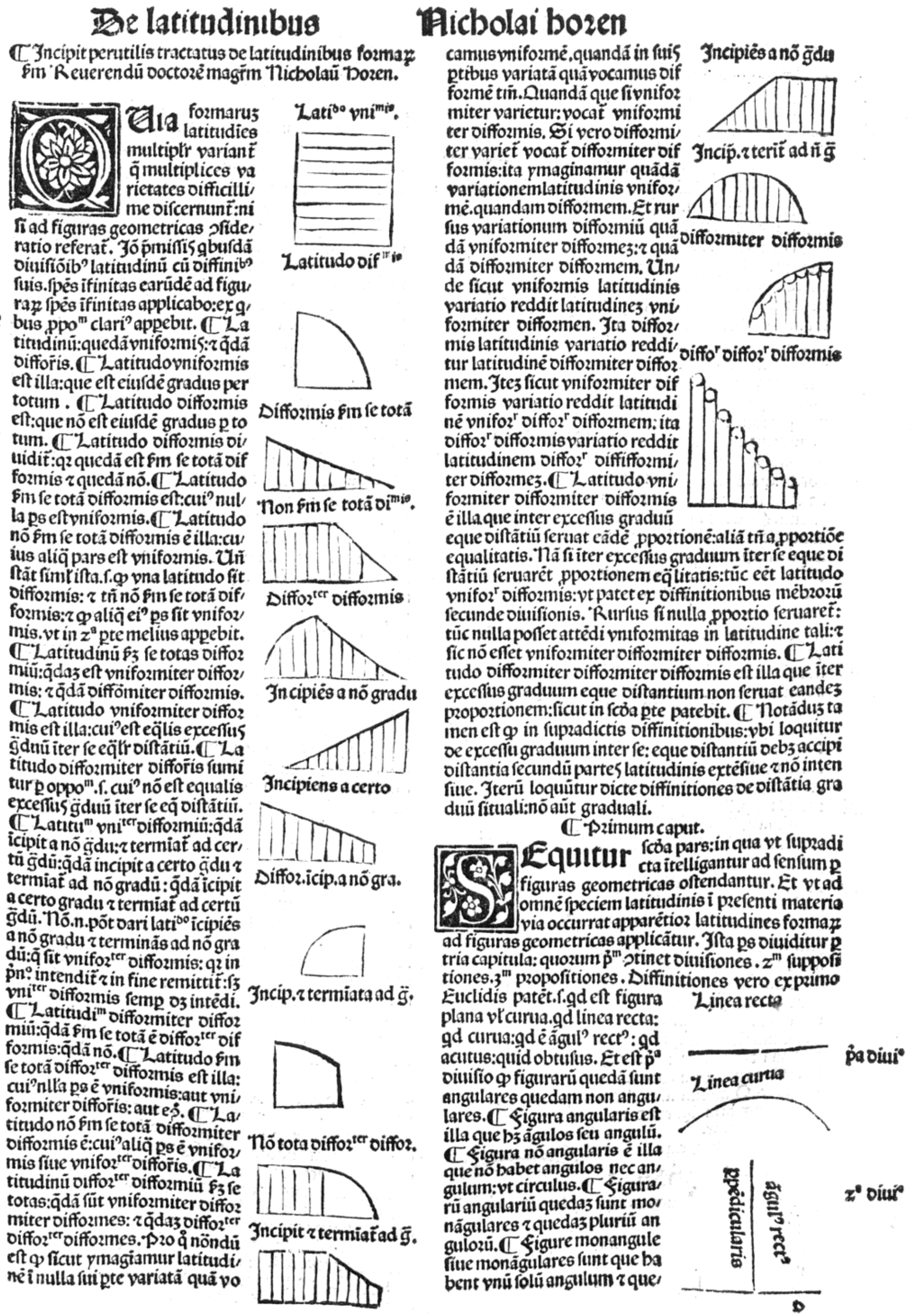


11. století

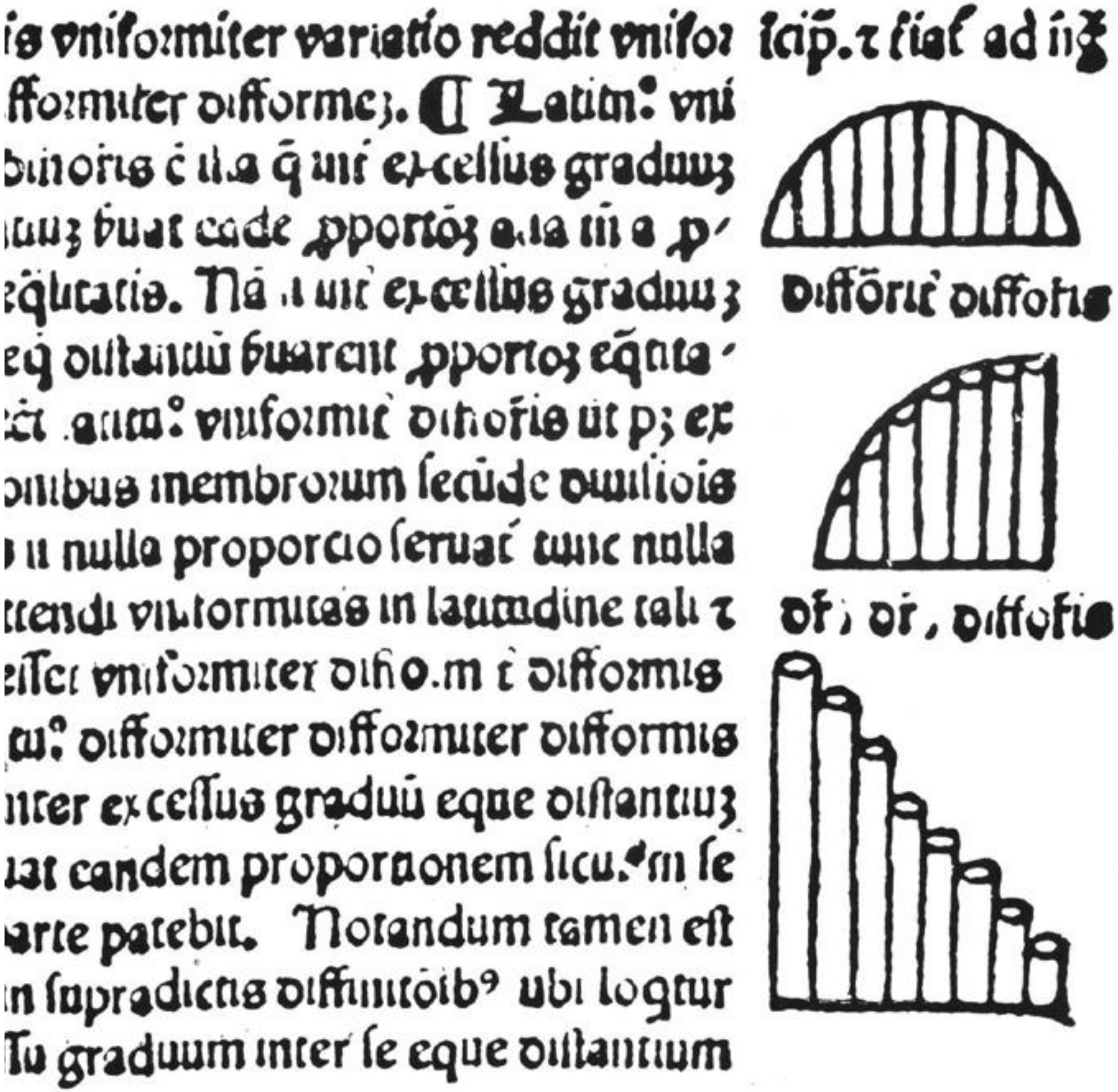


¶ Incipit perutilis tractatus de latitudinibus formaꝝ ꝑm Reuerendũ doctorẽ magr̃m Nicholaũ Horen.

Quia formaruz latitudĩes multiplr̃ variant̃ q̃ multiplices varietates difficillime discernunt̃: nisi ad figuras geometricas ↄsideratio referat̃. Iõ ꝑmissis q̃busdã diuisiõib⁹ latitudinũ cũ diffinib⁹ suis. spẽs ĩfinitas earũdẽ ad figuraꝝ spẽs ĩfinitas applicabo: ex q̃bus ꝓpo^m clari⁹ appebit. ¶ Latitudinũ: quedã vniformis: ⁊ q̃dã diffor̃is. ¶ Latitudo vniformis est illa: que est eiusdẽ gradus per totum. ¶ Latitudo difformis est: que nõ est eiusdẽ gradus p totum. ¶ Latitudo difformis diuidit̃: q2 quedã est ꝑm se totã difformis ⁊ quedã nõ. ¶ Latitudo ꝑm se totã difformis est: cui⁹ nulla ps est vniformis. ¶ Latitudo nõ ꝑm se totã difformis ẽ illa: cuius aliq̃ pars est vniformis. Unñ stãt siml' ista. s. q vna latitudo sit difformis: ⁊ tñ nõ ꝑm se totã difformis: ⁊ q aliq̃ ei⁹ ps sit vniformis. vt in z^a pte melius appebit. ¶ Latitudinũ ꝑz se totas difformiũ: q̃daz est vniformiter difformis: ⁊ q̃dã diffõmiter difformis. ¶ Latitudo vniformiter difformis est illa: cui⁹ est eq̃lis excessus g̃duũ iter se eq̃lr̃ distãtiũ. ¶ Latitudo difformiter diffor̃is sumitur p oppo^m. s. cui⁹ nõ est equalis excessus g̃duũ iter se eq̃ distãtiũ. ¶ Latitu^m vni^ter difformiũ: q̃dã ĩcipit a nõ g̃du: ⁊ termiat̃ ad certũ g̃dũ: q̃dã incipit a certo g̃du ⁊ termiat̃ ad nõ gradũ: q̃dã ĩcipit a certo gradu ⁊ termiat̃ ad certũ g̃dũ. Nõ. n. põt dari lati^do ĩcipiẽs a nõ gradu ⁊ terminãs ad nõ gradũ: q̃ sit vnifor^ter difformis: q2 in ꝑn⁹ intendit̃ ⁊ in fine remittit̃: sz vni^ter difformis semp oz intẽdi. ¶ Latitudi^m difformiter difformiũ: q̃dã ꝑm se totã ẽ diffor^ter difformis: q̃dã nõ. ¶ Latitudo ꝑm se totã diffor^ter difformis est illa: cui⁹ nll'a ps ẽ vniformis: aut vniformiter diffor̃is: aut eꝫ. ¶ Latitudo nõ ꝑm se totã difformiter difformis ẽ: cui⁹ aliq̃ ps ẽ vniformis siue vnifor^ter diffor̃is. ¶ Latitudinũ diffor^ter difformiũ ꝑz se totas: q̃dã sũt vniformiter difformiter difformes: ⁊ q̃daz diffor^ter diffor^ter difformes. Pro q̃ nõndũ est q sicut ymagiamur latitudinẽ ĩ nulla sui pte variatã quã vocamus vniformẽ. quandã in suis ptibus variatã quã vocamus difformẽ tñ. Quandã que si vniformiter varietur: vocat̃ vniformiter difformis. Si vero difformiter variet̃ vocat̃ difformiter difformis: ita ymaginamur quãdã variationem latitudinis vniformẽ. quandam difformem. Et rursus variationum difformiũ quãdã vniformiter difformez: ⁊ quãdã difformiter difformem. Unde sicut vniformis latitudinis variatio reddit latitudinez vniformiter difformen. Ita difformis latitudinis variatio redditur latitudinẽ difformiter difformem. Itez sicut vniformiter difformis variatio reddit latitudinẽ vnifor^r diffor^r difformem: ita diffor^r difformis variatio reddit latitudinem diffor^r diffifformiter difformez. ¶ Latitudo vniformiter difformiter difformis ẽ illa que inter excessus graduũ eque distãtiũ seruat eãdẽ ꝓportionẽ: aliã tñ a ꝓportiõe equalitatis. Nã si iter excessus graduum iter se eque distãtiũ seruarẽt ꝓportionem eq̃litatis: tũc eẽt latitudo vnifor^r difformis: vt patet ex diffinitionibus mẽbroꝝ secunde diuisionis. Rursus si nulla ꝓportio seruaret̃: tũc nulla posset attẽdi vniformitas in latitudine tali: ⁊ sic nõ esset vniformiter difformiter difformis. ¶ Latitudo difformiter difformiter difformis est illa que iter excessus graduum eque distantium non seruat eandez proportionem: sicut in scd̃a pte patebit. ¶ Notãduz tamen est q in supradictis diffinitionibus: vbi loquitur de excessu graduum inter se: eque distantiũ debz accipi distantia secundũ partes latitudinis extẽsiue ⁊ nõ intensiue. Iterũ loquũtur dicte diffinitiones de distãtia graduũ situali: nõ aũt graduali.

¶ Primum caput.

Sequitur scd̃a pars: in qua vt supradicta ĩtelligantur ad sensum p figuras geometricas ostendantur. Et vt ad omnẽ speciem latitudinis ĩ presenti materia via occurrat apparẽtior latitudines formaꝝ ad figuras geometricas applicãtur. Ista ps diuiditur p tria capitula: quorum ꝑ^m ↄtinet diuisiones. z^m suppositiones. 3^m propositiones. Diffinitiones vero ex primo Euclidis patẽt. s. qd est figura plana vl' curua. qd linea recta: qd curua: qd ẽ ãgul⁹ rect⁹: qd acutus: quid obtusus. Et est ꝑ^a diuisio q figurarũ quedã sunt angulares quedam non angulares. ¶ Figura angularis est illa que hꝫ ãgulos seu angulũ. ¶ Figura nõ angularis ẽ illa que nõ habet angulos nec angulum: vt circulus. ¶ Figurarũ angulariũ quedaz sunt monãgulares ⁊ quedaz pluriũ angulorũ. ¶ Figure monangule siue monãgulares sunt que habent vnũ solũ angulum ⁊ que


is vniformiter variatio reddit vnifor
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equalitatis. Nã si iter excessus graduuz
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et latitu^o vniformis difformis vt p3 ex
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attendi vniformitas in latitudine tali ⁊
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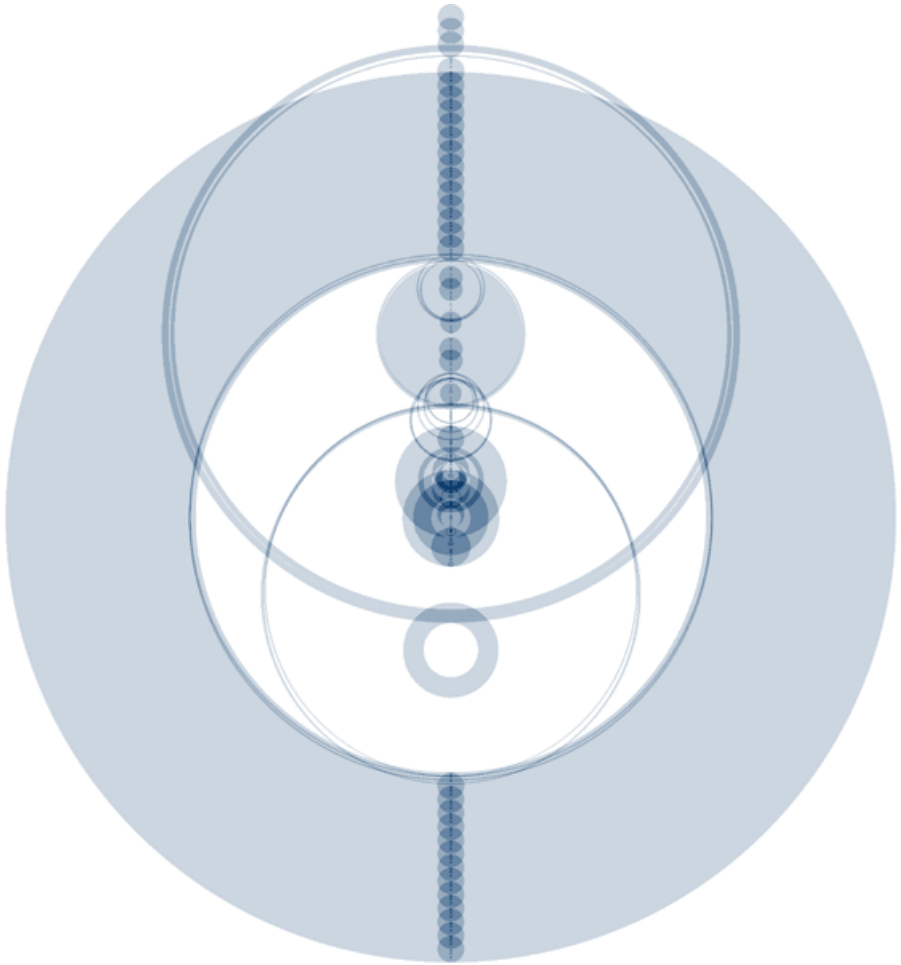
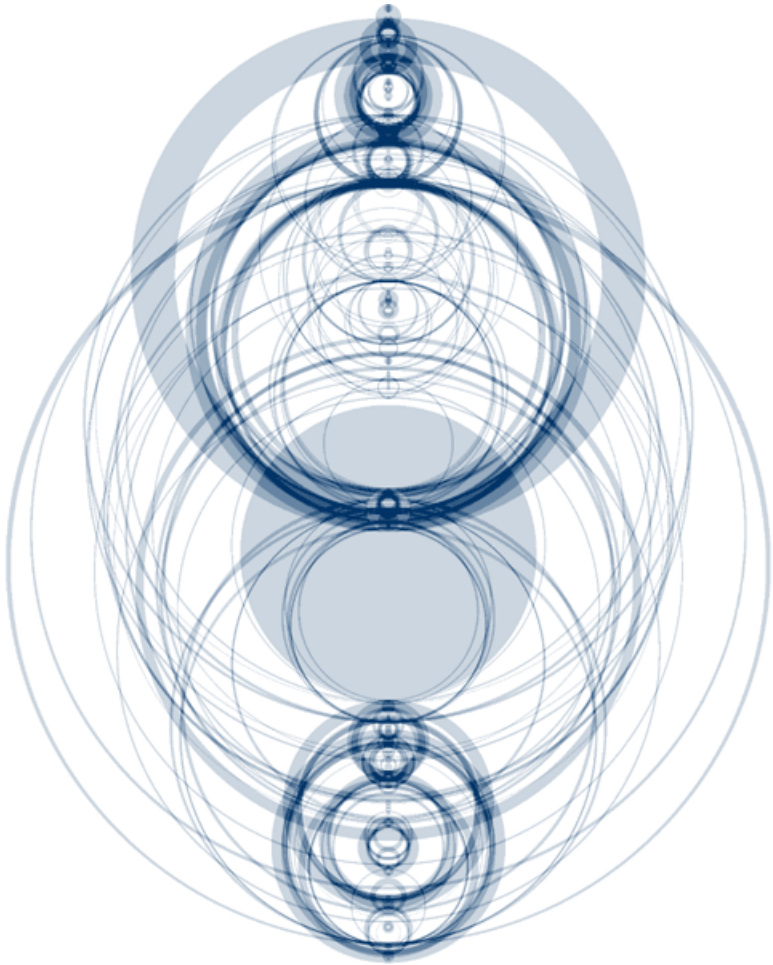
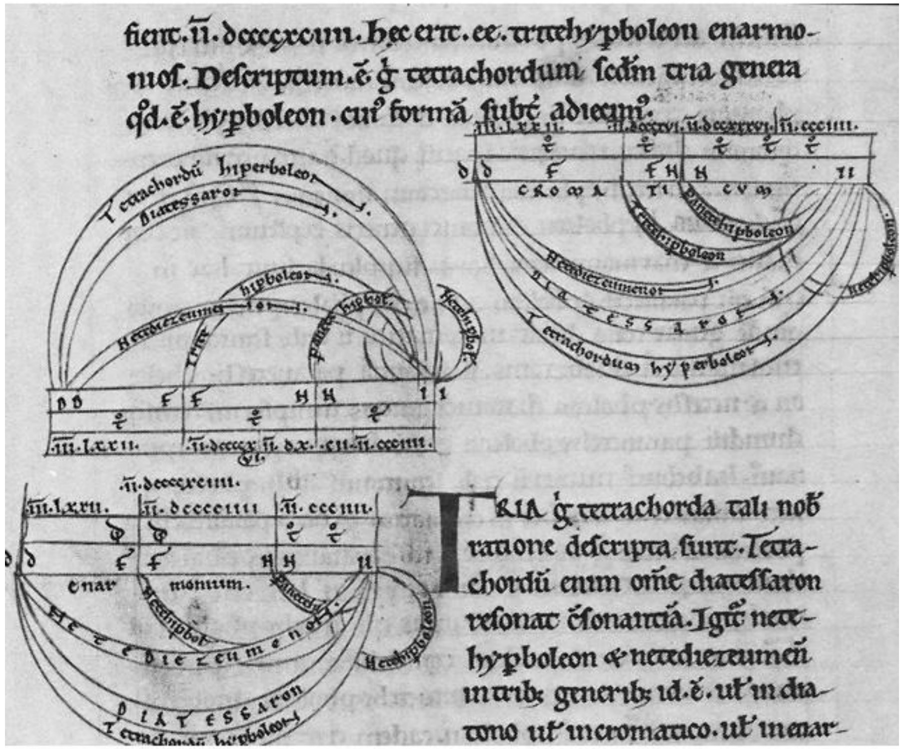
uat candem proportionem sicut in se
arte patebit. Notandum tamen est
in supradictis diffinitoib⁹ ubi loqtur
u graduum inter se eque distantium

Martin Wattenberg



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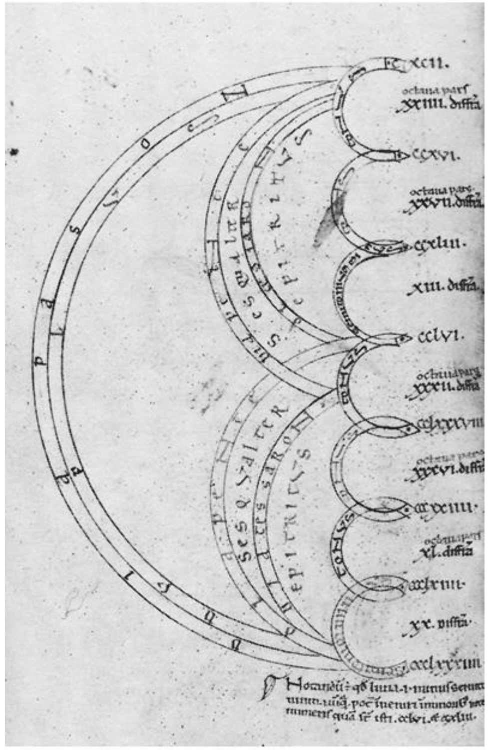

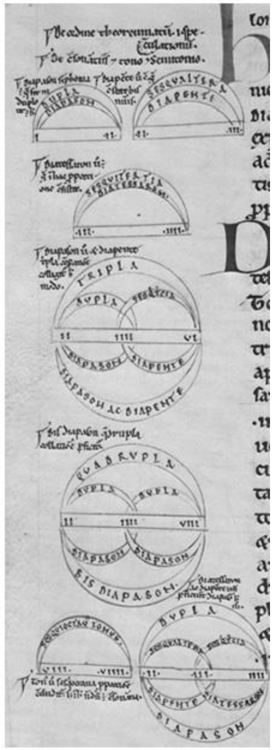

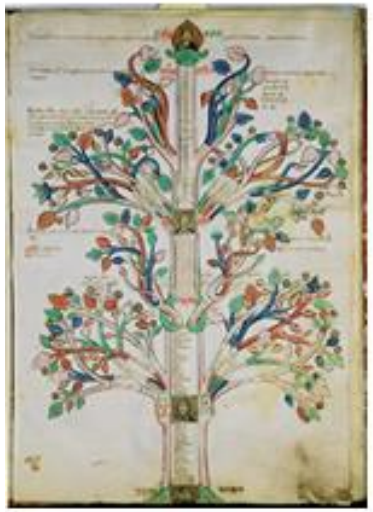

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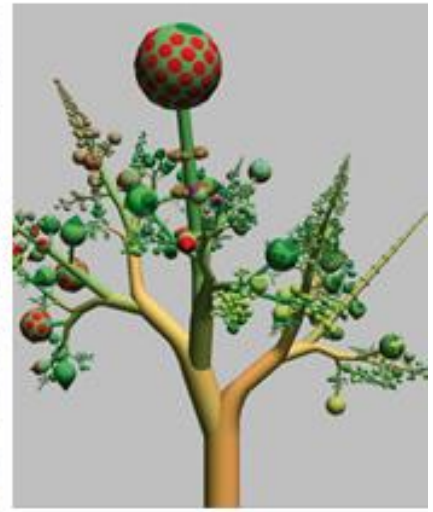

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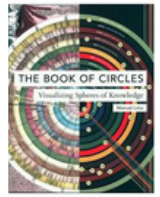

The book of circles : visualizing spheres of knowledge /
Autor Lima, Manuel, 1978-
Vydáno 2017
Další autoři: '; "...Lima, Manuel, 1978-..."
Umístění:
✖ Pedagogická fakulta
Kniha Vypůjčeno

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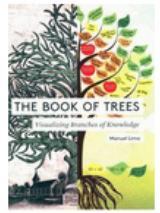

The book of trees : visualizing branches of knowledge /
Autor Lima, Manuel, 1978-
Vydáno 2014
Umístění:
✖ Filozofická fakulta
✖ Pedagogická fakulta
Kniha Vypůjčeno

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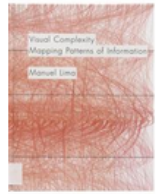
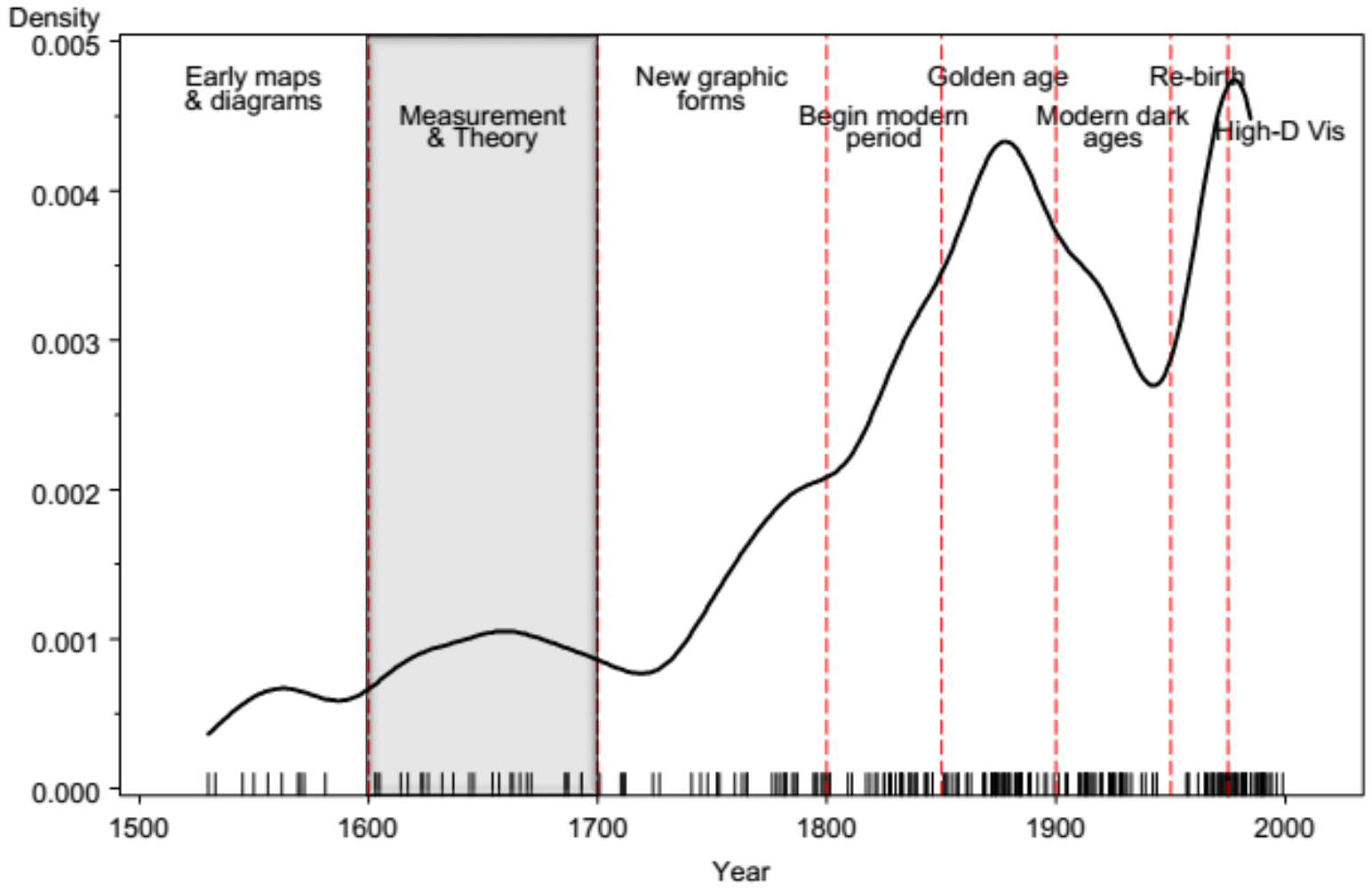


Visual complexity : mapping patterns of information /
Autor Lima, Manuel, 1978-
Vydáno 2011
Umístění:
✔ Fakulta informatiky
✔ Přírodovědecká fakulta
Kniha Dostupné



analytická geometrie

souřadnicový systém

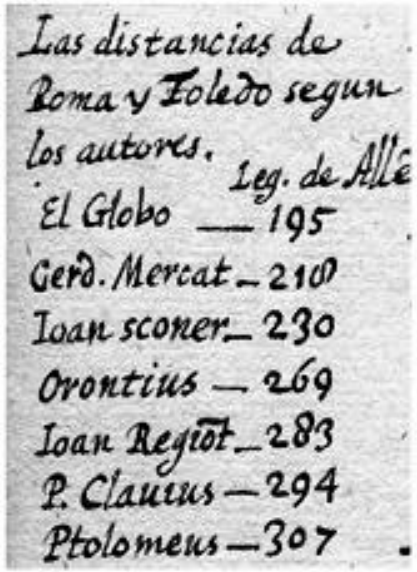
počátky sběru dat

měření času, prostor

1644

Michael Florent van Langren

Rozdíly v odhadech zeměpisné délky


Las distancias de
Roma y Toledo segun
los autores.
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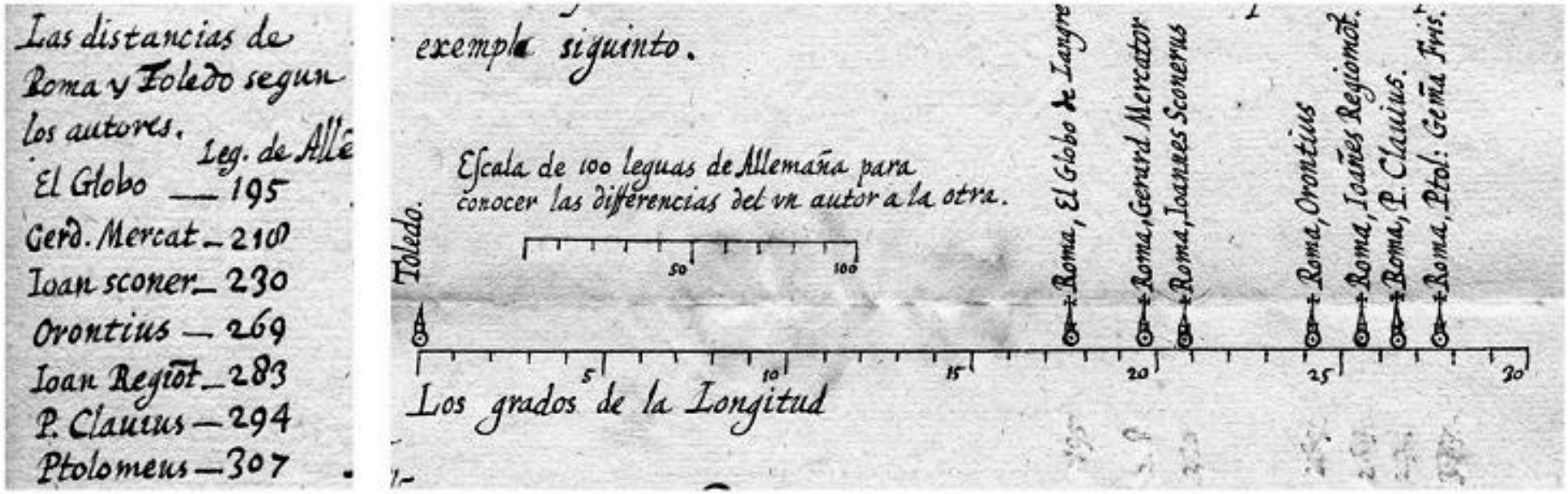
Gerd. Mercat _ 210
Ioan sconer _ 230
Orontius _ 269
Ioan Regiot _ 283
P. Clauius _ 294
Ptolomeus _ 307

1644

Michael Florent van Langren

Rozdíly v odhadech zeměpisné délky



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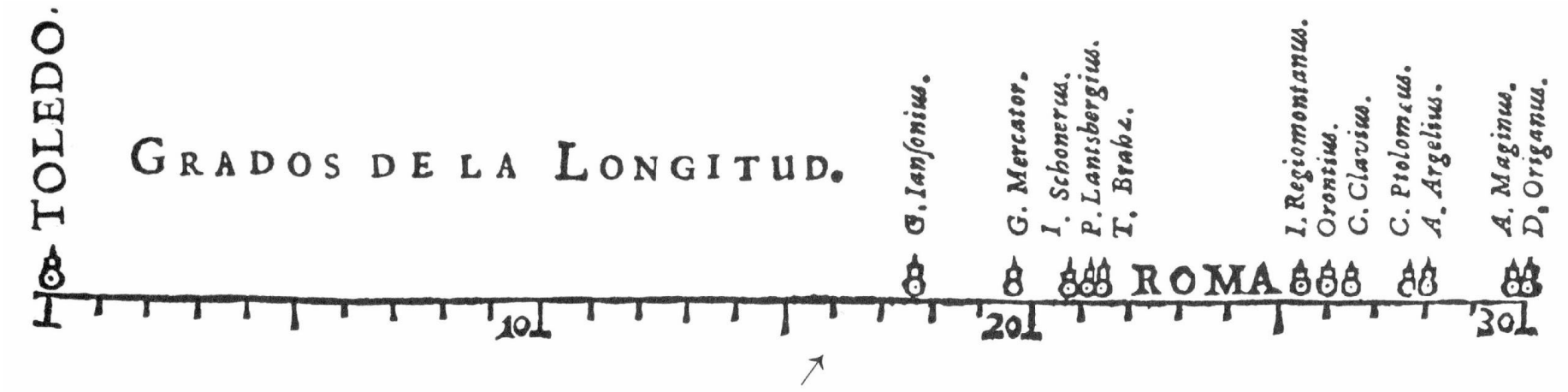
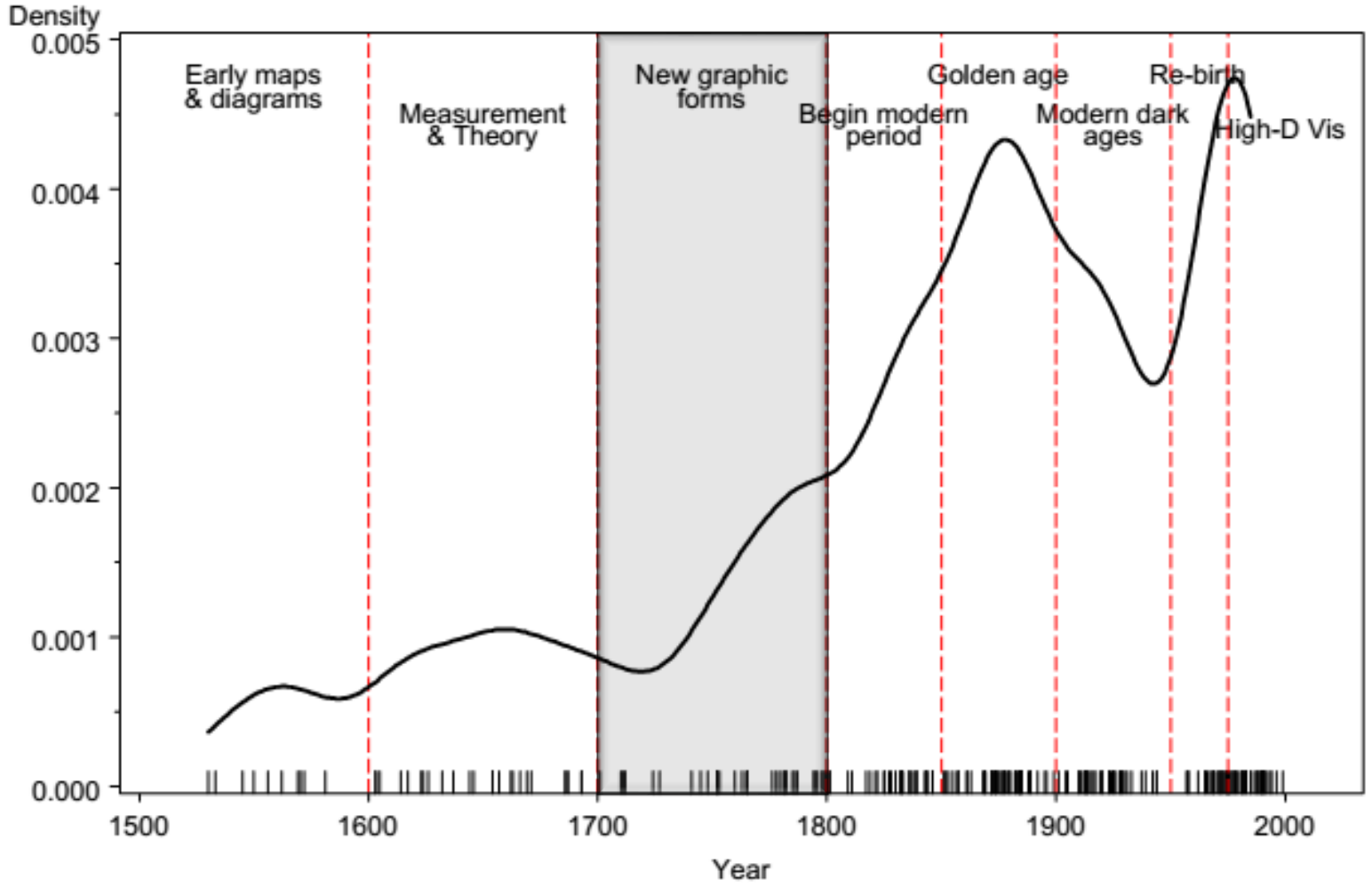
Michael Florent van Langren

Rozdíly v odhadech zeměpisné délky





technologická vylepšení

nové metafory

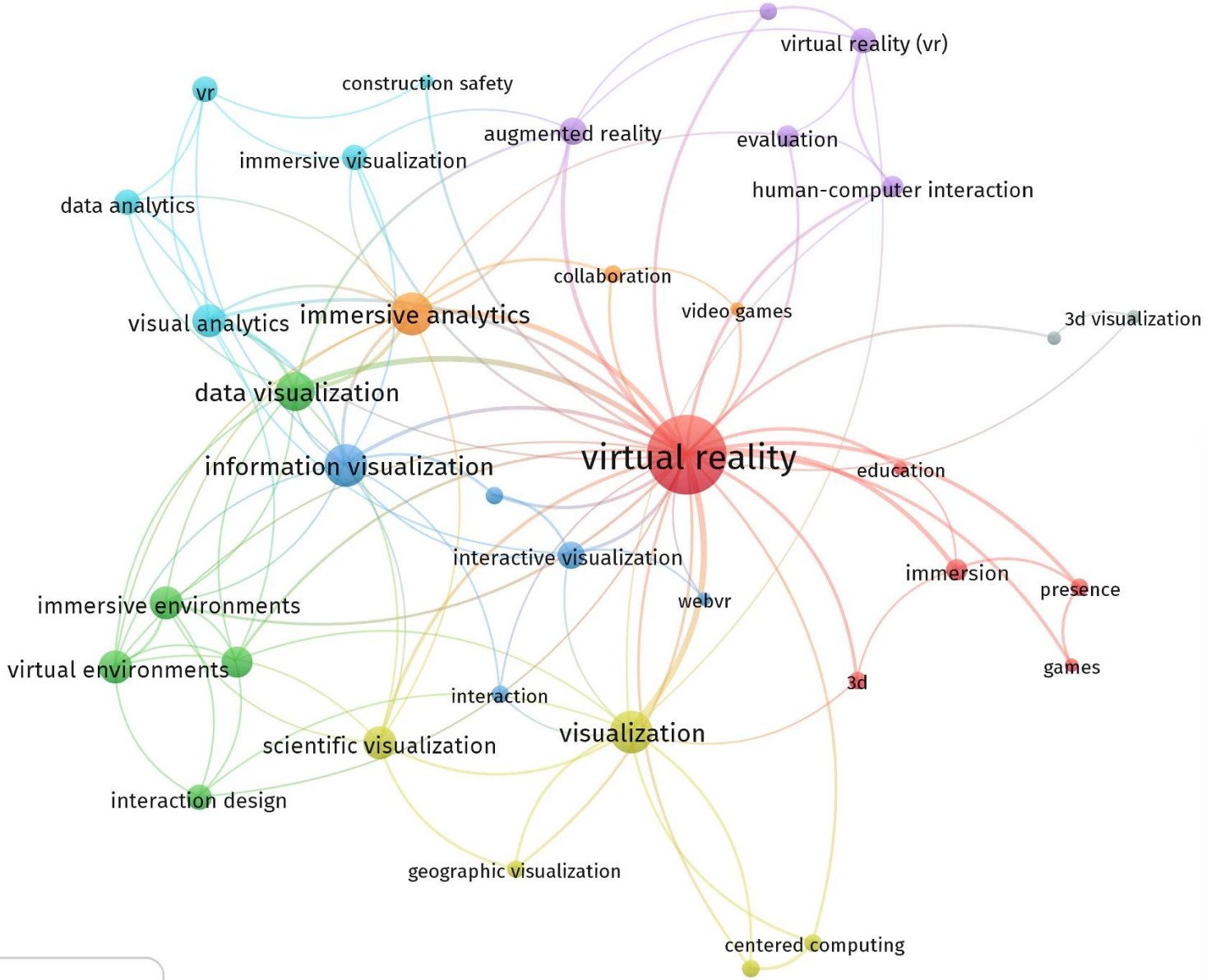
systematický sběr dat

data nad mapou

1753

Jacques Barbeu-Dubourg

Časová osa



VOSviewer

Virtual Reality (2023) 27:1447–1480
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ORIGINAL ARTICLE

Visualization in virtual reality: a systematic review

Elif Hilal Korkut[1] · Elif Surer[1]

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Abstract
Rapidly growing virtual reality (VR) technologies and techniques have gained importance over the past few years, and academics and practitioners have been searching for efficient visualizations in VR. To date, the emphasis has been on the employment of game technologies. Despite the growing interest and potential, visualization studies have lacked a common baseline in the transition period of 2D visualizations to immersive ones. To this end, the presented study aims to provide a systematic literature review that explains the state-of-the-art research and future trends in visualization in virtual reality. The research framework is grounded in empirical and theoretical works of visualization. We characterize the reviewed literature based on three dimensions: (a) Connection with visualization background and theory, (b) Evaluation and design considerations for virtual reality visualization, and (c) Empirical studies. The results from this systematic review suggest that: (1) There are only a few studies that focus on creating standard guidelines for virtual reality, and each study individually provides a framework or employs previous studies on traditional 2D visualizations; (2) With the myriad of advantages provided for visualization and virtual reality, most of the studies prefer to use game engines; (3) Although game engines are extensively used, they are not convenient for critical scientific studies; and (4) 3D versions of traditional statistical visualization techniques, such as bar plots and scatter plots, are still commonly used in the data visualization context. This systematic review attempts to add a clear picture of the emerging contexts, different elements, and interdependencies to the literature.

Keywords Virtual reality · Visualization · Game technologies · Systematic review

1 Introduction

The word "visualization" has been an overloaded term even before being established as a scientific field and has a prolonged usage with different meanings in different contexts. Since the visualization structures and types that can be presented in immersive environments are very diverse, immersive visualization is placed in the convergence of different research areas. In immersive environments, data can be presented with 3D models, 3D graphs and plots, simulations, and multiple 2D representations. The data source can be statistics, medicine, computer sciences, heritage, and many others. Its scope includes technology-related areas, such as multisensory interfaces, interaction, navigation, collaborative aspects, rendering techniques, and domain-specific subjects. Immersive environments offer distinctive methods to engage with the rapidly expanding digital realm as an immersive computing technology. Over time, various fundamental VR technologies have emerged that collectively allow a person to experience a virtual environment. The technology is specifically tailored to use human information processing systems with an emphasis on presenting information to our senses (Suh and Prophet 2018), and interaction opportunities provide new ways to express ideas and propose new interaction methods for a wide range of research domains and disciplines (Fig. 1). With recent technological advances, the invention of several libraries, tools,

EXPLICATION des Signes employés dans la Carte Chronographique.

Amiral
Anatomiste
Artiste
Aßaßin, Aßaßiné
Astronome
Belliqueux
Botaniste, Naturaliste
Chymiste
Collegues, Aßociés
Conquerant
Cruel
Débauché
Deposé, Chaßé, Retiré
Evêque
Empoisonneur Empoisonné
Faineant
Femme
Fou, Inconstant
Generux, bienfaisant
Géographe
Géometre
Grand
Heretique, Errant, Schismatique
Heureux
Historien, Chronologiste
Impie Idolatre
Inposteur, faux Prophete
Interregne
Incertain
Jurisconsulte
Juste
Legislateur

Ligne de vie
Malheureux
Martyr
Mechant, Injuste
Medecin
Ministre
Moine
Musicien
Orateur, Rethur
Peintre
Philosophe, Sage
Pilote, Marin
Poëte
Prisonnier
Prophete
Prudent, Rusé
Puni, mis à mort
Rebelle
Retabli, Rappellé
Riche, Avare
Roy. Empereure
Royaume
Republique
Ruine
Saint
Savant
Souverain pontife
Suicide, homicide de soi même
Scrupuleux, Superstitieux
Souveraineté
Théologien
Tué à la guerre
Usurpateur, Tyran

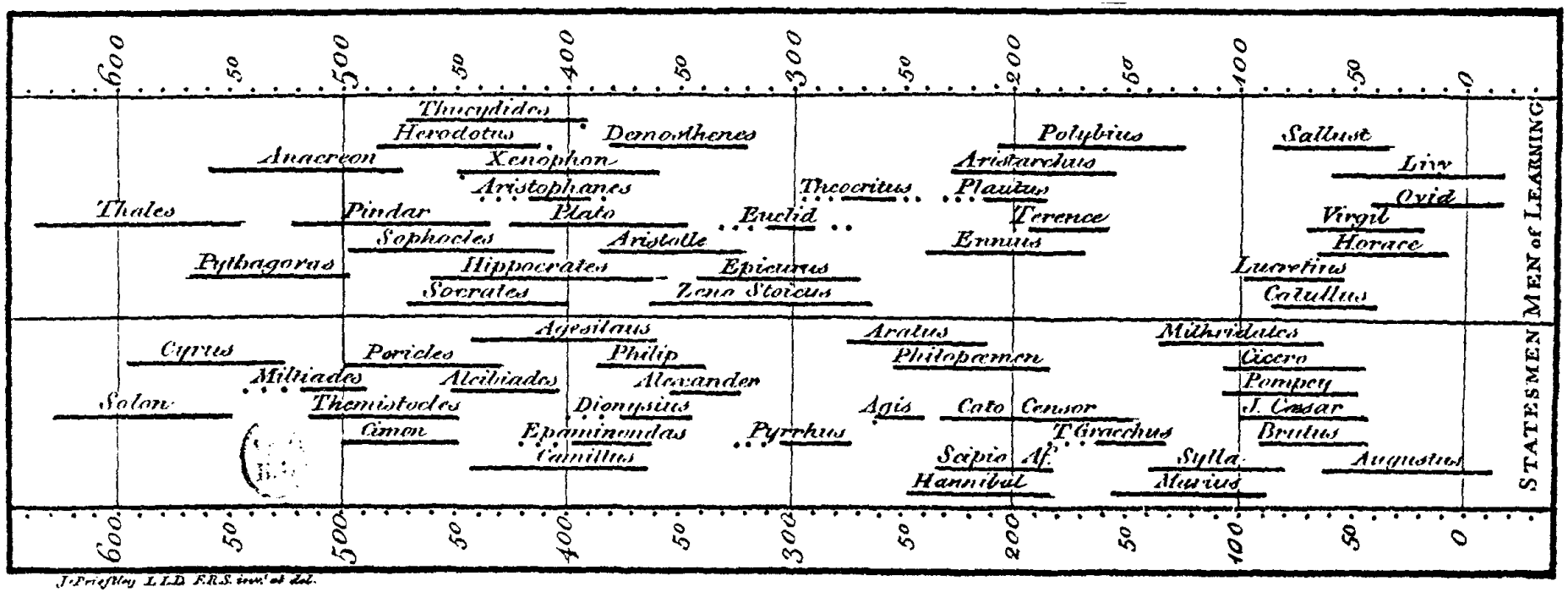
Značky v ose


L. CUIGUET.
E. Deschamps

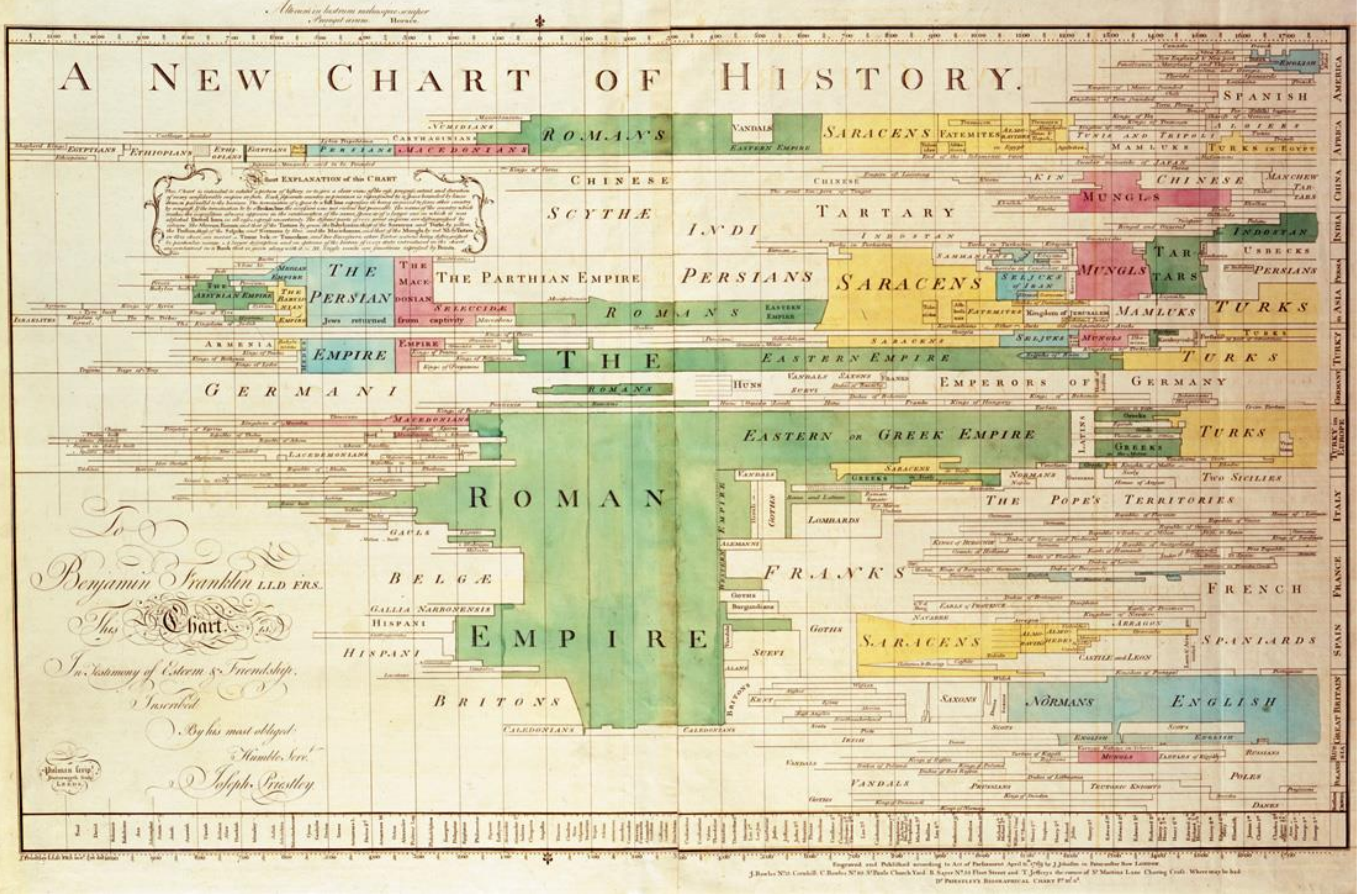
1765

Joseph Priestly

Časová osa



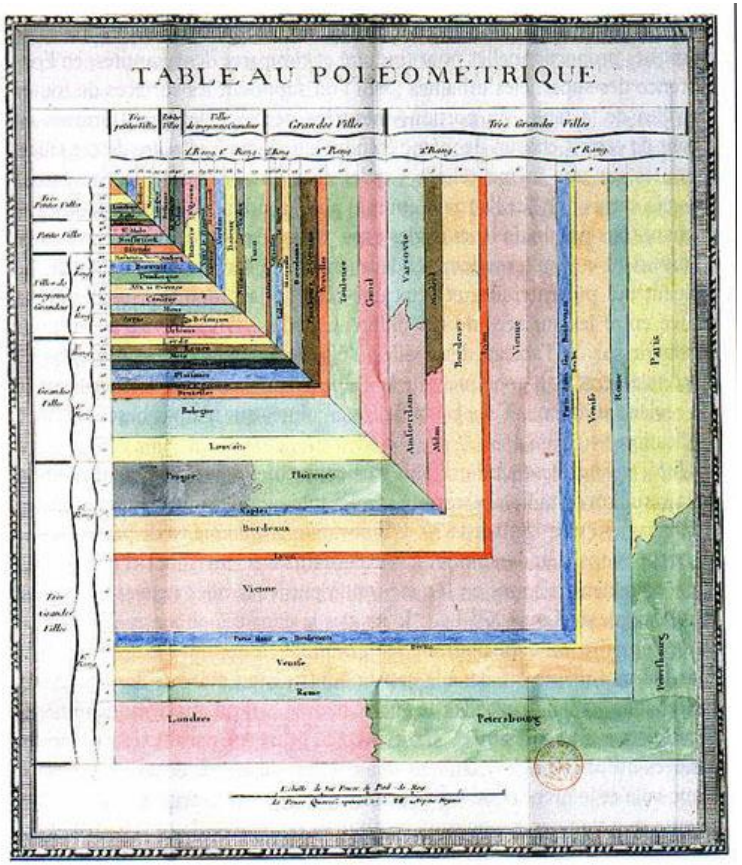
...zobrazení nejistoty...


A NEW CHART OF HISTORY.
Short EXPLANATION of this CHART
ROMANS
SARACENS
FATEMITES
SPANISH
TURKS IN EGYPT
MAMLUKS
TUNIS AND TRIPOLI
CARTHAGINIANS
NUMIDIANS
VANDALS
EASTERN EMPIRE
EGYPTIANS
ETHIOPIANS
PERSIANS
MACEDONIANS
CHINESE
SCYTHÆ
INDI
TARTARY
MUNGLS
MANCHEW TARTARS
INDOSTAN
USBECKS
PERSIANS
THE PERSIAN EMPIRE
THE MACEDONIAN
THE PARTHIAN EMPIRE
SELEUCIDÆ
ASSYRIAN EMPIRE
Jews returned from captivity
SELJUKS
TARTARS
Kingdom of JERUSALEM
MAMLUKS
TURKS
ARMENIA
EMPIRE
THE EASTERN EMPIRE
GERMANI
ROMANS
HUNS
EMPERORS OF GERMANY
EASTERN OR GREEK EMPIRE
LATINS
GREEKS
LACEDEMONIANS
ROMAN EMPIRE
NORMANS
TWO SICILIES
THE POPE'S TERRITORIES
LOMBARDS
GOTHS
WESTERN EMPIRE
ALEMANNI
GAULS
BELGÆ
FRANKS
FRENCH
GALLIA NARBONENSIS
HISPANI
SUEVI
ALANS
ARRAGON
CASTILE and LEON
SPANIARDS
BRITONS
SAXONS
NORMANS
ENGLISH
CALEDONIANS
SCOTS
IRISH
RUSSIANS
VANDALS
POLES
TEUTONIC KNIGHTS
DANES
AMERICA
AFRICA
CHINA
INDIA
PERSIA
in ASIA
TURKY
GERMANY
TURKY in EUROPE
ITALY
FRANCE
SPAIN
GREAT BRITAIN
To
Benjamin Franklin LLD FRS.
This Chart is
In Testimony of Esteem & Friendship,
Inscribed
By his most obliged
Humble Servt.
Joseph Priestley

1782

Charles de Fourcroy

Předchůdce kartodiagramu



1780+

William Playfair

Skoro všechny základní statistické grafy

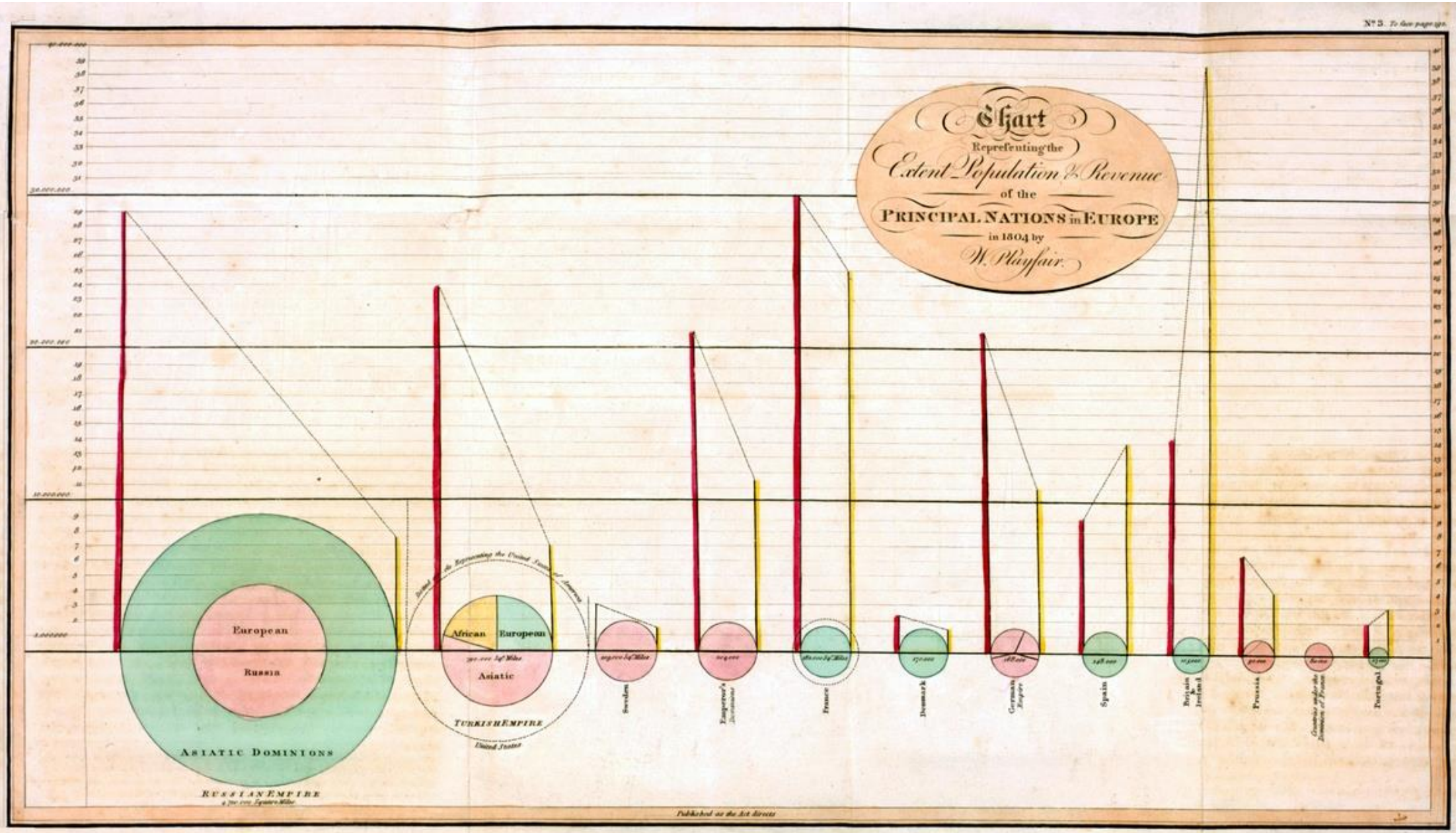
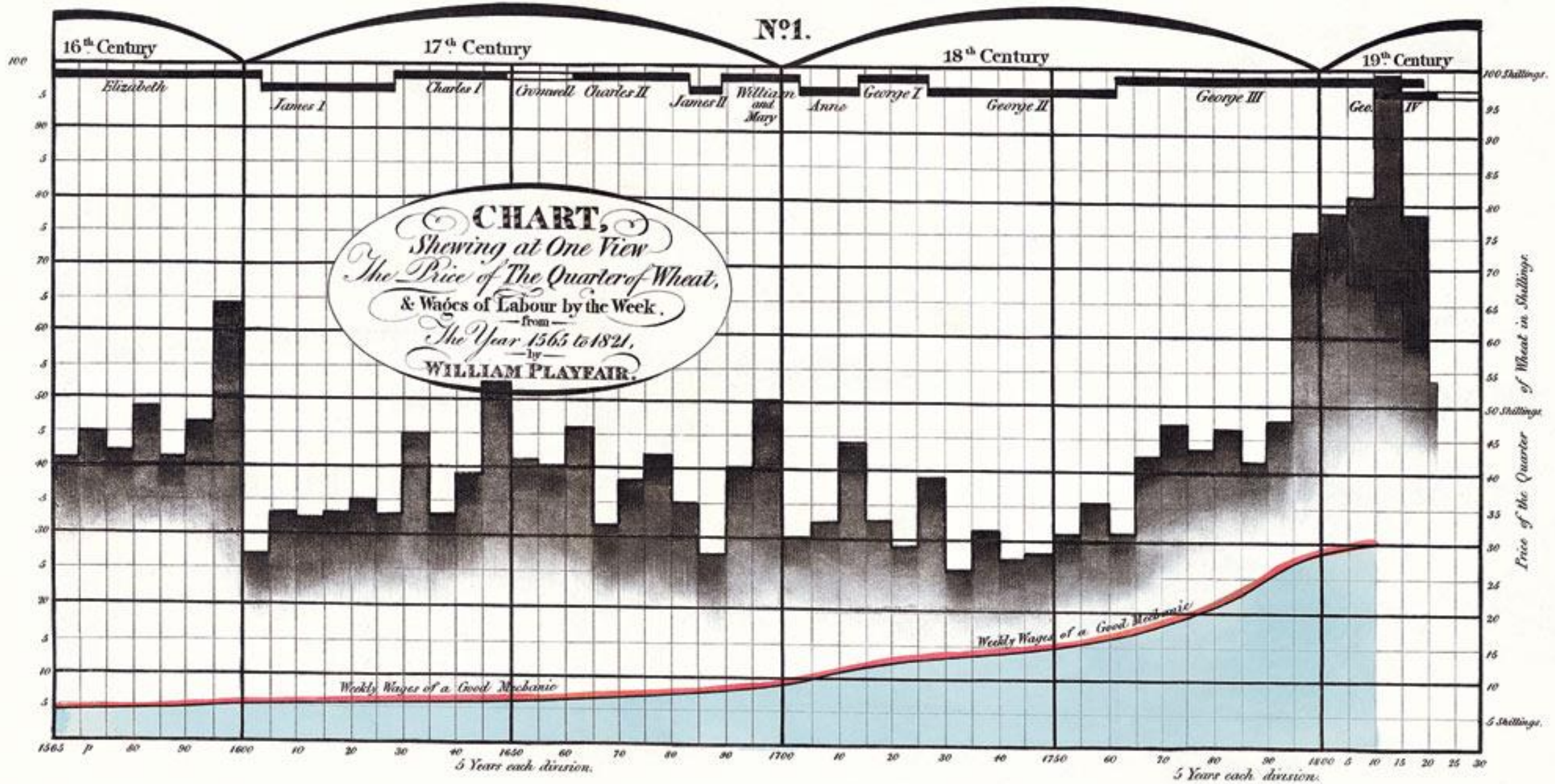


Chart
Representing the
Extent Population & Revenue
of the
PRINCIPAL NATIONS in EUROPE
in 1804 by
W. Playfair.
European
Russia
ASIATIC DOMINIONS
RUSSIAN EMPIRE
African
European
Asiatic
TURKISH EMPIRE
United States
Sweden
Emperor's Dominions
France
Denmark
German Empire
Spain
Britain & Ireland
Prussia
Portugal
Published as the Act directs


No.1.
16th Century
17th Century
18th Century
19th Century
Elizabeth
James I
Charles I
Cromwell
Charles II
James II
William and Mary
Annie
George I
George II
George III
Geo. IV
CHART,
Shewing at One View
The Price of The Quarter of Wheat,
& Wages of Labour by the Week,
from
The Year 1565 to 1821,
by
WILLIAM PLAYFAIR.
Weekly Wages of a Good Mechanic
Weekly Wages of a Good Mechanic
100 Shillings.
95
90
85
80
75
70
65
60
55
50 Shillings.
45
40
35
30
25
20
15
10
5 Shillings.
Price of the Quarter of Wheat in Shillings
1565
1600
1650
1700
1750
1800
5 Years each division.
5 Years each division.

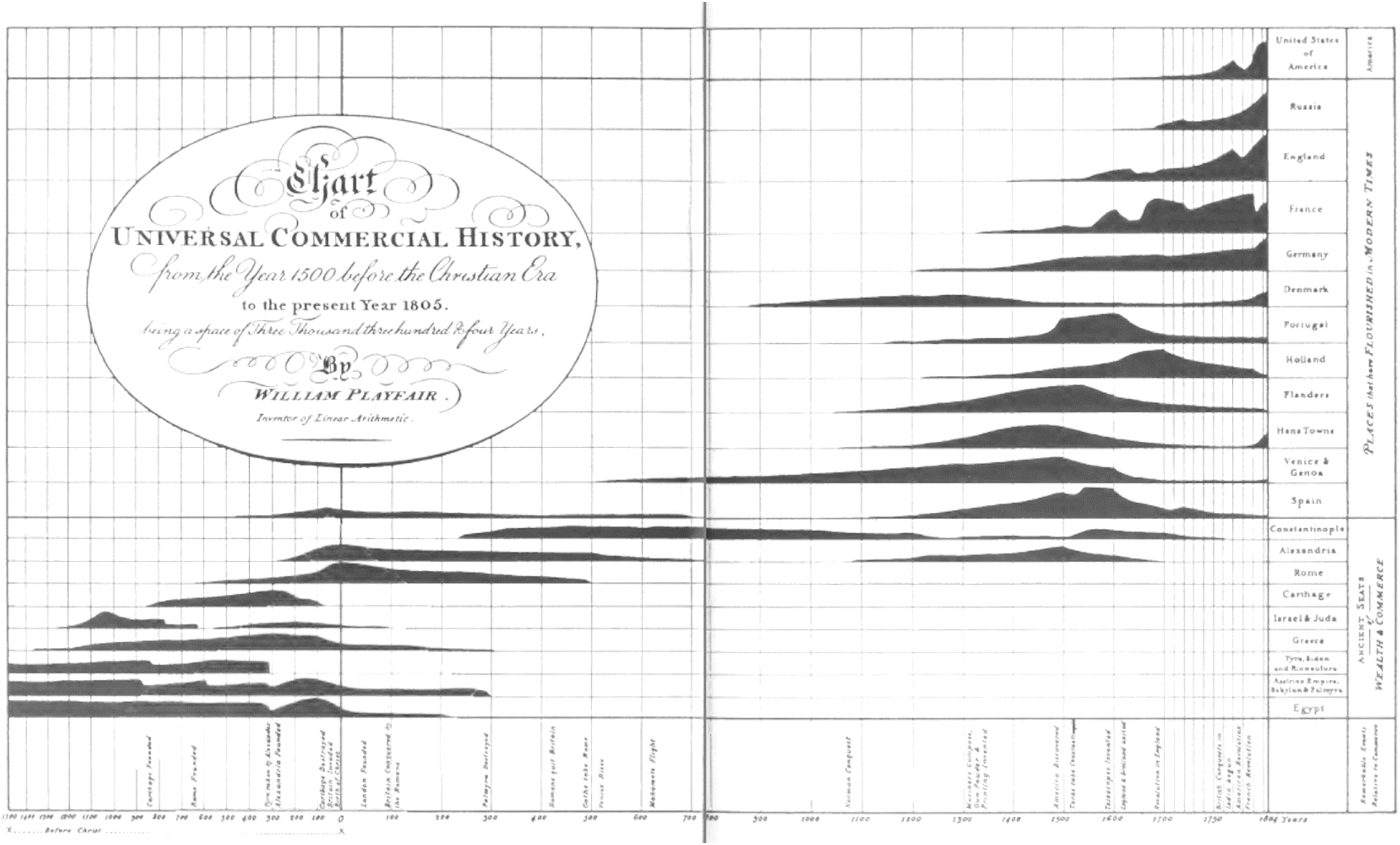
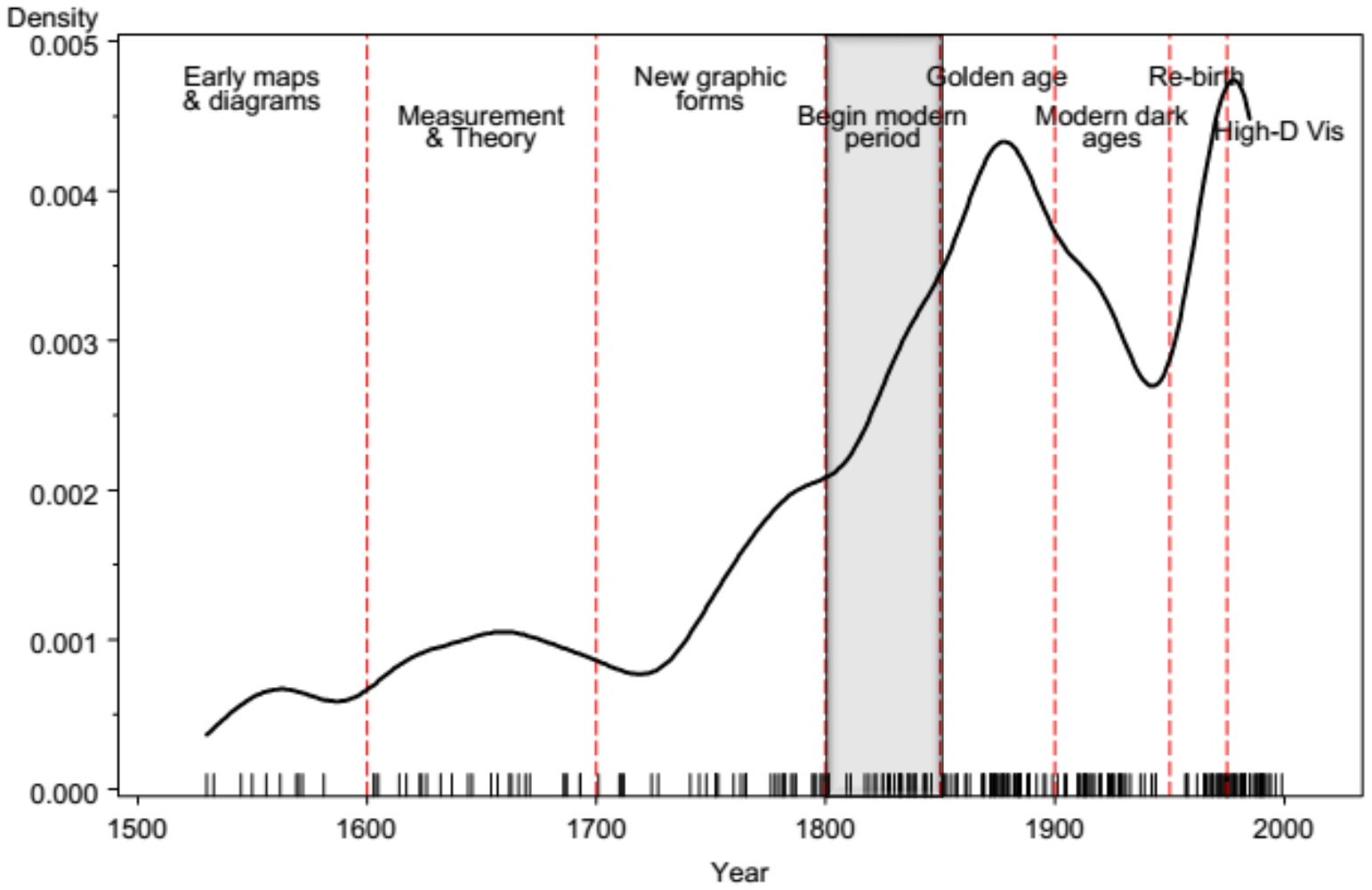


Chart
of
UNIVERSAL COMMERCIAL HISTORY,
from the Year 1500 before the Christian Era
to the present Year 1805.
being a space of Three Thousand three hundred & four Years,
By
WILLIAM PLAYFAIR.
Inventor of Linear Arithmetic.
United States of America
Russia
England
France
Germany
Denmark
Portugal
Holland
Flanders
Hans Towns
Venice & Genoa
Spain
Constantinople
Alexandria
Rome
Carthage
Israel & Juda
Greece
Tyre, Sidon and Nineveh
Assyrian Empire, Babylon & Palmyra
Egypt
America
PLACES that have FLOURISHED in MODERN TIMES
ANCIENT SEATS of WEALTH & COMMERCE
Remarkable Events Relative to Commerce
Before Christ
1804 Years



všechny základy máme

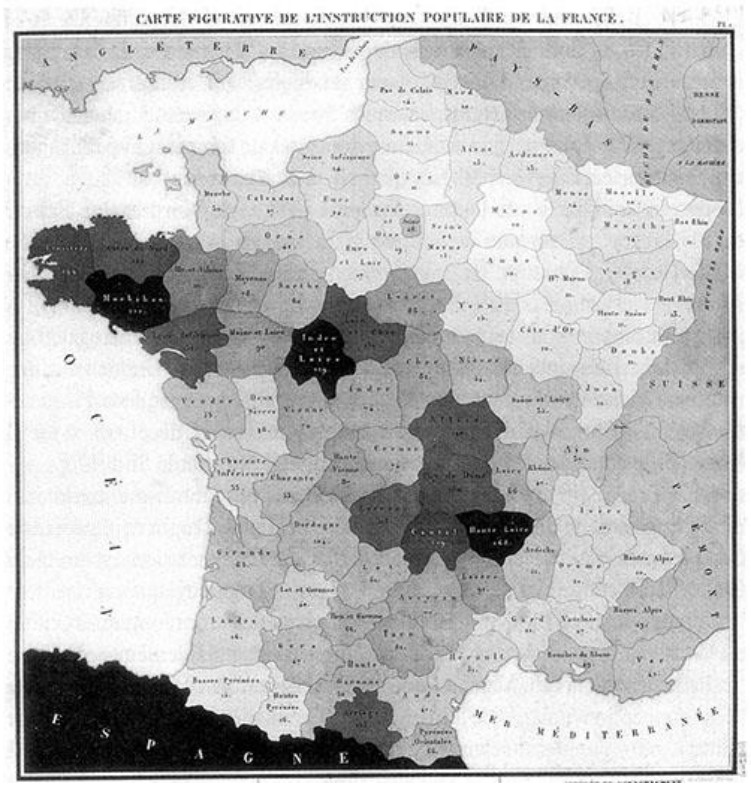
statistické atlasy

pokročilé metafory

1826

Charles Dupin

První choropleth (kartogram)



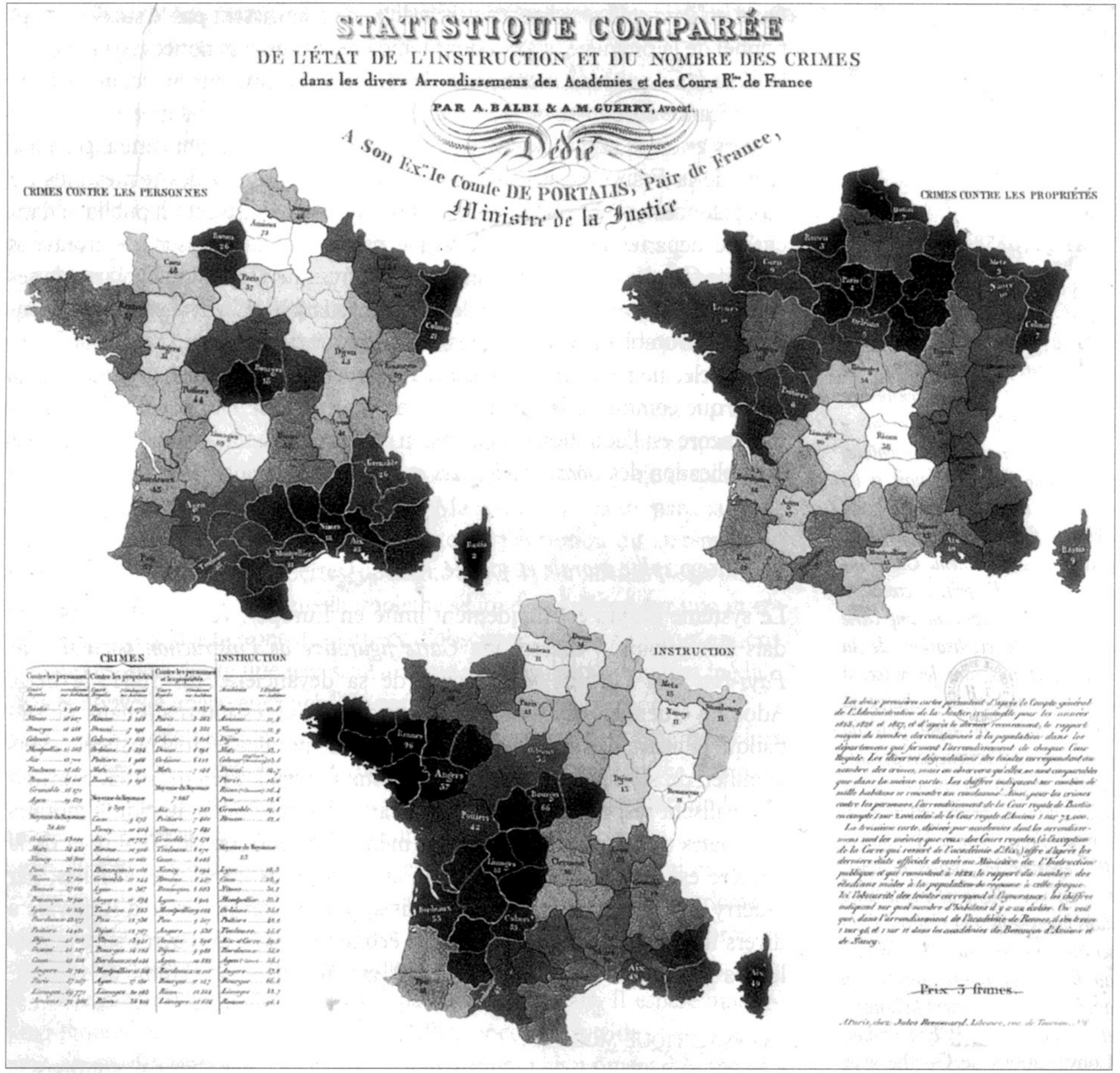
1833

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.“


STATISTIQUE COMPARÉE
DE L'ÉTAT DE L'INSTRUCTION ET DU NOMBRE DES CRIMES
dans les divers Arrondissemens des Académies et des Cours Rles de France
PAR A. BALBI & A.M. GUERRY, Avocat.
Dédié
A Son Exce le Comte DE PORTALIS, Pair de France,
Ministre de la Justice
CRIMES CONTRE LES PERSONNES
CRIMES CONTRE LES PROPRIÉTÉS
INSTRUCTION
CRIMES
Prix 5 francs.

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
BRINGS FORTH ALL MONSTROUS, ALL PRODIGIOUS THINGS.
HYDRAS AND GORGONS, AND CHIMERAS DIRE
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.*

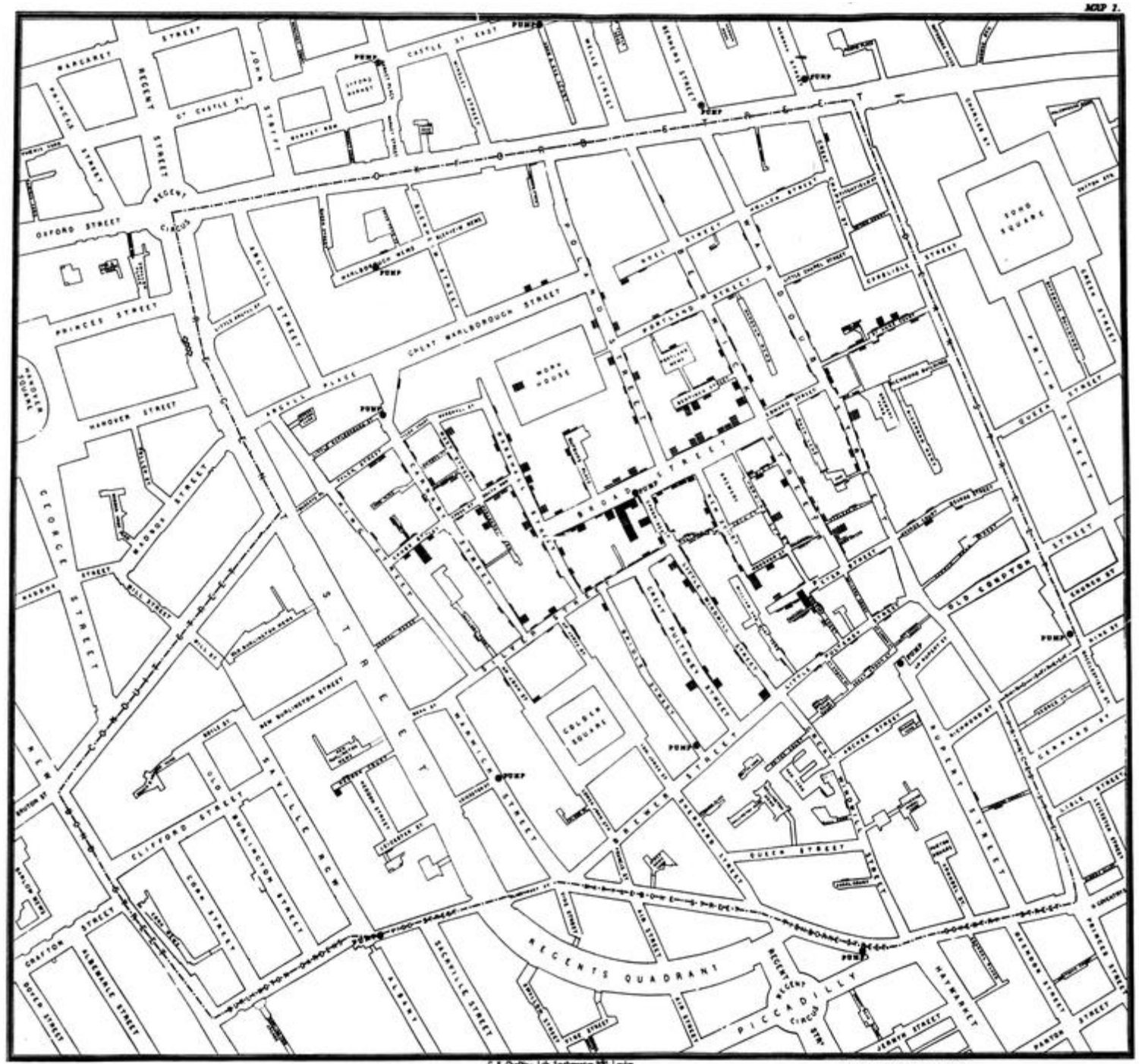
At 7, Spread Eagle Court, July 22nd, the wife of a labourer, aged 25, "cholera 12 hours". *Southwark & Vauxhall.*

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.*

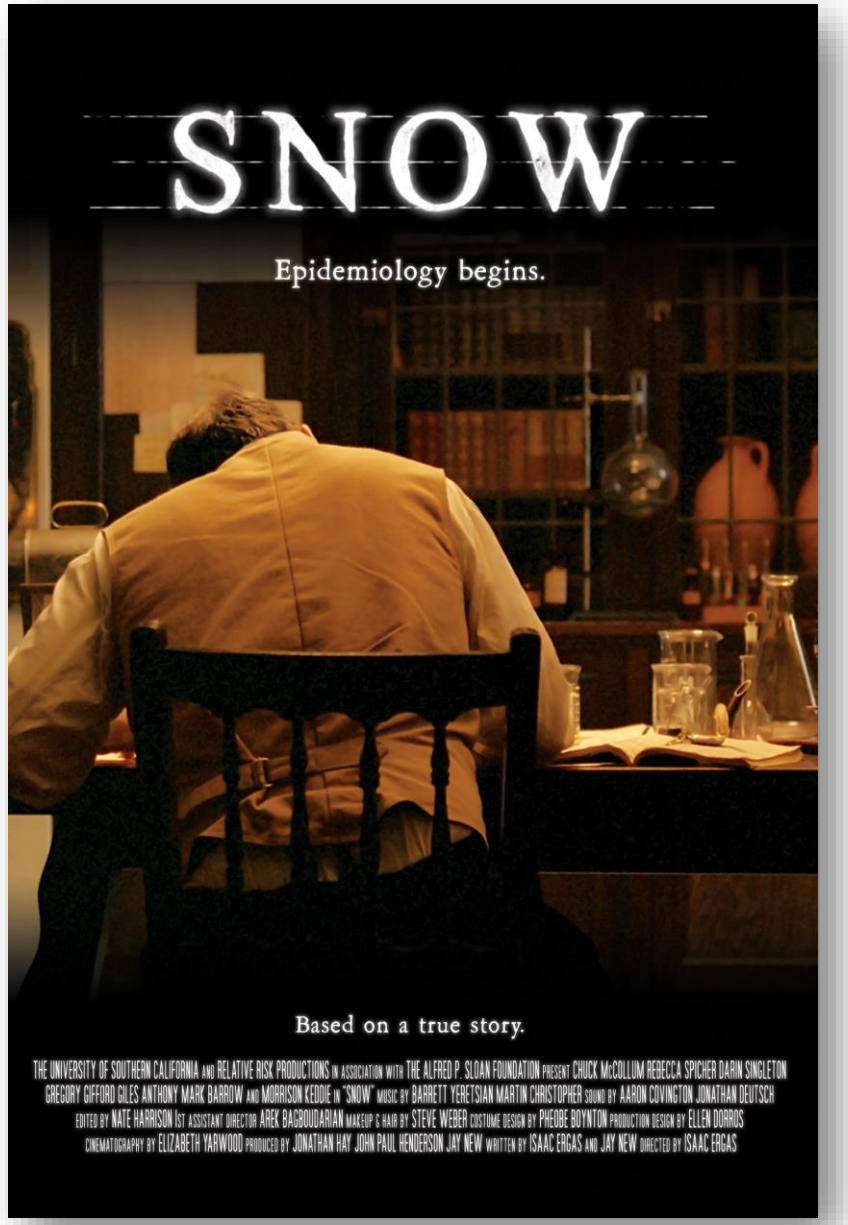
At 5, John's Place, July 25, the son of a baker, aged 4 years, "cholera 24 hours" . . *Same as above.*

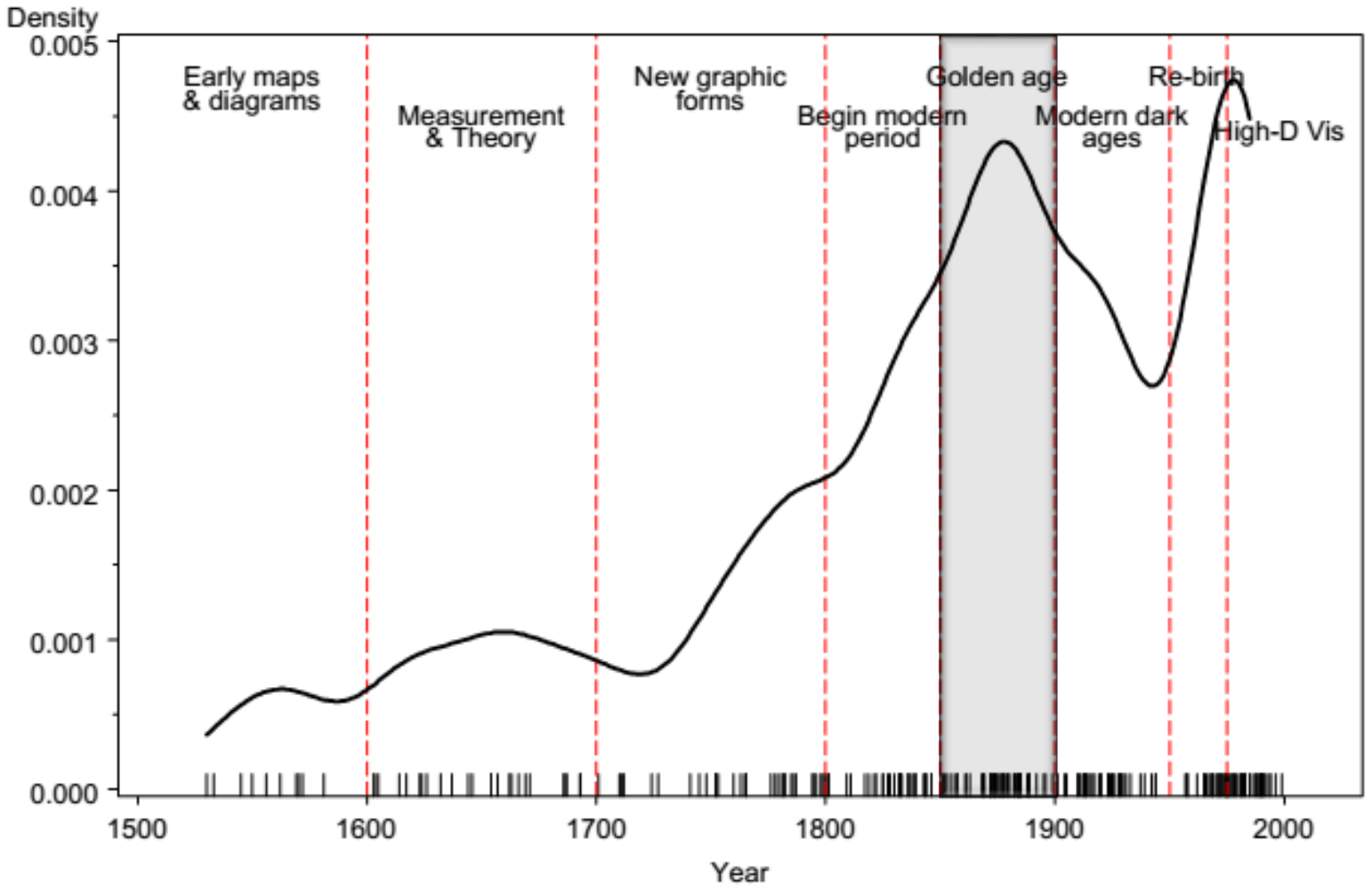


C. F. Cheffins, Lith. Southampton St^r. London.

SCALE 30 INCHES TO A MILE.


WORK HOUSE
MARSHALL ST.
WEST STREET
MARSHALL STREET
DUFOURS PLACE
BROAD
PUMP
STREET
BENTINCK STREET
EDWARD STREET
DUCK LANE
BREWERY
HOPKINS STREET
NEW STREET
COCK CT.
SOUTH ROW
CROSS ST
CAMBRIDGE ST
LITTLE
HUSBAND ST
PETER
STREET


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 KEDDIE IN "SNOW" MUSIC BY BARRETT YERETSIAN MARTIN CHRISTOPHER SOUND BY AARON COVINGTON JONATHAN DEUTSCH
EDITED BY NATE HARRISON 1ST ASSISTANT DIRECTOR AREK BAGBOUDARIAN MAKEUP & HAIR BY STEVE WEBER COSTUME DESIGN BY PHEOBE BOYNTON PRODUCTION DESIGN BY ELLEN DORROS
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

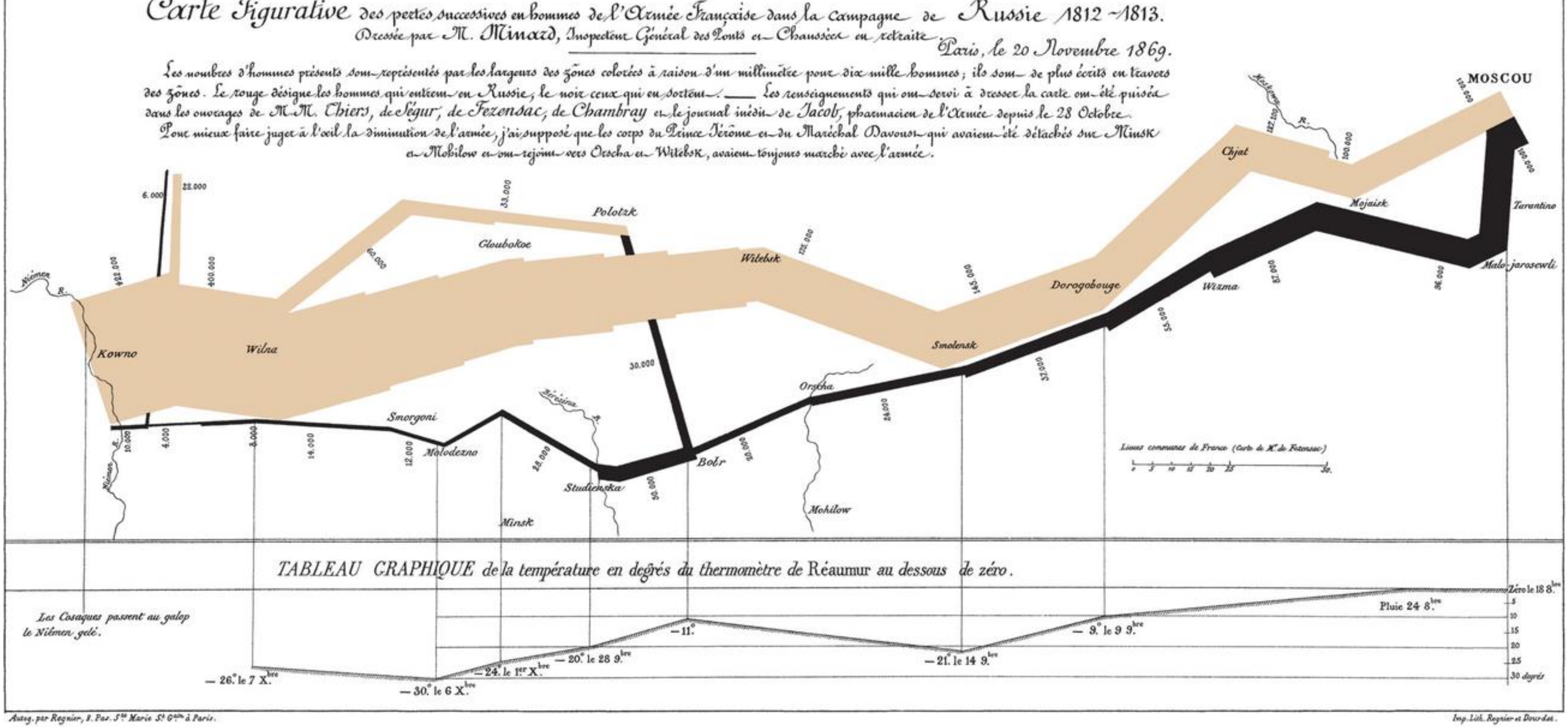
Charles Joseph Minard

Napoleonův pochod na Rusko a zpět

* * * * *

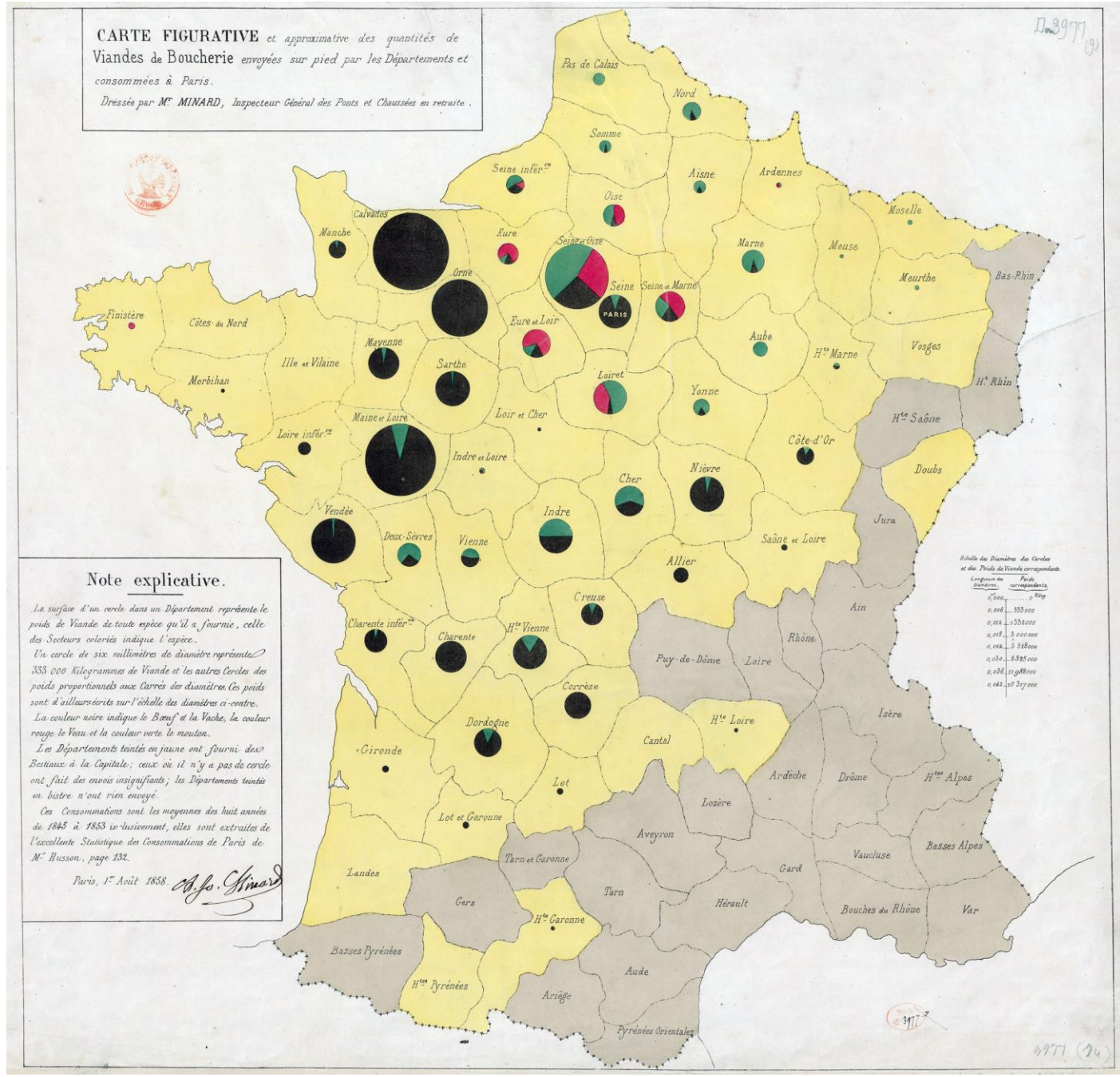
„Probably the best statistical graphic ever drawn.“

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 zônes colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zônes. 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. Thiers, 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 Davoust qui avaient été détachés sur Minsk et Mobilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.
MOSCOU
Chjat
Mojaisk
Tarantino
Malo-jarosewli
Wixma
Dorogobouge
Smolensk
Orscha
Mohilow
Witebsk
Polotzk
Gloubokoe
Wilna
Kowno
Niémen R.
Smorgoni
Molodezno
Bérésina R.
Studienska
Minsk
Botr
422.000
400.000
6.000
22.000
60.000
33.000
30.000
175.000
145.000
127.100
100.000
100.000
96.000
87.000
55.000
37.000
24.000
20.000
50.000
28.000
12.000
14.000
8.000
4.000
10.000
Lieues communes de France (Carte de M.r de Fezensac)
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.
Les Cosaques passent au galop le Niémen gelé.
Zéro le 18 8.bre
Pluie 24 8.bre
— 9.° le 9 9.bre
— 11.°
— 21.° le 14 9.bre
— 20.° le 28 9.bre
— 24.° le 1.er X.bre
— 30.° le 6 X.bre
— 26.° le 7 X.bre
5
10
15
20
25
30 degrés
Autog. par Regnier, 8. Pas. S.te Marie S.t G.ain à Paris.
Imp. Lith. Regnier et Dourdet.

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

Dressée par Mr 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 toute espèce qu'il a fournie, celle des Secteurs coloriés indique l'espèce.

Un cercle de six millimètres de diamètre représente 333 000 Kilogrammes de Viande et les autres Cercles des poids proportionnels aux Carrés des diamètres. Ces poids sont d'ailleurs écrits sur l'échelle des diamètres ci-contre.

La couleur noire indique le Bœuf et la Vache, la couleur rouge le Veau et la couleur verte le mouton.

Les Départements teintés en jaune ont fourni des Bestiaux à la Capitale; ceux où il n'y a pas de cercle ont fait des envois insignifiants; les Départements teintés en bistre n'ont rien envoyé.

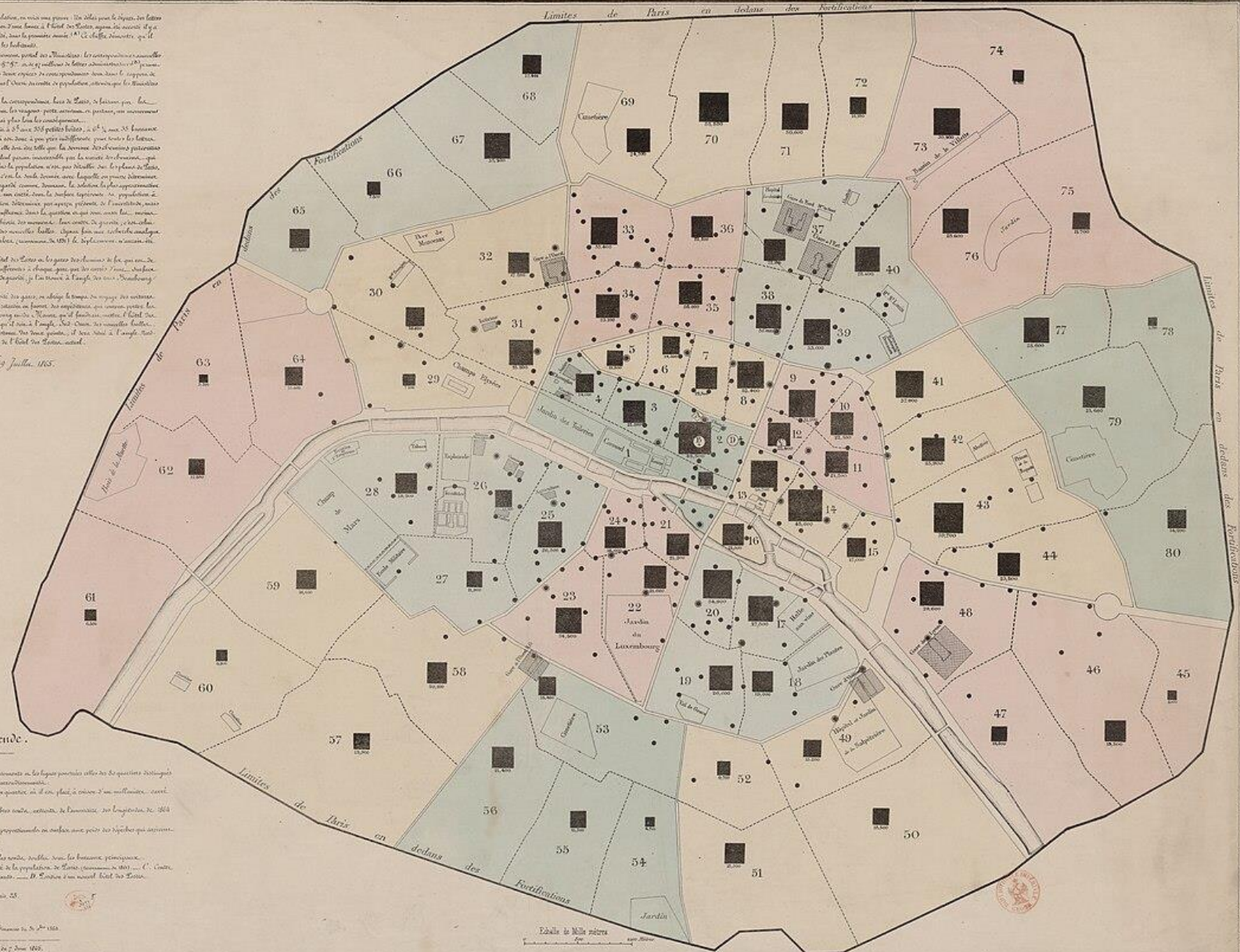
Ces Consommations sont les moyennes des huit années de 1845 à 1853 inclusivement, elles sont extraites de l'excellente Statistique des Consommations de Paris de Mr Husson, page 132.

Paris, 1er Août 1858. A. Jos. Minard

Echelle des Diamètres des Cercles et des Poids de Viande correspondants.

Longueur des Diamètres.	Poids correspondants. Kilog.
0,000	0
0,006	333 000
0,012	1 332 000
0,018	3 000 000
0,024	5 328 000
0,030	8 325 000
0,036	11 988 000
0,042	16 317 000

CARTE figurative relative au choix de l'emplacement d'un nouvel **HÔTEL** des **POSTES** de Paris, dressée par Mr MINARD, Inspecteur Général des Ponts et Chaussées en retraite.

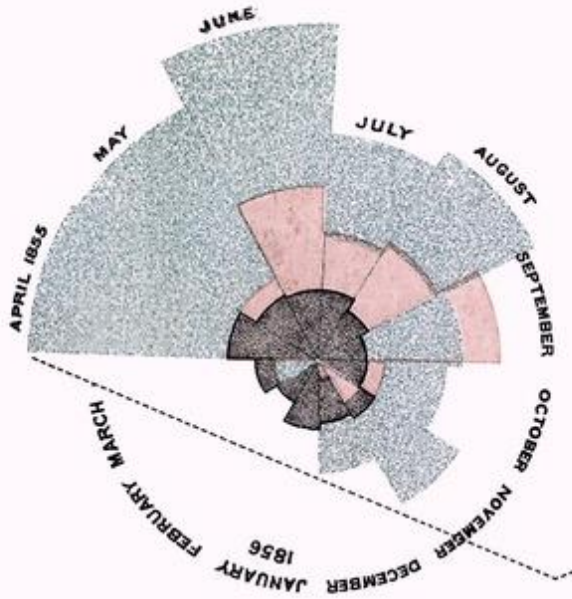


1858

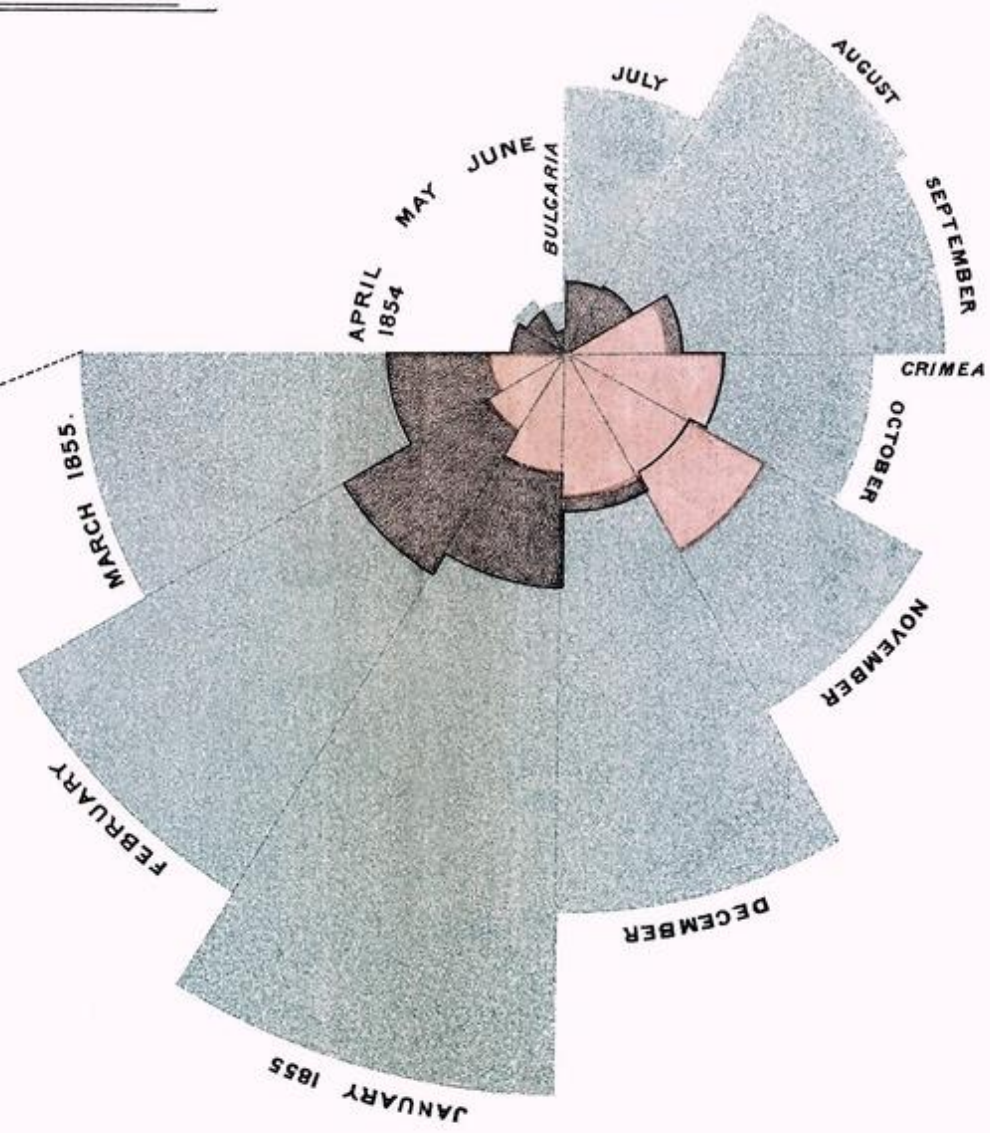
Florence Nightingale

DIAGRAM of the CAUSES of MORTALITY IN THE ARMY IN THE EAST.

2.
APRIL 1855 to MARCH 1856.



1.
APRIL 1854 to MARCH 1855.



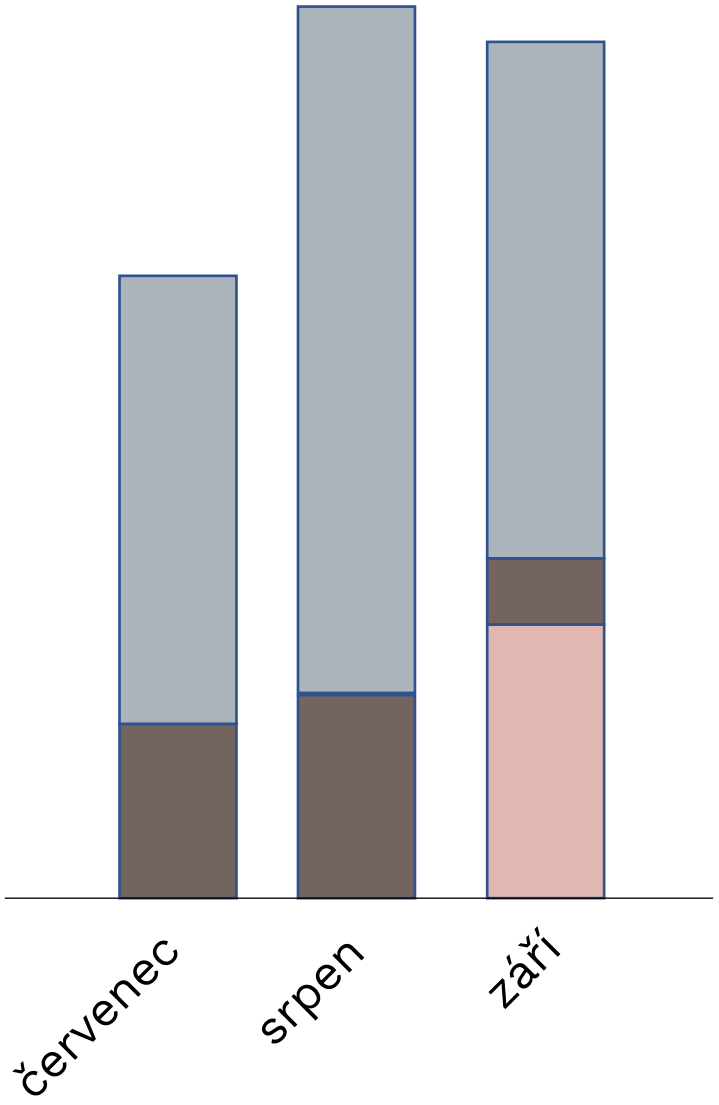
The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

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.r 1854 marks the boundary of the deaths from all other causes during the month.

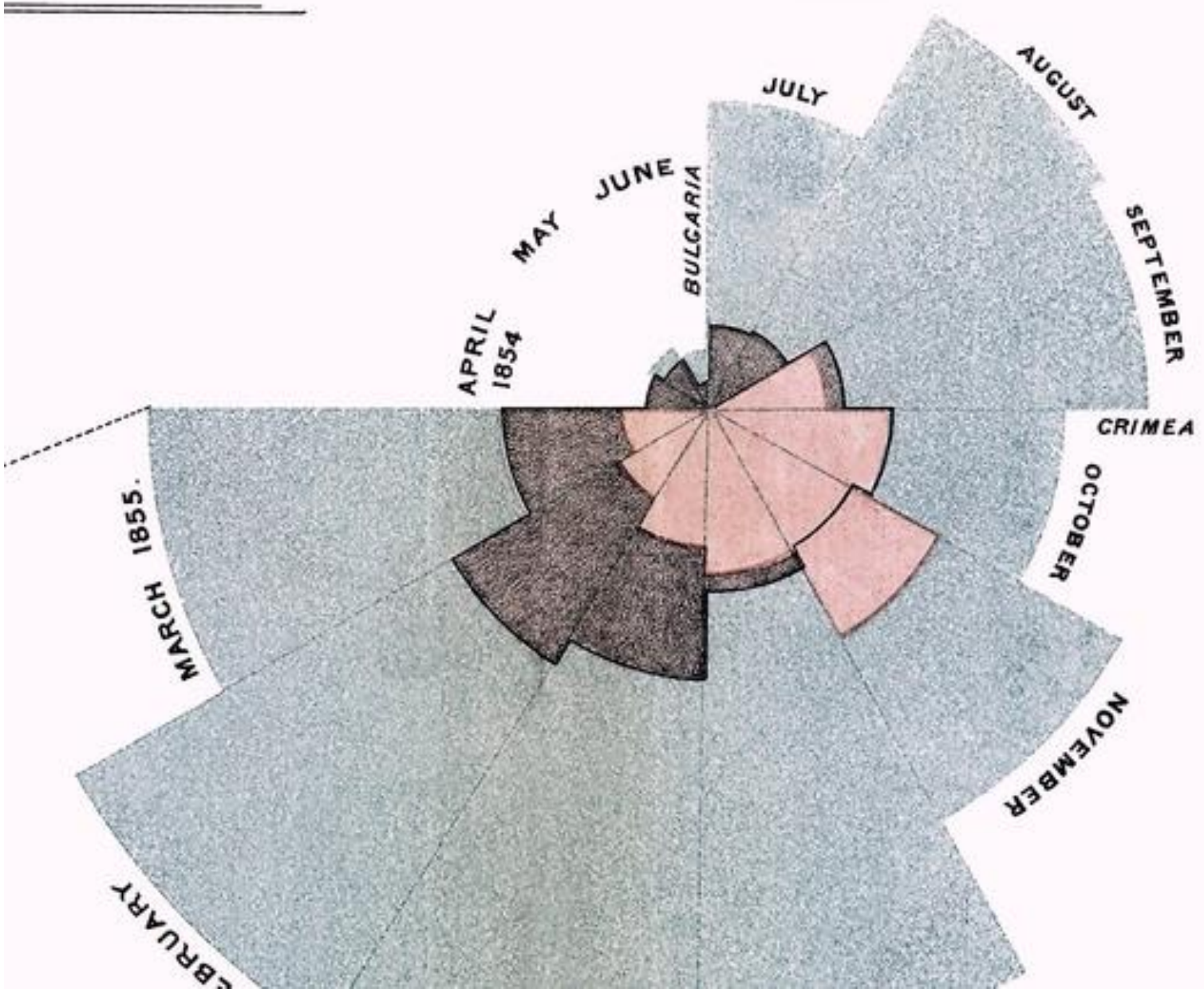
In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

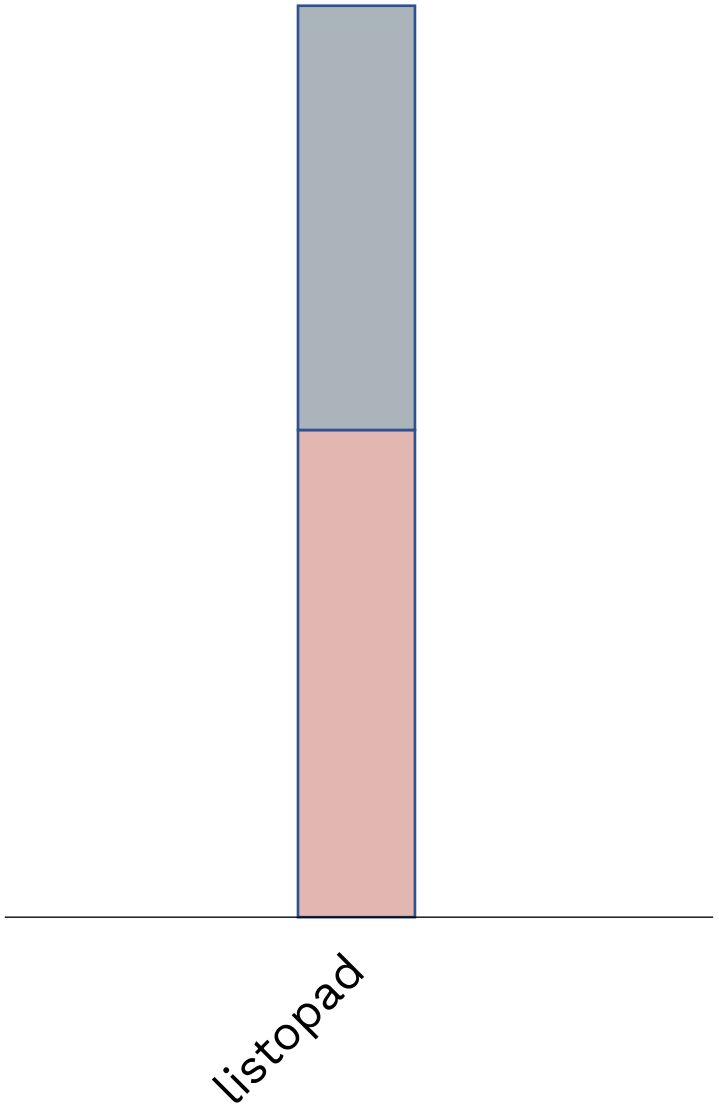
The entire areas may be compared by following the blue, the red & the black lines enclosing them.



AUSES OF MORTALITY
Y IN THE EAST.

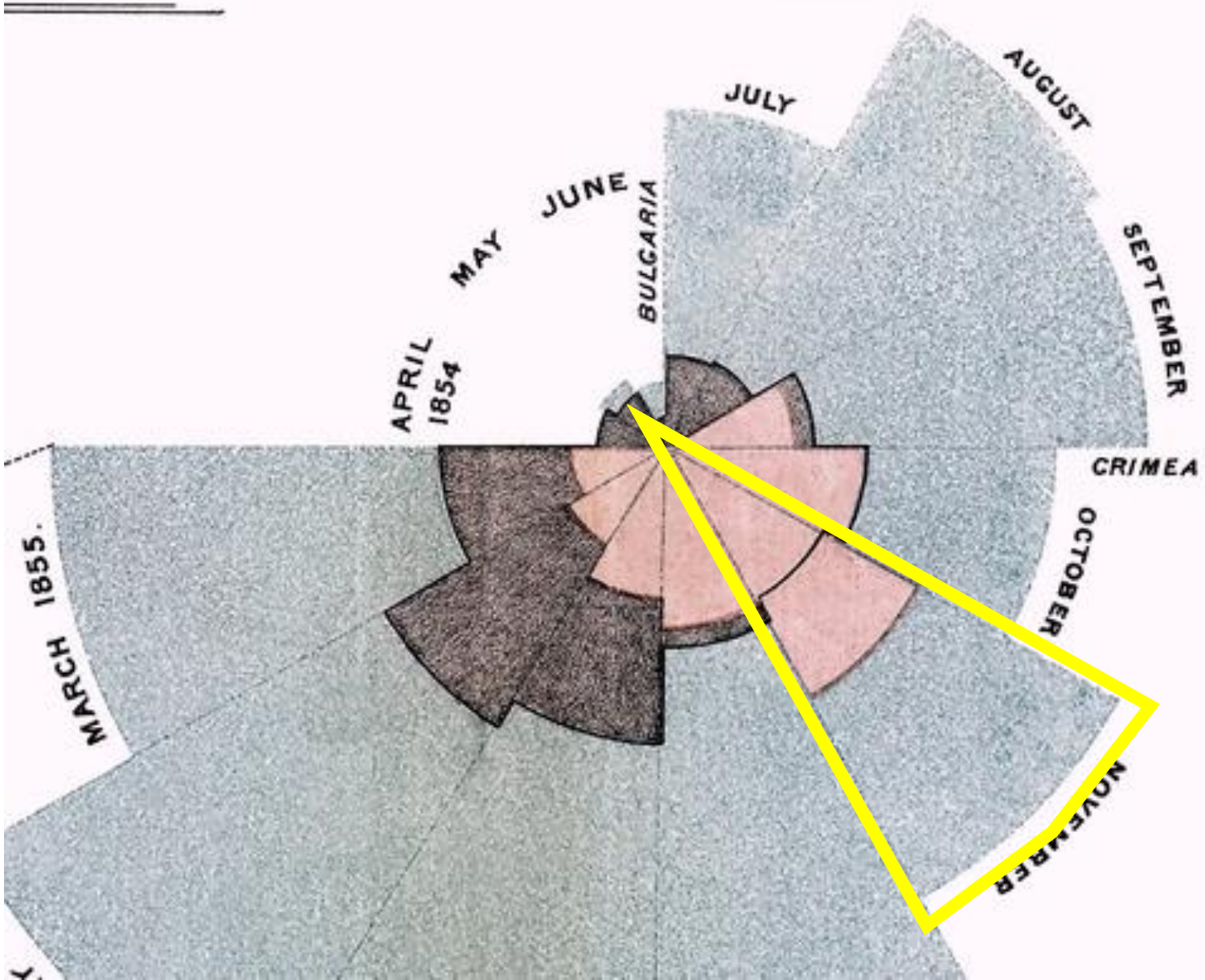
1.
APRIL 1854 TO MARCH 1855.





ES OF MORTALITY
THE EAST.

1.
APRIL 1854 TO MARCH 1855.

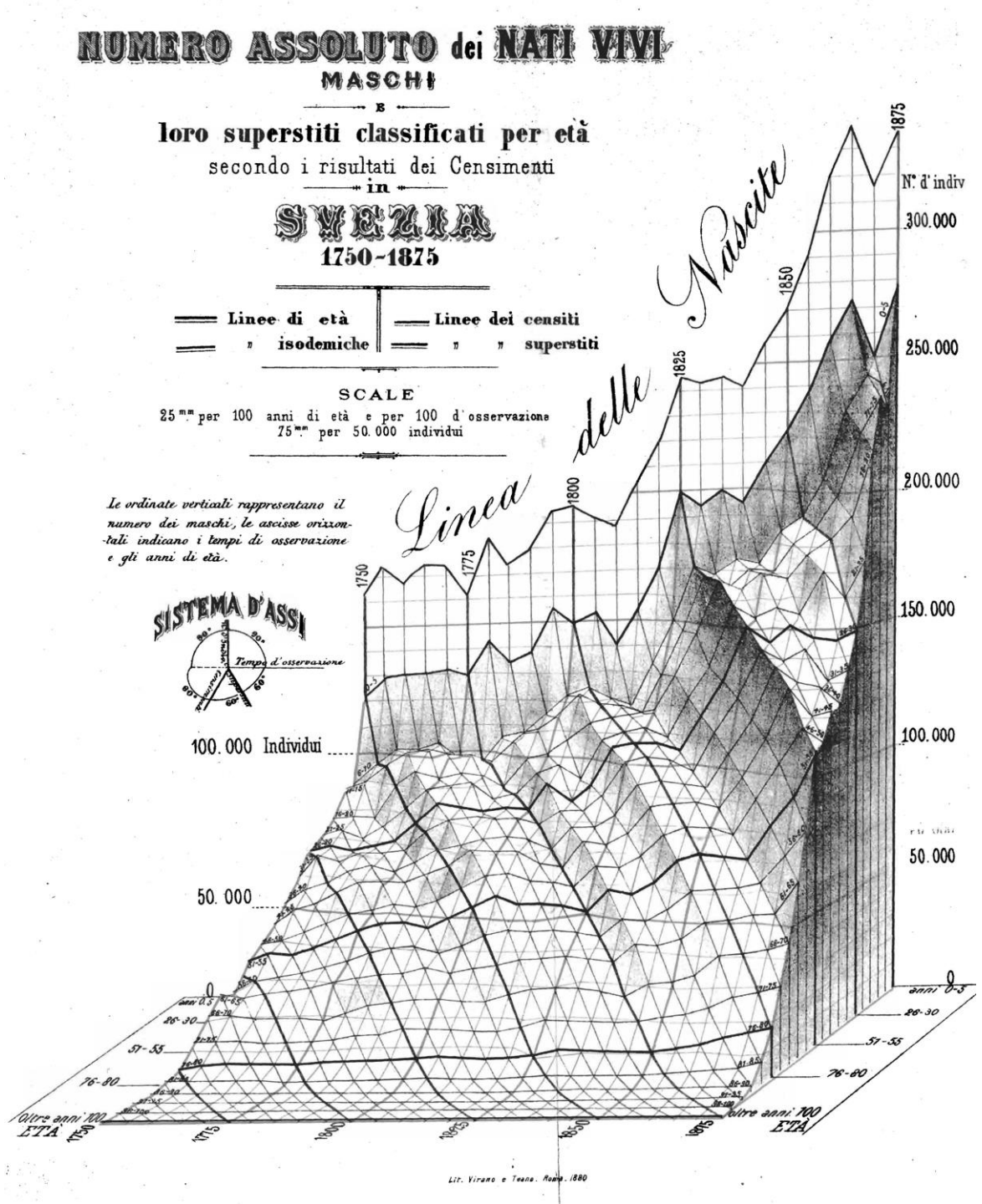


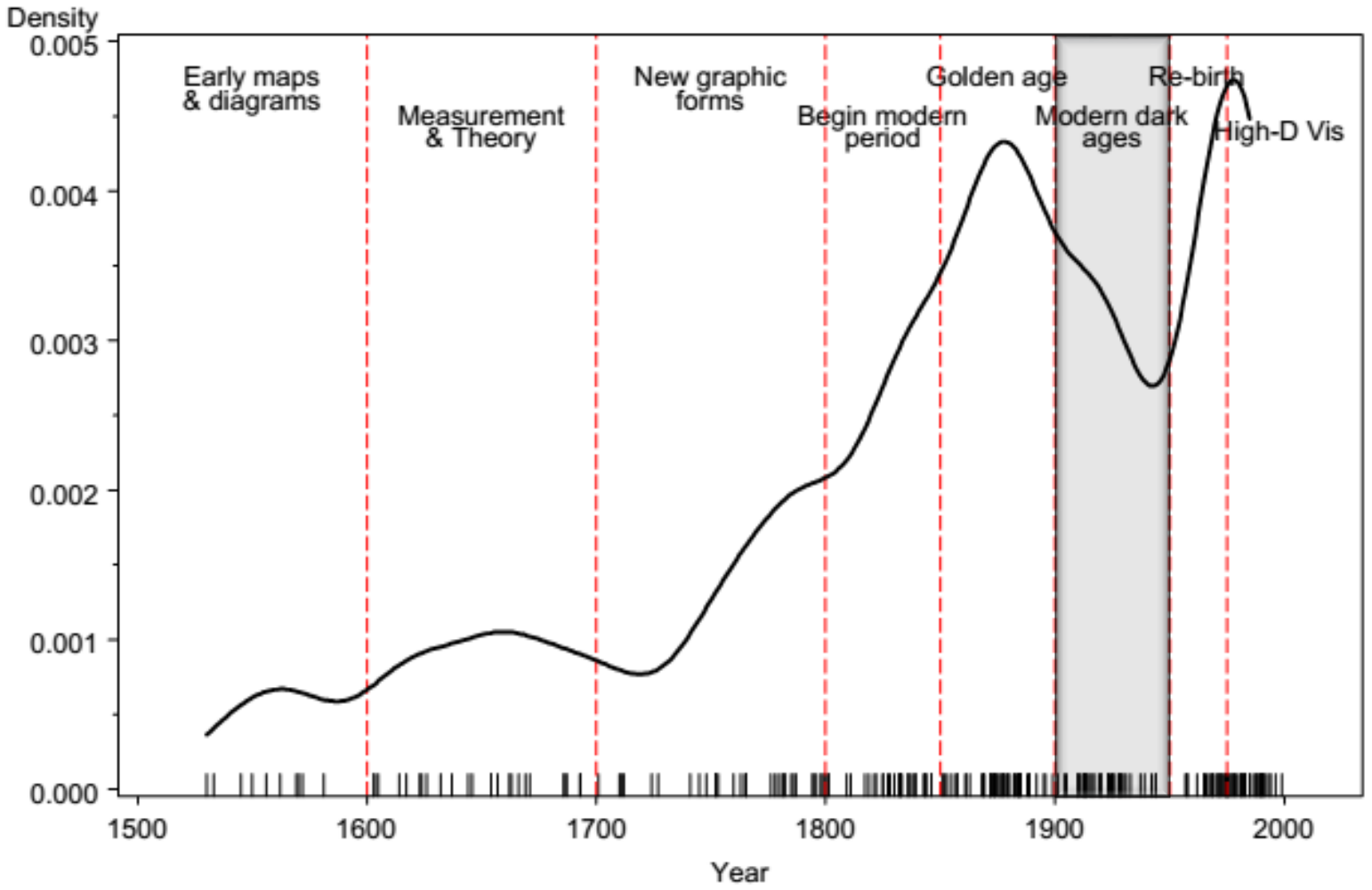
1860+

William Farr

Luigi Perozzo

1879





nová statistická škola

pokřivenost x přesnost

tabulka je víc než graf

The New York Evening Post (1806)

[From a London Paper]

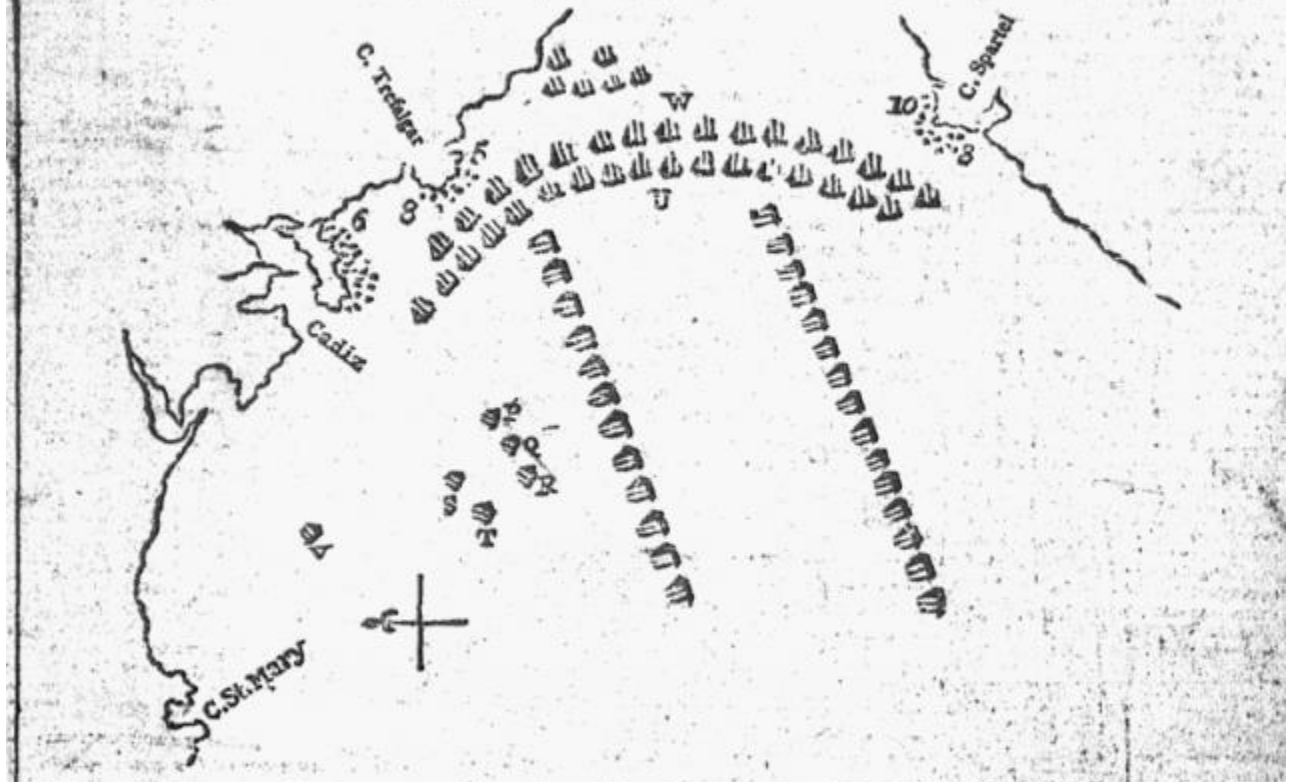
PLAN

OF THE

BRILLIANT ACTION OFF TREFALGAR,

REVISED BY AN OFFICER WHO CAME HOME WITH THE

VICTORIOUS DISPATCHES.



BRITISH FLEET:

VAN.

	Guns.	Commanders.
Victory	100	Admiral Lord NELSON, Capt. T. M. HARDY.
Temeraire	98	—— E. HARVEY.
Neptune	98	—— T. F. FREEMANTLE.
Conqueror	74	—— I. PELLEW
Leviathan	74	—— H. W BAYNTUN.
Ajax	74	—— J. PILFORD.
Orion	74	—— E. CODRINGTON.
Agamemnon	74	—— Sir E. BERRY.
Minotaur	74	—— C. J M MANSFIELD.
Spartiate	74	—— Sir F. LAPOREY.
Britania	100	Rear Admiral Earl of NORTHESK,

THE COMBINED FLEET.

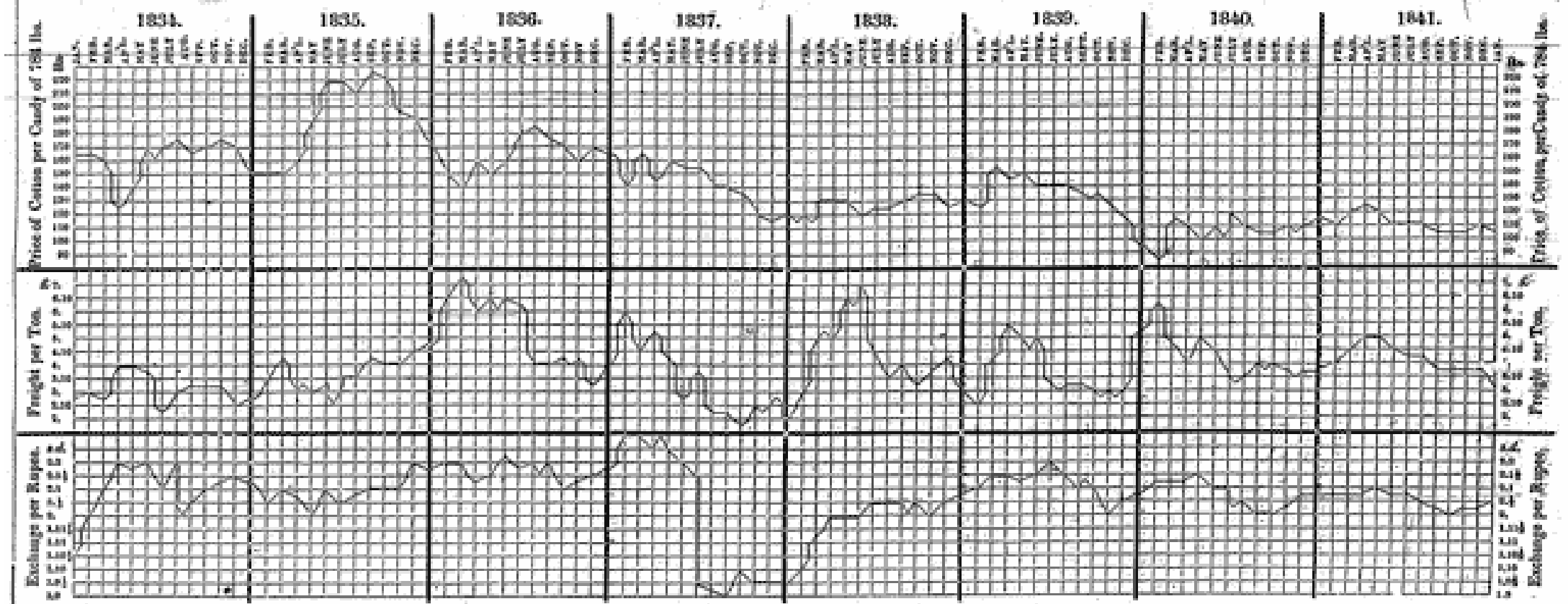
SPANISH SHIPS

	Guns.	Commanders.
Santissima Trinidad	140	Admiral Don Ignac le Morra D'Alva; Capt. Don Franc De Walave.
Prince of Austuria	120	Admiral Gravina, Commander in Chief; Captain Don Rapael D'Hora.
Argonaut	80	Adm. Sig. D. Comingo Gardal. hharas; Captain Count D. S. Antonio Parecas.
Neptuno	80	Commodore Don Bastaser; Capt Don Cazelana Valdes.
Santa Anna	120	San Susto 74

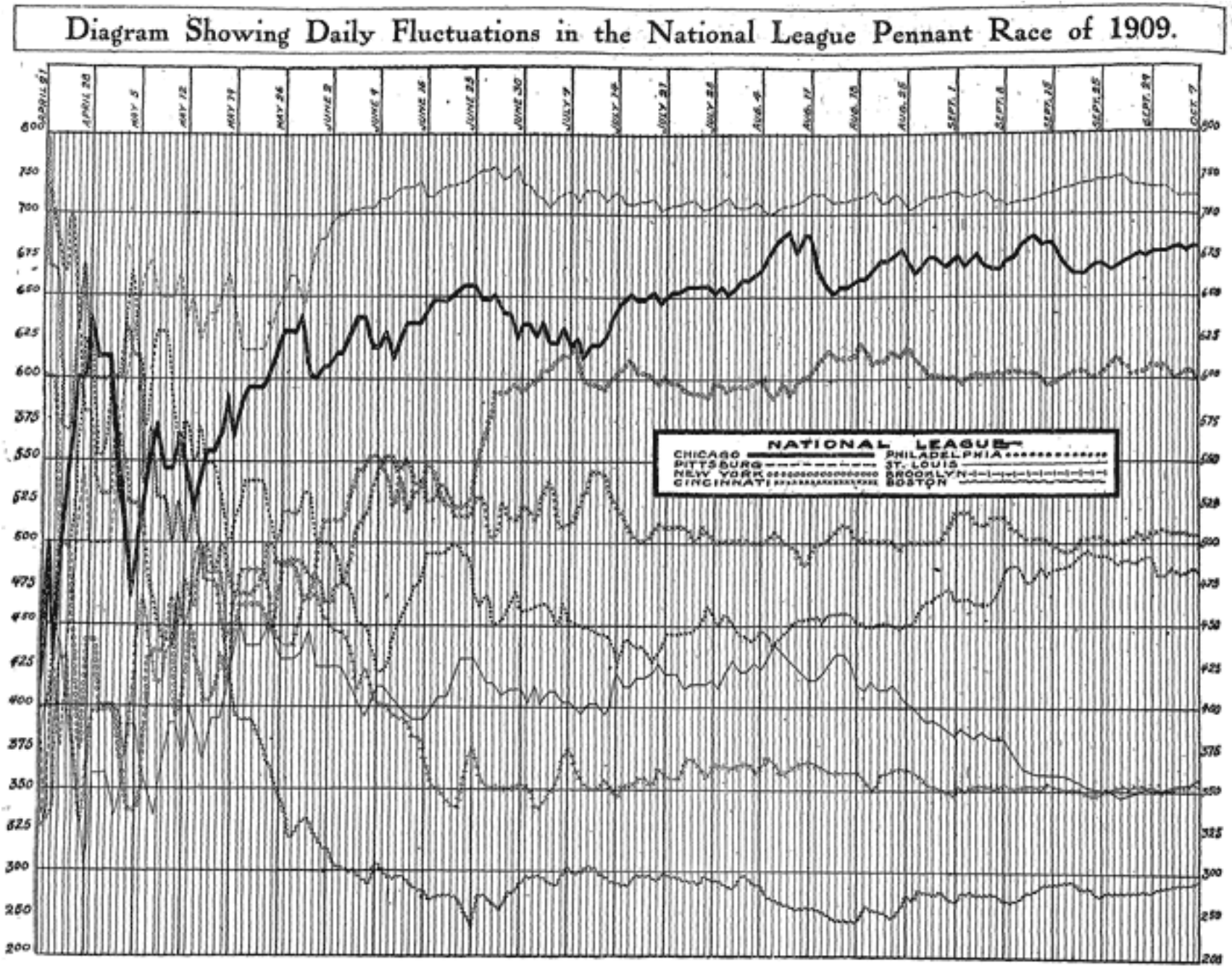
The Bombay Times (1842)

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.

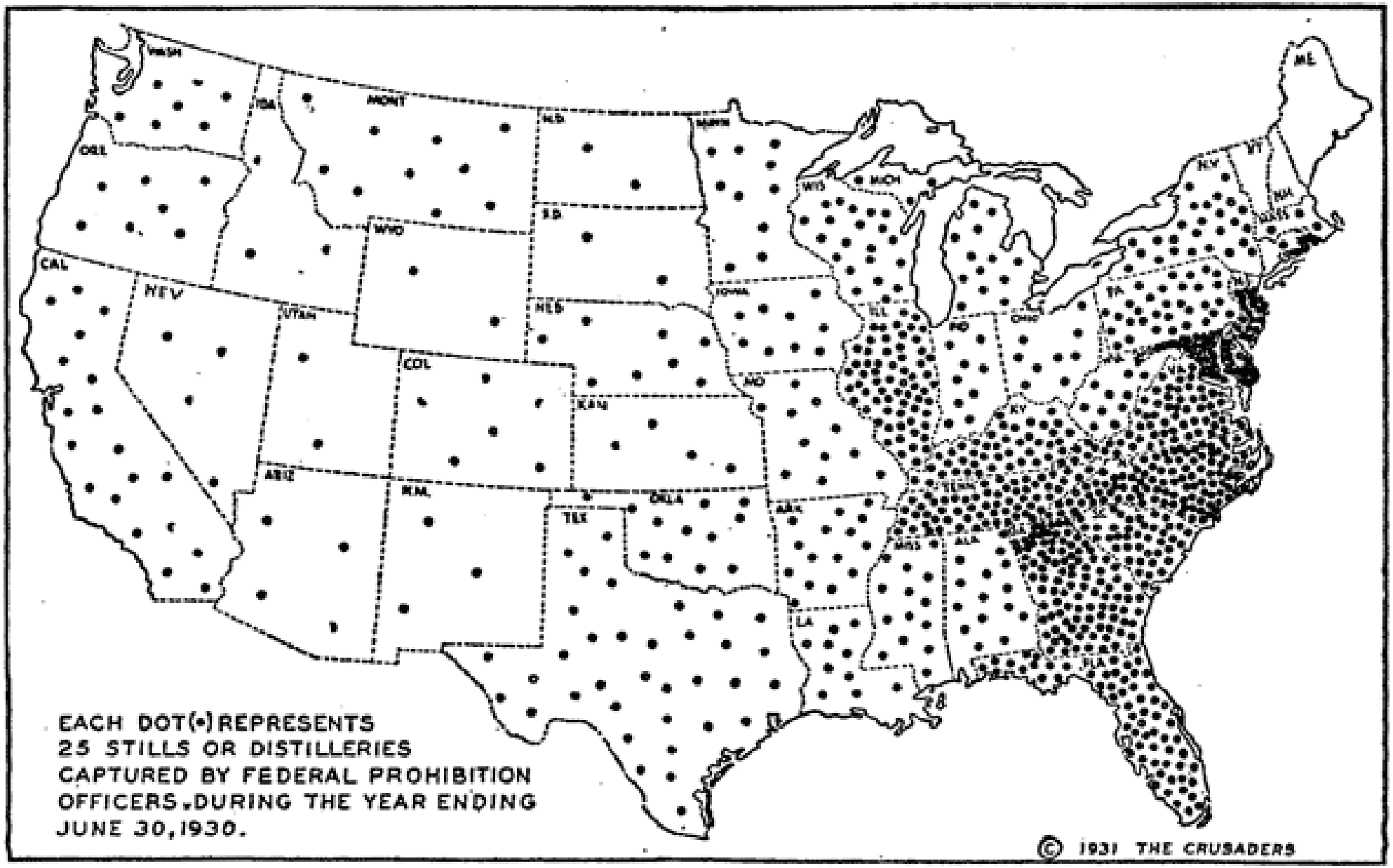


*** For the setting up of the above in moveable types we are indebted to Mr. Webster of the American Mission Press, Bombay.



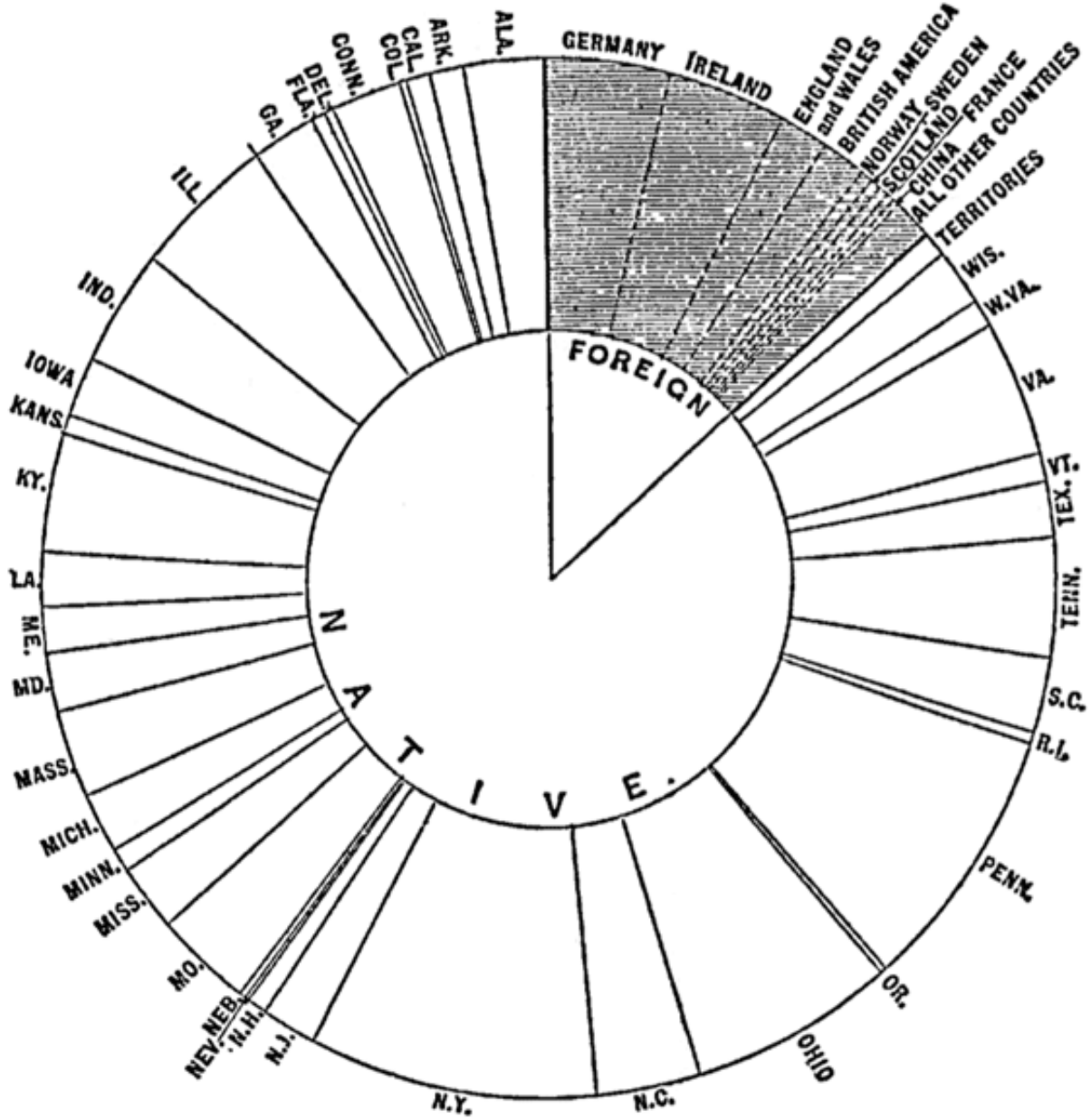
The Chicago Tribune (1909)

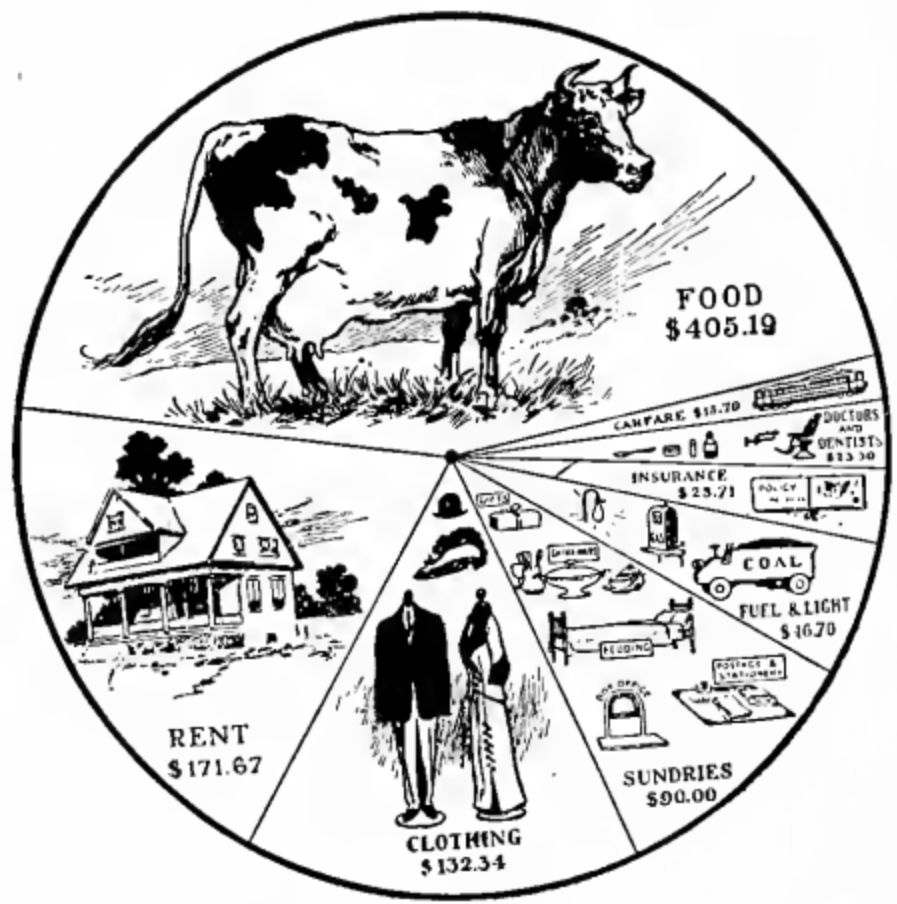
CRUSADERS' MAP OF YEAR'S STILL SEIZURES.



The New York Times (1931)

POPULATION ACCURATELY MEASURED.



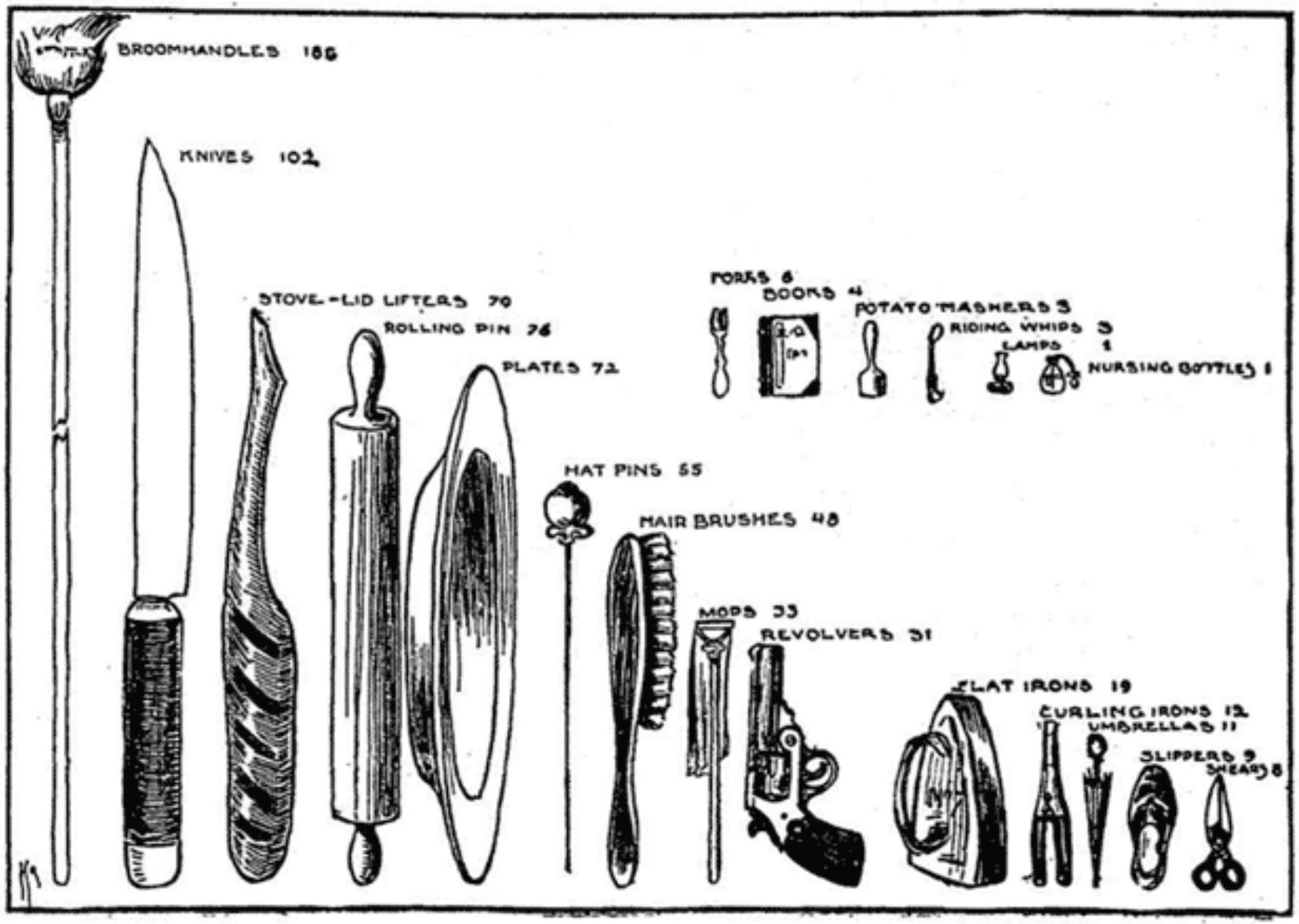


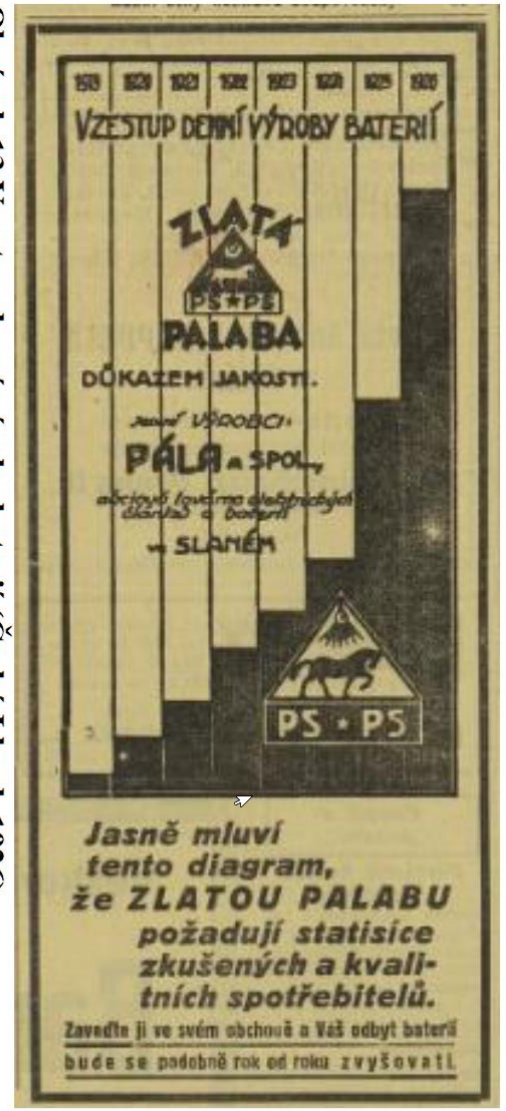
The Survey

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

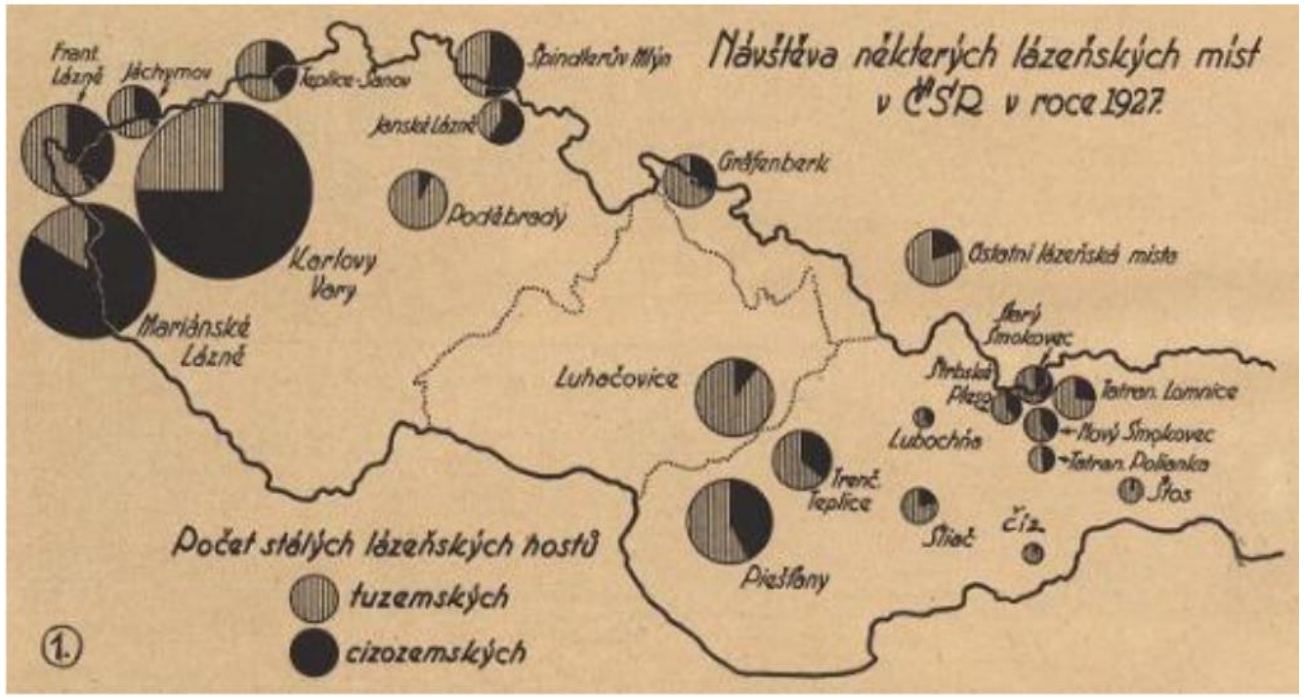
DIAGRAM SHOWING RELATIVE POPULARITY OF WOMEN'S WEAPONS.





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

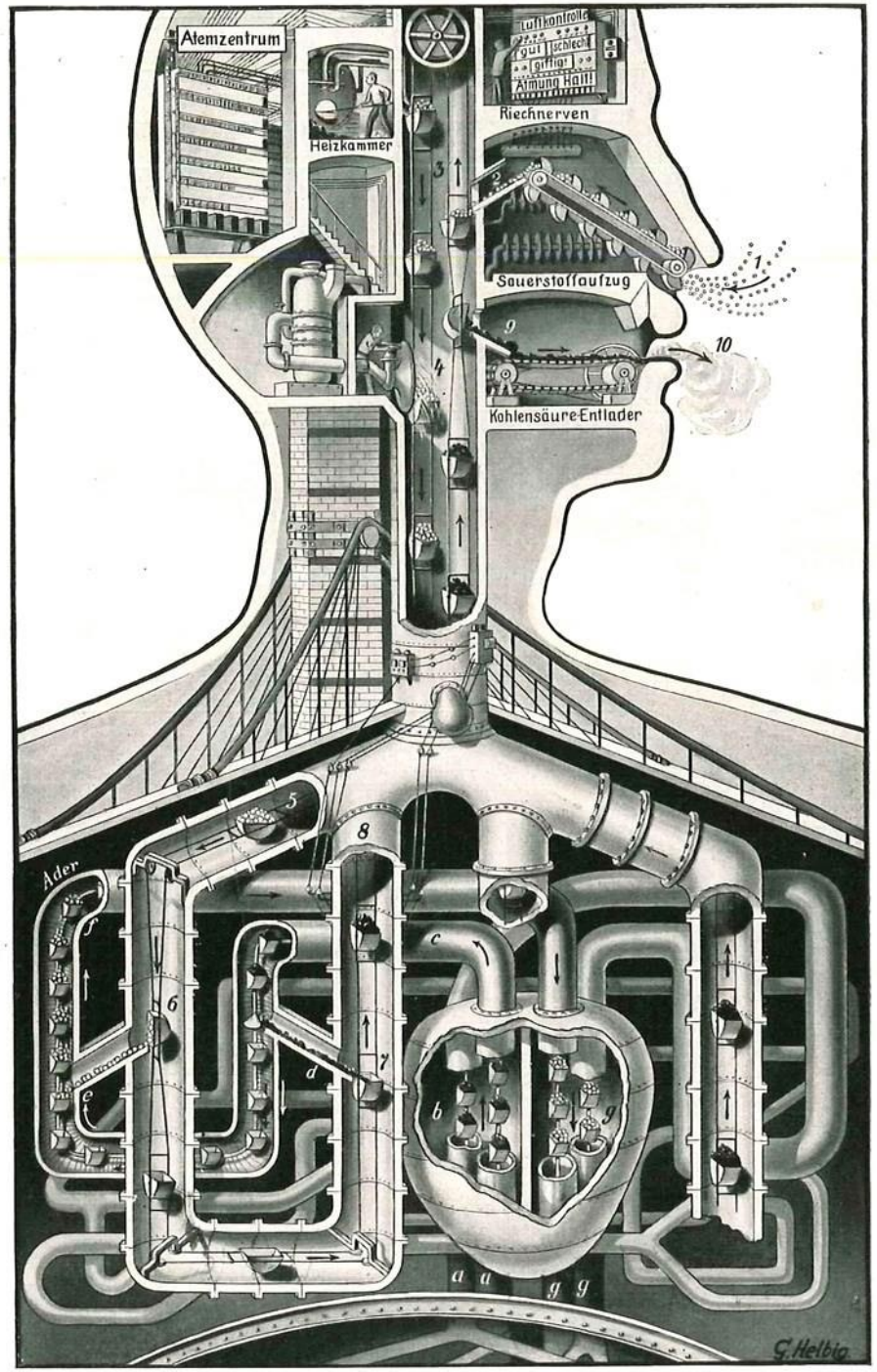
https://is.muni.cz/th/gcpfw/



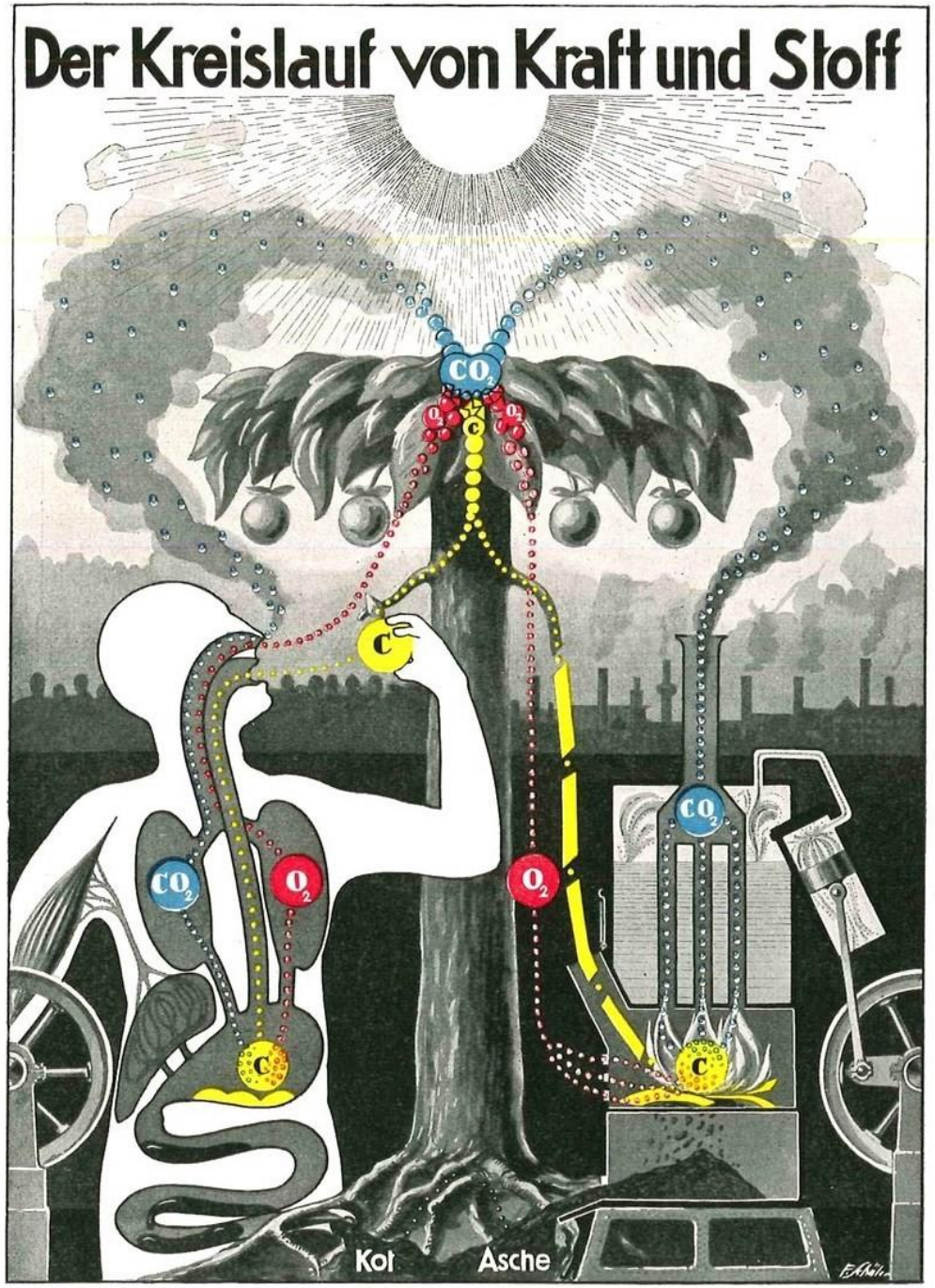
Obrázek 15 Návštěvnost československých lázní 2 (Pestrý týden, 1928)

Fritz Kahn

1910+



Die Atmung des Menschen



Der Kreislauf von Kraft und Stoff

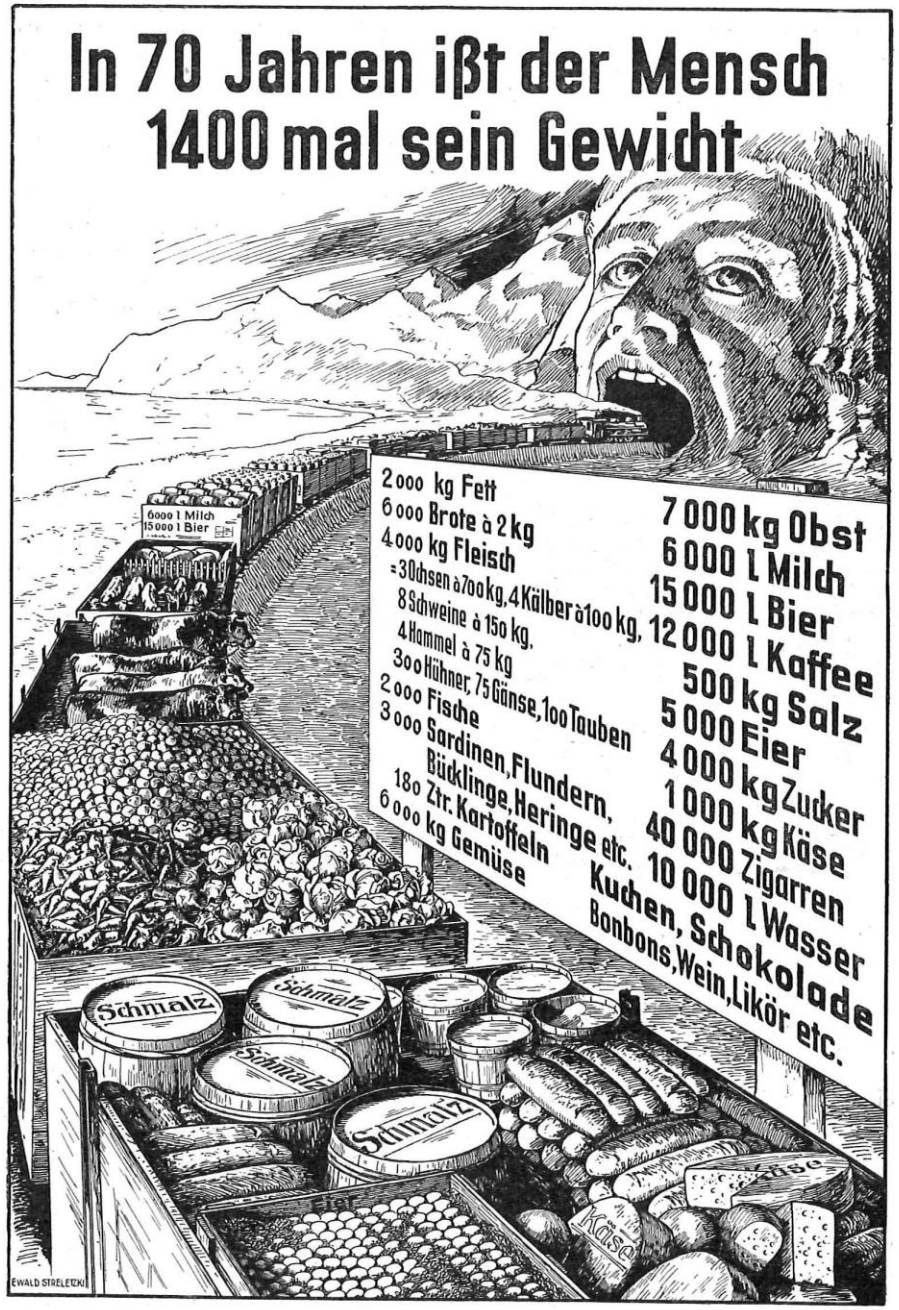
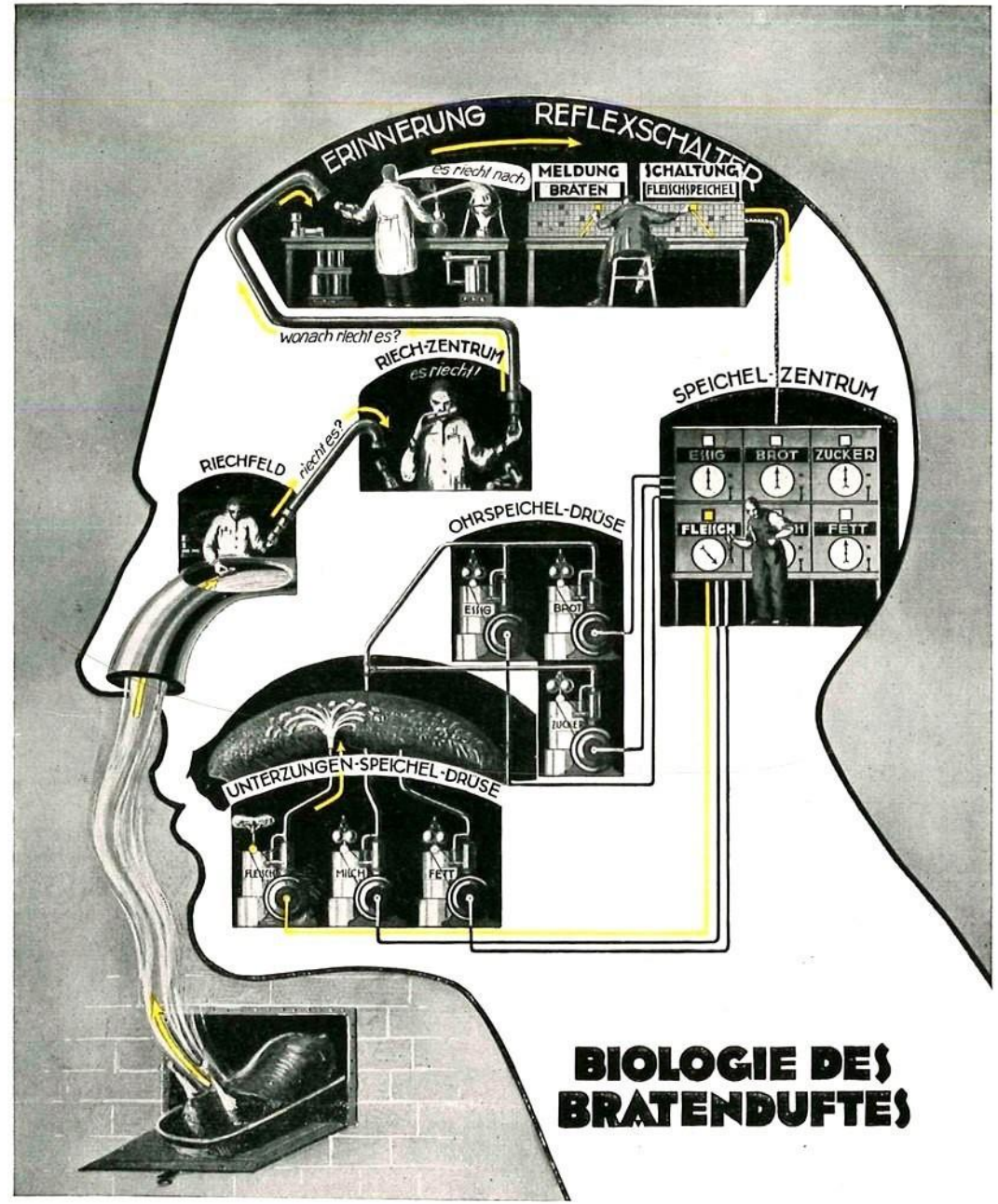
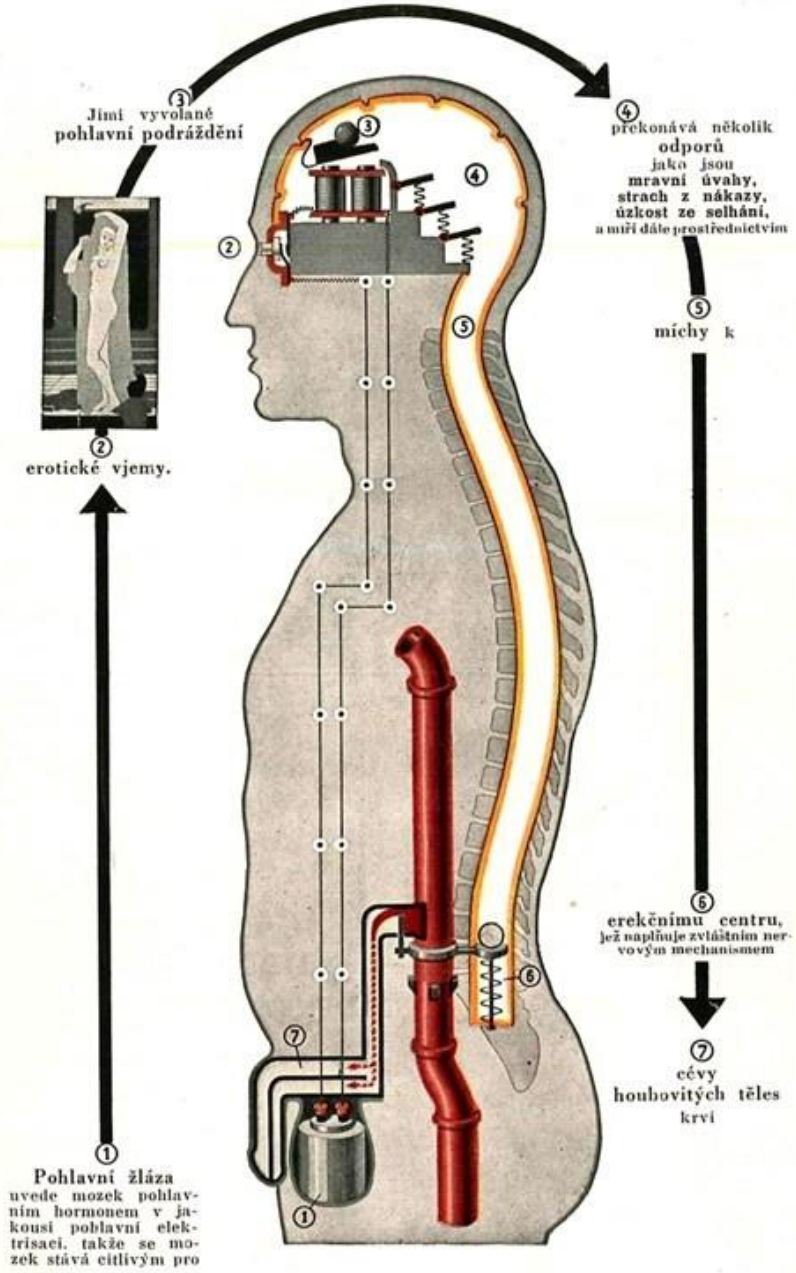


Abb. 161.

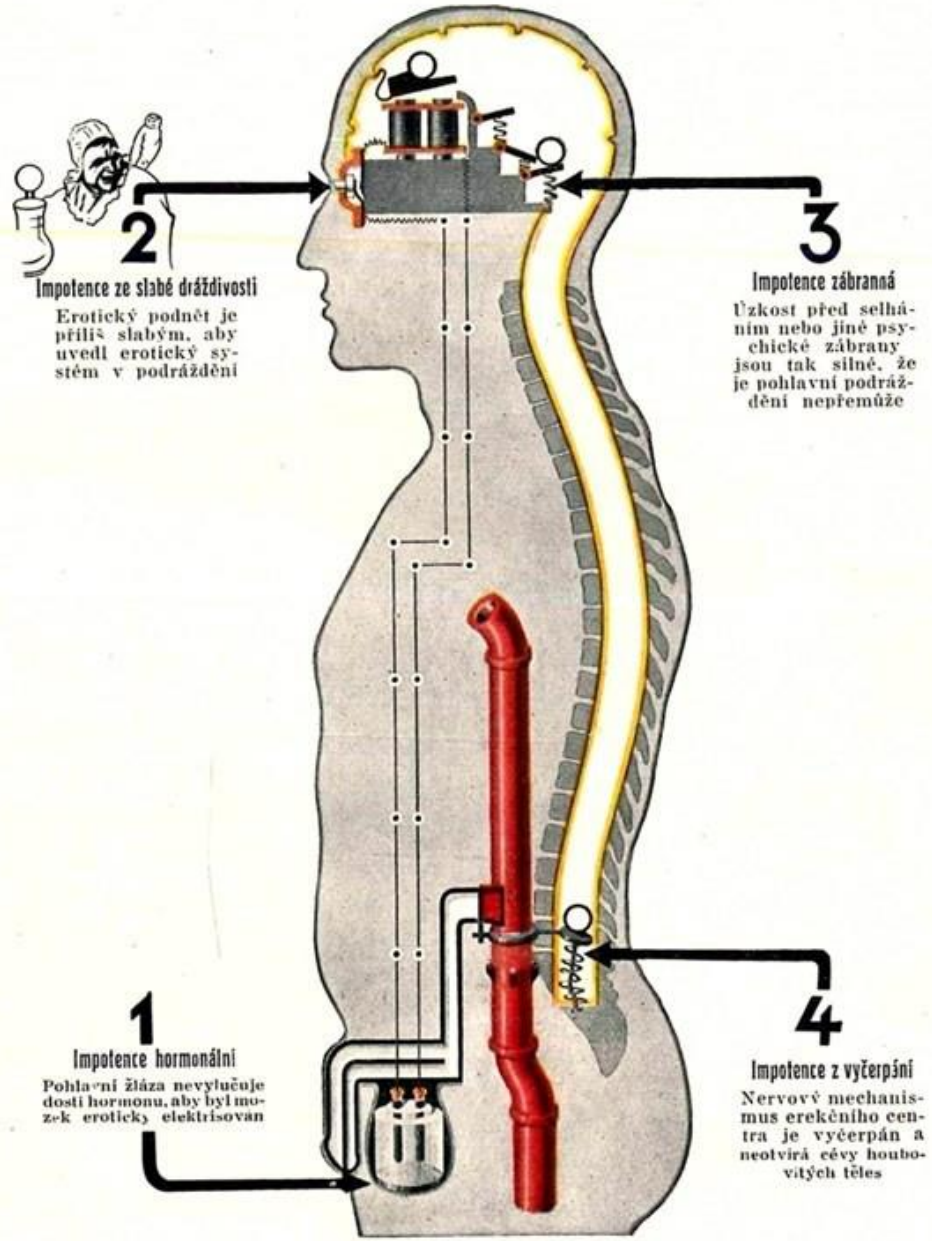


Bildliche Darstellung der Vorgänge, die sich zwischen der Geruchsempfindung und dem „reflektorischen" Speichelfluß im Kopf des Menschen abspielen



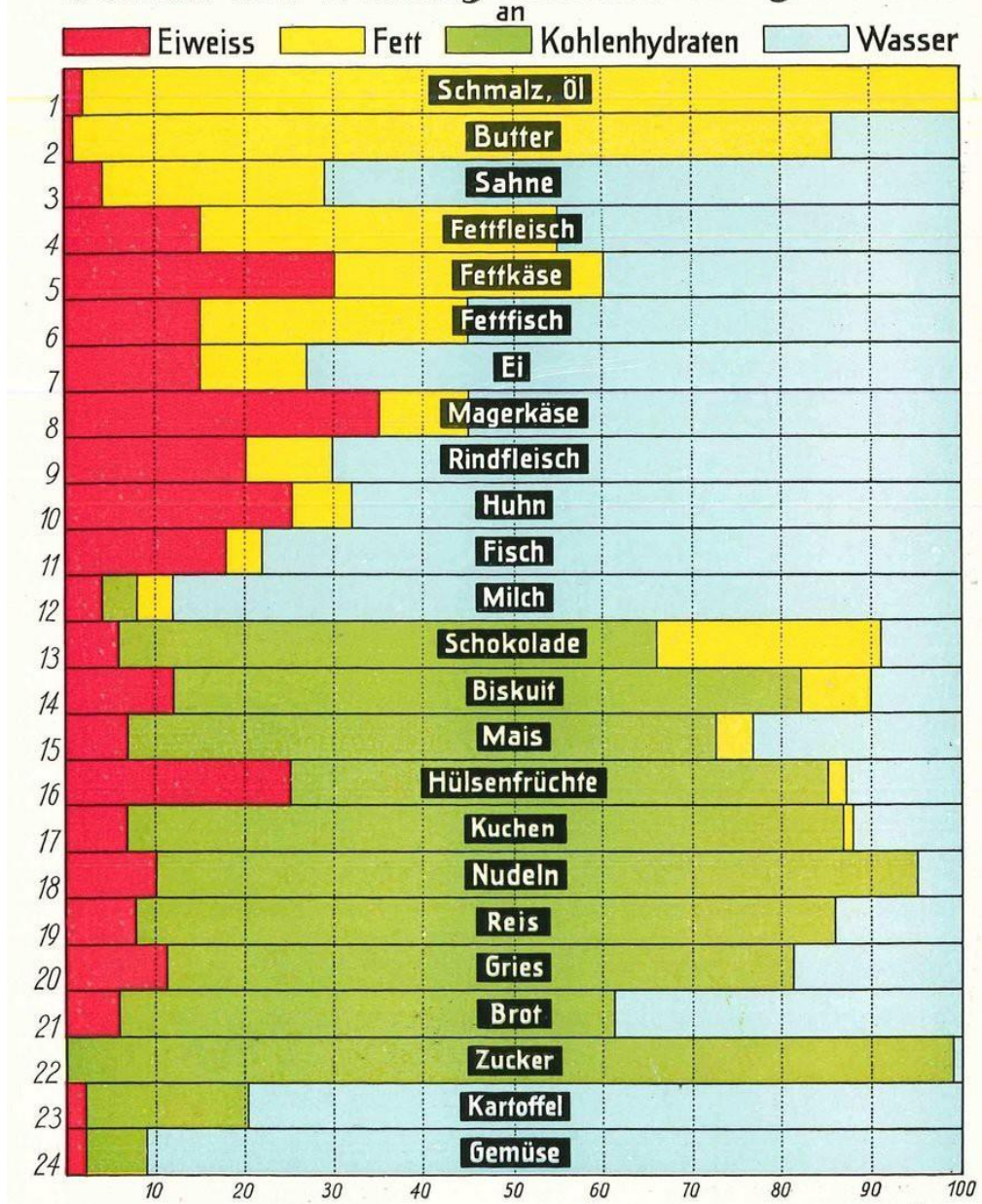
Obr. 9. *Erekce*

Technicko-schematické znázornění mužského erekčního systému
Bližší vysvětlení v textu



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

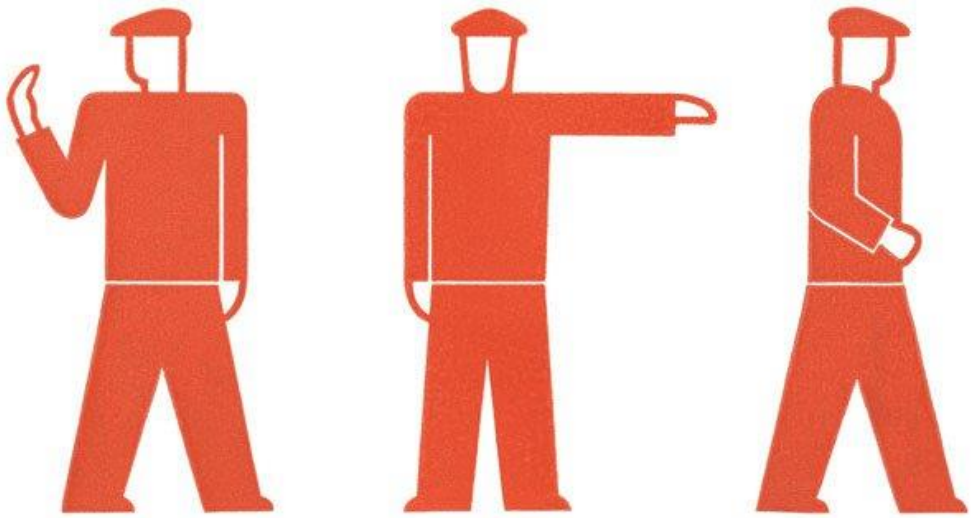
Gehalt der wichtigsten Nahrungsmittel an



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

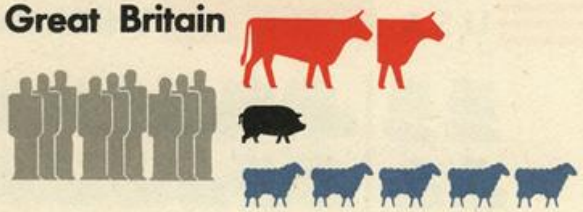


ISOTYPE

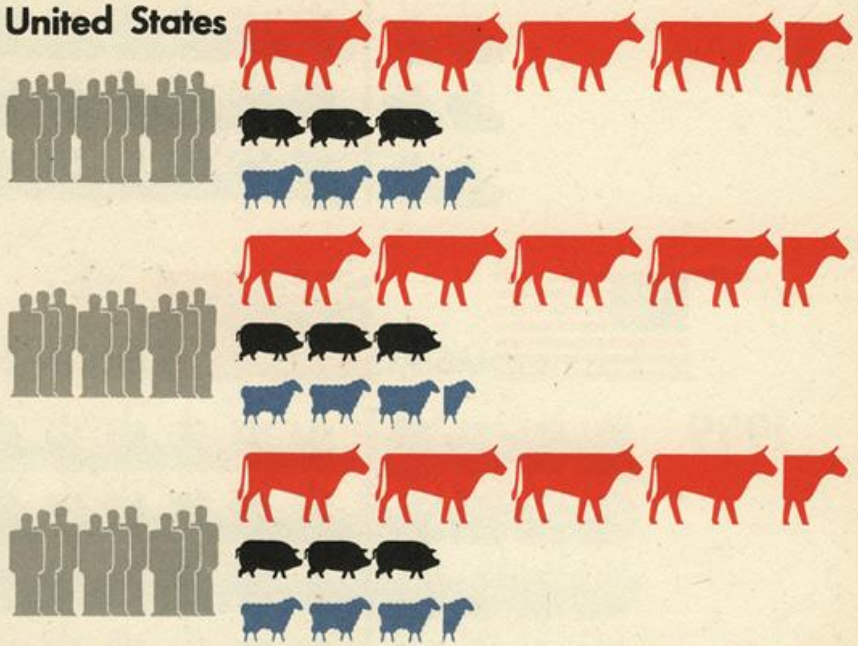
„Neurth věřil, že složité společenské jevy může pomocí obrazů pochopit i analfabet. Verbální jazyk byl pro něj nežádoucí médium, které je v rozporu s myšlenkou internacionalismu. Pod heslem „*slova rozdělují, obrazy spojují*“ vzniklo moderní obrazové písmo, univerzální znaková řeč symbolů, jehož prostřednictvím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

Population and Live Stock

Great Britain



United States



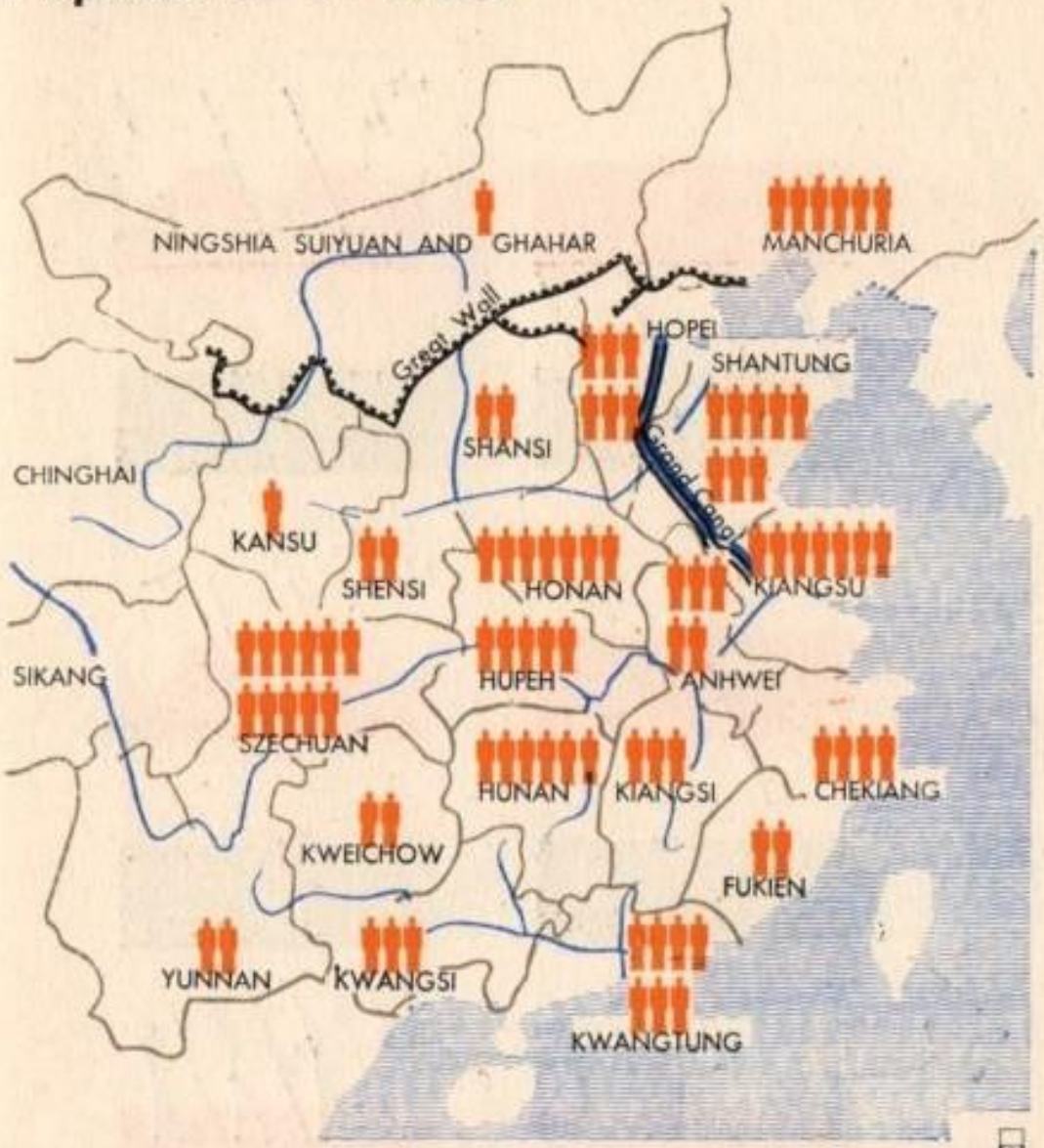
Each grey figure represents 5 million population
Each complete red symbol represents 5 million cattle
Each complete black symbol represents 5 million pigs
Each complete blue symbol represents 5 million sheep

Average for 1935 - 1939

ISOTYPE

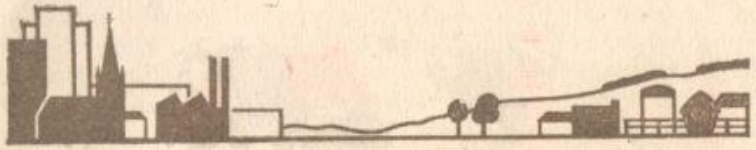
There are more cattle and pigs per head of population in America than Britain, but sheep—only 5 in U.S. for every 9 in Britain—are a different story, and provide the tender home-grown leg of mutton prized by the British.

Population in 1936



Each symbol represents 5 million people

Urbanization in the West



United States

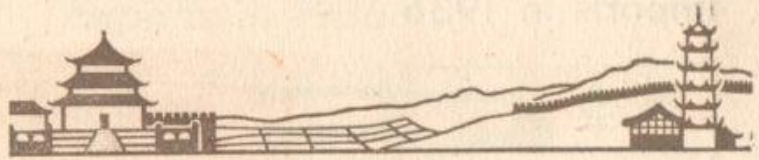
Great Britain

France

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

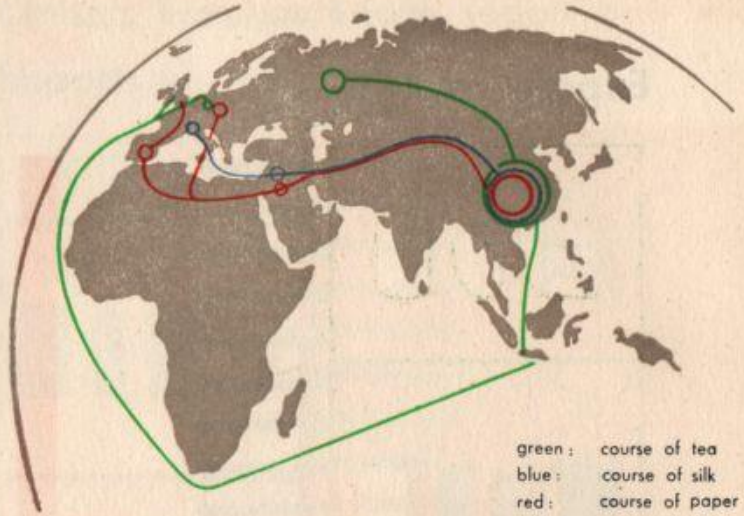
ISOTYPE INSTITUTE

Urbanization in China

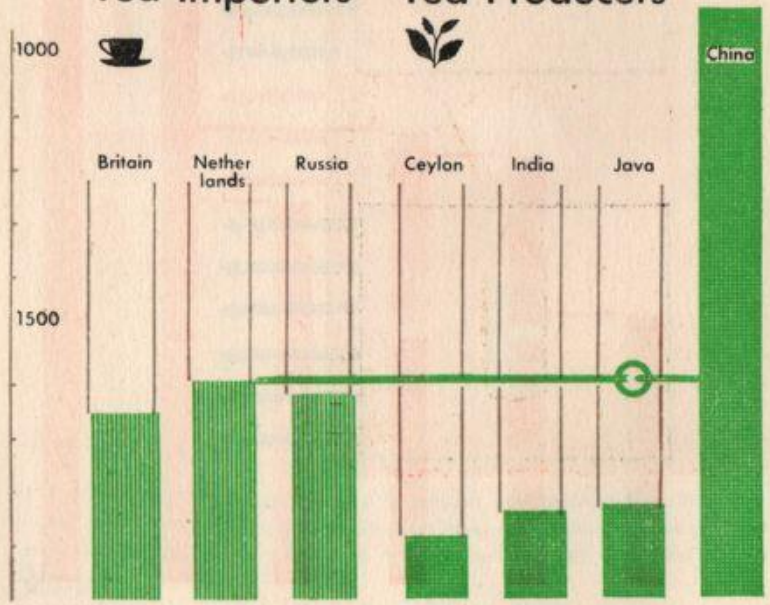


China

CHART 2



Tea Importers Tea Producers



Silk and Paper Manufacture

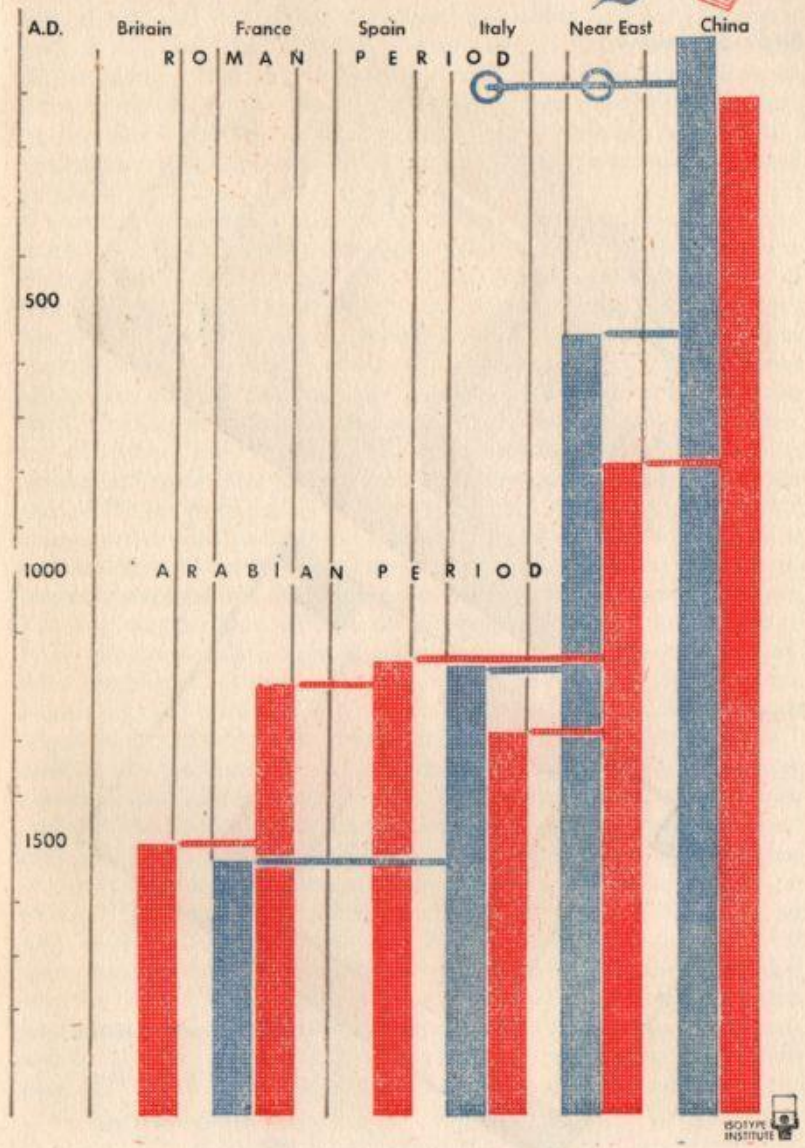
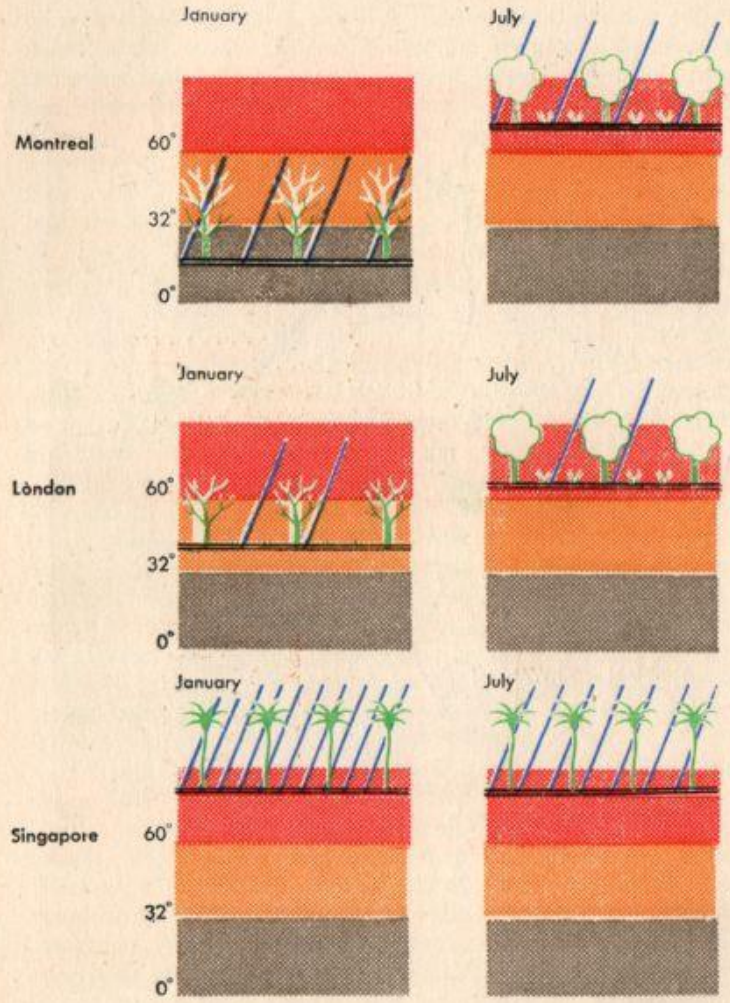
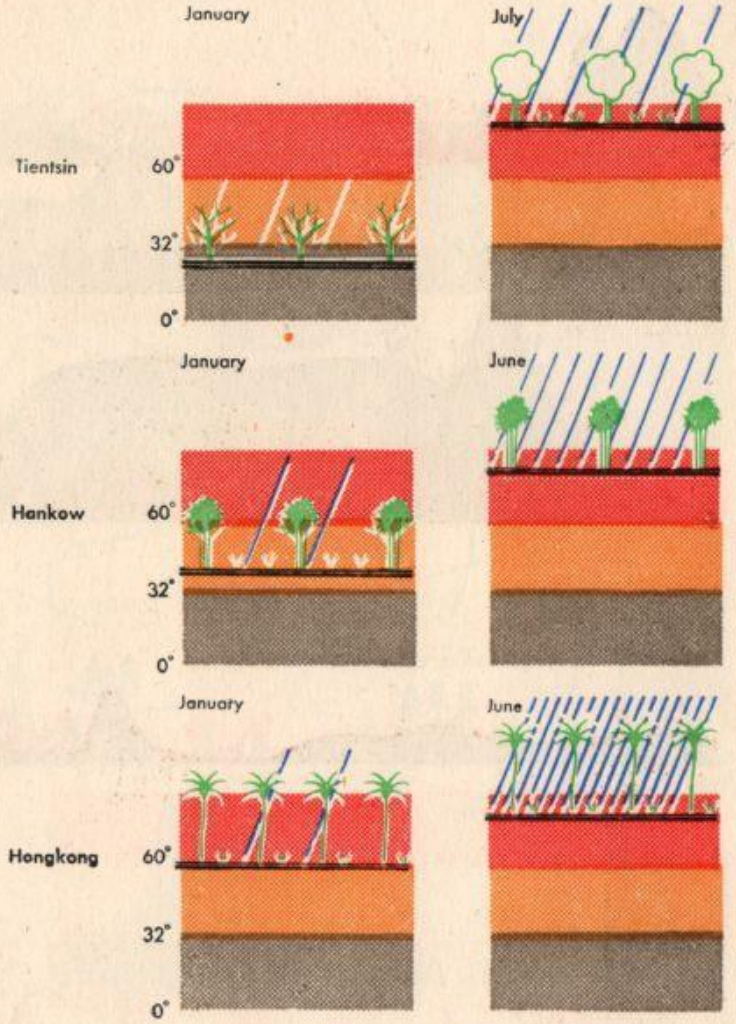


CHART 3

Climate in the British Commonwealth



Climate in China



ISOTYPE INSTITUTE

CHART 7

Religious Contacts between West and East

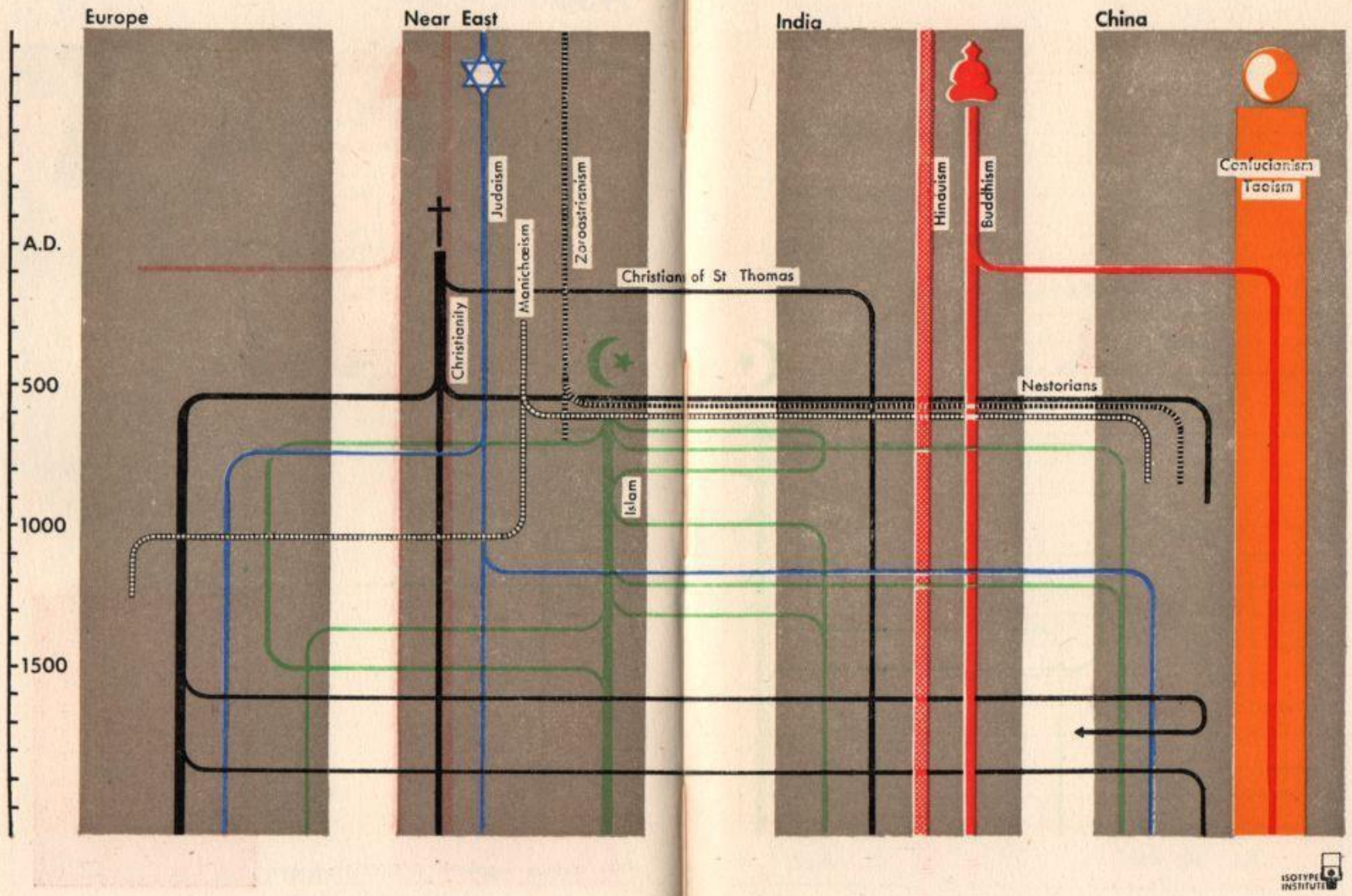
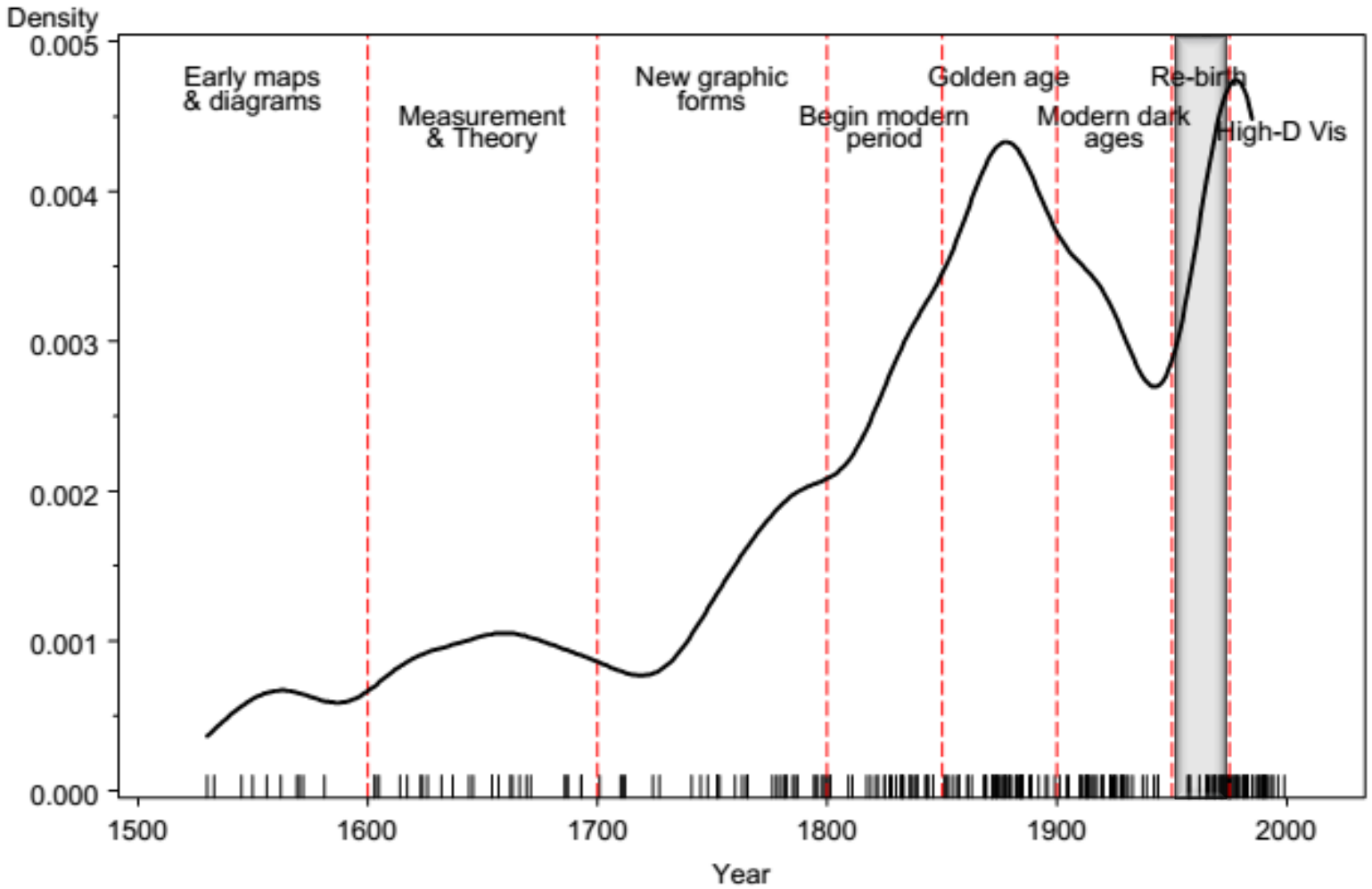


CHART 13


Density
0.005
0.004
0.003
0.002
0.001
0.000
Early maps & diagrams
Measurement & Theory
New graphic forms
Begin modern period
Golden age
Modern dark ages
Re-birth
High-D Vis
1500
1600
1700
1800
1900
2000
Year

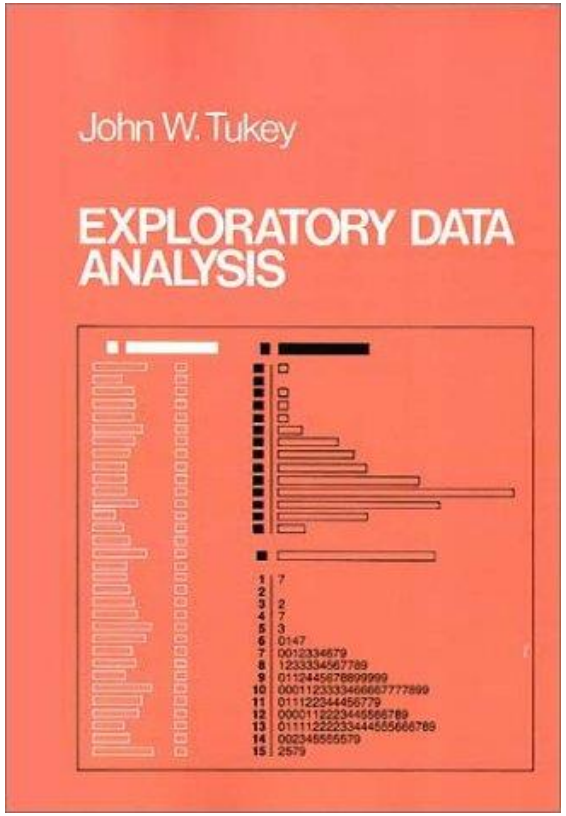
1950+

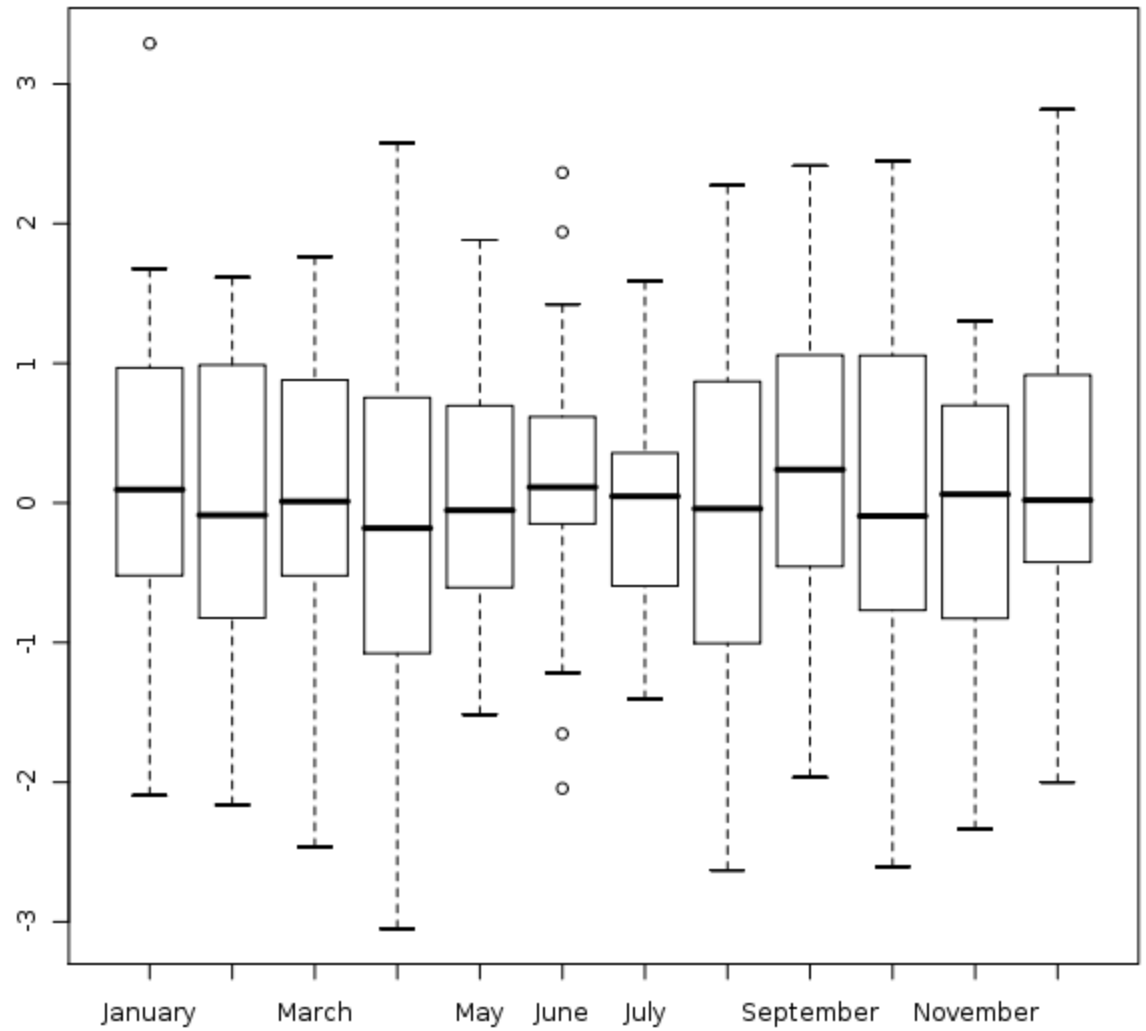
Počítače

1962

John Turkey

Exploratory Data Analysis

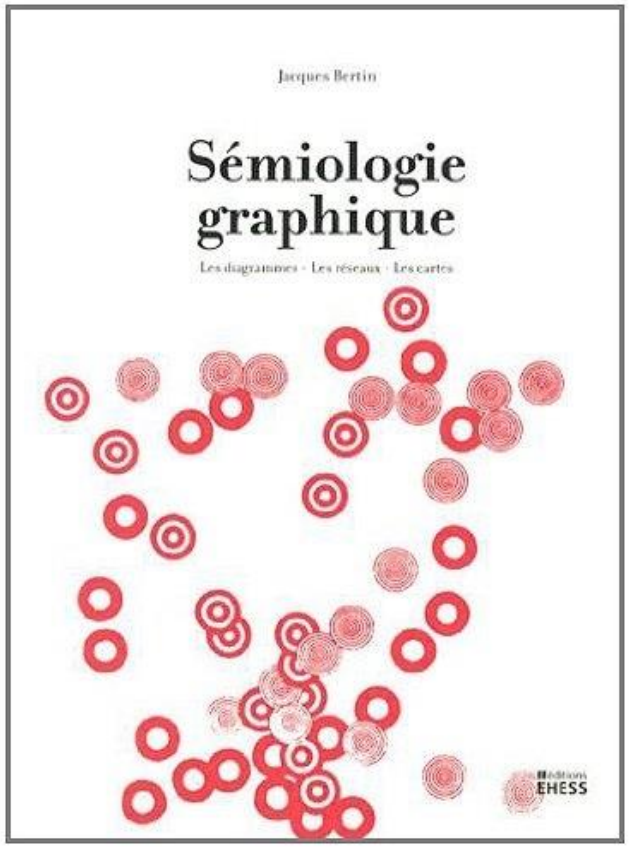


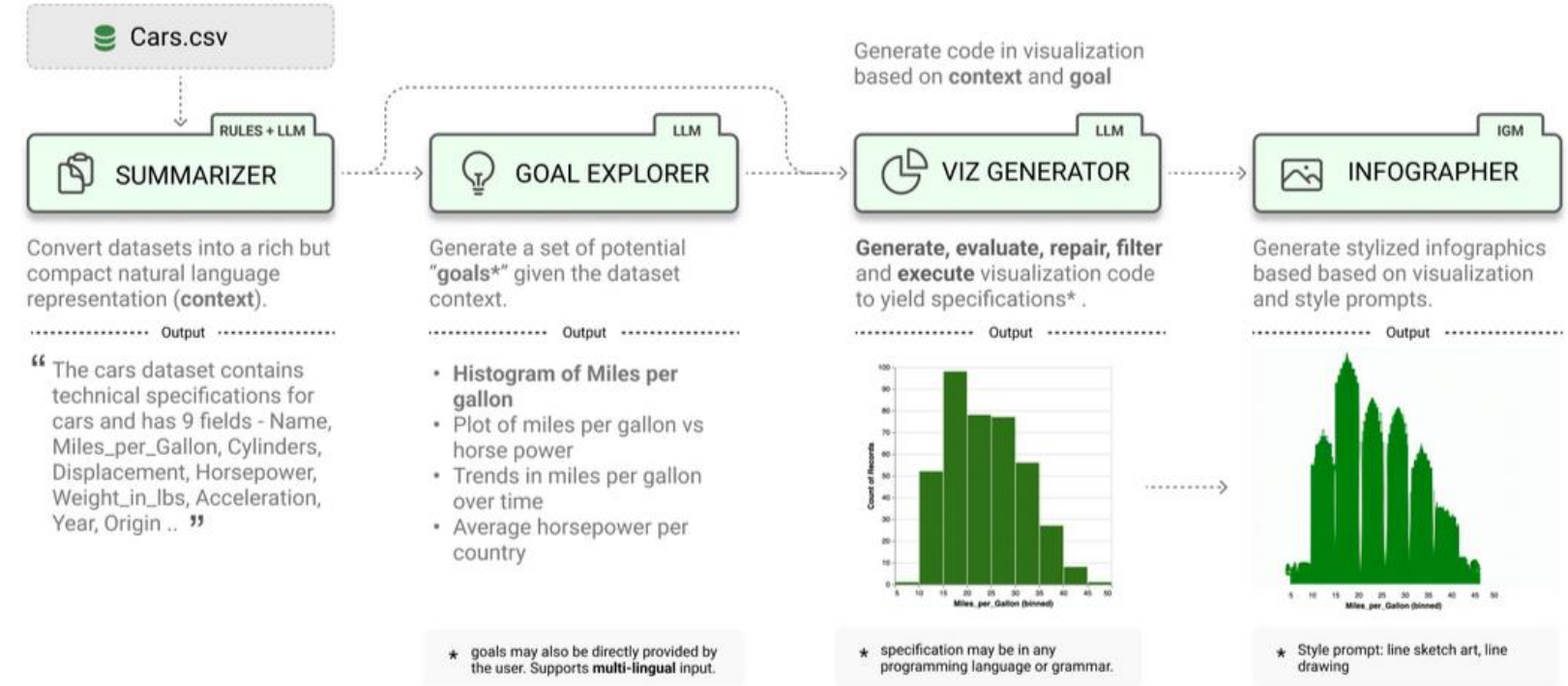

3
2
1
0
-1
-2
-3
January
March
May
June
July
September
November

1967

Jacques Bertin

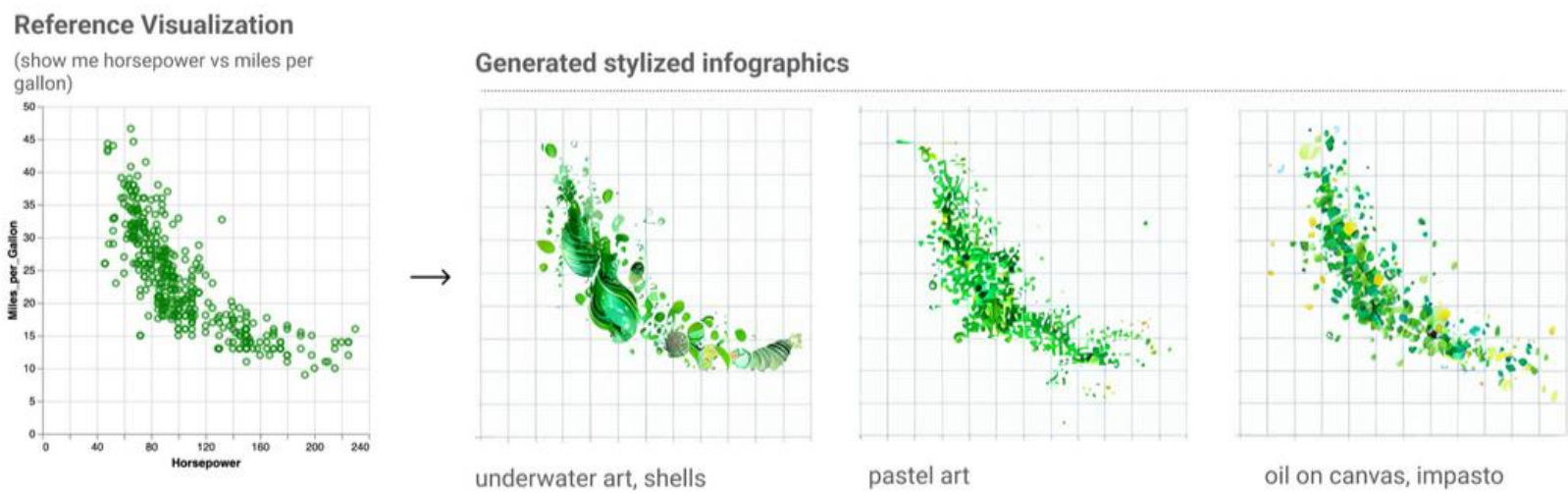
Semiologie Graphique





Architecture for LIDA

LLM = Large Language Model | IGM = Image Generation Model



Example infographics generated with LIDA

http://datavis.ca/milestones/

Co je dnes vizualizace?

Vizualizace dnes

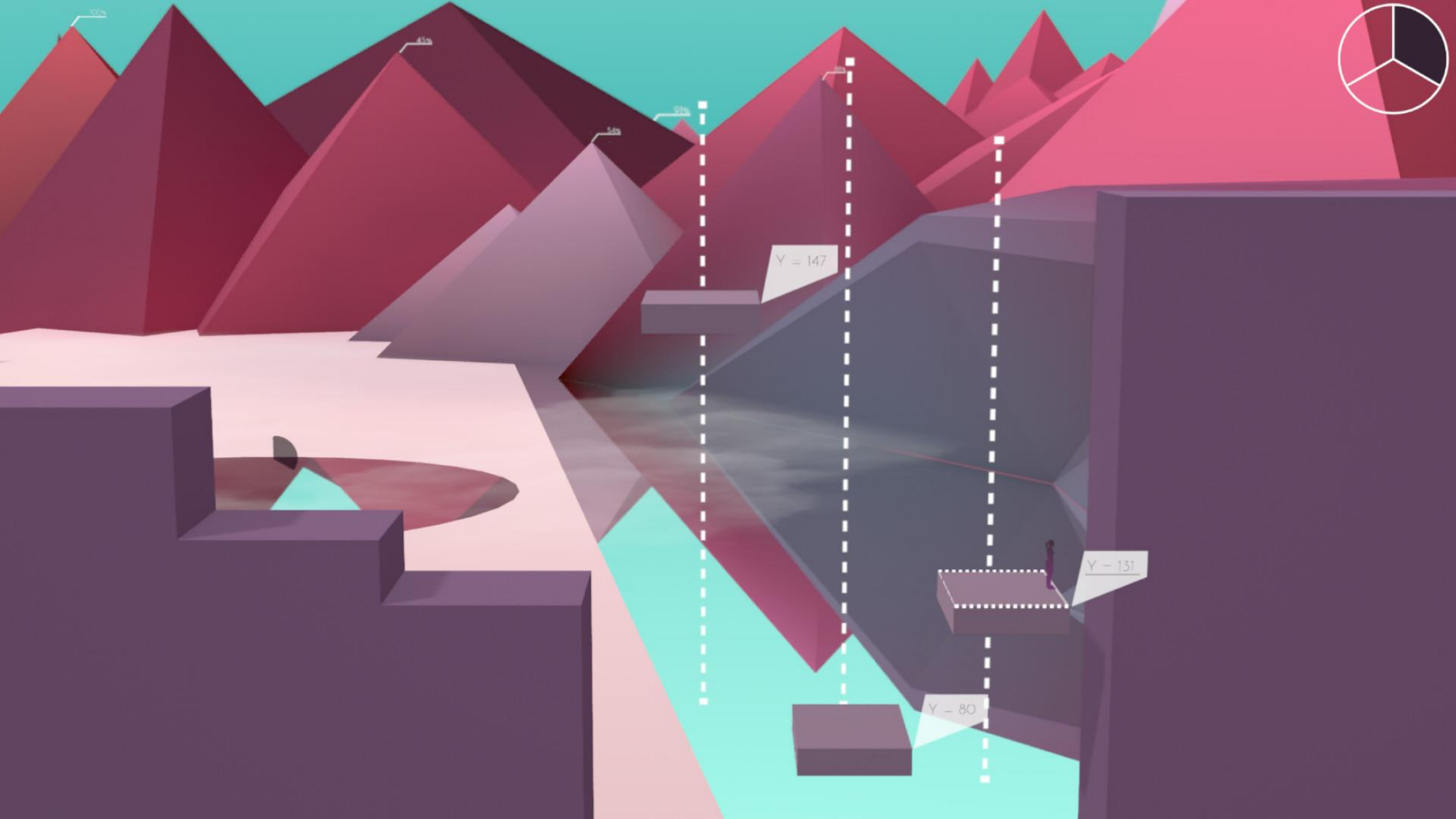
↳otevírání pole širokému spektru lidí *(ve smyslu tvorby)*

↳stabilní **oblast studia** v akademické sféře

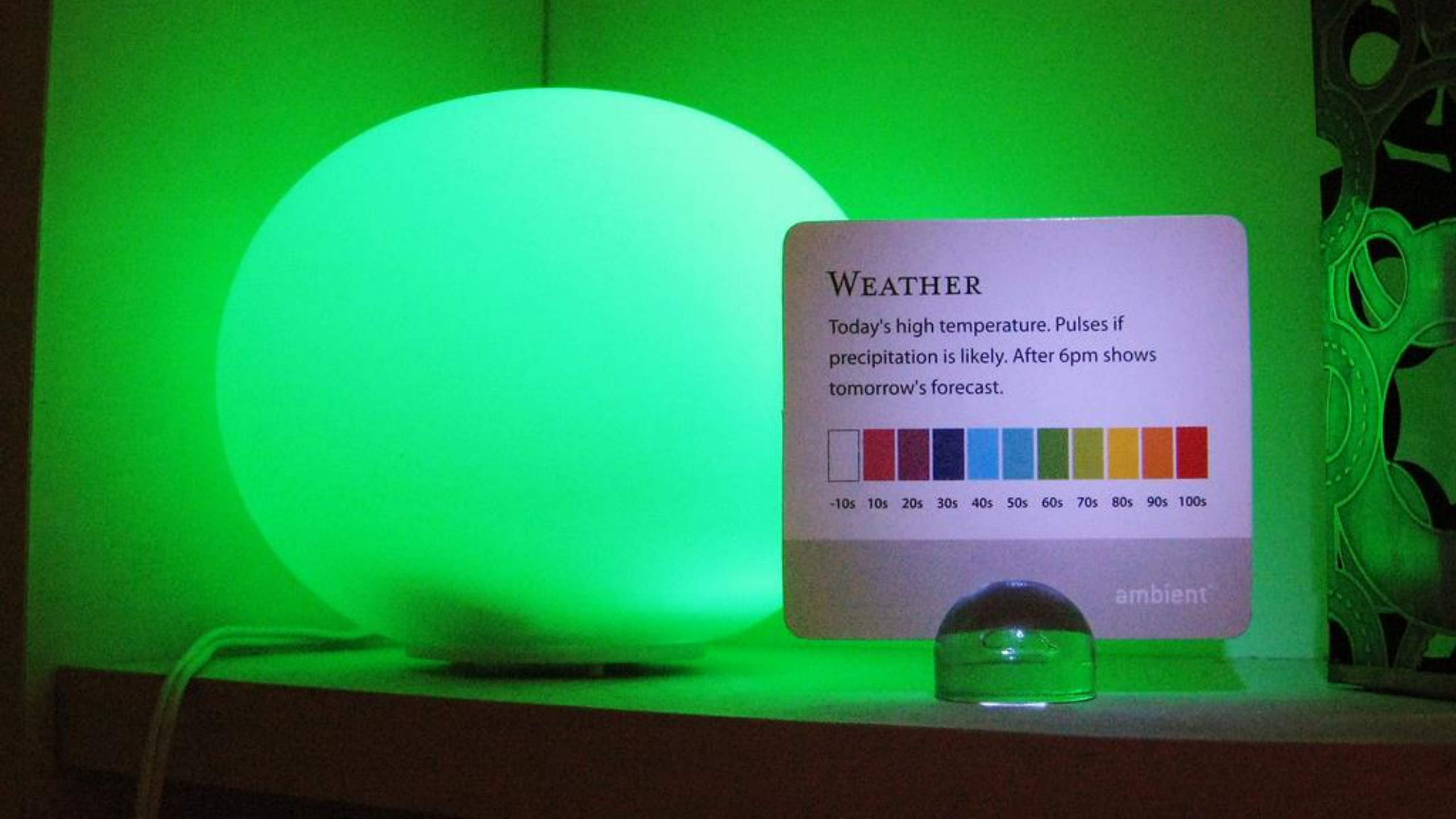
↳vznikají samostatné studijní obory

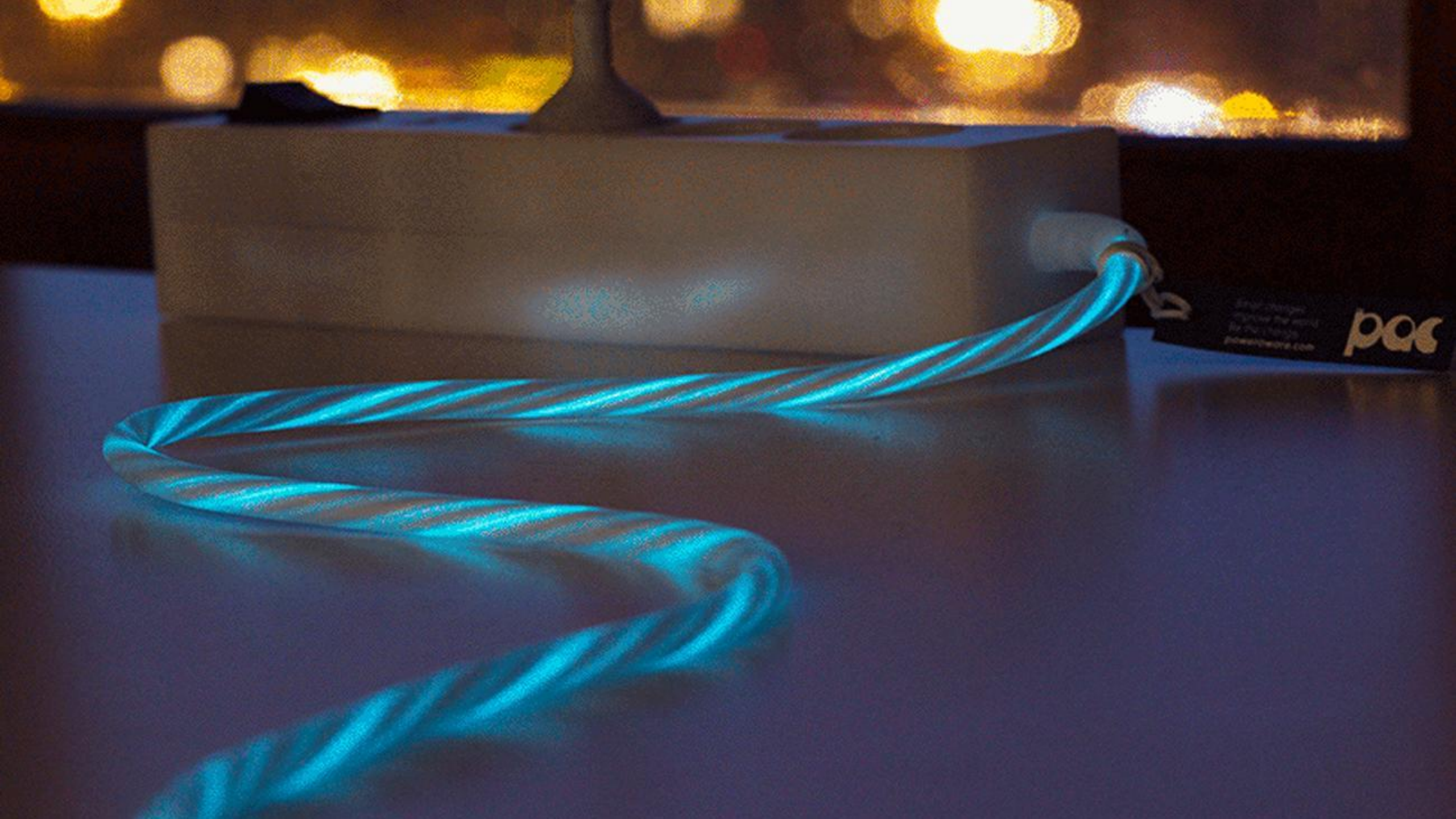
↳otevřené vzdělávání v oblasti - MOOC

↳zmatení pojmů a představ *(nejen v umění)*


Y = 147
Y = 131
Y = 80


Feeling All
Gender Both
Age All
Weather All
Location All
Date All
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
united states illinois chicago / party
WE FEEL FINE


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


pac

Objem a dostupnost dat

↳data smog - *přehlcení 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, Power BI

↳R, Python; D3.js a podobné knihovny

↳Gephi, NodeXL -> *vizualizace sítí*

↳Voyant Tools -> *digital humanities*

↳Processing -> *datové umění*

↳VDEs

Komunita a spolupráce

↳sdílení

↳inspirace

↳podpora

↳Data Visualization Society

A zase 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…*

Mgr. Tomáš Marek
marek@kisk.cz