

Datascience

04 - Basics of infographics and visualization



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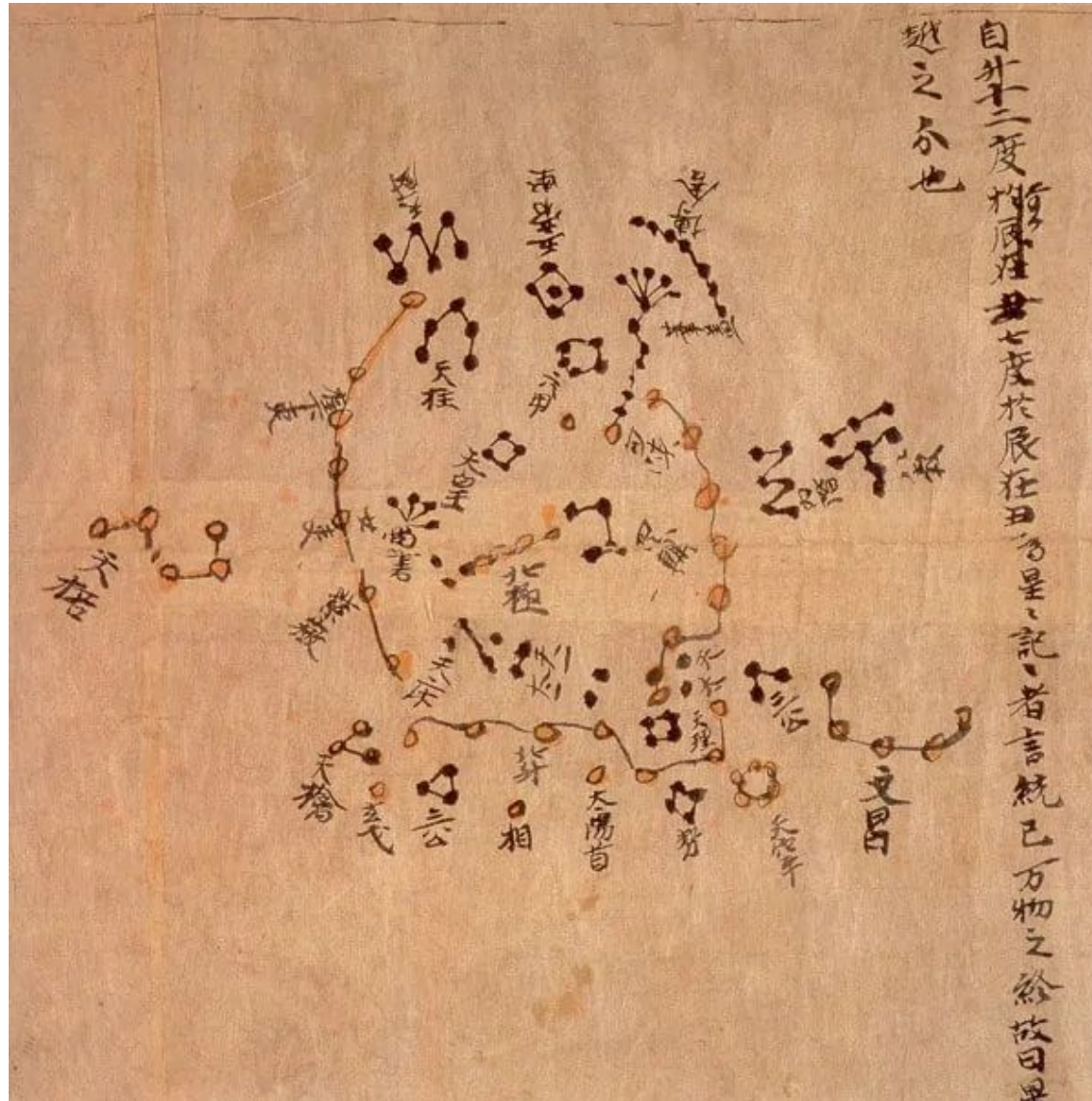
Key Features of Infographics:

- Goal is to make large amounts of data immediately understandable.
- Information can be quickly digested.
- Possibly visually striking.

All Infographics Contain:

- **Content** Almost all infographics use some text to get the message across. However, there are some infographics – such as the IKEA stick figures – which convey the message without any text.
- **Visuals:** The visuals need to be striking and clearly convey the information.
- **Knowledge:** The goal of an infographic is to convey information. Without knowledge, then it is just a graphic and not infographic.

History - Cave paintings



History - Maps

Beatus of Liébana was a monk geographer from the Iberian Kingdom of Asturias during the eighth-century. He created this world map around the year 776, basing it on the accounts given by Isidore of Seville, Ptolemy and the Holy Bible.

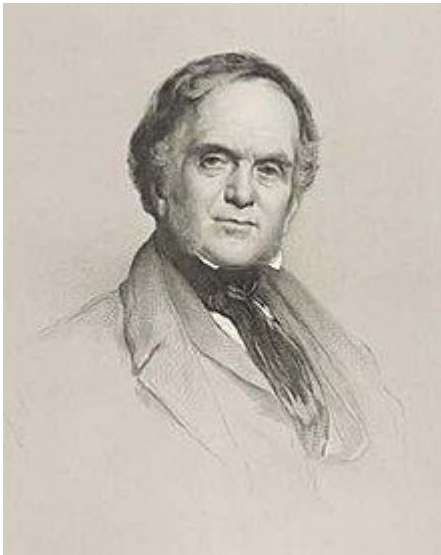


History - Maps



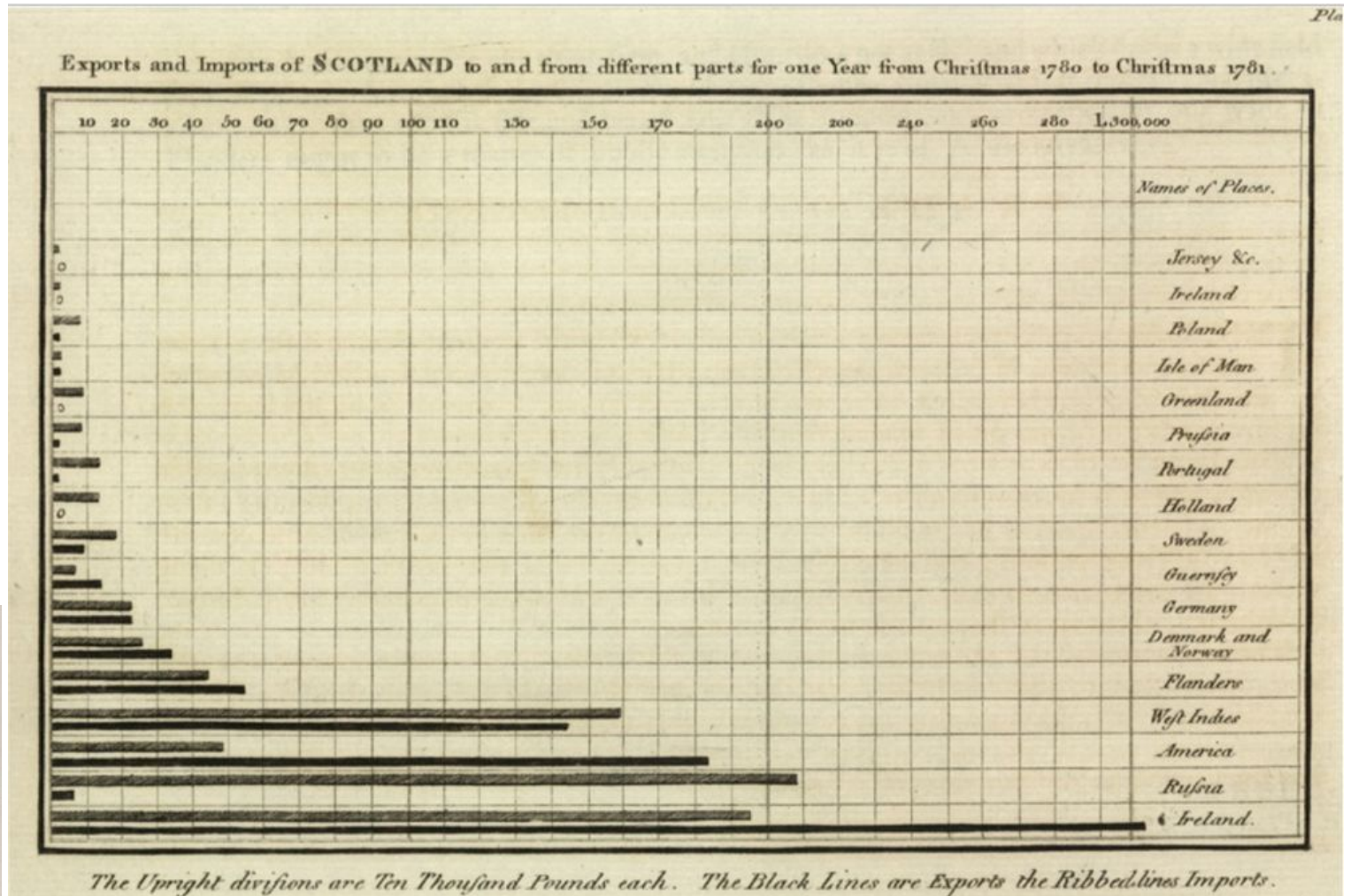
History - William Playfair 1759-1823

- He invented the pie charts
- Also line and area charts etc.



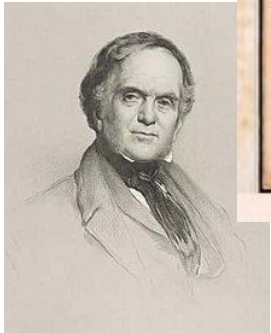
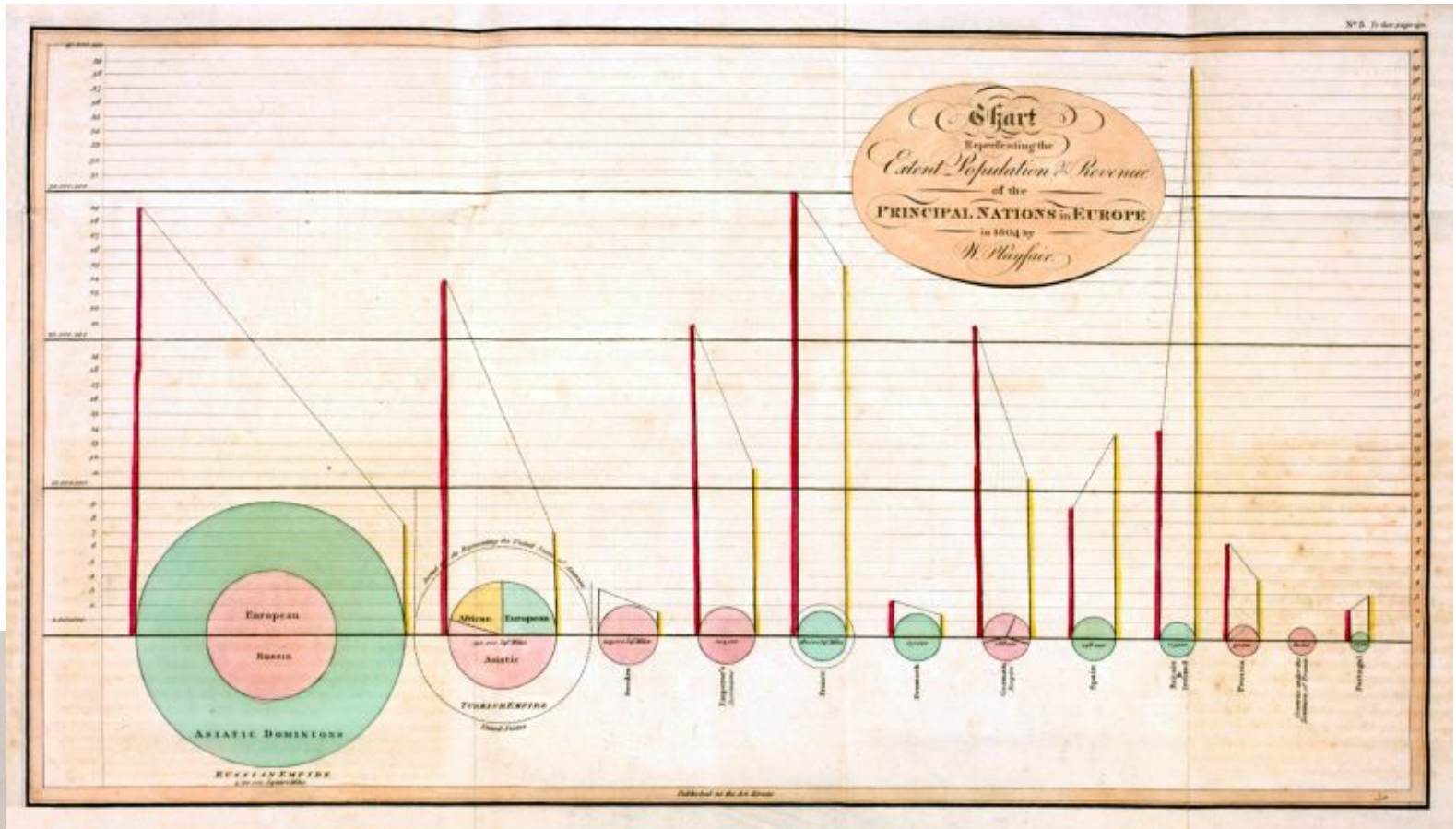
History - William Playfair 1759-1823

Exports and imports of Scotland



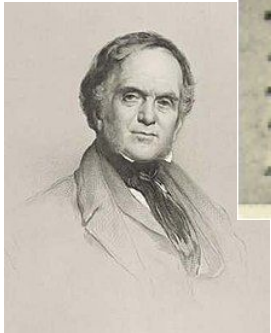
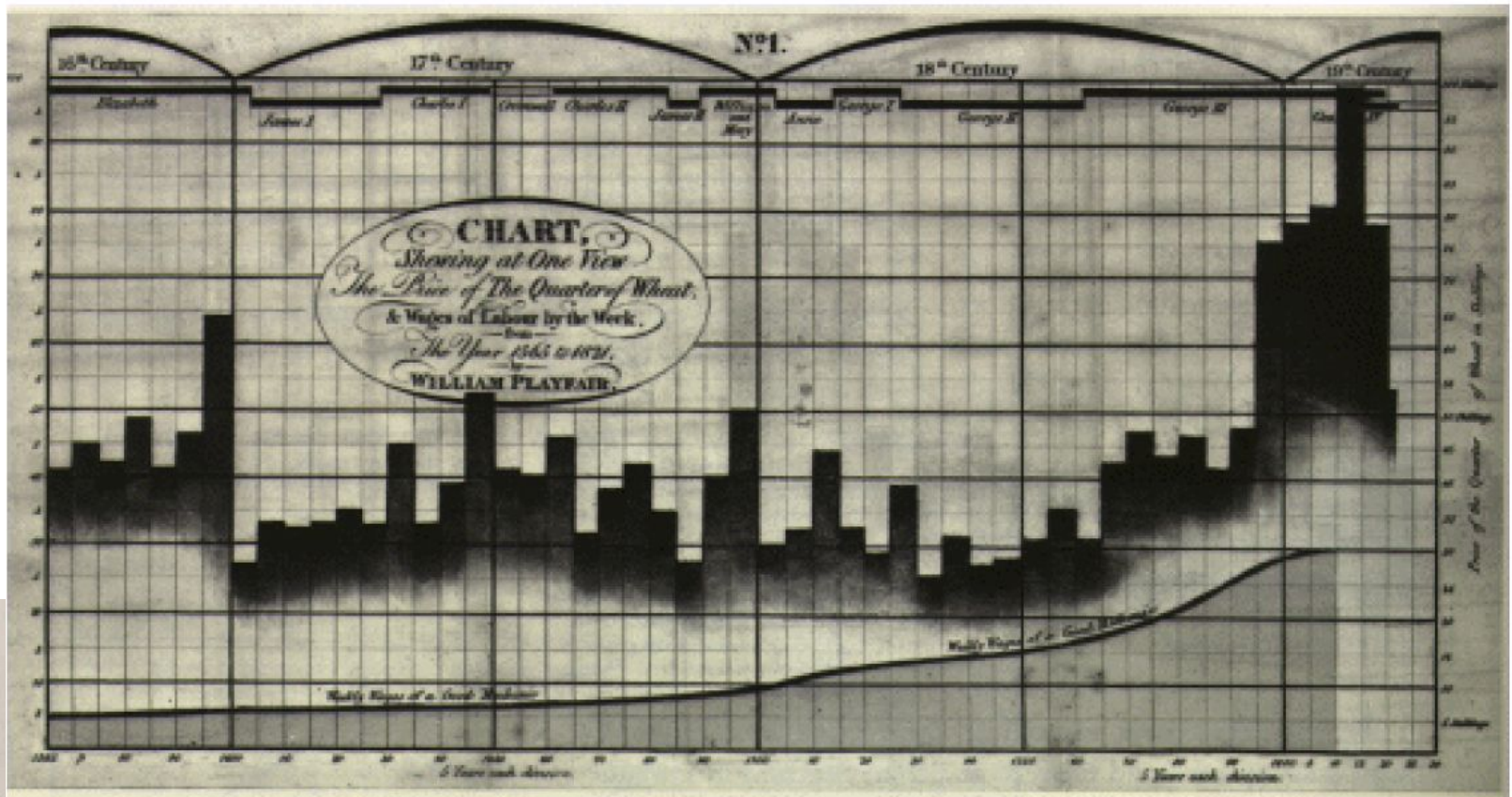
History - William Playfair 1759-1823

Statistics of main countries



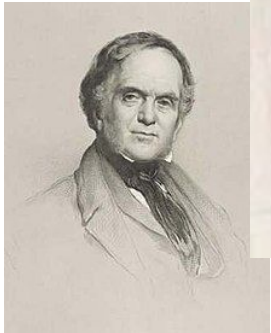
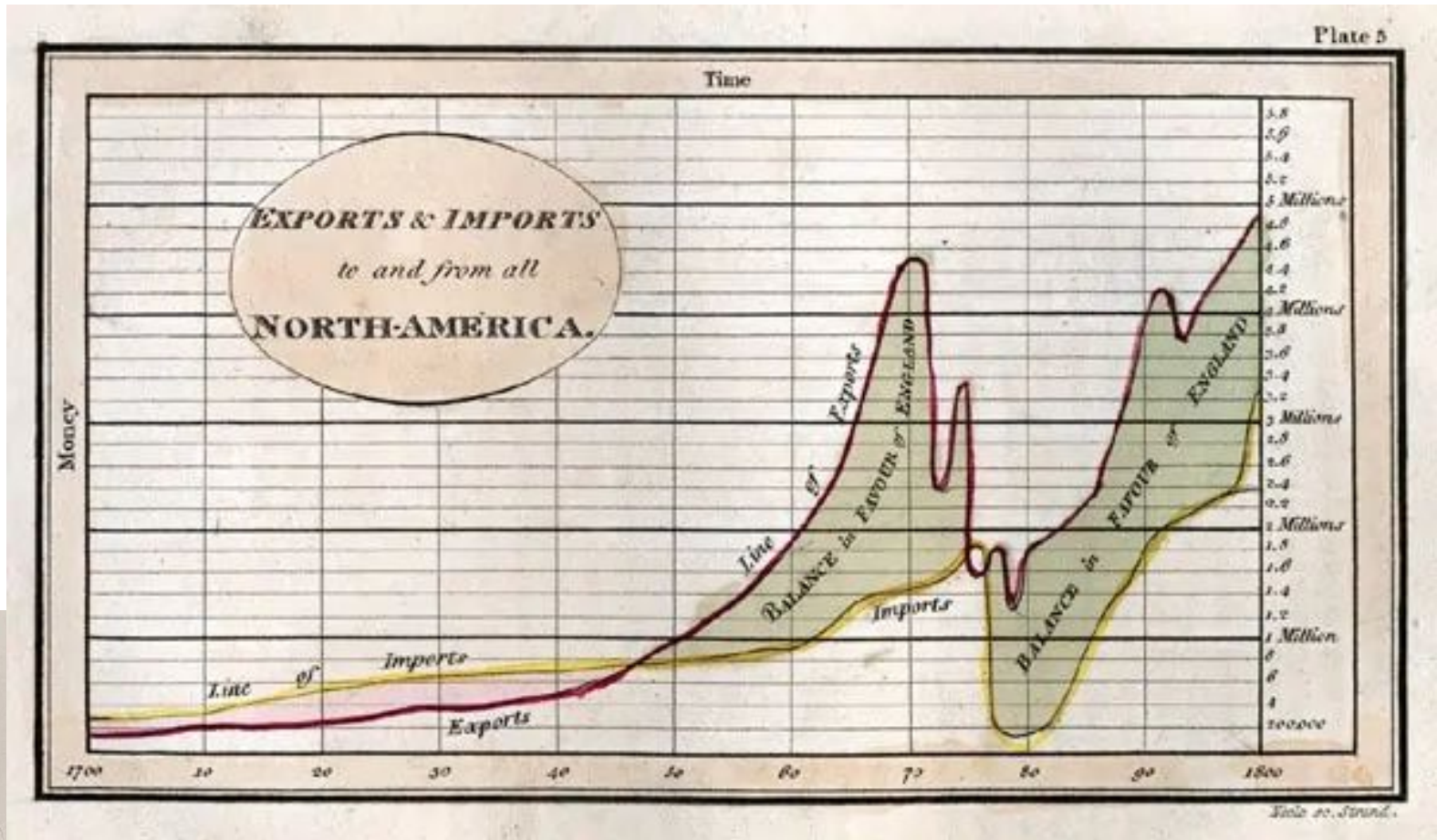
History - William Playfair 1759-1823

compares three parallel time-series: prices of wheat, wages, and the reigns of British kings and queens.



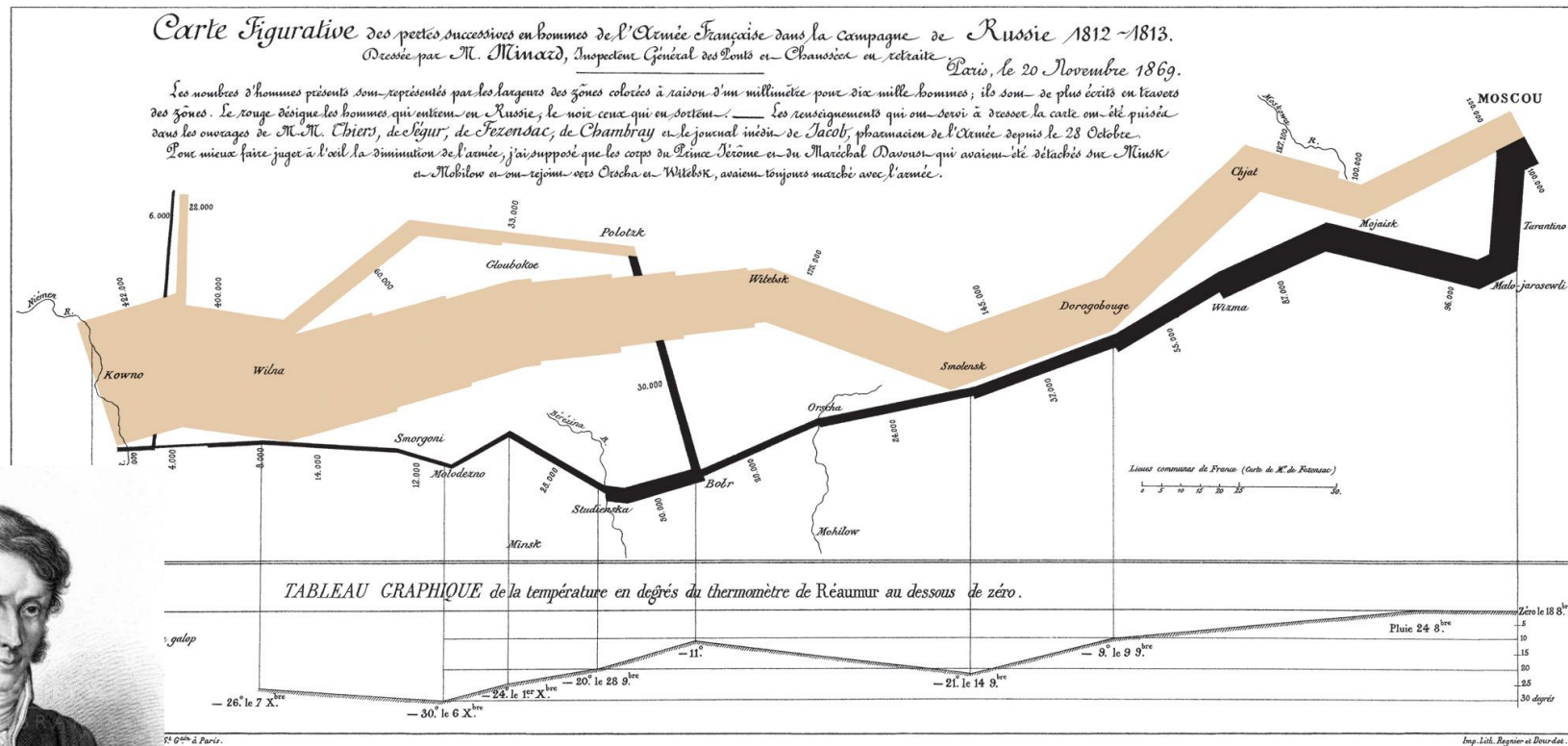
History - William Playfair 1759-1823

Export and import of North America



History - Charles Joseph Minard

1861 graphic depicting the Russian campaign of 1812



History - Florence Nightingale 1820 – 1910

- She was an English social reformer, statistician and the founder of modern nursing.

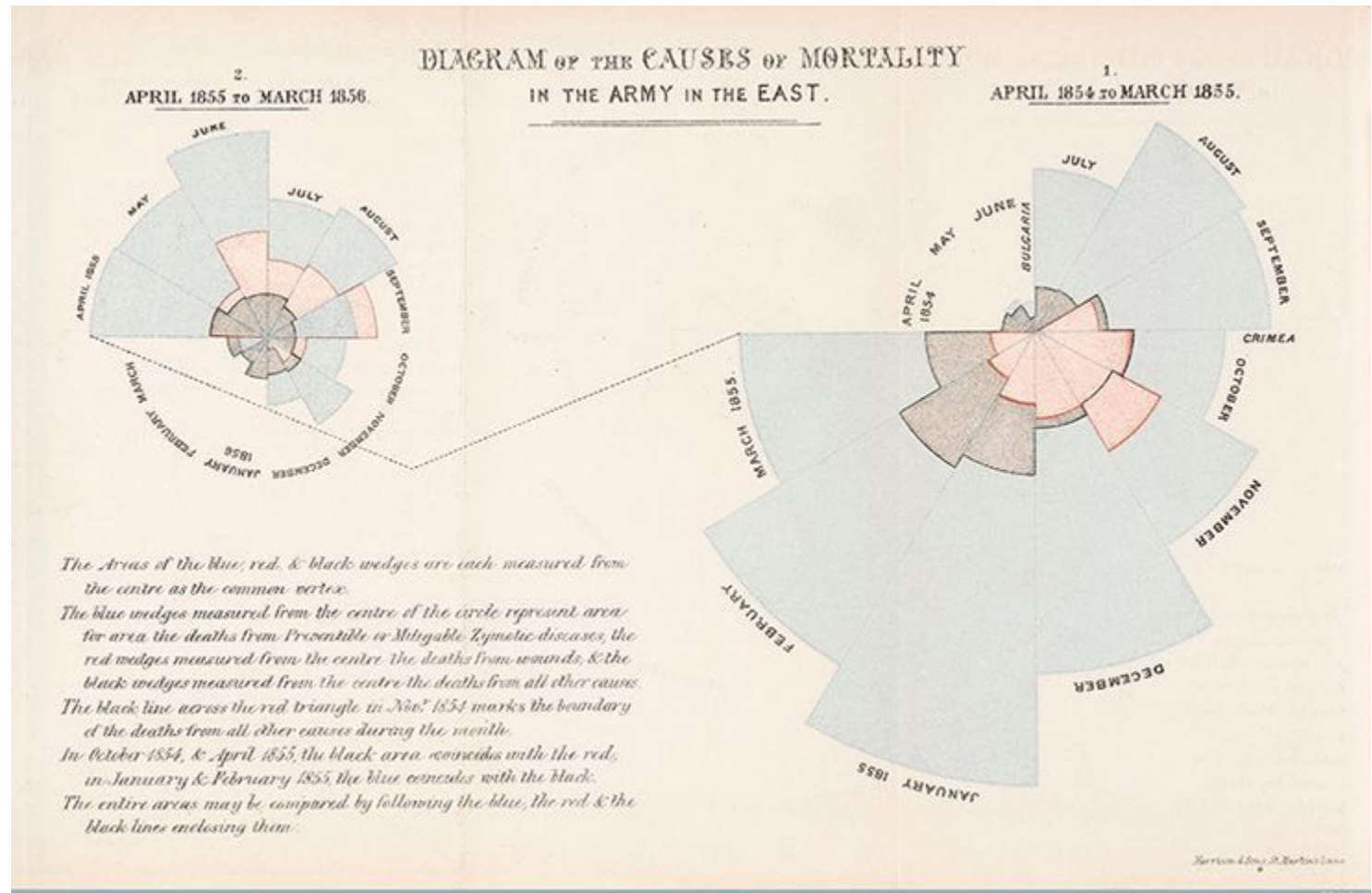


FIGURE 2

representing the relative Sexual Morbidity from ALL CAUSES, ZYTIOTIC DISEASES, GONORRHOEA, AND VENEREAL DISEASES in the ENGLISH MALE POPULATION aged 15-45, and in the DEPARTMENT OF THE LINE serving at home

ENGLISH MALE POPULATION aged 15-45 (1881-1882)

| Age in Years | Sexual Morbidity | Zyotiatic Diseases | Gonorrhoea | Venerae Diseases |
|--------------|------------------|--------------------|------------|------------------|
| 15-20 | 10,000 | 1,000 | 1,000 | 1,000 |
| 20-25 | 9,000 | 1,000 | 1,000 | 1,000 |
| 25-30 | 8,000 | 1,000 | 1,000 | 1,000 |
| 30-35 | 7,000 | 1,000 | 1,000 | 1,000 |
| 35-40 | 6,000 | 1,000 | 1,000 | 1,000 |
| 40-45 | 5,000 | 1,000 | 1,000 | 1,000 |

Sexual Morbidity is 100 times from 15-20, 100 times from 20-25, 100 times from 25-30, 100 times from 30-35, 100 times from 35-40, 100 times from 40-45

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ENGLISH MALE POPULATION aged 15-45 (1881-1882)

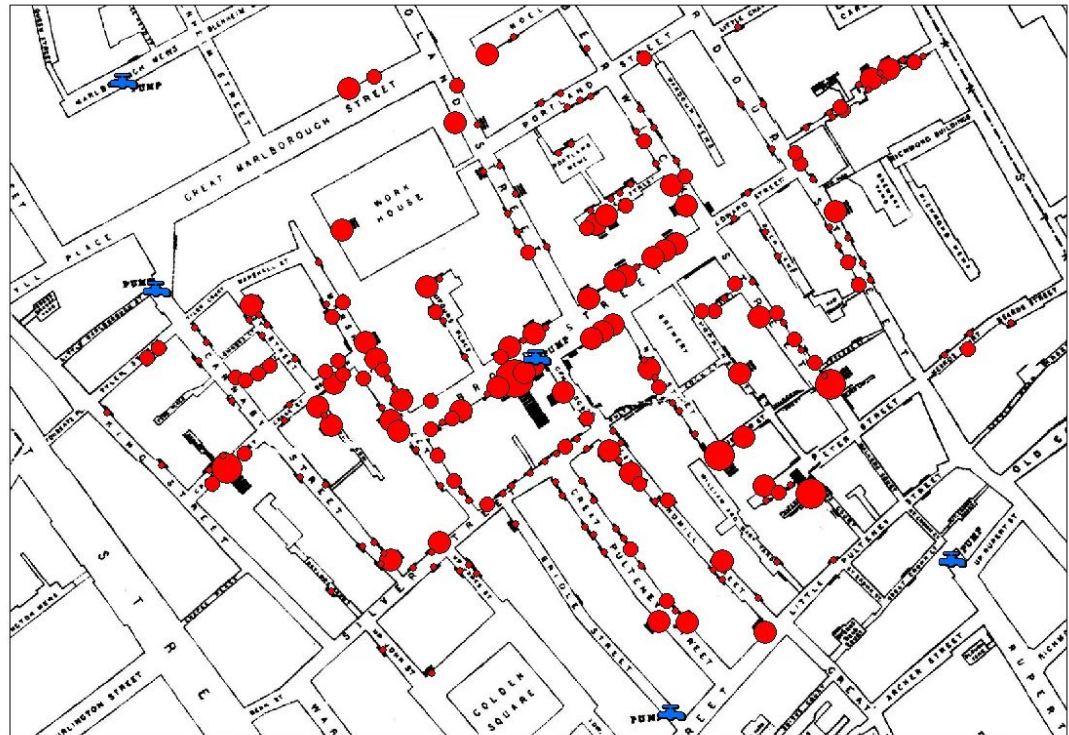
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History - Dr. John Snow and the cholera outbreak 1854

- He plotted the location and number of deaths and the location of water wells and showed that for the cholera outbreak only one well was responsible.



History - Timeline of data visualization

- Milestones in the History of Thematic Cartography, Statistical Graphics, and Data Visualization

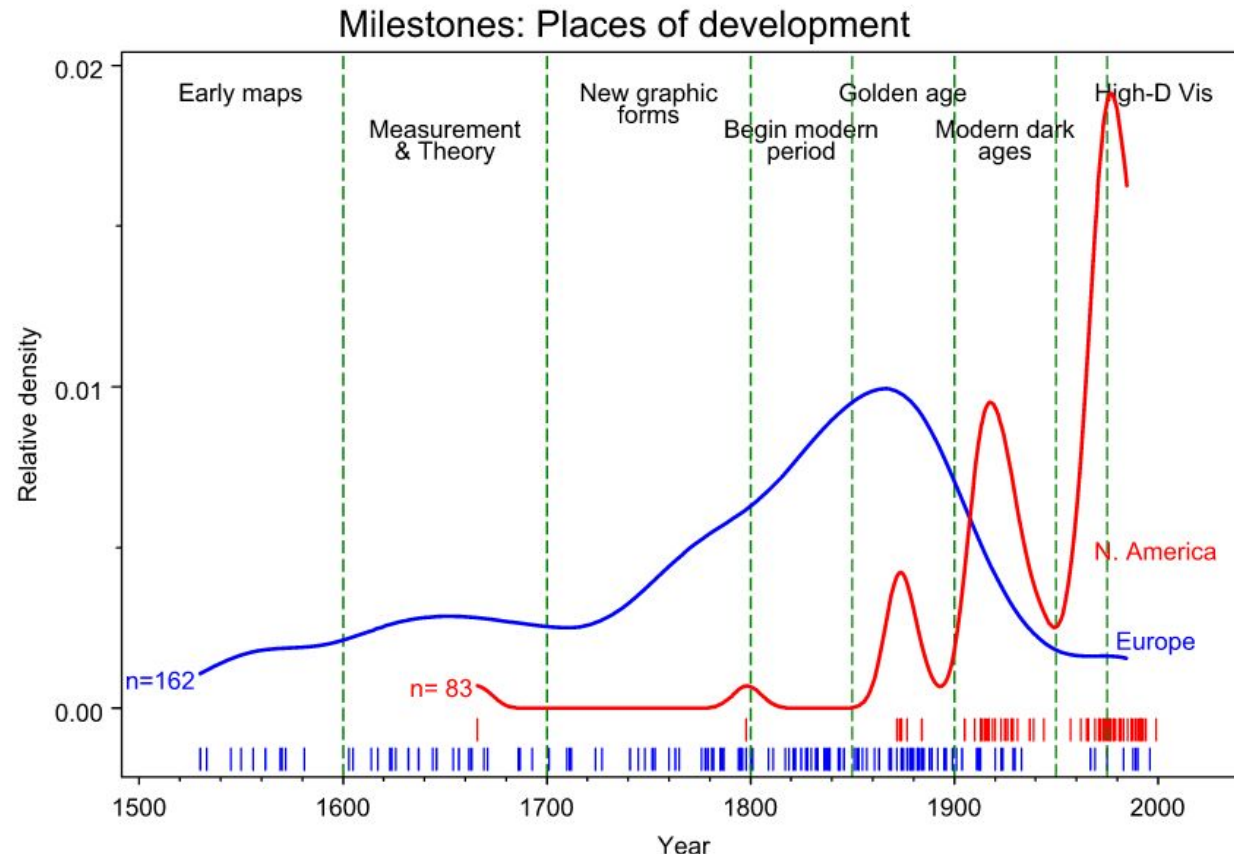


Figure 1.16. The distribution of milestone items over time, comparing trends in Europe and North America

Further readings

- <https://www.slideshare.net/thompsonkaren/data-visualization-theory-59604862>
- <https://medium.com/public-health/john-snow-early-big-data-science-d62b4dacd71b>
- A lengthy handbook from the pre-jupyter era:
http://www.haralick.org/DV/Handbook_of_Data_Visualization.pdf -
- **Rules for preparing graphics:**
http://ling.uni-konstanz.de/pages/home/butt/main/material/lingvis/VisTheory_v1_online.pdf

Visualization Platforms

<https://financesonline.com/data-visualization/>



What Are the 20 Best Data Visualization Software Solutions of 2020?

1 Sisense

2 Looker

3 Zoho Analytics

4 Reveal

5 Periscope Data

6 Tableau

7 Domo

8 Microsoft Power BI

9 Qlikview

10 Klipfolio

11 IBM Watson Analytics

12 MATLAB

13 SAP Analytics Cloud

14 Kibana

15 Plotly

16 Chartio

17 Infogram

18 Highcharts

19 Visme

20 Geckoboard

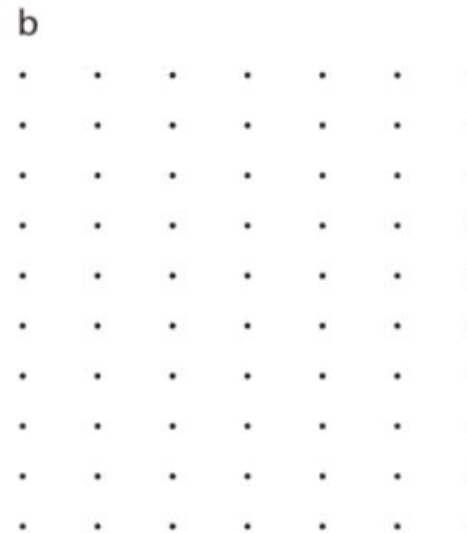
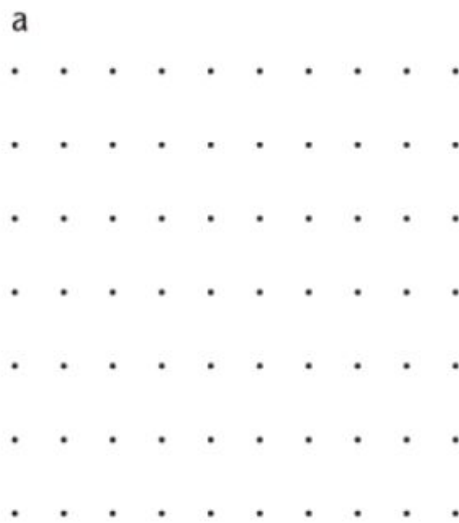
Visualization technique - Gestalt Laws

Gestalt psychology or gestaltism is a school of psychology that emerged in Austria and Germany in the early twentieth century based on work by Max Wertheimer, Wolfgang Köhler, and Kurt Koffka. As used in Gestalt psychology, the German word **Gestalt** is interpreted as **"pattern"** or **"configuration"**. Gestalt psychologists emphasized that organisms perceive entire patterns or configurations, not merely individual components

1. Proximity
2. Similarity
3. Connectedness
4. Continuity
5. Symmetry
6. Closure and Common region
7. Figure and Ground

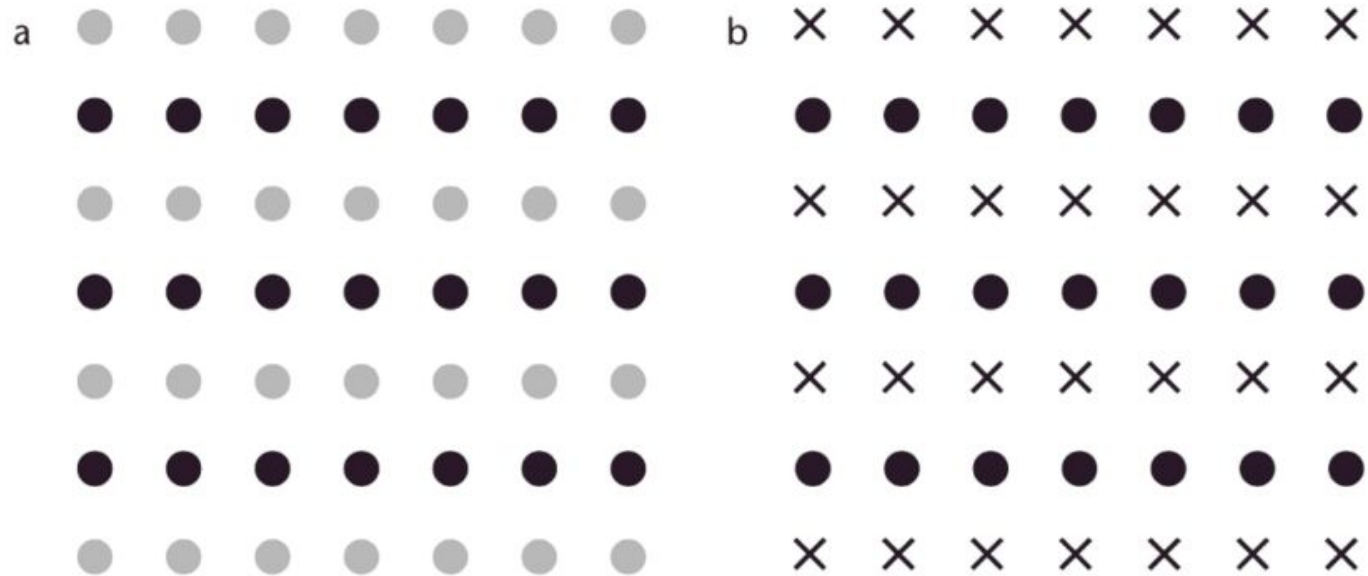
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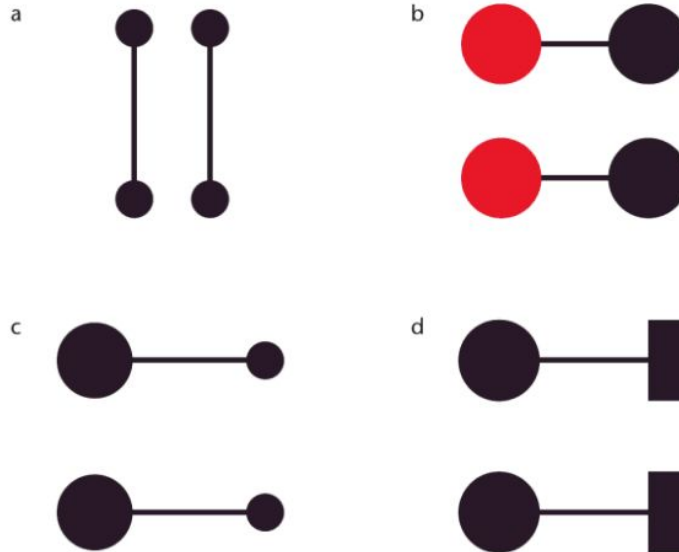
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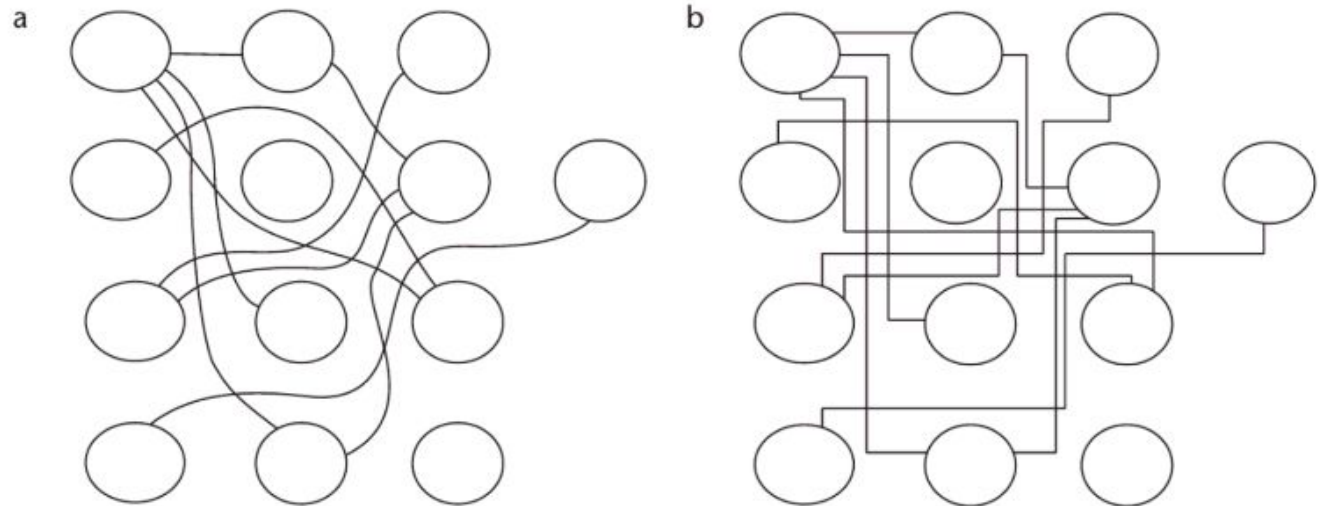
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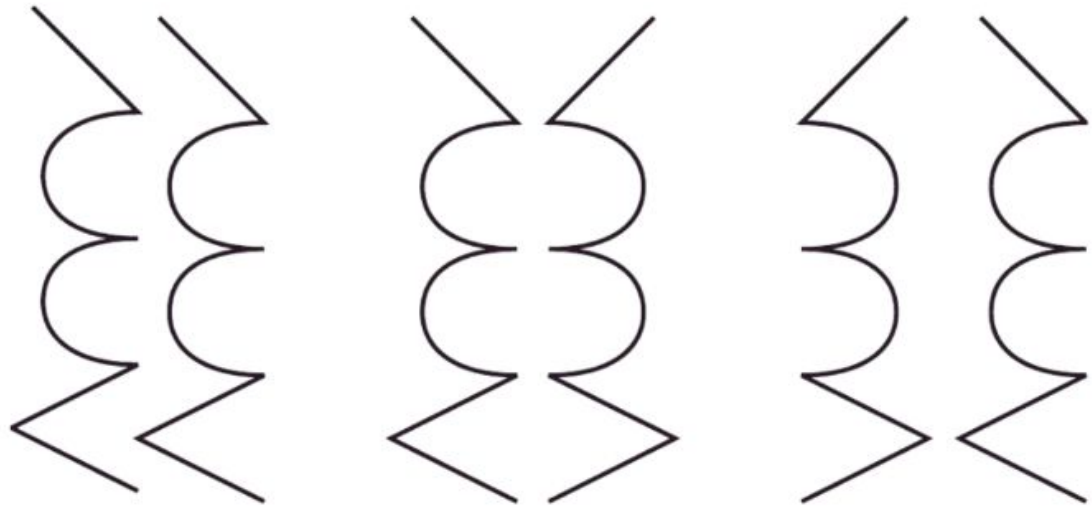
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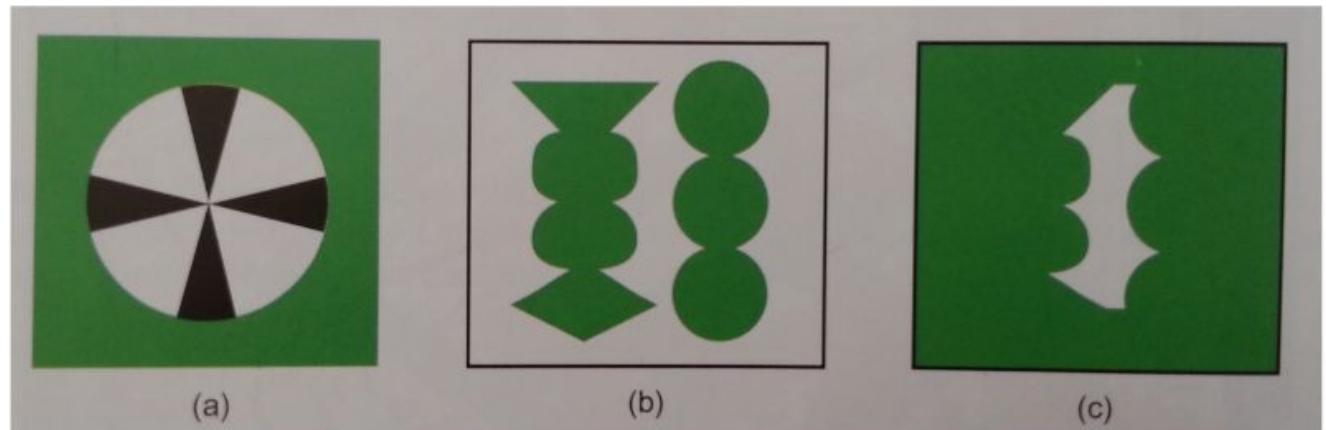
(a)



(b)

Visualization technique - Gestalt Laws

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6. Closure and Common region
7. **Figure and Ground**



Visualization technique - Visual variables of mark

1. Position
2. Shape
3. Size (Length, Area, Volume)
4. Brightness
5. Color
6. Orientation
7. Texture
8. Motion