

# **Working with Data**

## **A Workshop on Understanding, Visualising and Mapping Data**

**Chennai, 3-5 August 2012**

### **Second day 4<sup>th</sup> August 2012**

- |                                              |               |
|----------------------------------------------|---------------|
| 1. Presentation by Open Knowledge Foundation | [10:30-11:00] |
| 2. What is data visualisation?               | [11:15-12:15] |
| 3. Tools for spatial data collection         | [13:30-14:15] |
| 4. Introduction to tools                     | [14:15-14:30] |
| 5. Session on geo/visualisation tools #1     | [14:45-16:00] |
| 6. Session on geo/visualisation tools #2     | [16:15-17:30] |

# Working with Data

## A Workshop on Understanding, Visualising and Mapping Data

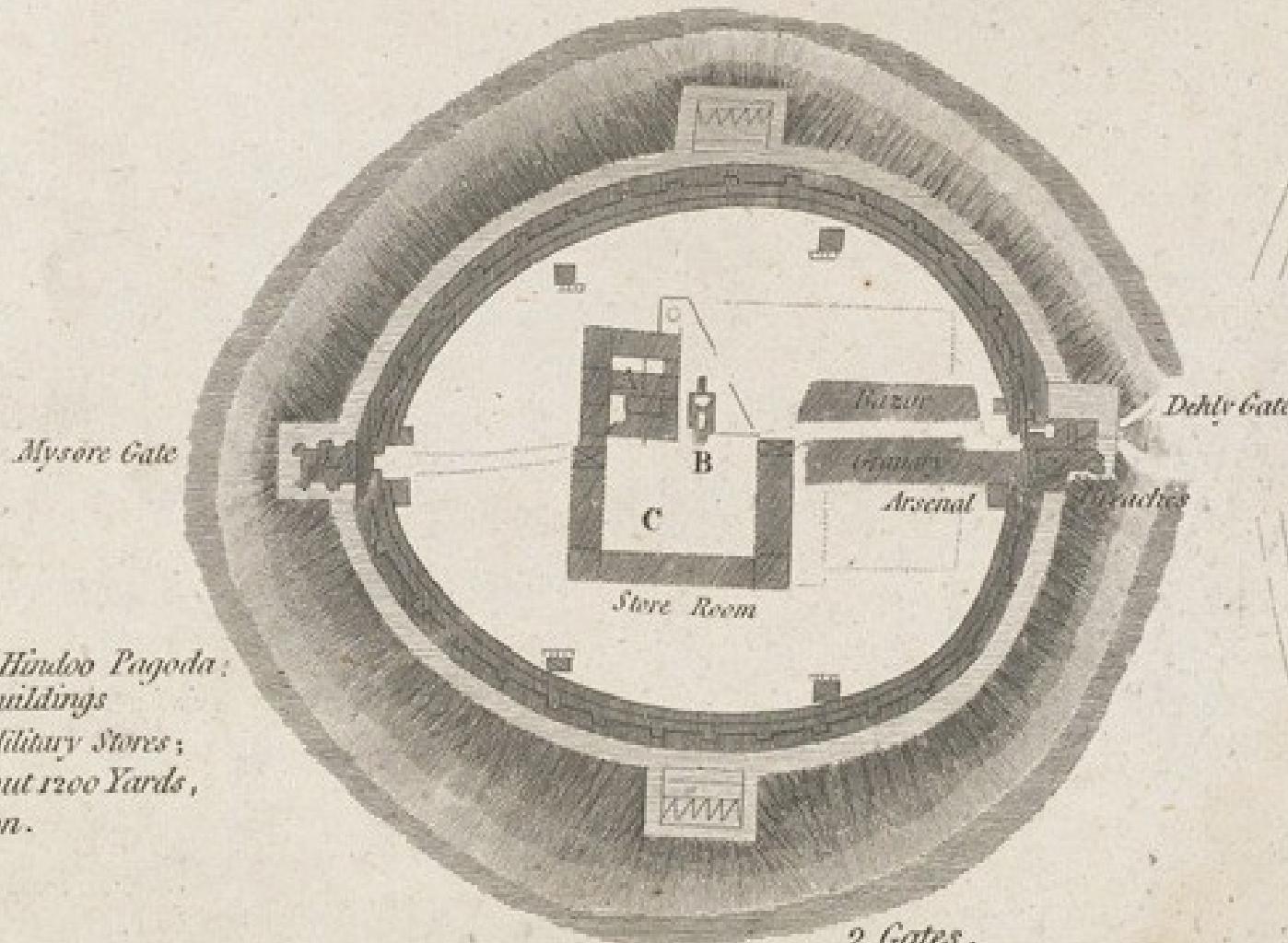
Chennai, 3-5 August 2012

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PLAN of the FORT of BANGALORE from SIGHTS, without Measurement . . .  
 All the Bastions are small, with 7 Embrasures, Wall about 17 Feet high a double Rampart about 30 Feet broad.



A. Palace of Tippoo.

B. a Column before the Hindoo Pagoda:

C. Large Square with Buildings

all round filled with Military Stores;  
 the whole Length about 1200 Yards,  
 Breadth in proportion.

2 Gates.

A Flat of 30 Feet for faussebraye.

Ditch about 30 Feet deep.

Cavaliers in the inner side.

Large Batteries outside .



Plan of Bangalore (with the Attacks) taken by the English Army -  
under the Command of the R<sup>t</sup> Honble Earl Cornwallis. H. G. S. S. March 22<sup>nd</sup> 1791 -

A. Battery of 6 guns for taking off the defences.

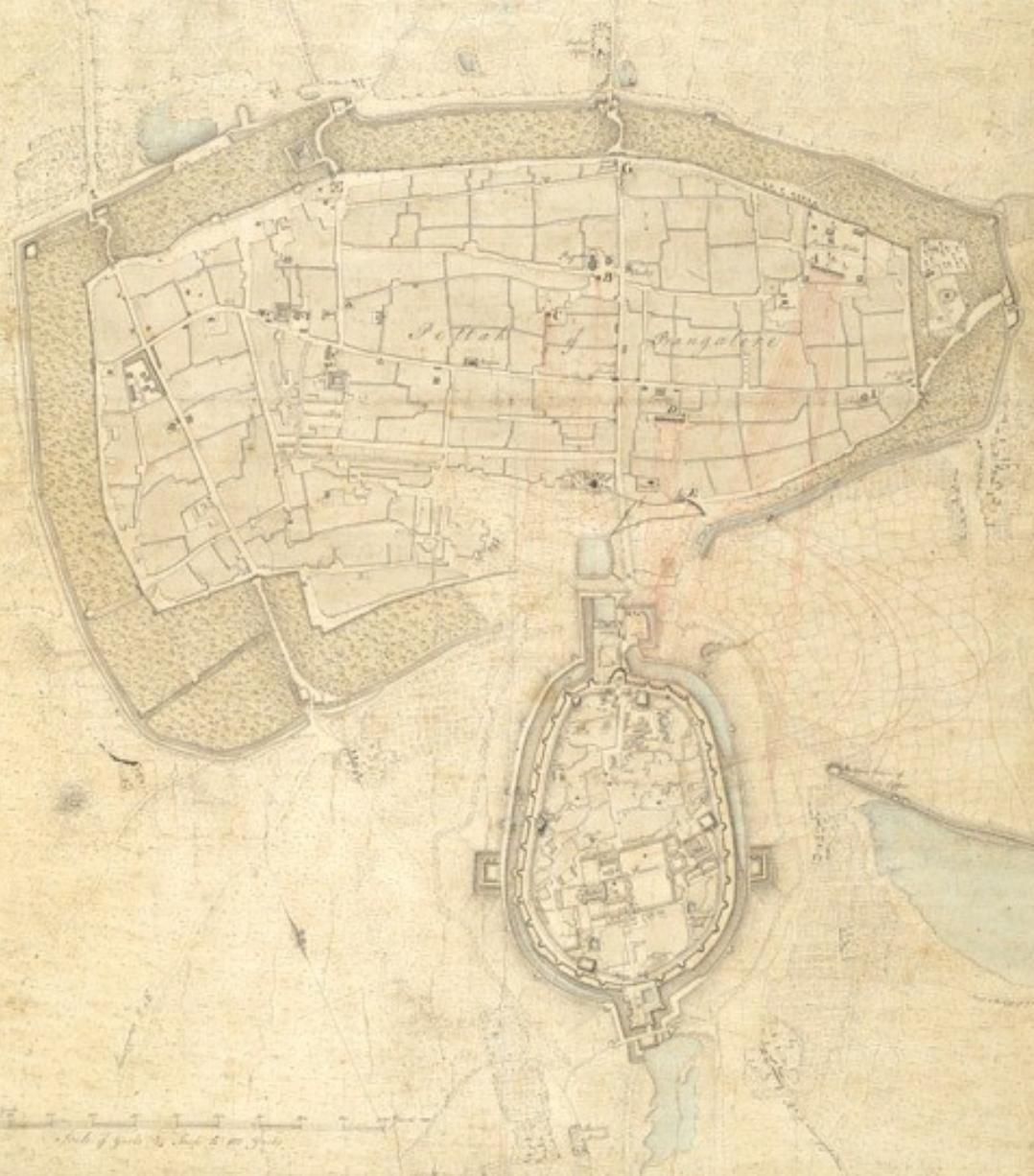
B & C. Grafting Batteries.

D, E. Breaching Batteries. —

F, G. The Approaches.

H. The Pottah Gate Stormed 7<sup>th</sup> March 1791.

I, K. The Artillery Batteries. —





THE WORLD  
ON MERCATOR'S PROJECTION.

*Port of Europa and Africa on the East side of the Map and of America on the West side, intended to show the Ocean and Navigation Roads complete. The Anterior portion of the Transatlantic Route, see in Section of Map.*

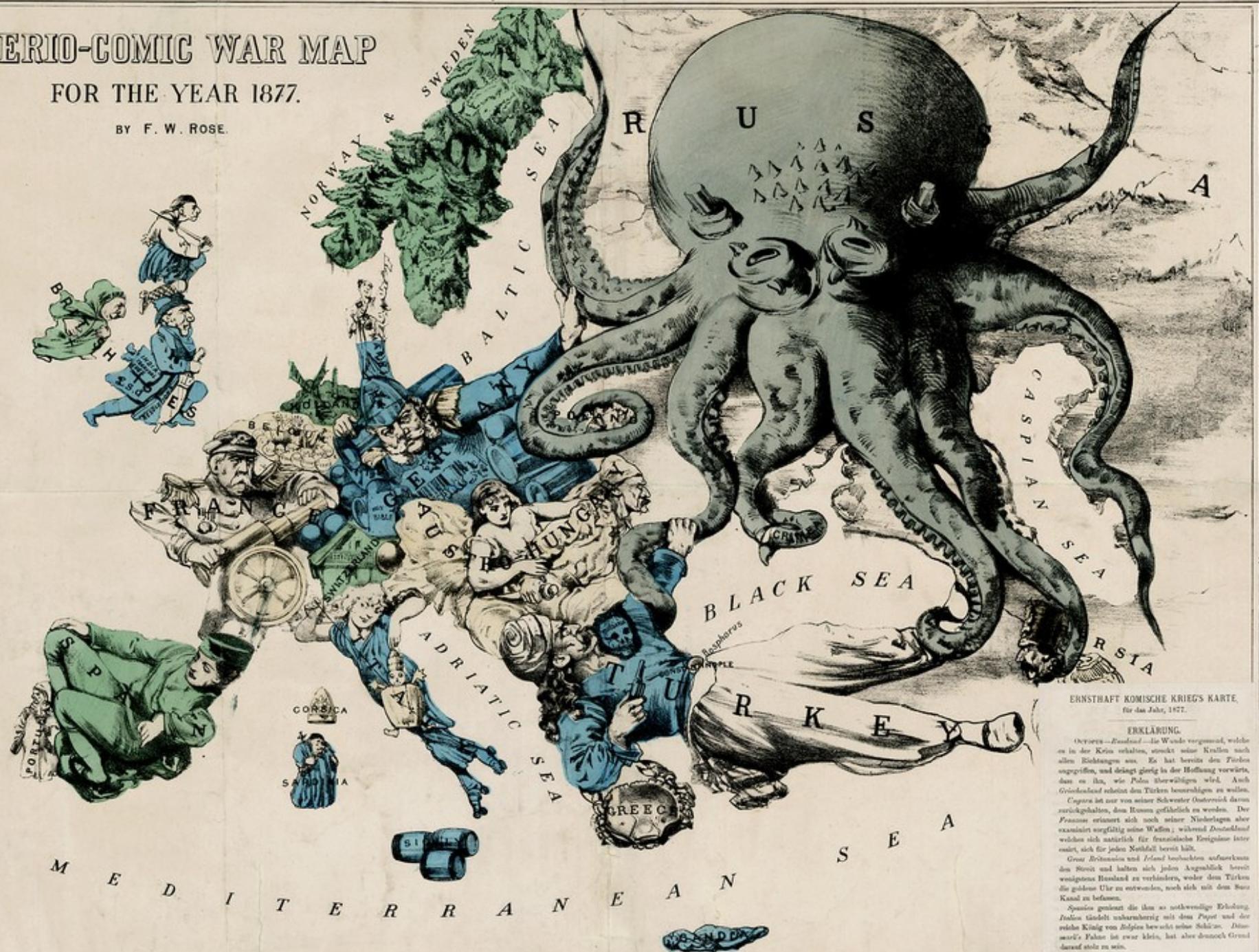
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# SERIO-COMIC WAR MAP

FOR THE YEAR 1877.

BY F. W. ROSE.



## **JOHN BULL AND his FRIENDS**

# A SERIO-COMIC MAP OF EUROPE

— BY —  
**FRED. W. ROSE**

#### **Author of "Anatomical Tractatus Medicorum" &c.**

1900

*Journal of Clinical Endocrinology*



閻生先午進村中 士博學法  
棄馬郎三喜原小 生學大藝義農慶

# 歐亞外交地圖 滑稽

All Sorts of DIPLOMATIC PLAYS  
of EUROPE AND ASIA.



歐亞外交地圖 滑稽  
說明

本圖是歐亞外交地圖，滑稽。圖中俄羅斯被畫成一個巨大的章魚，伸展著八條觸手，觸及歐洲、中東和中國。英國、法國、德國、奧匈帝國、土耳其、波斯等國則被視為被控制的生物或地點。中國被畫成一個綠色的、痛苦的臉孔，而日本則是一個拿着刀劍的武士形象。

圖中還包含許多標註，如大西洋、地中海、黑海、波羅的海、瑞典、芬蘭、波蘭、匈牙利、希臘、土耳其、波斯、西藏、印度、緬甸、暹羅、南洋、朝鮮、蒙古、中國、日本等。

圖下方有許多細小的文字說明，但因為字體太小，無法完全辨認。

# THE PRUSSIAN OCTOPUS.

3

SCHLESWIG HOLSTEIN  
AND Lauenburg  
Wrested from Denmark  
in 1864

ANNEXED BY  
PRUSSIA IN  
1866

POLISH  
TERRITORY  
STOLEN BY  
PRUSSIA IN  
1772, 1793 &  
1795

BELGIUM  
invaded and  
occupied by  
Germany in  
defiance of  
her treaty ob-  
ligations in  
1914

ACQUIRED  
by PRUSSIA  
in 1813

ANNEXED BY  
PRUSSIA IN  
1866

Silesia  
seized by  
Prussia from  
Austria  
in 1740

ALSACE  
LORENAE  
brought from  
France in  
1871

FEDERATED WITH  
PRUSSIA SINCE 1870

FRANCE

ITALY

AUSTRIA  
HUNGARY  
SUBJUGATED  
BY PRUSSIA IN  
1866  
ALLIED WITH  
PRUSSIA SINCE  
1879

RUMANIA

BULGARIA

BOSNIA AND  
HERZEGOVINA  
annexed by Austria-  
Hungary in defiance  
of her treaty  
obligations in  
1908

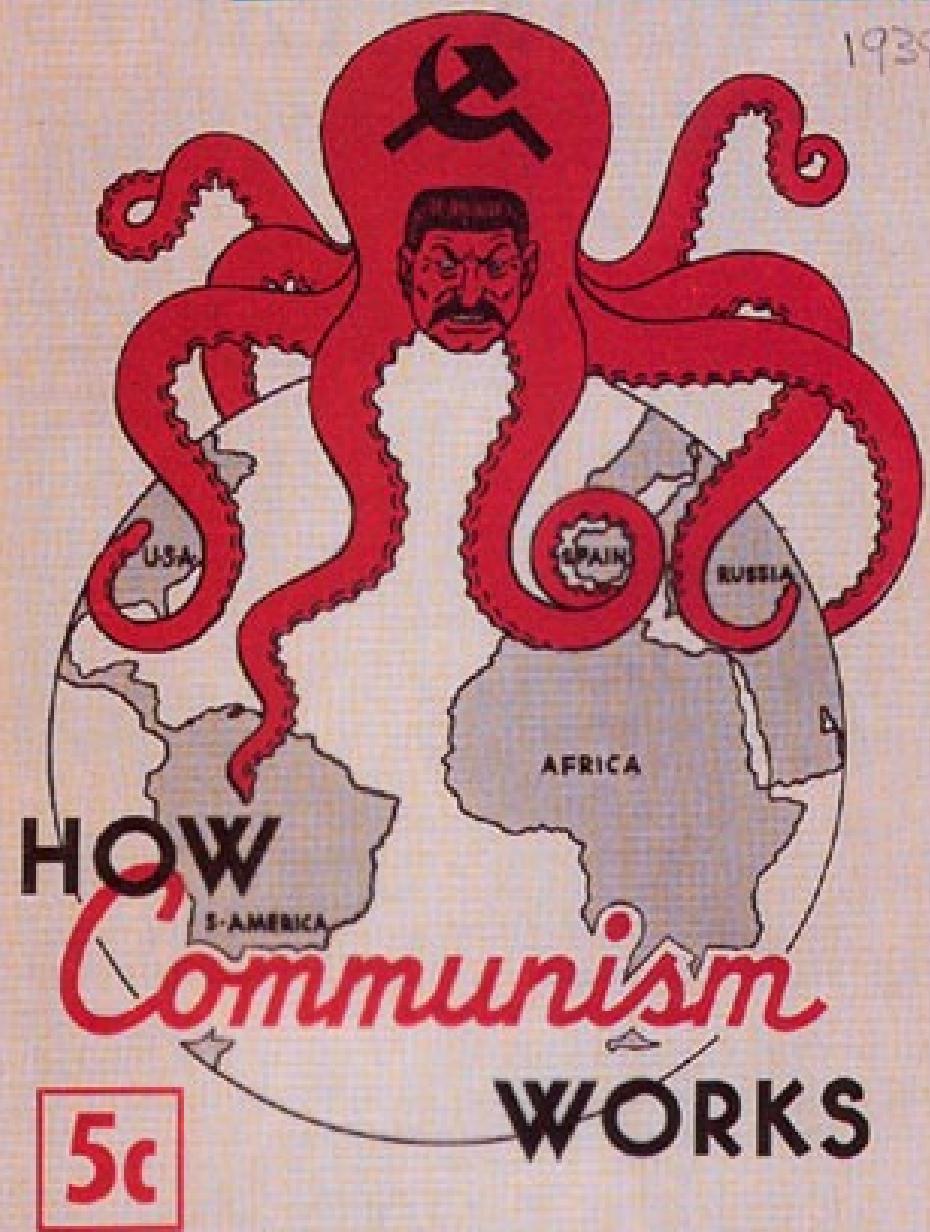
SERBIA  
invaded and  
devastated by  
Germany and  
Austria-  
Hungary  
in 1915

MONTENEGRO  
invaded & devastated  
in 1915

"We do not threaten small nations," declared the German Chancellor on December 10th, 1915: "we do not wage the war which has been forced upon us in order to subjugate foreign peoples, but for the protection of our life and freedom." This pictorial map is a commentary on his words. It shows how Prussia has stolen one province after another from her neighbours and, like a baleful octopus, is still stretching out her tentacles to grasp further acquisitions. The territories included in the original Kingdom of Prussia are marked thus . The territories since absorbed by negotiation, force, or fraud are marked thus .

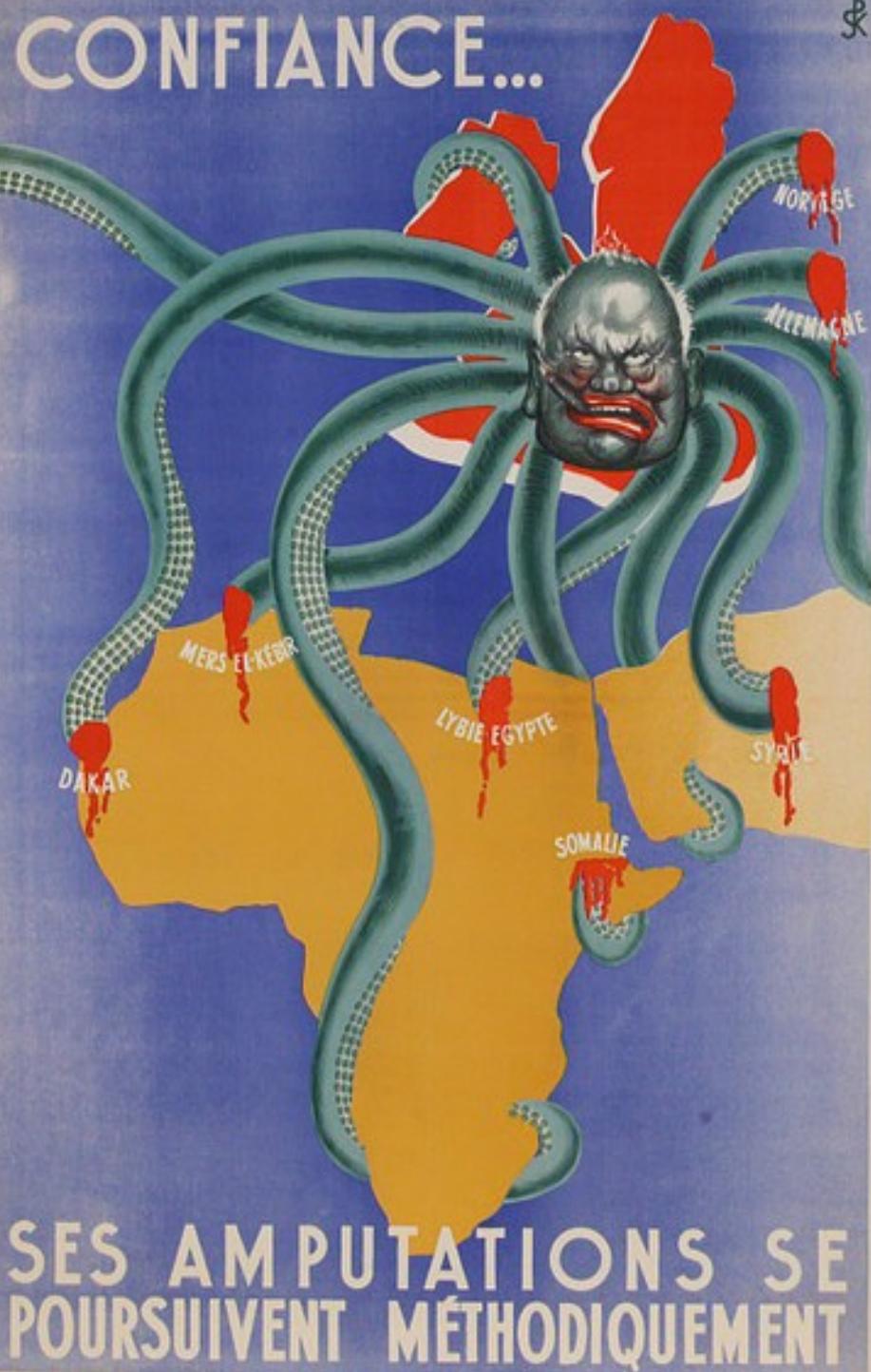
6081  
R1  
[5000]  
1740-1915

Pam. / HOW COMMUNISM WORKS  
by Catholic Library Service



KEEP THIS PAM-PHLET MOV-ING!

Generalissimo COMMUNISTE  
Telling Facts About the  
Soviet Union



•MACKAY•  
HAMILTON SPECTATOR



RUSSIA  
IN 2008

# CORNERED

The last pockets of al-Qaeda forces—and perhaps Osama bin Laden himself—remained holed up in the mountains of Tora Bora last week. It was al-Qaeda's final stand against advancing alliance forces and U.S. special ops. From the air, U.S. planes blasted the mountain in caves hoping either to bury or unearth the holdouts and bin Laden.



**ON THE GROUND** Aided by U.S. special forces, Alliance fighters, armed with Kalashnikovs, rocket-propelled grenades and a few tanks, have advanced over the treacherous terrain from the north and fought pitched battles against al-Qaeda forces, capturing caves and taking prisoners.

## PINNING DOWN OSAMA

One Eastern Alliance group claimed to be closing in on a cave in the mountains of Tora Bora that held bin Laden. A barrage of allied bombing ensued. U.S. officials, though, insisted they didn't know bin Laden's exact whereabouts, and some reports even claimed he had escaped into Pakistan weeks ago.

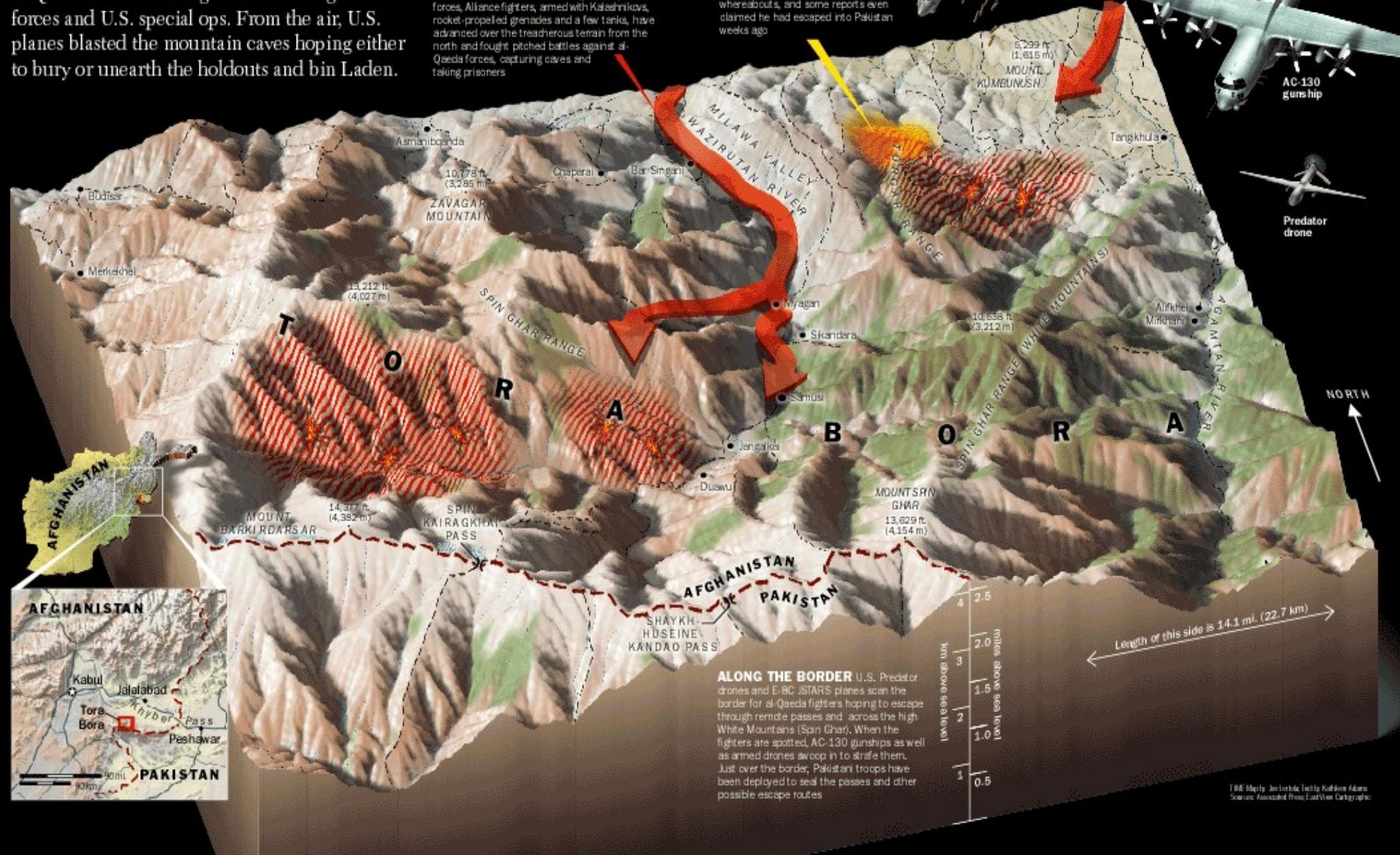
B-52 bomber

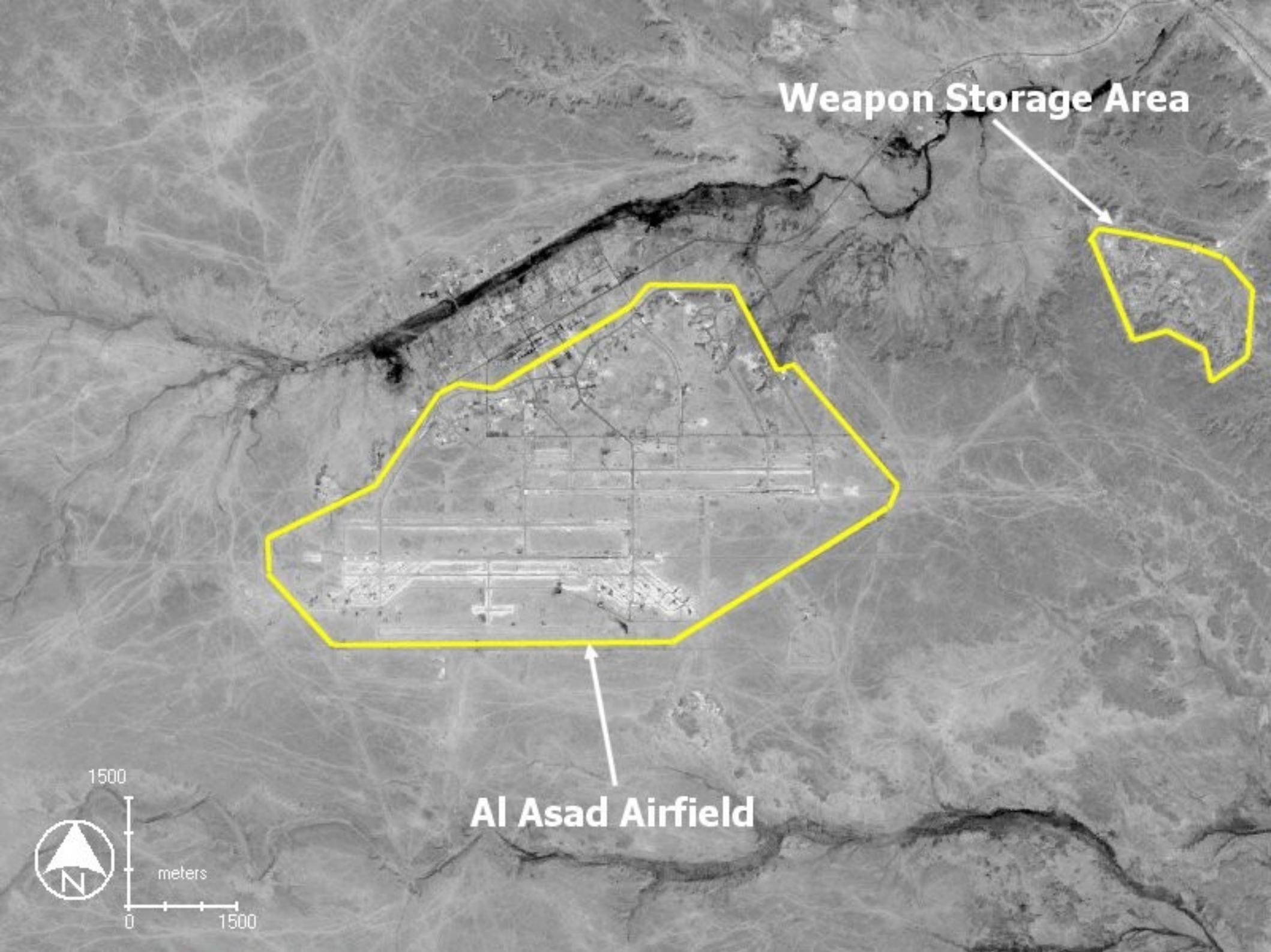


AC-130 gunship

Predator drone

**AIR STRIKES** In an all-out air assault, both short- and long-range bombers, including F-18s, F-14s, B-52s and B-1s, have been targeting underground cave complexes and above-ground al-Qaeda forces with laser-guided bunker busters, earth-penetrating JDAMs and several BLU-82s—the 15,000-lb. bombs known as "daisy cutters."





**Weapon Storage Area**

**Al Asad Airfield**



1500

meters

0

1500

## US SOLDIERS - 2009

### COMMITTED SUICIDE



### KILLED IN IRAQ



304

149



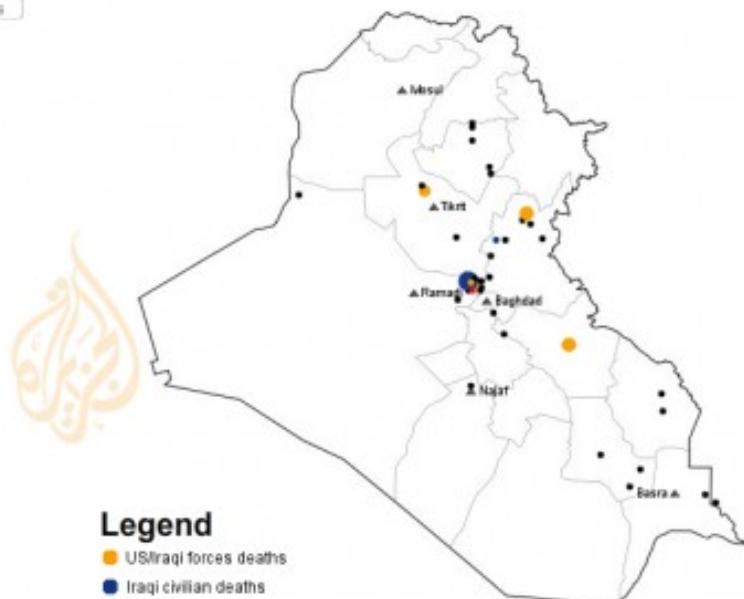
Roadside Bombs Checkpoint Deaths Assassinations

## Roadside Bombs

Militant groups in other countries, perhaps after seeing the success of IEDs in Iraq, have begun using them as well.

Their use in Afghanistan has increased exponentially, from just 308 in 2004 to more than 7,000 in 2009. More than 100 IEDs detonated each day in the week leading up to Afghanistan's presidential election last year. They have become the leading killer of US and NATO troops in Afghanistan.

JIEDDO, the Pentagon organisation that tracks IEDs, said they have also been repeatedly used in Pakistan, India, Russia, Sri Lanka and other countries.

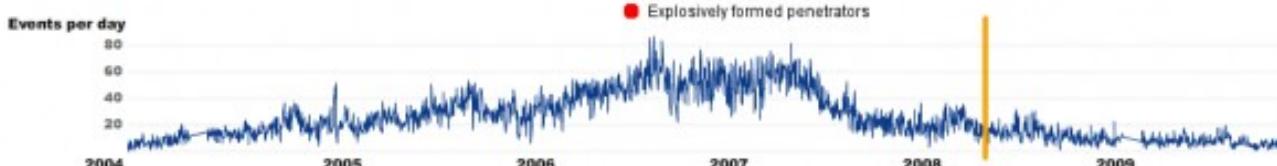


### Legend

- US/Iraqi forces deaths
- Iraqi civilian deaths
- No deaths
- Explosively formed penetrators

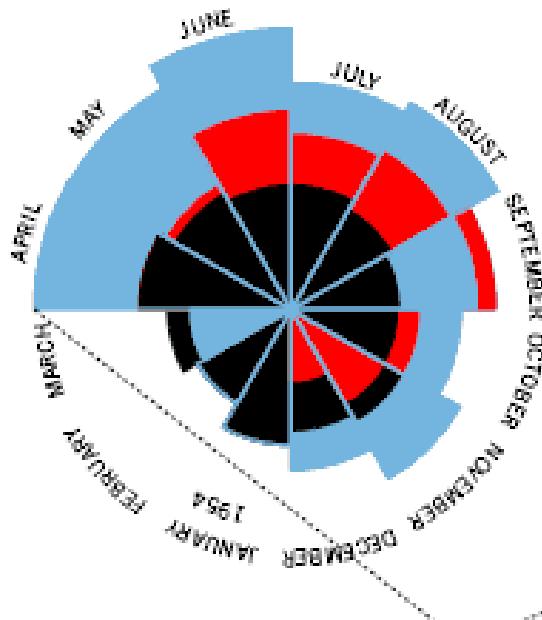
Incidents: 49,683       Fast     Slow  
Deaths: 21,156     

### June 11, 2008

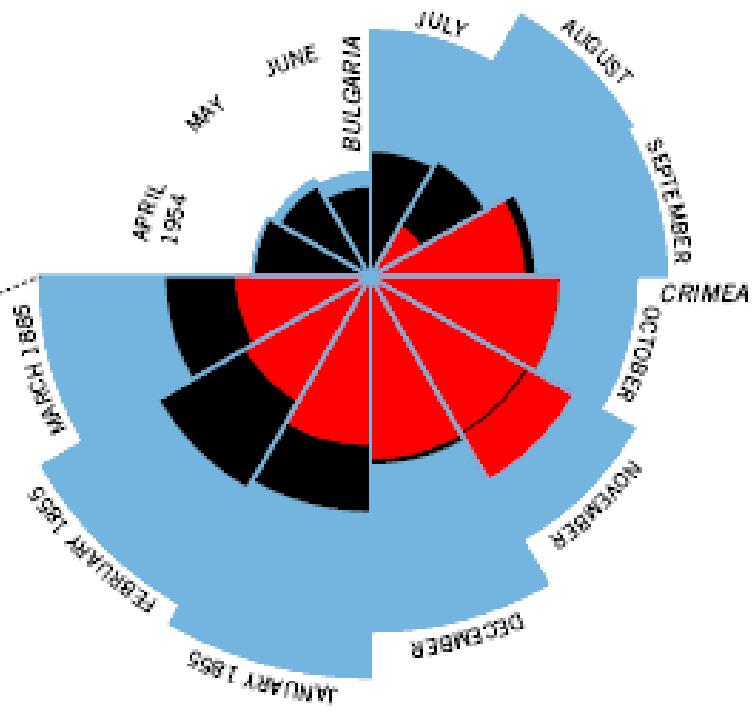


# DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST

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' 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.*

# Types of charts

- Scatterplot, line chart, histogram, bar chart
- Pie chart, tree map,
- Bubble chart, radar chart
- Time line, flow chart, mind map
- Choropleth, flow map, cartogram

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# Gestalt principles of visual perception

- law of proximity
- law of similarity
- law of enclosure
- law of closure
- law of continuity

# **Manuel Lima's information visualisation manifesto**

## a selection

- form follows function
- start with a question
- cite your source
- the power of narrative
- embrace time
- avoid gratuitous visualisations

*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 lettres des zones. Le rouge désigne les hommes qui entrent en Russie; le noir ceux qui en sortent. — Les renseignements qui ont servi à dresser la carte ont été pris dans les ouvrages de M. M. Chiers, de Segur, de Fezonsac, de Chambray et le journal médical 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 en Mobilow et se rejoignirent vers Oryha en Witlobk, avaient toujours marché avec l'armée.

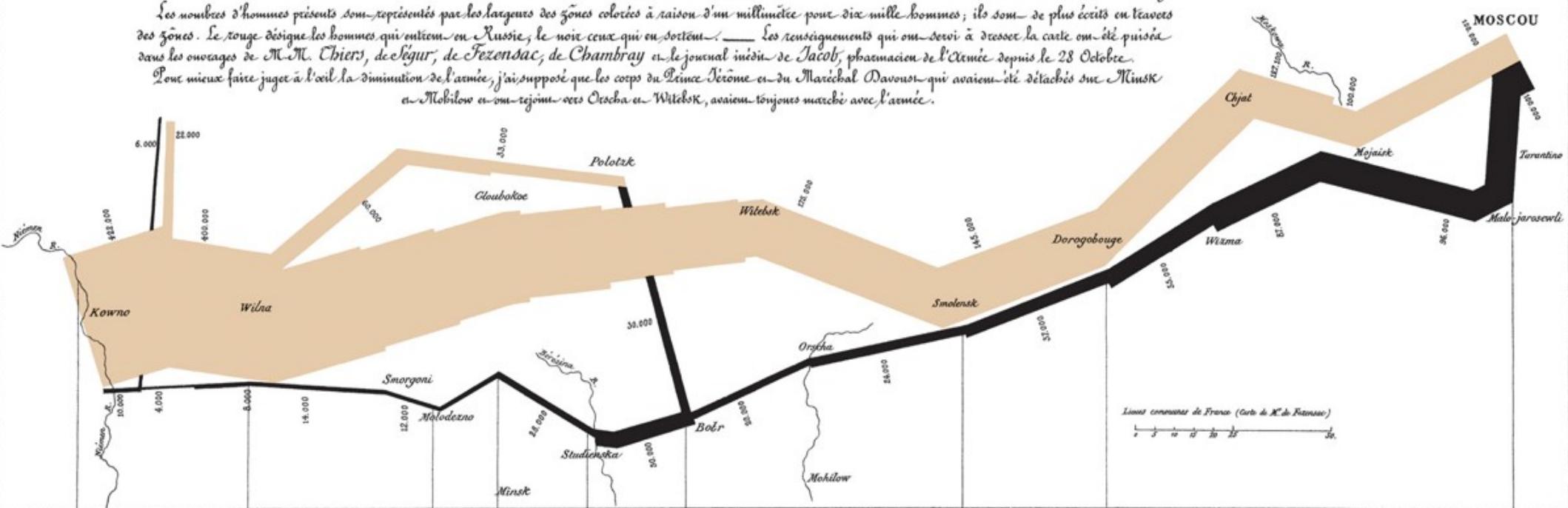
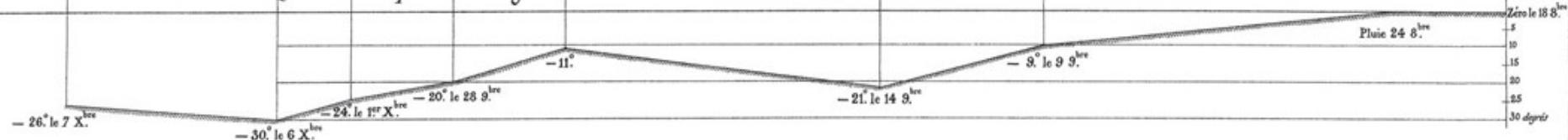


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.

Les cosaques passent au galop  
le Niemen gelé.



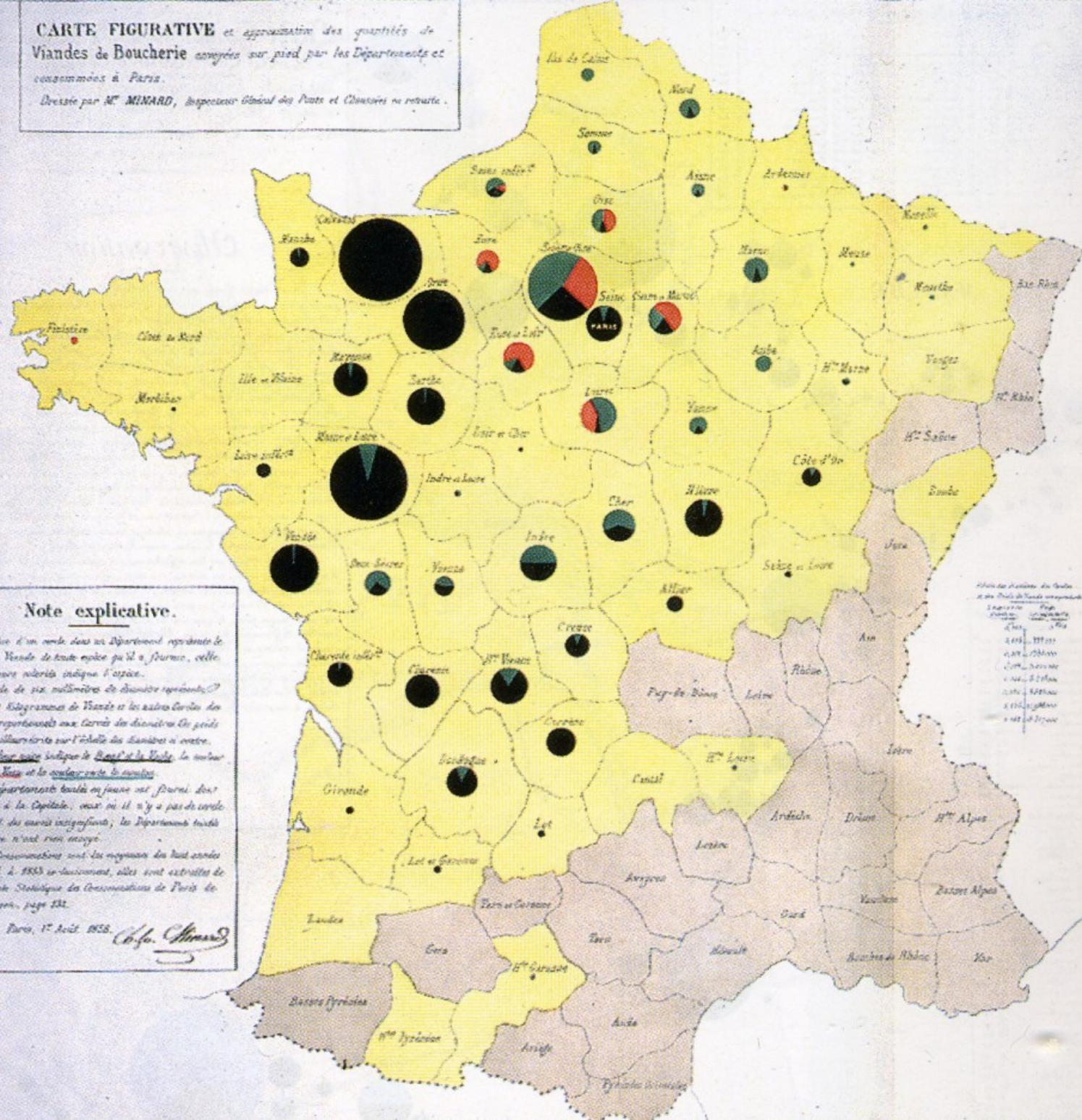
# Subjective guiding principles

- juxtapose, compare and relate
- combine/collect data to challenge existing views
- it is easy to make complicated and beautiful data visualisations but difficult to communicate them
- reading visualisation requires understanding of the context, do not generalise the visualisation too much



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

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



# The True Size of Africa

A small contribution in the fight against rampant *Immappancy*, by Kai Krause

Graphic layout for visualization only ( some countries are cut and rotated )  
But the conclusions are very accurate: refer to table below for exact data

COUNTRY	AREA x 1000 km <sup>2</sup>
China	9.597
USA	9.629
India	3.287
Mexico	1.964
Peru	1.285
France	633
Spain	506
Papua New Guinea	462
Sweden	441
Japan	378
Germany	357
Norway	324
Italy	301
New Zealand	270
United Kingdom	243
Nepal	147
Bangladesh	144
Greece	132
<b>TOTAL</b>	<b>30.102</b>
<b>AFRICA</b>	<b>30.221</b>

In addition to the well known social issues of *illiteracy* and *innumeracy*, there also should be such a concept as "*immappancy*", meaning insufficient geographical knowledge.

A survey with random American schoolkids let them guess the population and land area of their country. Not entirely unexpected, but still rather unsettling, the majority chose "*1-2 billion*" and "*largest in the world*", respectively.

Even with Asian and European college students, geographical estimates were often off by factors of 2-3. This is partly due to the highly distorted nature of the predominantly used mapping projections (such as Mercator).

A particularly extreme example is the worldwide misjudgement of the true size of Africa. This single image tries to embody the massive scale, which is larger than the USA, China, India, Japan and all of Europe..... combined!

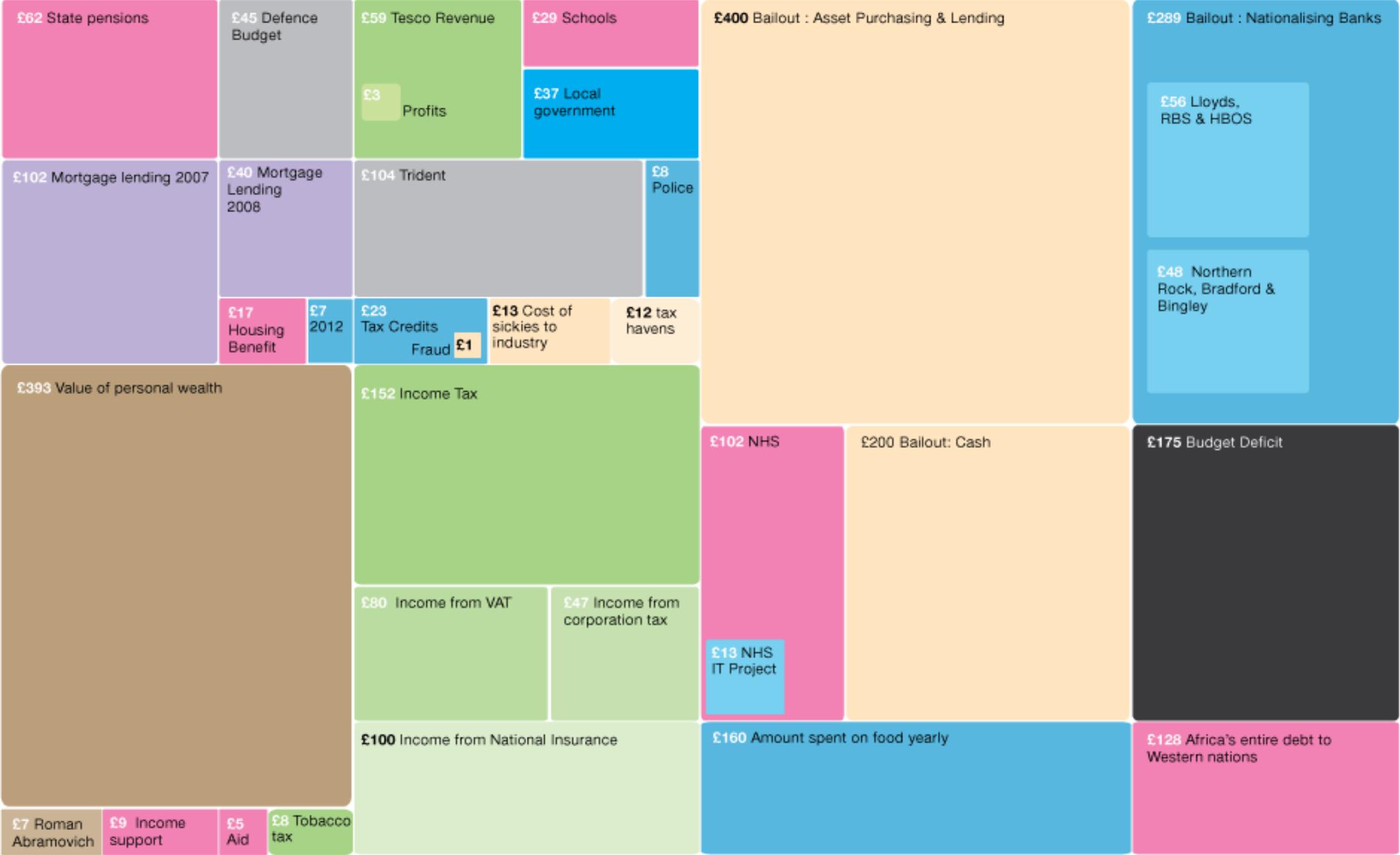


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## Top 100 Countries

Area in square kilometers, Percentage of World Total  
Sources: Britannica, Wikipedia, Almanac 2010

	AREA km <sup>2</sup>	%
1	17,098,242	11.50
2	9,984,679	6.70
3	9,596,961	6.40
4	9,629,091	6.40
5	8,514,877	5.70
6	7,692,024	5.20
7	3,287,263	2.30
8	2,780,400	2.00
9	2,721,900	1.80
10	2,565,813	1.70
11	2,381,741	1.60
12	2,344,658	1.60
13	2,166,086	1.50
14	2,149,690	1.40
15	1,964,375	1.30
16	1,860,360	1.30
17	1,759,540	1.20
18	1,628,750	1.10
19	1,564,120	1.10
20	1,288,216	0.86
21	1,284,000	0.86
22	1,267,000	0.85
23	1,246,700	0.85
24	1,240,182	0.83
25	1,221,037	0.82
26	1,141,748	0.76
27	1,104,300	0.74
28	1,025,520	0.69
29	1,062,000	0.67
30	945,087	0.63
31	923,768	0.62
32	912,050	0.61
33	824,116	0.55
34	801,590	0.54
35	796,059	0.53
36	783,562	0.53
37	756,102	0.51
38	752,612	0.51
39	676,578	0.45
40	652,090	0.44
41	637,657	0.43
42	632,834	0.43
43	622,984	0.42
44	603,500	0.41
45	587,041	0.39
46	582,000	0.39
47	580,367	0.39
48	527,968	0.35
49	513,120	0.34
50	505,992	0.34
51	486,150	0.33
52	475,442	0.32
53	462,840	0.31
54	447,400	0.30
55	446,550	0.30
56	441,370	0.30
57	438,317	0.29
58	406,752	0.27
59	390,757	0.26
60	377,925	0.25
61	367,114	0.24
62	342,000	0.23
63	328,419	0.23
64	321,212	0.22
65	306,860	0.22
66	323,802	0.22
67	302,463	0.21
68	312,685	0.21
69	309,500	0.21
70	301,320	0.20
71	300,000	0.20
72	274,222	0.18
73	270,467	0.18
74	267,668	0.18
75	266,000	0.18
76	256,369	0.20
77	245,857	0.17
78	242,900	0.16
79	241,030	0.16
80	238,539	0.16
81	238,391	0.16
82	236,800	0.16
83	214,969	0.14
84	207,600	0.14
85	199,951	0.13
86	196,722	0.13
87	185,180	0.12
88	181,025	0.12
89	176,215	0.12
90	163,820	0.11
91	163,610	0.11
92	147,181	0.10
93	143,950	0.10
94	143,100	0.10
95	131,957	0.09
96	130,373	0.09
97	129,538	0.08
98	118,484	0.08
99	117,600	0.08
100	132,632,524	89.34



## The Billion Pound-O-Gram

David McCandless / [InformationIsBeautiful.net](http://InformationIsBeautiful.net)

■ Giving   ■ Spending   ■ Fighting   ■ Hoarding   ■ Lending   ■ Bailing   ■ Earning

Source: UK Treasury, Guardian

CARTE ASSENTRÉE à APPROXIMATIF représentant pour l'année 1850  
les ÉMIGRANTS du GLOBE

Les Pays d'où ils partent et ceux où ils arrivent, dessiné par M<sup>e</sup> MINARD  
Imprimeur Général des Beaux-arts, Chanoine et Notaire, principalement sur les  
renseignements publiés dans l'Emigration Européenne de M<sup>e</sup> A. LEBOVITZ  
et le recueil des émigrés de New-York.

Paris, le 26 Septembre 1859.

AMÉRIQUE DU NORD

AMÉRIQUE DU SUD

E U R O P E

A F R I Q U E

A S I E

ASIE OCCIDENTALE

CHINE

A U S T R A L I E

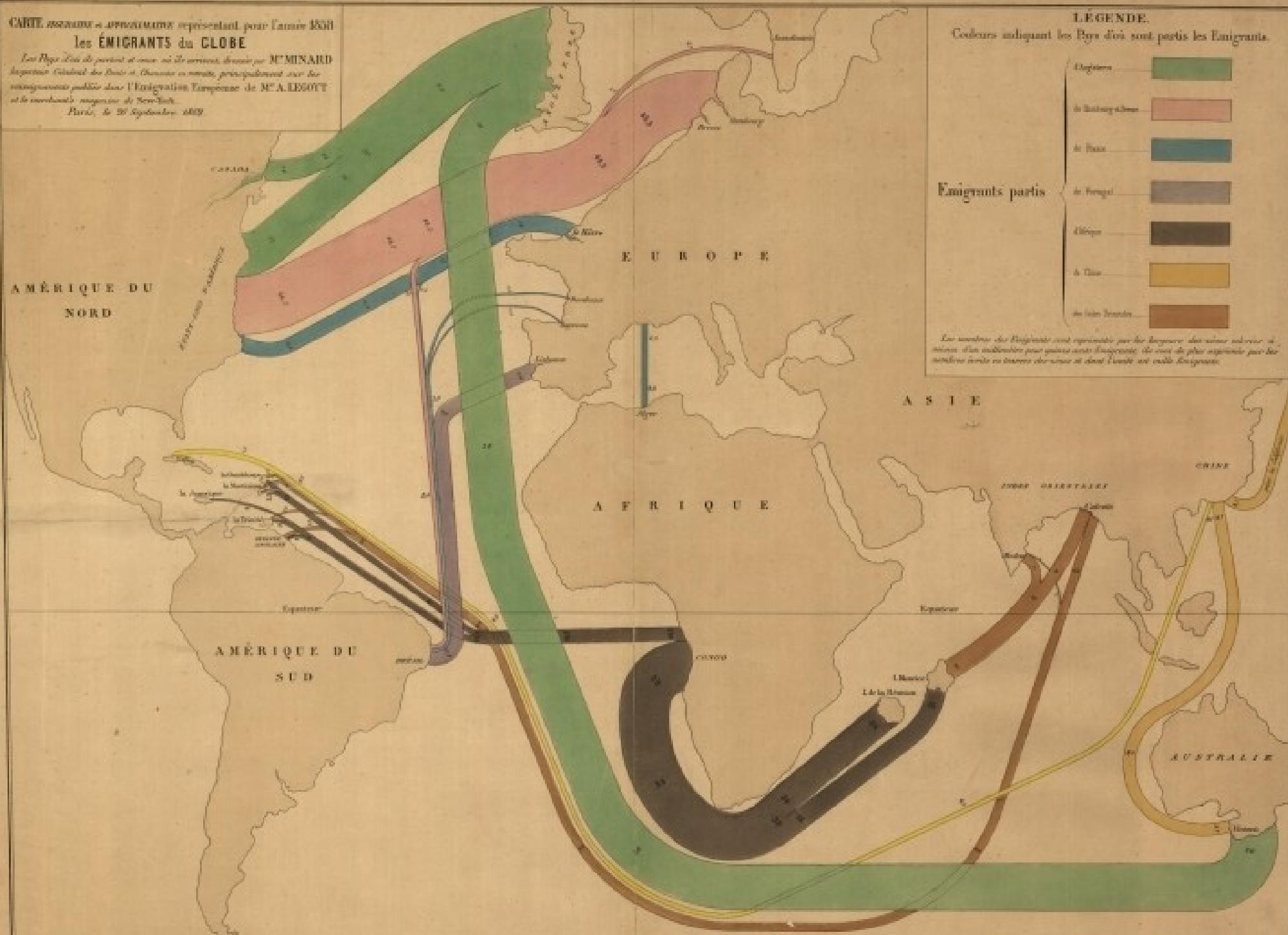
LÉGENDE.

Couleurs indiquant les Pays d'où sont partis les Emigrants.

Angleterre	
de l'Allemagne	
de France	
de Portugal	
de Belgique	
de Russie	
de la Suisse	

Emigrants partis

Les nombres des Emigrants sont exprimés par des longueurs des voies indiquées, et  
celles d'elles indiquent pour quelle route l'émigration, de quoi ou plus exactement pour les  
nombres écrits en tracés obliques et dont l'unité est celle d'émigrants.



# Survived

Survived

Perished

Sex

Male

Female

Age

Adult

Child

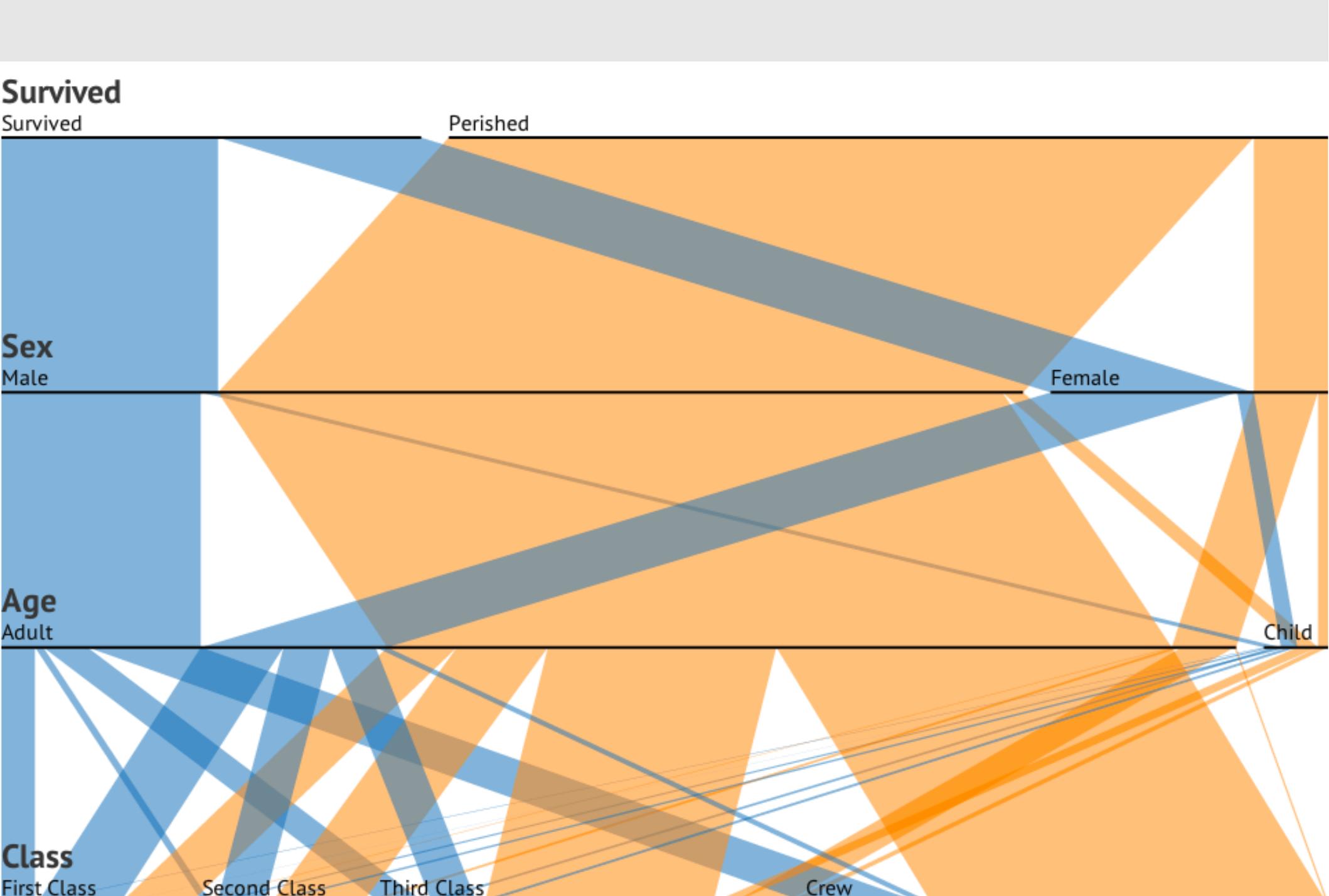
Class

First Class

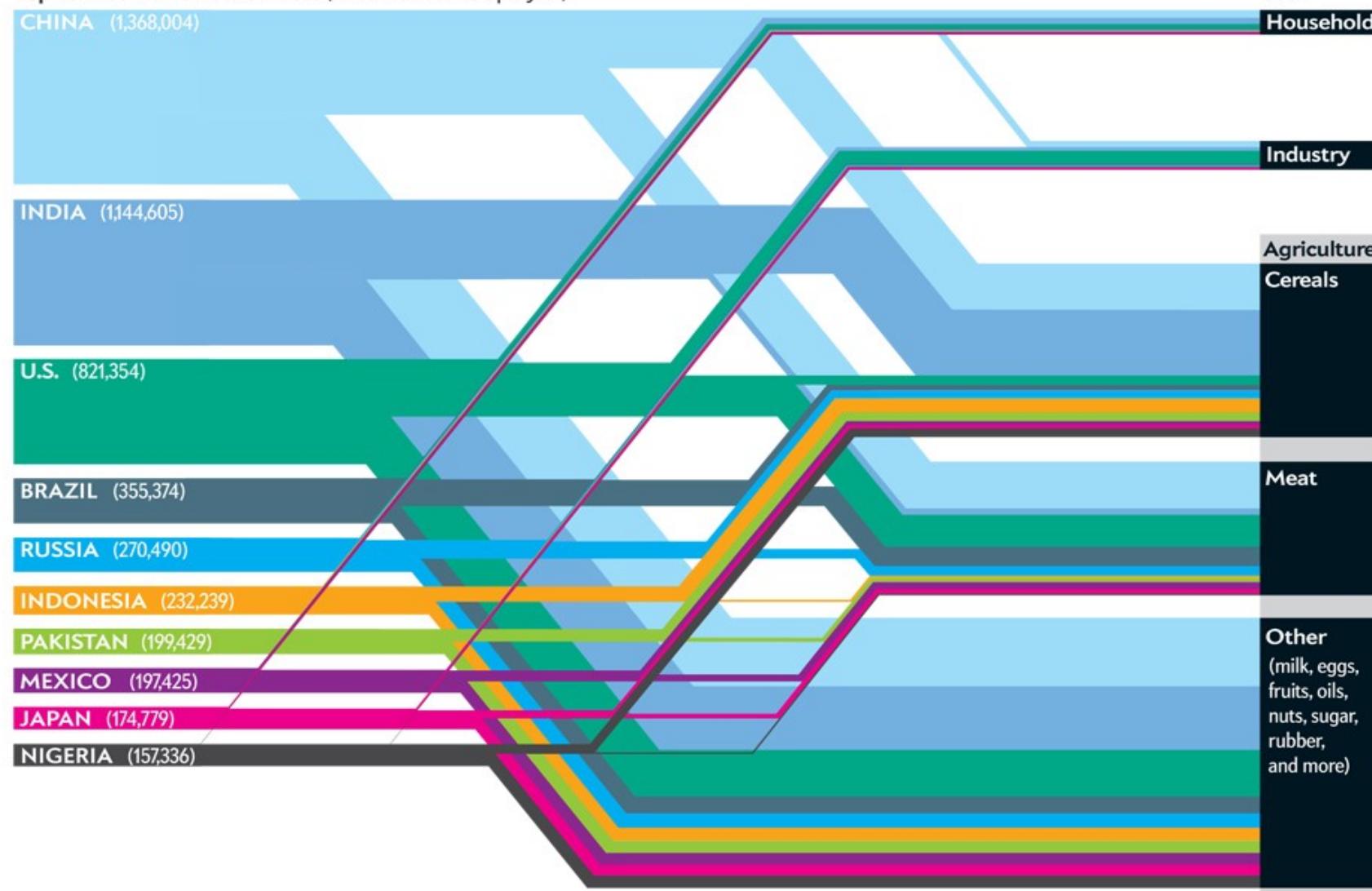
Second Class

Third Class

Crew



### Top 10 Freshwater Consumers (million cubic meters per year)



Largest Net Importers and Exporters of Virtual Water  
(in crop, animal and industrial products)



Graphics by Jen Christiansen

Source: "The Water Footprint of Humanity," by Arjen Y. Hoekstra and Mesfin M. Mekonnen, in Proceedings of the National Academy of Sciences USA. Published online February 13, 2012

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A 3D perspective aerial view of a city area featuring a large, light-colored stadium with a distinctive curved roof. The stadium is surrounded by a complex network of roads and green spaces. A large, semi-transparent purple polygonal shape is overlaid on the left side of the image, covering parts of the stadium and the surrounding urban landscape. In the bottom right corner, there is a black rectangular callout box containing the text "Busy traffic crossing".

Busy traffic crossing



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EN | FR contact oecd.org

Index

Countries

Topics

About



### Create Your Better Life Index

Rate the topics according to their importance to you:

Topic	Importance (Slider)
Housing	<input type="range" value="0"/>
Income	<input type="range" value="0"/>
Jobs	<input type="range" value="0"/>
Community	<input type="range" value="0"/>
Education	<input type="range" value="0"/>
Environment	<input type="range" value="0"/>
Civic Engagement	<input type="range" value="0"/>
Health	<input type="range" value="0"/>
Life Satisfaction	<input type="range" value="0"/>
Safety	<input type="range" value="0"/>
Work-Life Balance	<input type="range" value="0"/>

Reset

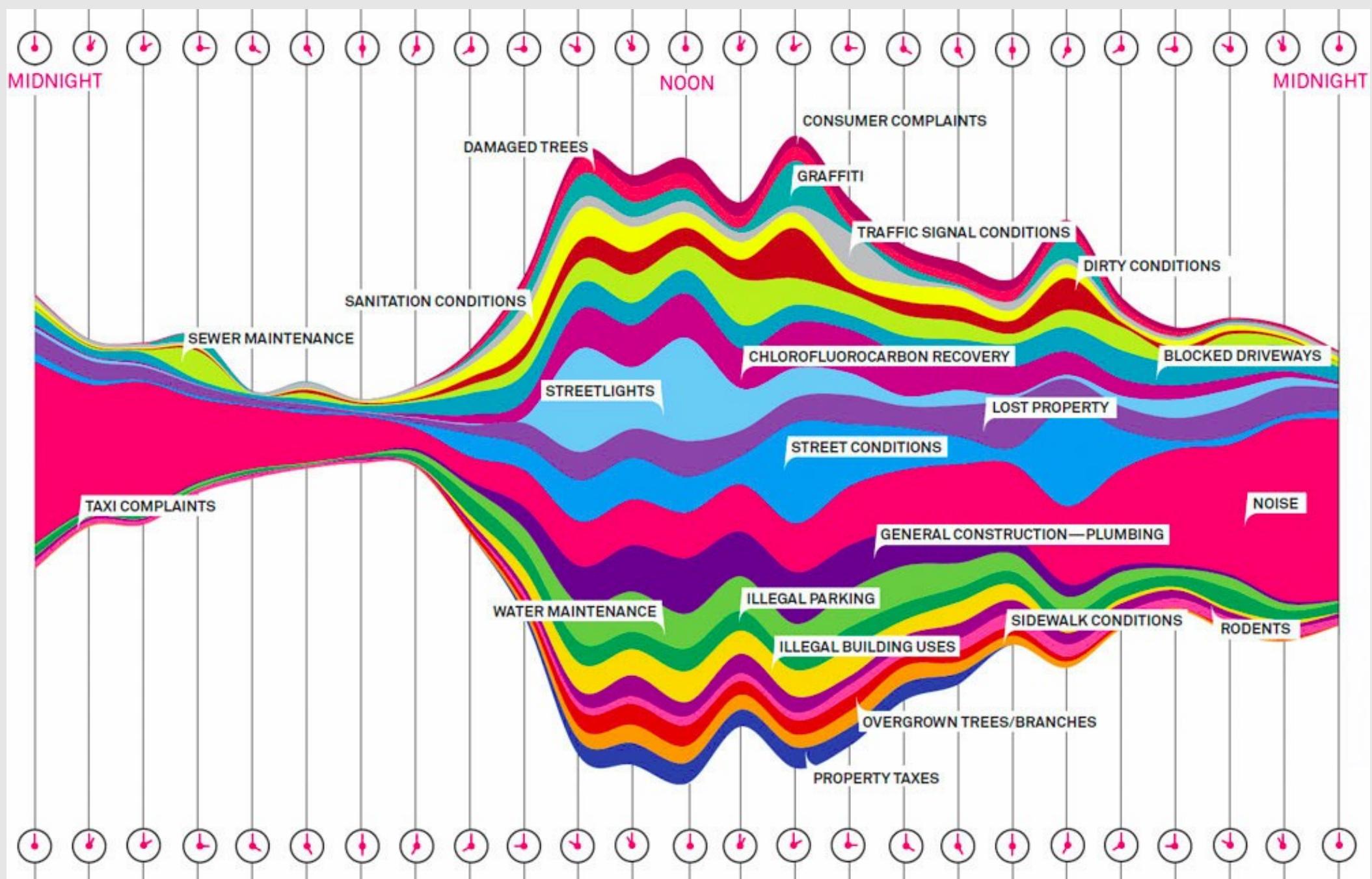
Help

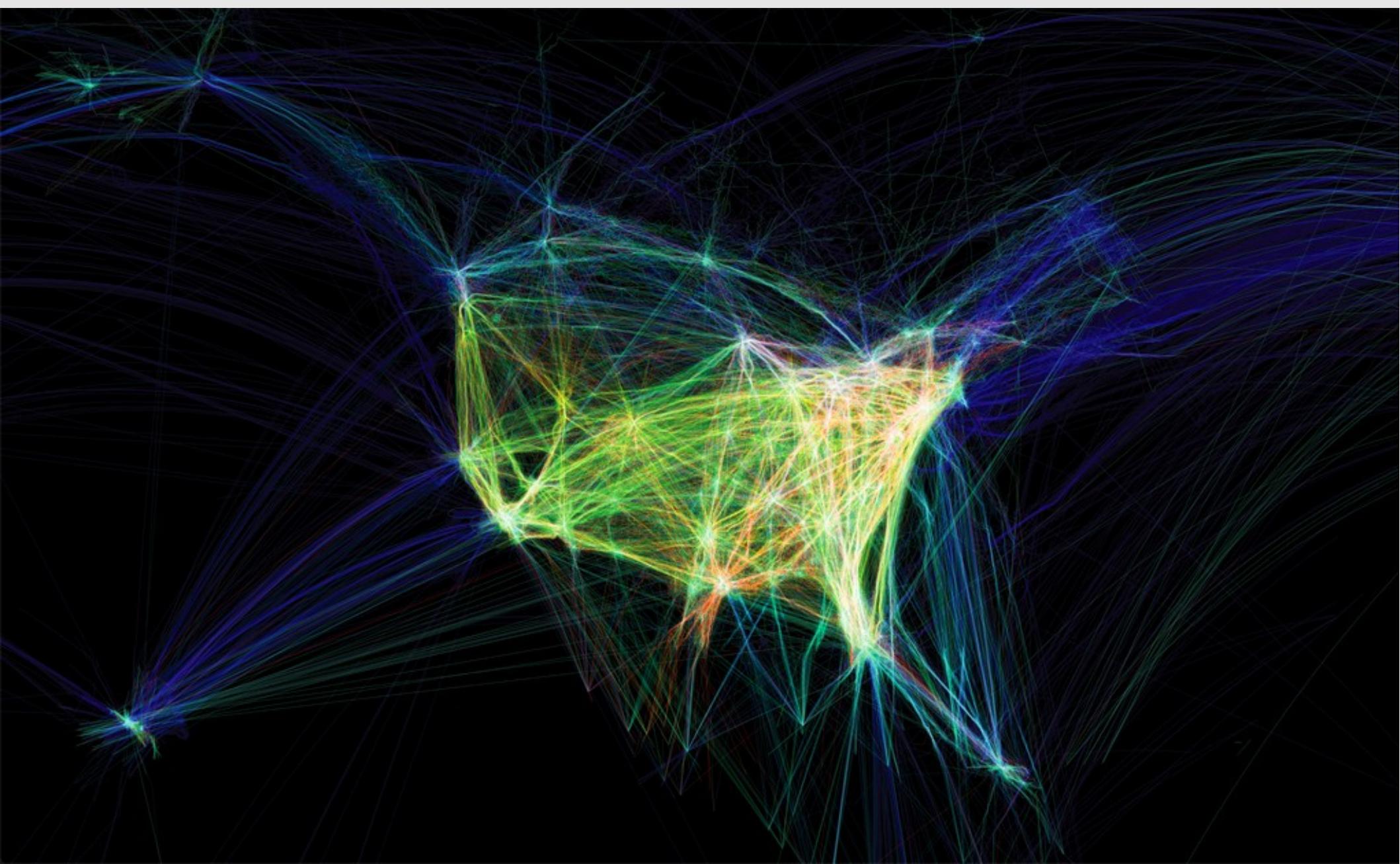
Compare men and women

Compare your index

Share your index

# How's life?

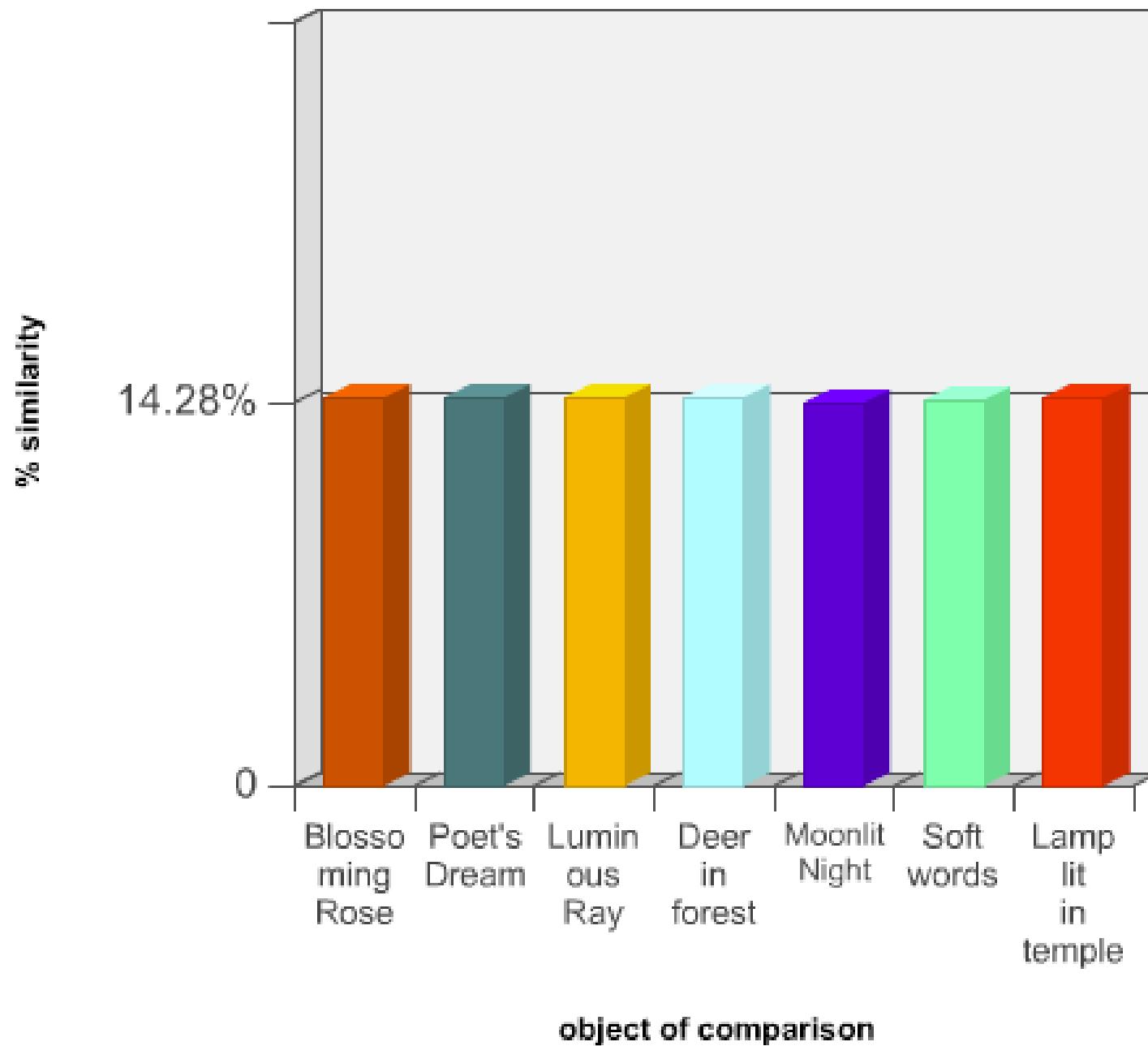




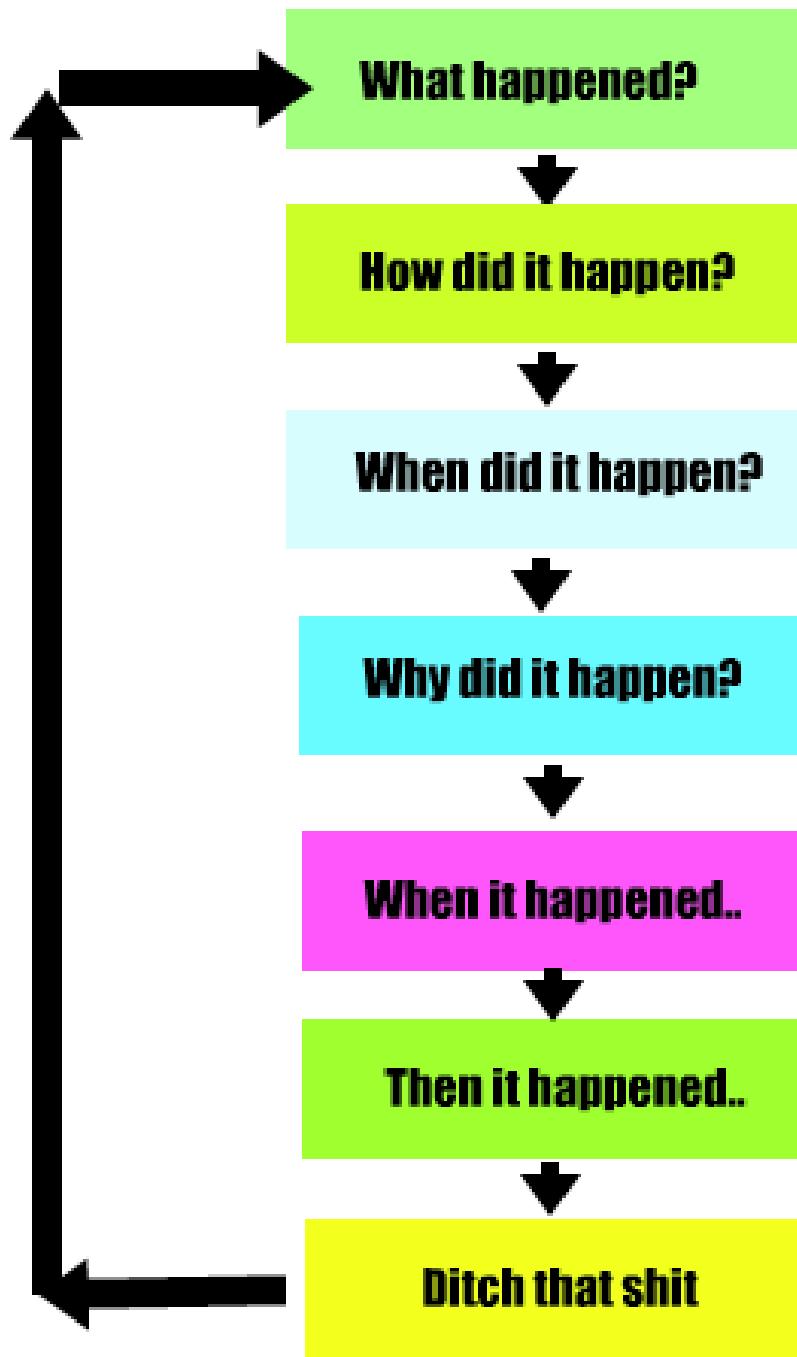
# Subjective guiding principles

- juxtapose, compare and relate
- combine/collect data to challenge existing views
- it is easy to make complicated and beautiful data visualisations but difficult to communicate them
- reading visualisation requires understanding of the context, do not generalise the visualisation too much

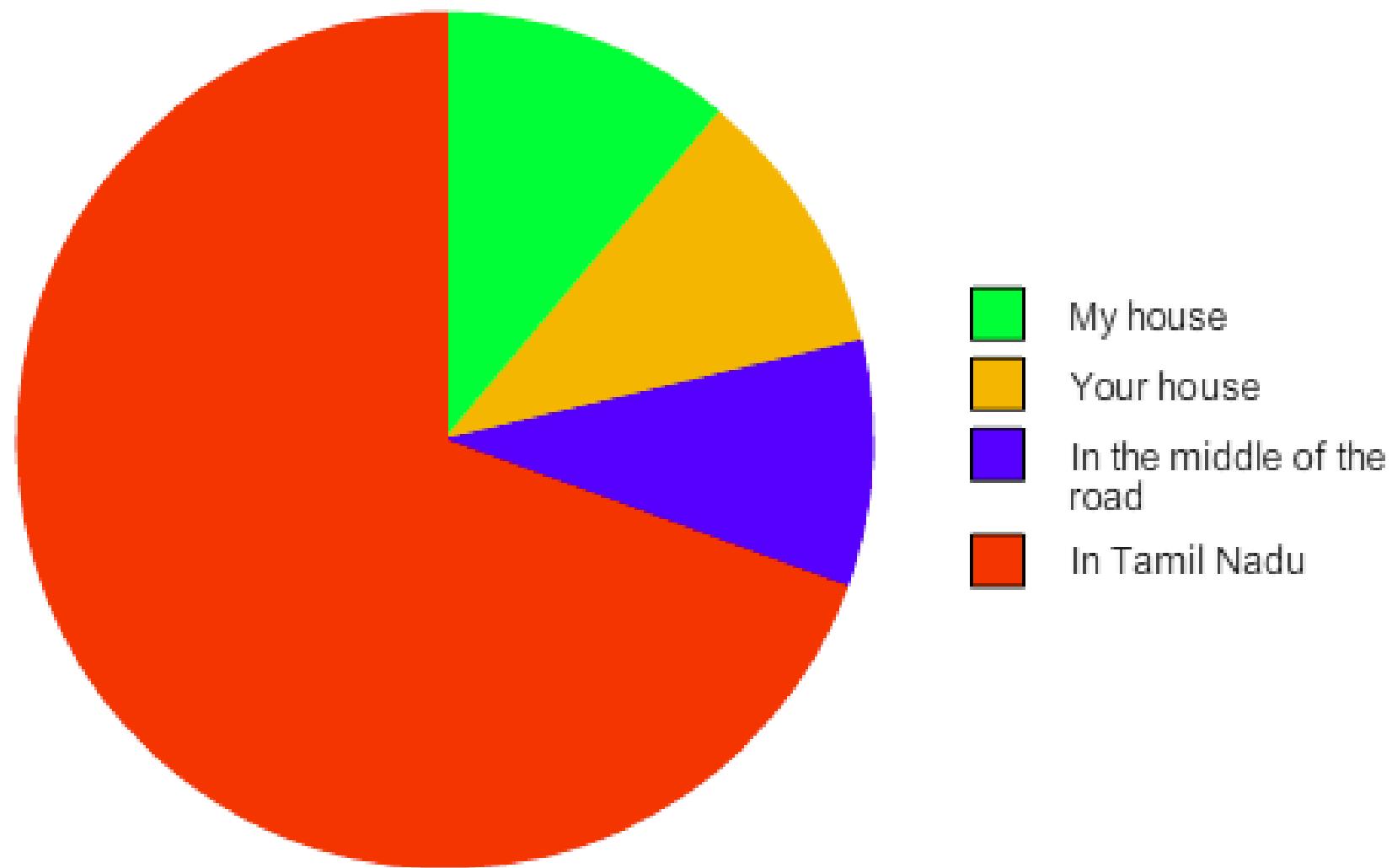
# When I saw a girl in 1942, it felt like



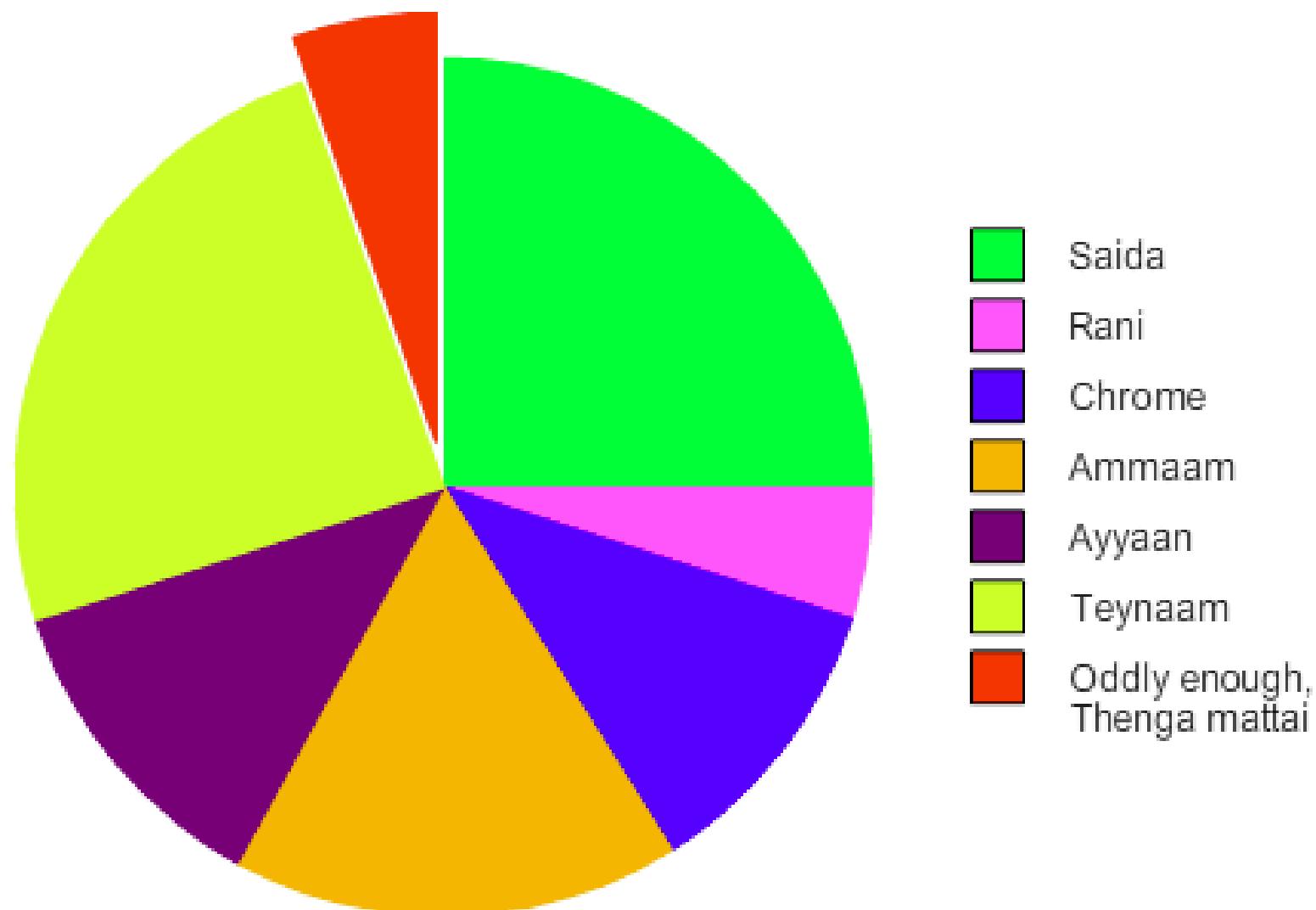
# Rajesh Khanna's algorithm of life



# Party Location probabilities



# Kinds of Pettais that make up Tamil Nadu based Hip-Hop



# Subjective guiding principles

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