

# Data Visualization & Design

**Week 6**

This week in **visualization** —

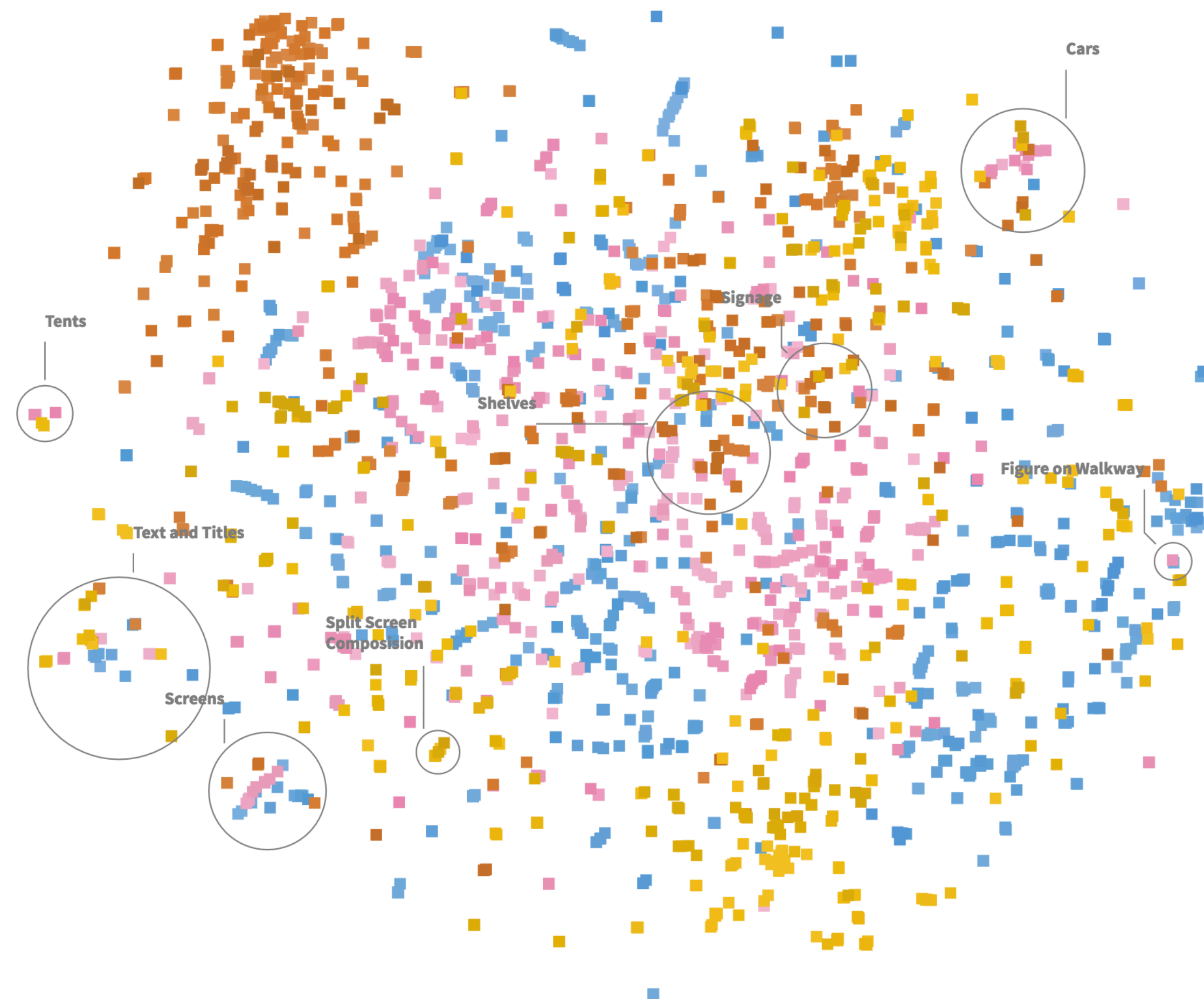
## Model 2: Inception

This next model attempts to go beyond the previous one by constructing our feature matrix not directly from the field of colors, but rather by passing the images through a neural network that has been **trained to recognize objects** within images and using its output.

The neural network we use is a deep learning model called **InceptionV3** that is produced by Google. InceptionV3 is trained on a collection of images known as **ImageNet**.<sup>8</sup> ImageNet is a collection of labelled images in categories such as animals, appliances, birds, furniture, people and much much more. The InceptionV3 model we use has been trained to recognize objects from **1000 of these categories** with a high accuracy.

The output of the InceptionV3 model is a label like “cow” or “hat”. However we can use **one of the internal representations** of images that the network produces to construct our feature matrix. As before we use T-SNE to group similar frames in 2D space.

**Mouse over** or **click** the underlined links below to highlight those groups and to see where those frames would appear in the color-based model we used previously.



# Assignment #2 — **Notes**

1. Data ink

2. Isotype

1. **Data ink**

2. Isotype

## **Data-ink ratio—**

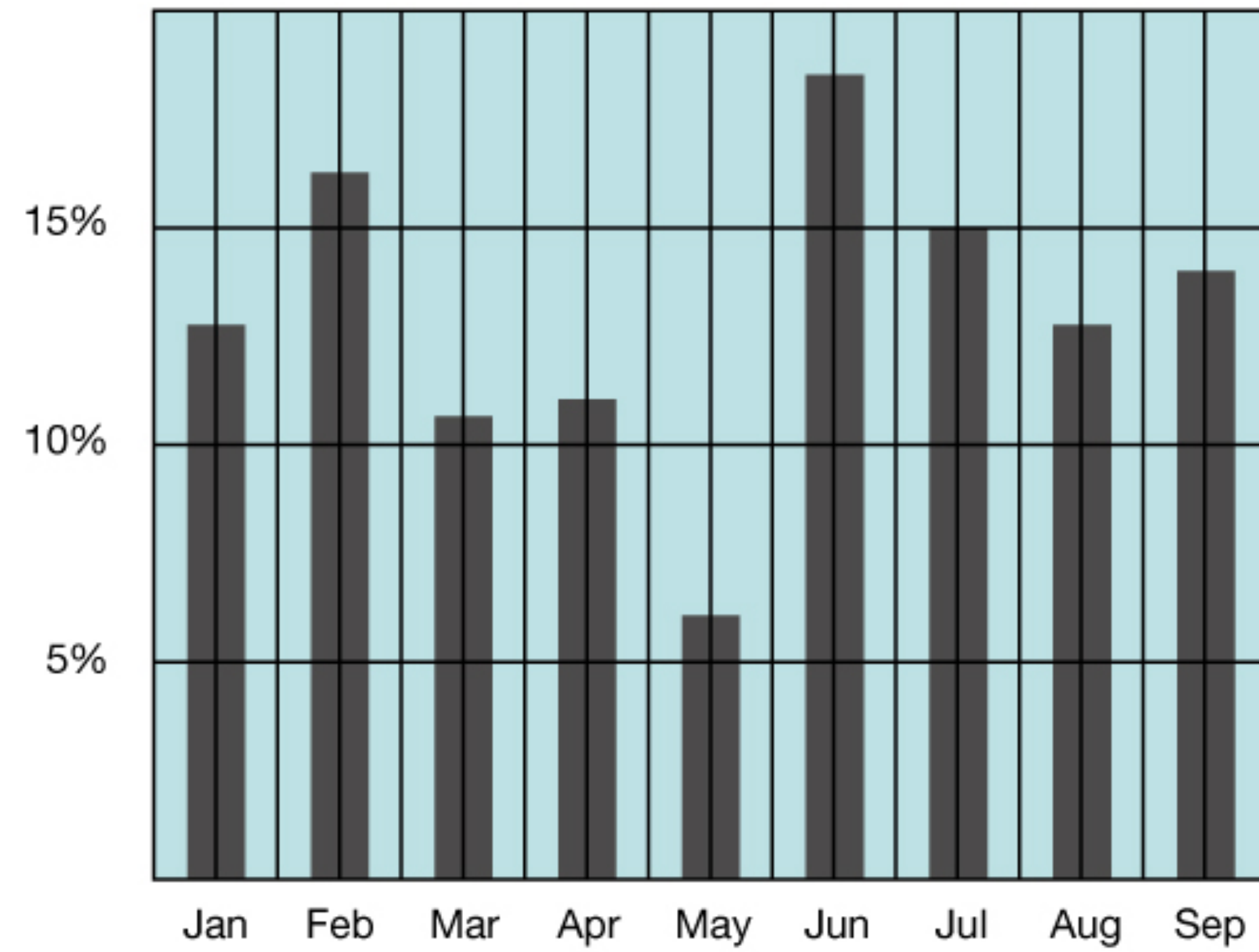
The non-erasable ink used for the presentation of data

*(Edward Tufte)*

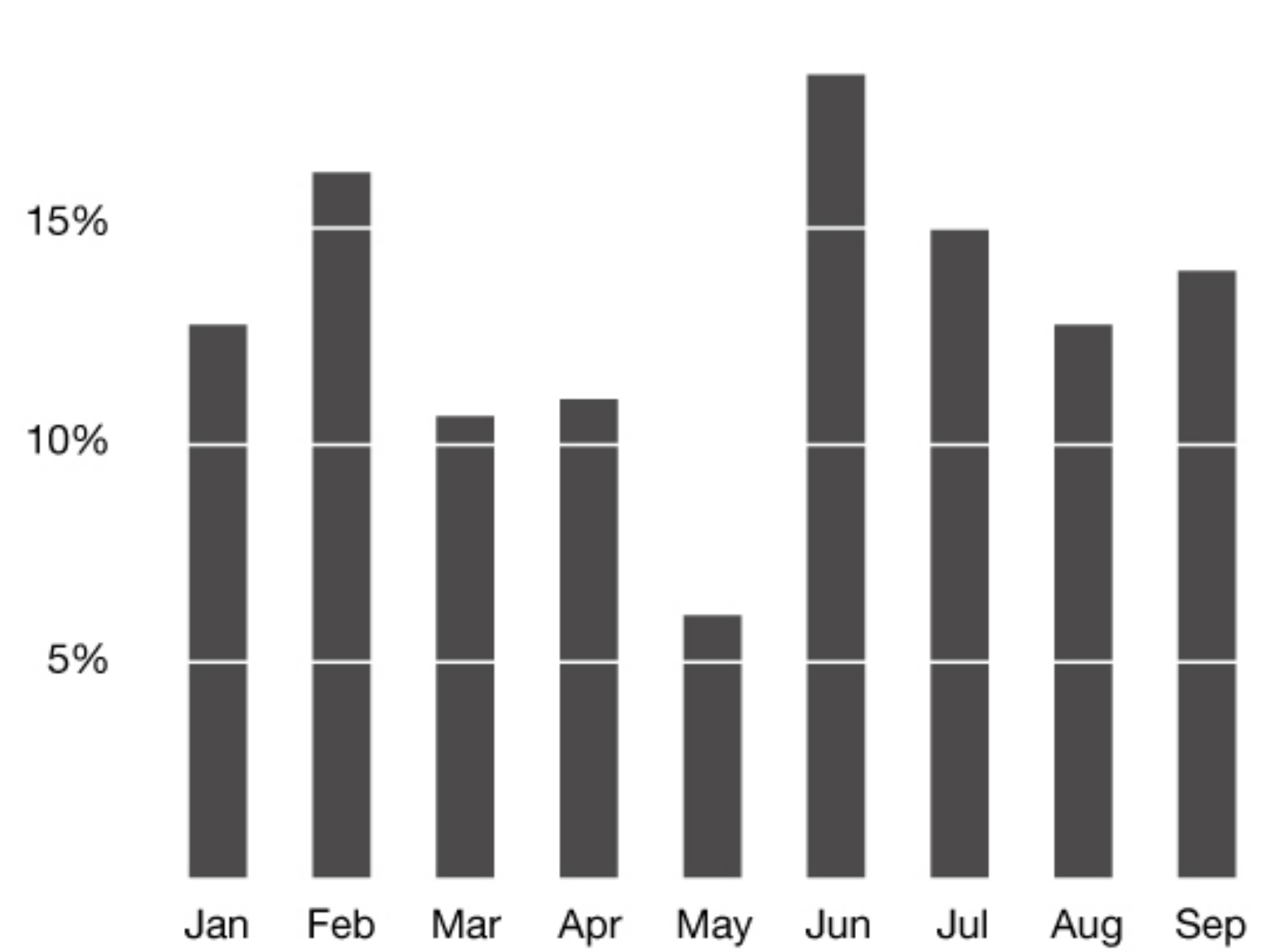
$$\text{Data-ink ratio} = \frac{\text{Data-ink}}{\text{Total ink used to print graphic}}$$



**LOW DATA-INK RATIO**



**HIGH DATA-INK RATIO**



## MONSTROUS COSTS

Total House and Senate  
campaign expenditures,  
in millions



**“CHARTJUNK”**

1. Data ink

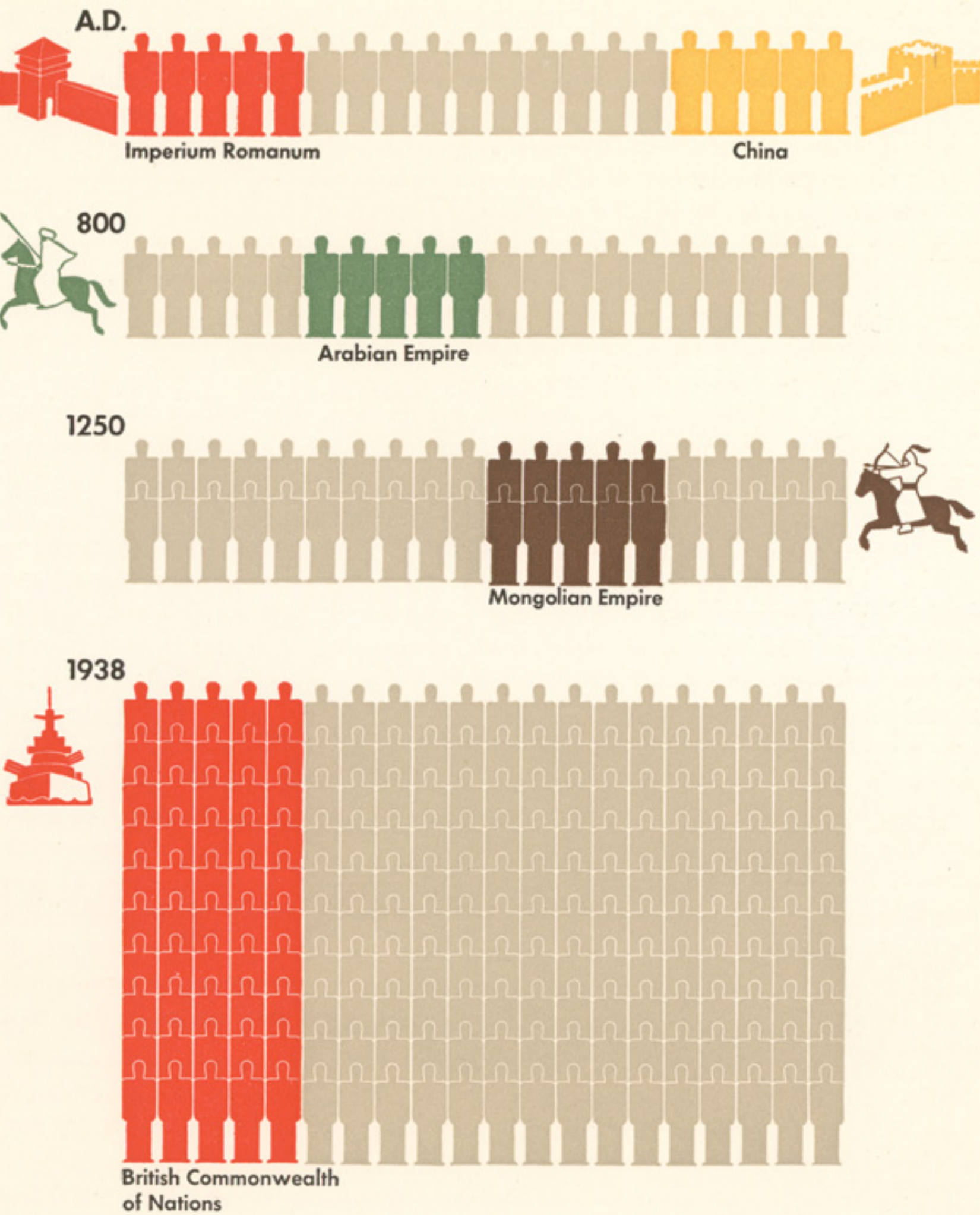
2. **Isotype**

# A brief history of **Isotype**

or, “International System Of TYpographic Picture Education”

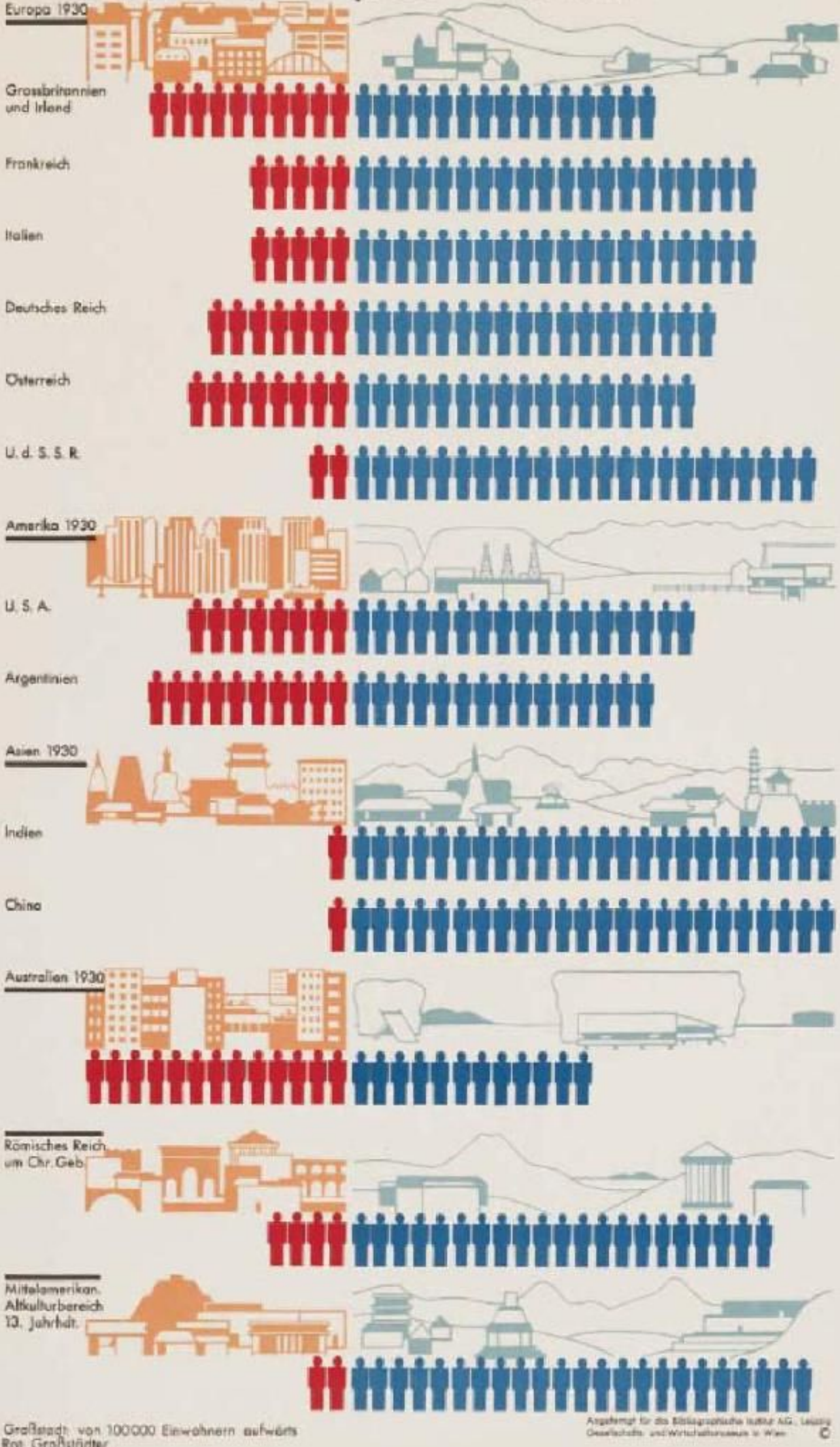


World Imperia



Each man symbol represents 10 million population

Großstädter unter je 25 Personen

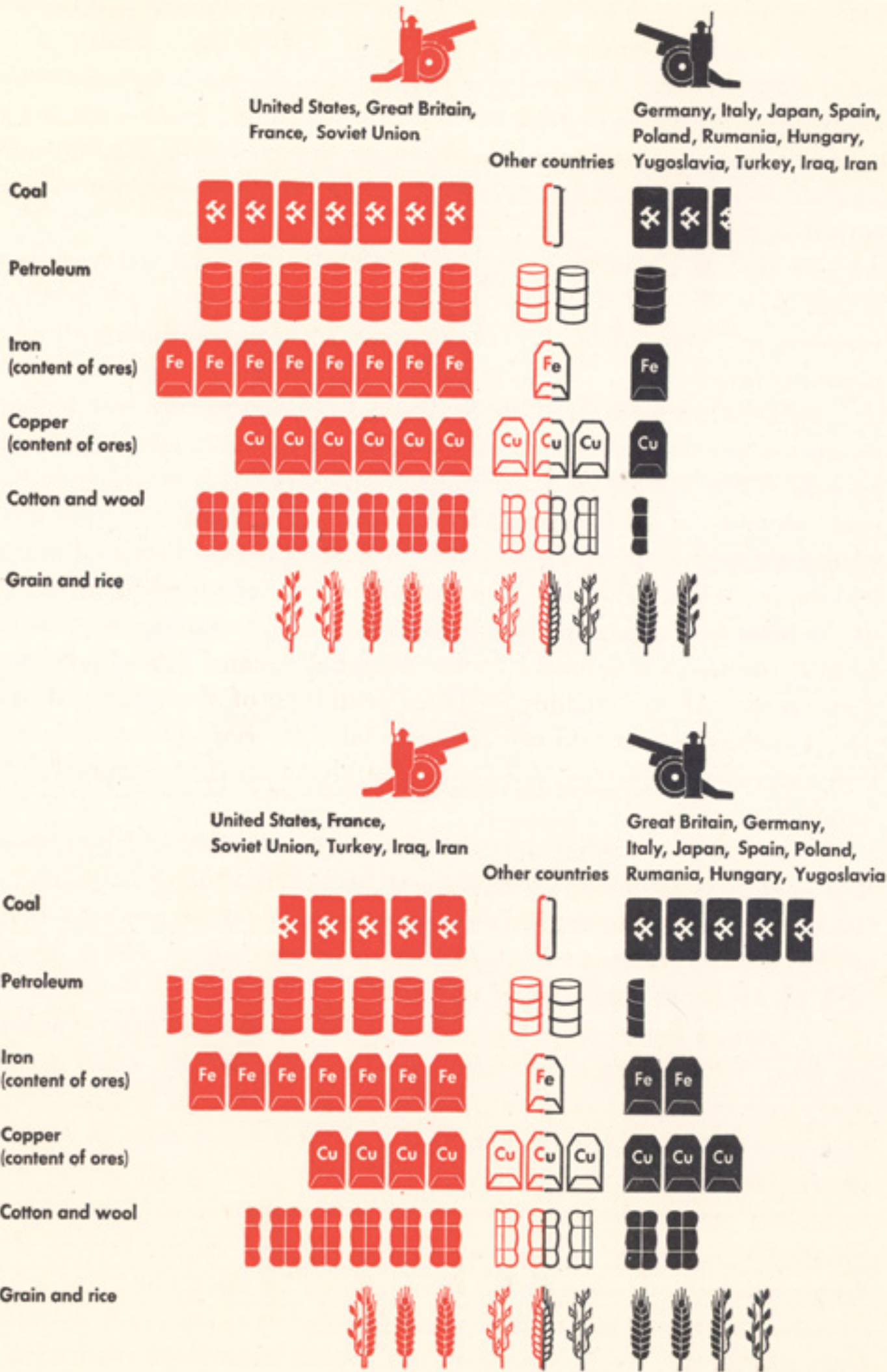


ISOTYPE

Großstadt von 100000 Einwohnern aufwärts

Angelehnt für die Bibliographische Institut AG, Leipzig Gesellschafts- und Wirtschaftslexikon in Wien

Silhouettes of War Economy



Each symbol represents 10 % of world production





Central Power

Germany, Austria, Hungary, Bulgaria, Turkey



Allies

USA, British Empire, France, Belgium,  
Italy, Serbia, Romania, Russia, Japan a.s.o.

## Great War 1914-18

Each figure 1 million soldiers  
(killed, wounded, others returning home)

ISOTYPE



The **isotype** was initiated by **Otto Neurath** in collaboration with **Gerd Arntz**.

# Origins of Isotype

- Developed at the Gesellschafts- und Wirtschaftsmuseum in Wien (social and economic museum of Vienna)
- Neurath believed the museum should be a teaching museum, not a repository of artifacts
- First known as the **Vienna Method of Pictorial Statistics**
- Its aim was to “represent social facts pictorially” and to bring “dead statistics” to life, by making them more visually memorable



# Principles of Isotype

- Greater quantities are not represented by an enlarged pictogram, but by **a greater number of the same-sized pictogram**
- In Neurath's view, variation in size does not allow accurate comparison
- Variation in multiples does, because multiple pictograms can be counted
- To avoid distortion, pictograms are represented as flat (rarely in perspective)
- Focused on **visual education**



= 75,606



Google X5 = 379,592



Employees

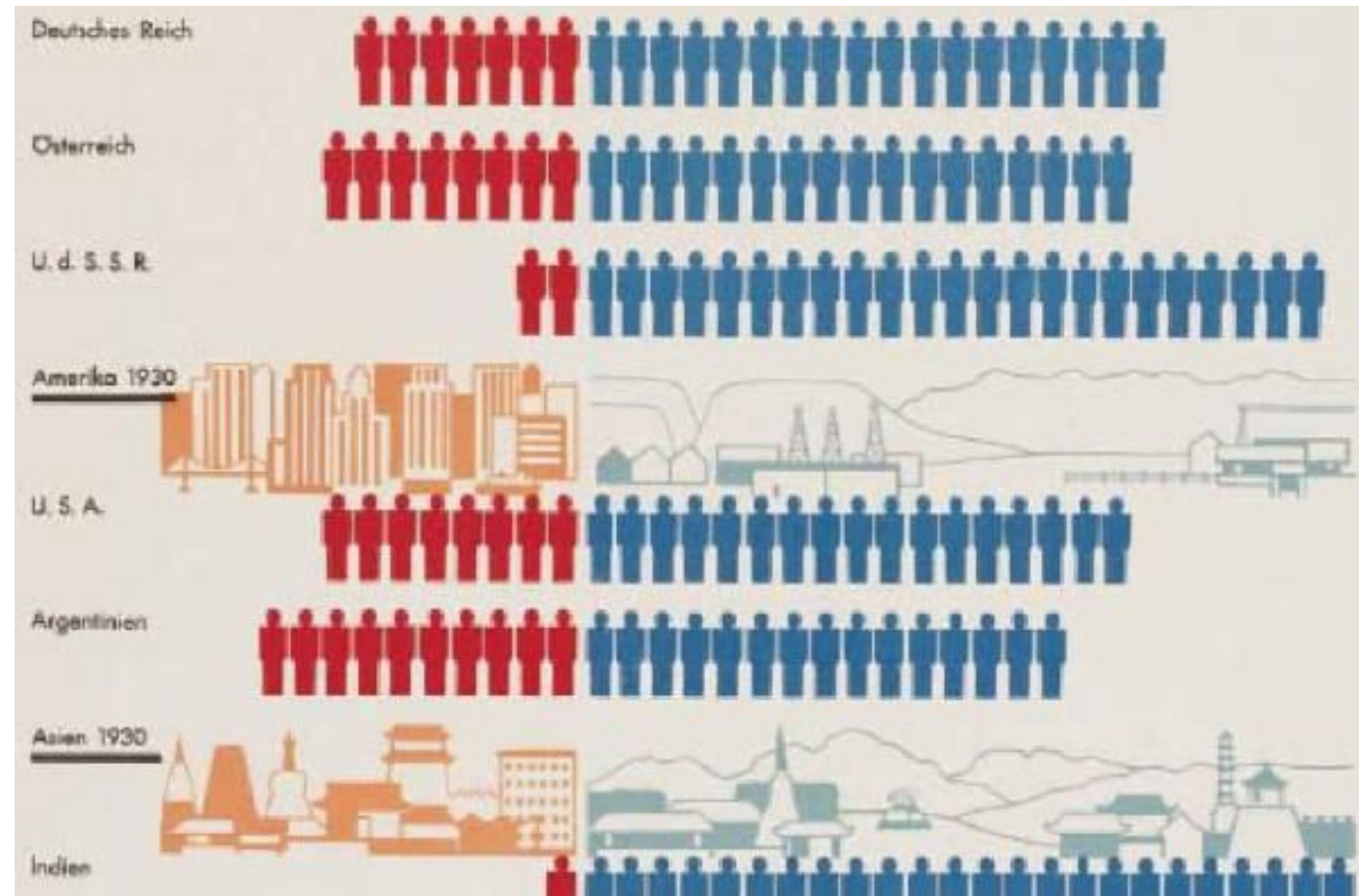


\* 5 <

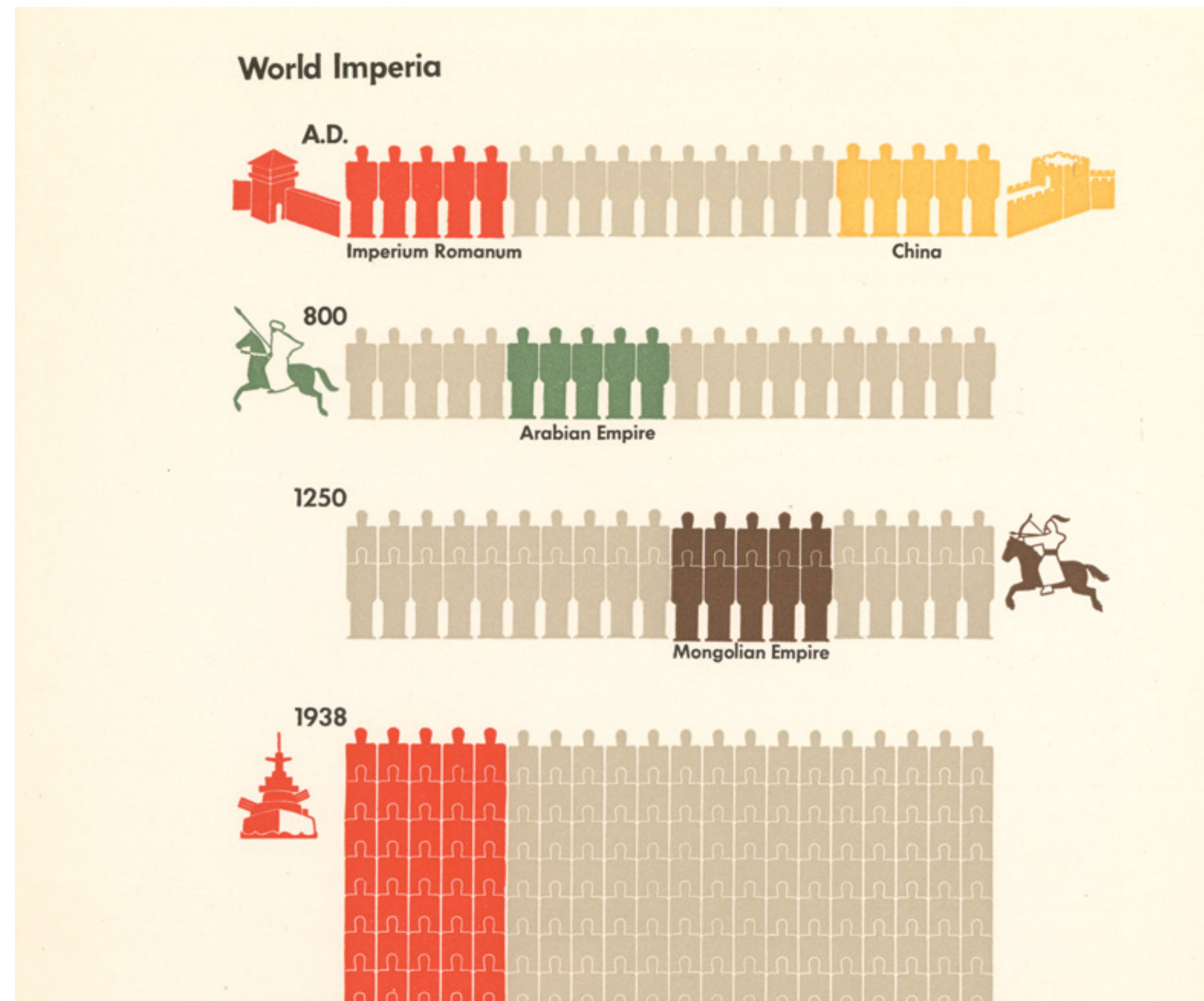




# Guideline 1 — **Make the icons the same size**

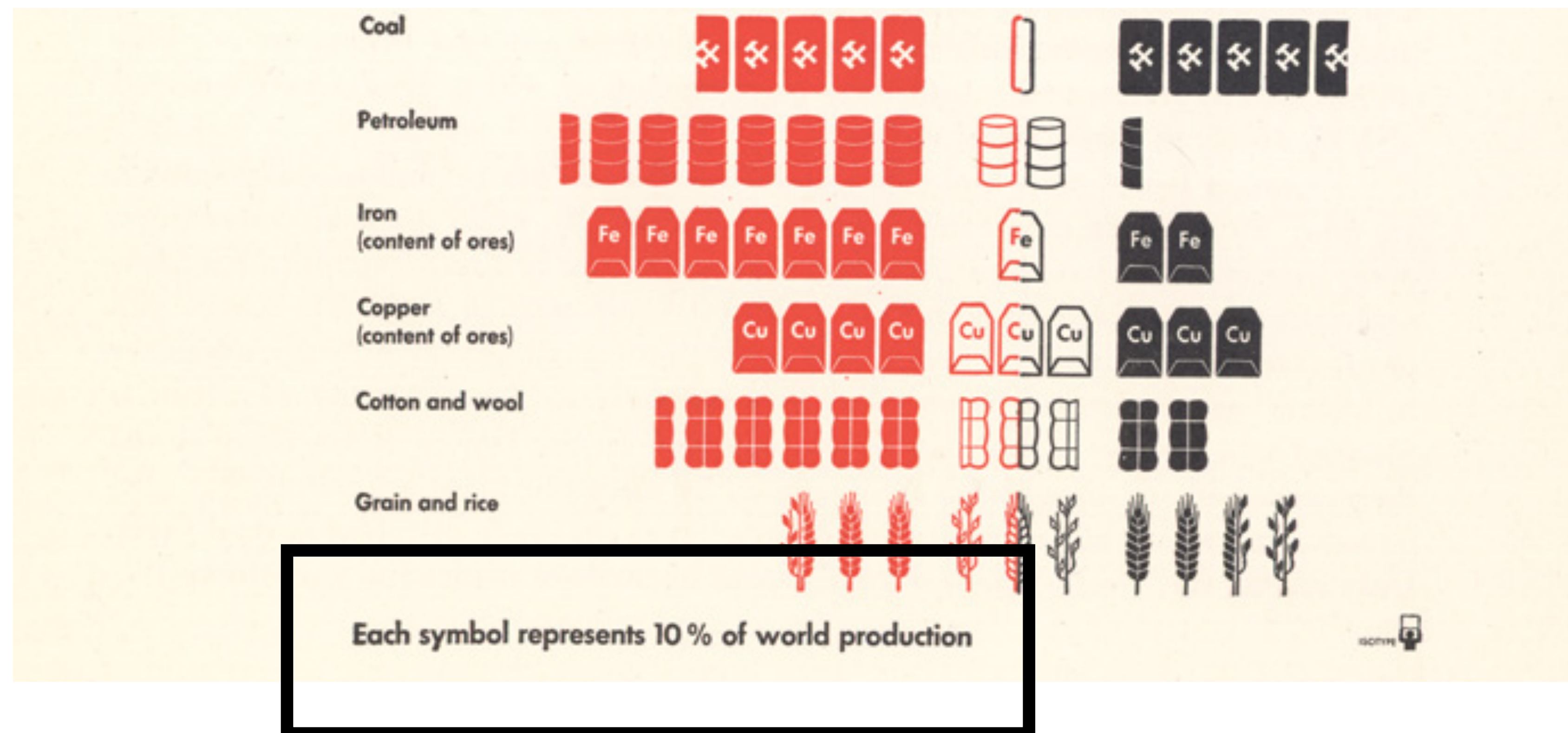


## Guideline 2 — Use color sparingly (for categories)



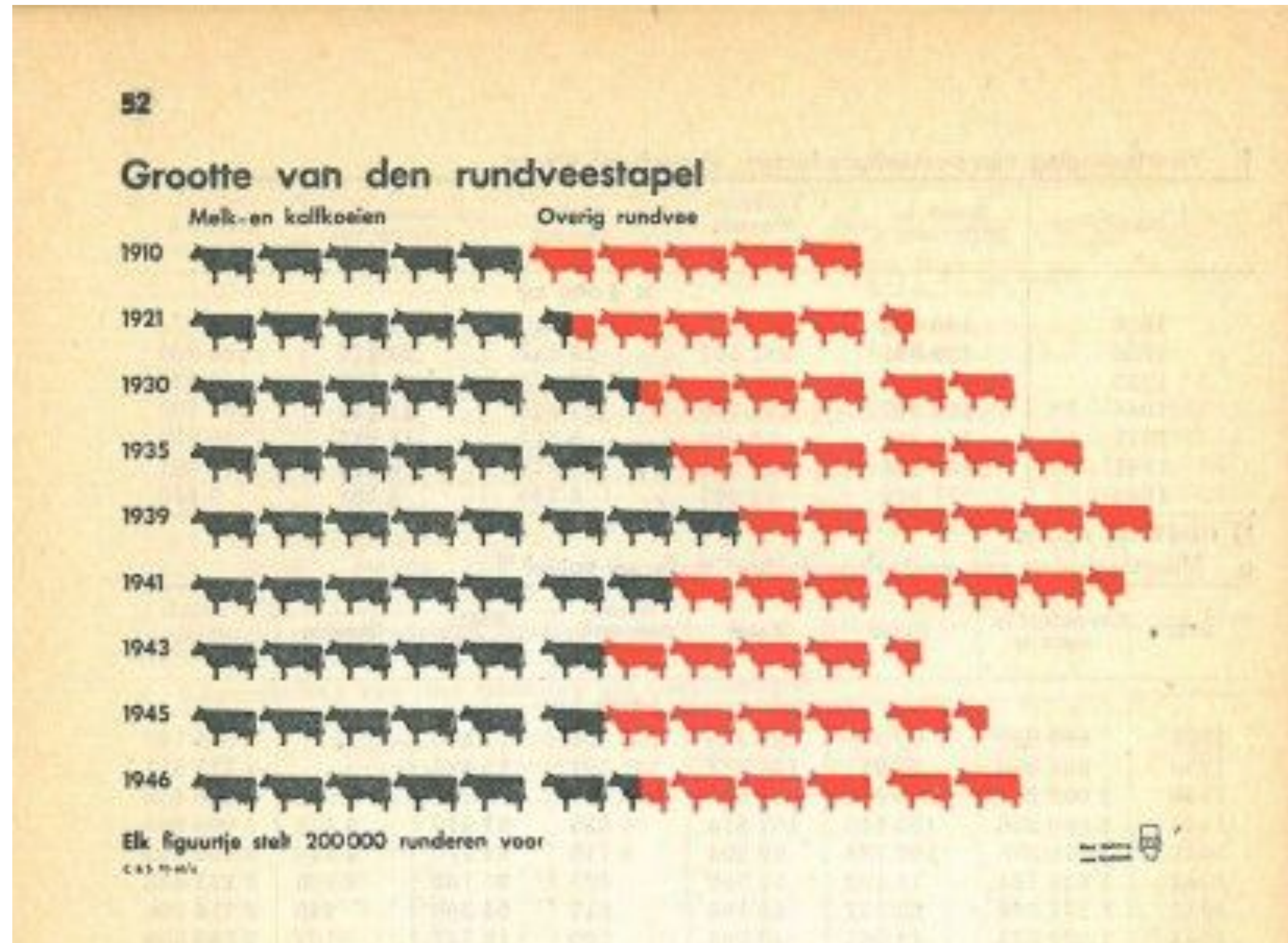


# Guideline 3 — **ALWAYS** include a legend





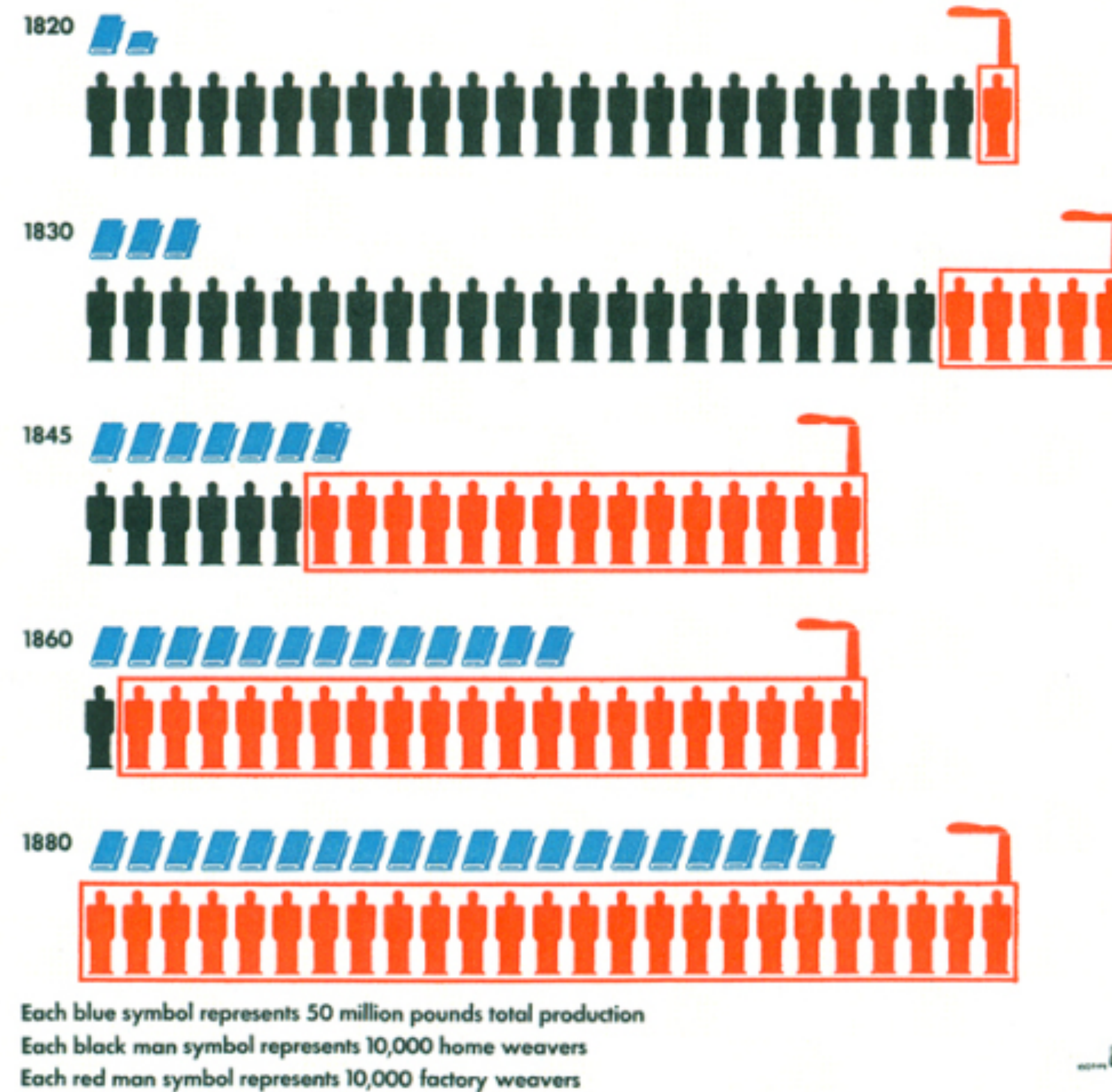
## Guideline 4 — Include *partial* icons if needed





# Guideline 5 — Include *enough* symbols

Home and Factory Weaving in England



# Introduction to **Tableau**



[https://github.com/emilyfuhrman/  
datavis\\_design/blob/master/2017\\_Fall/  
Studios/01\\_Introduction\\_to\\_Tableau.md](https://github.com/emilyfuhrman/datavis_design/blob/master/2017_Fall/Studios/01_Introduction_to_Tableau.md)

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