Cody Dunne
Northeastern University

———

WHAT IS VISUALIZATION?

Feel free to interrupt with questions!

Plan for Today

- Discuss what visualization is & why we care
- Get to know each other

STAFF INTRODUCTIONS

Instructors

Cody Dunne

codydunne-and-tas@ccs.neu.edu, c.dunne@northeastern.edu

Office Hours: Tuesdays 2–3pm on Khoury Office Hours

Fun Fact: I like pretty pictures that tell you something about data!

Teaching Assistants

Mann Purohit

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Office Hours: TBD on Khoury Office Hours

Shaival Sujalkumar Shah

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Office Hours: TBD on Khoury Office Hours

Sarvagna Shukla

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Uzma Haque Syeda

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Service-Learning Teaching Assistant

Paige Klung

codydunne-and-tas@ccs.neu.edu, klung.p@northeastern.edu

Office Hours: By appointment only

Library Visualization Specialist

Kate Kryder

codydunne-and-tas@ccs.neu.edu, k.kryder@northeastern.edu

Office Hours: By appointment on Zoom (schedule here)

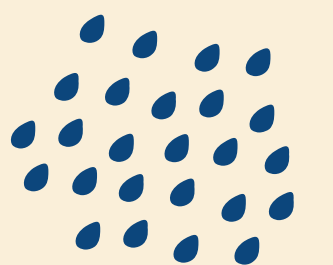Fun Fact: Students who visit me often refer to the D3 Reusable Chart Model as the "Cody code."
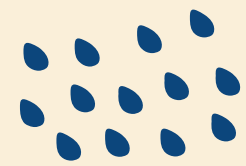
Introduction to Service-Learning

DS 4200 Information Presentation and Visualization

- Year: 3rd
- Major: Health Science
- Minor: Psychology
- Hometown: San Francisco, CA
- 3rd year in S-L
  - 2 S-L courses
  - 2nd semester as an S-LTA

Service-Learning

What is it?

Form of experiential learning for students and a teaching tool for faculty

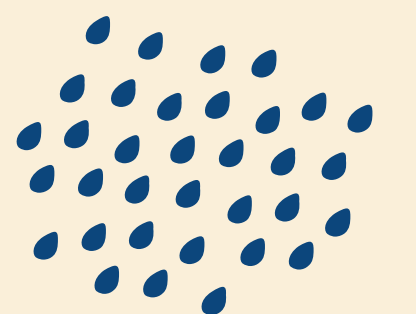Integrates academics and service projects to meet community and classroom goals
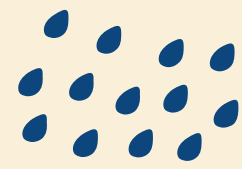
Why?

Relationship building

Integrated learning

Collaboration

ABCD

Reflection

S-L Project

- Semester-long service-learning project
- Up to you to choose your community partner
  - Together we will choose ⅓
- Groups approx. 3 people
- Real-world research

My Role

Support and advise

Facilitate and encourage reflection

Contact: klung.p@northeastern.edu

Questions?

What is visualization anyway?
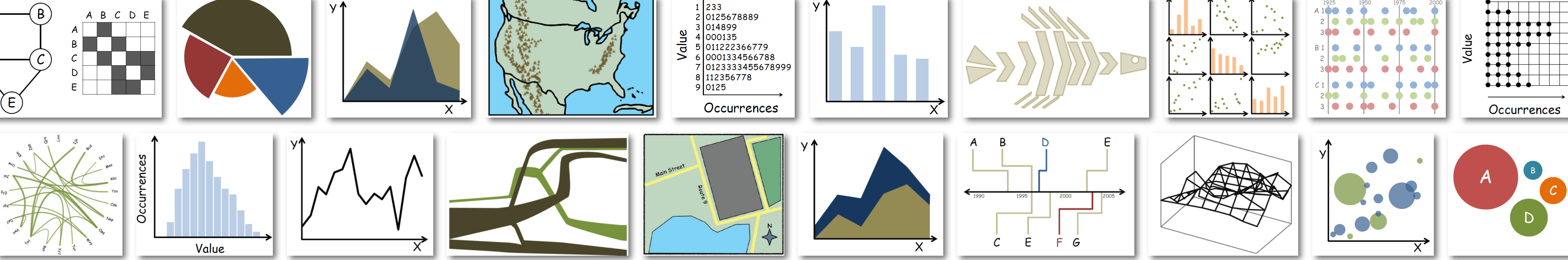
(static or interactive)　　　(abstract or spatial)
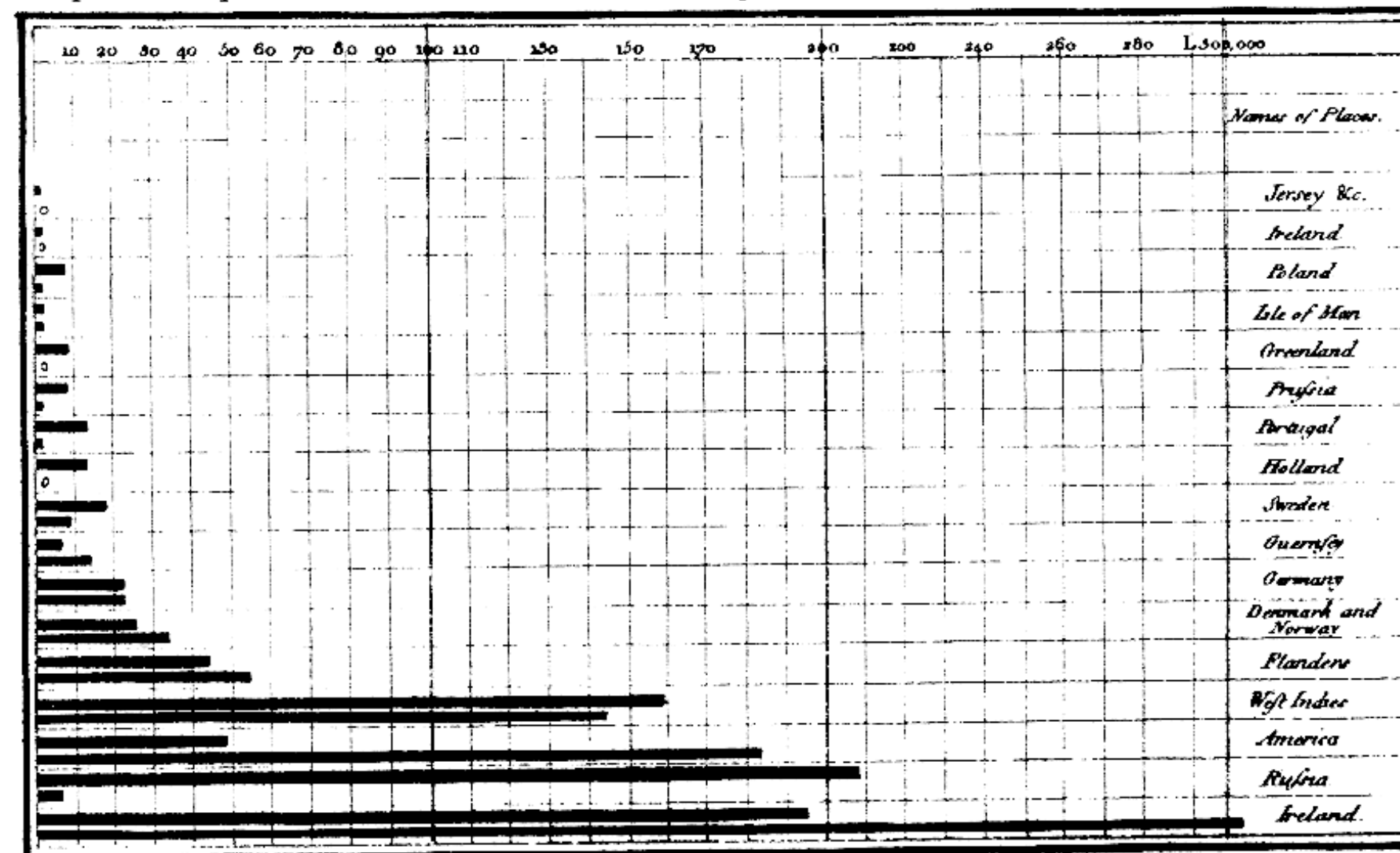
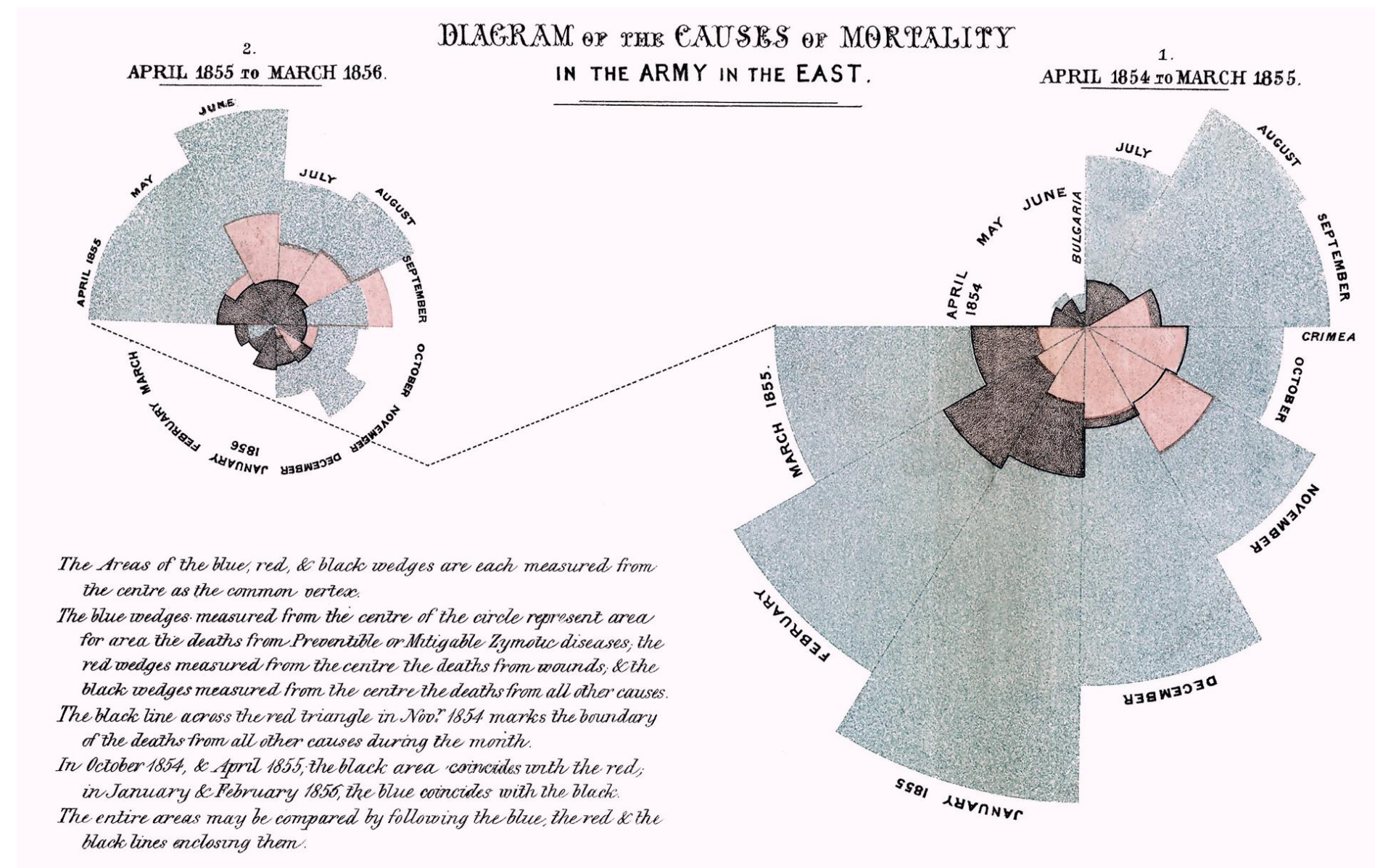visualization: the visual representation of data to reinforce human cognition
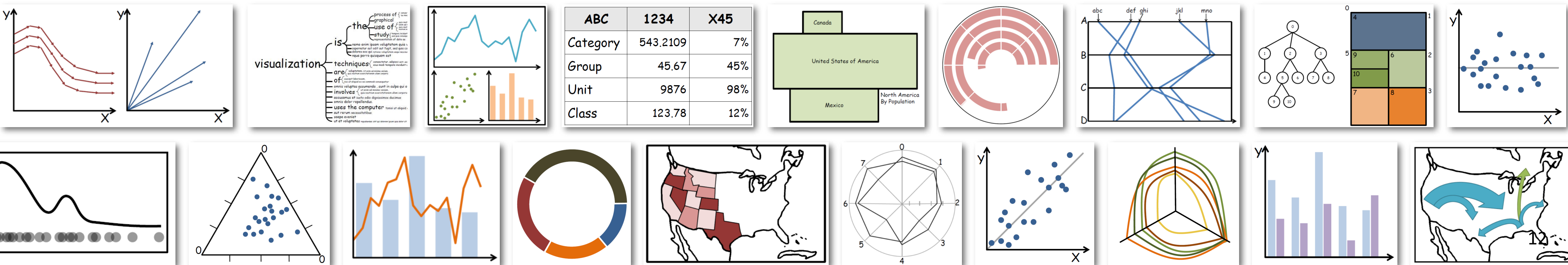
PTOLEMY (C. 150)

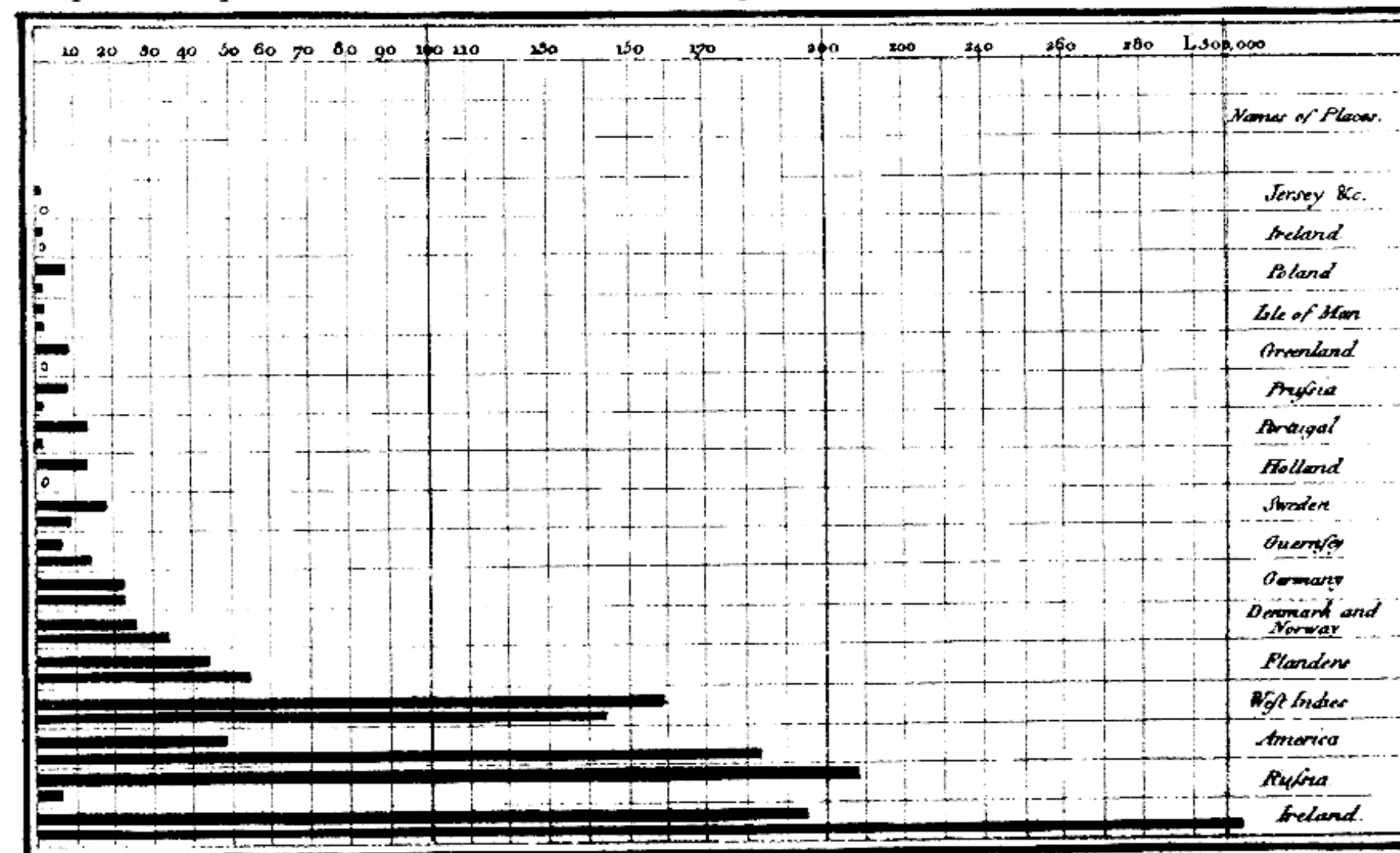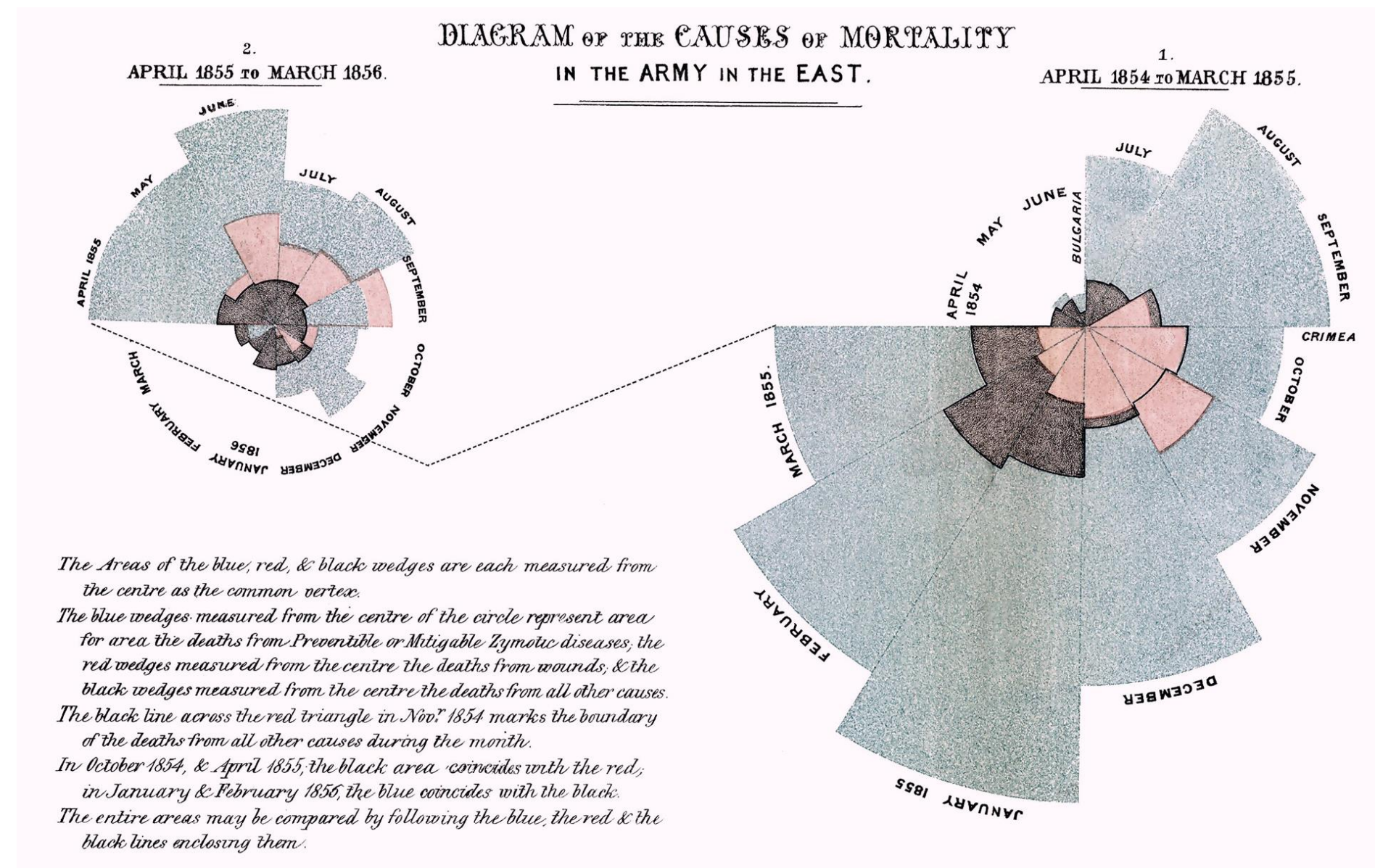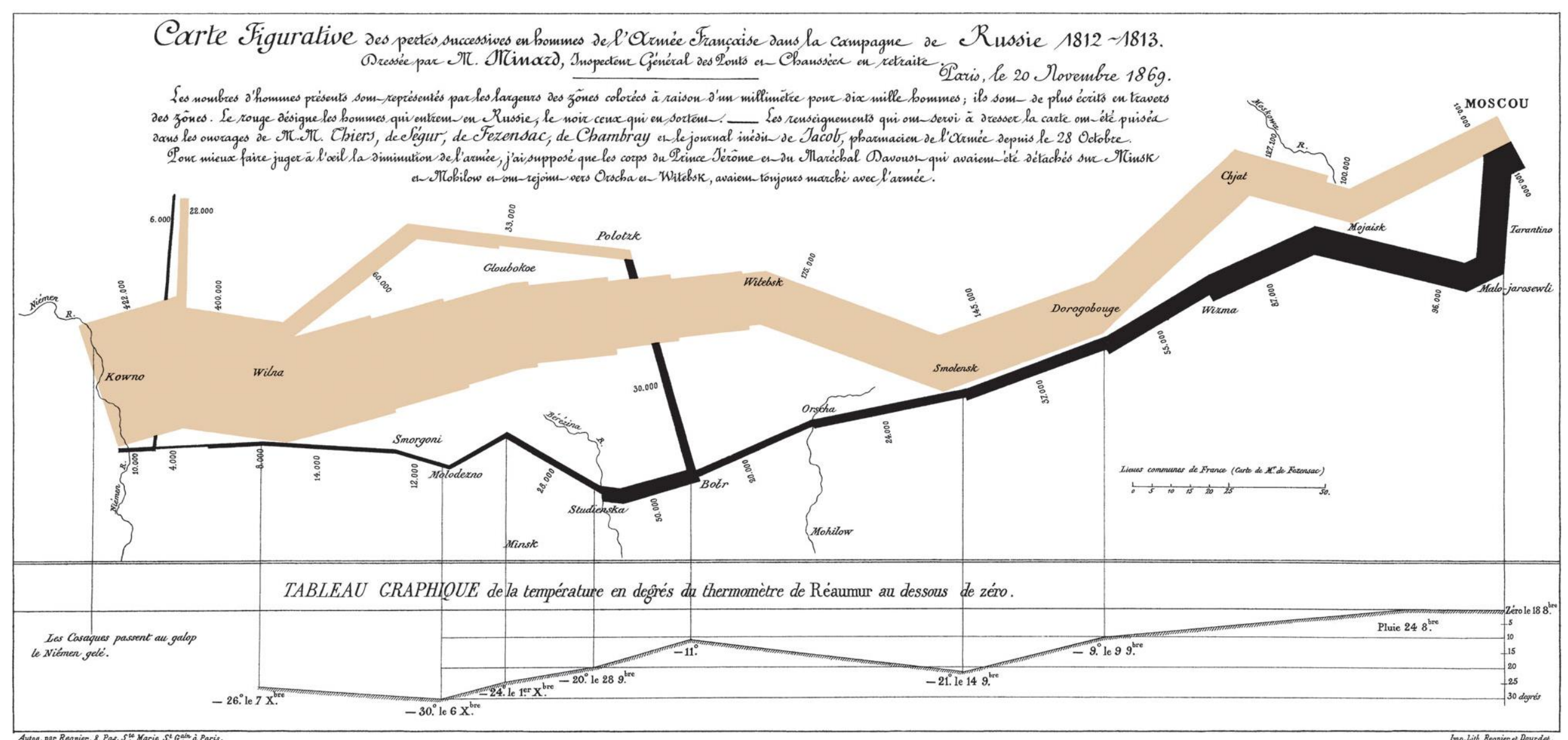Exports and Imports of SCOTLAND to and from different parts for one Year from Christmas 1780 to Christmas 1781.

WILLIAM PLAYFAIR (C. 1786)
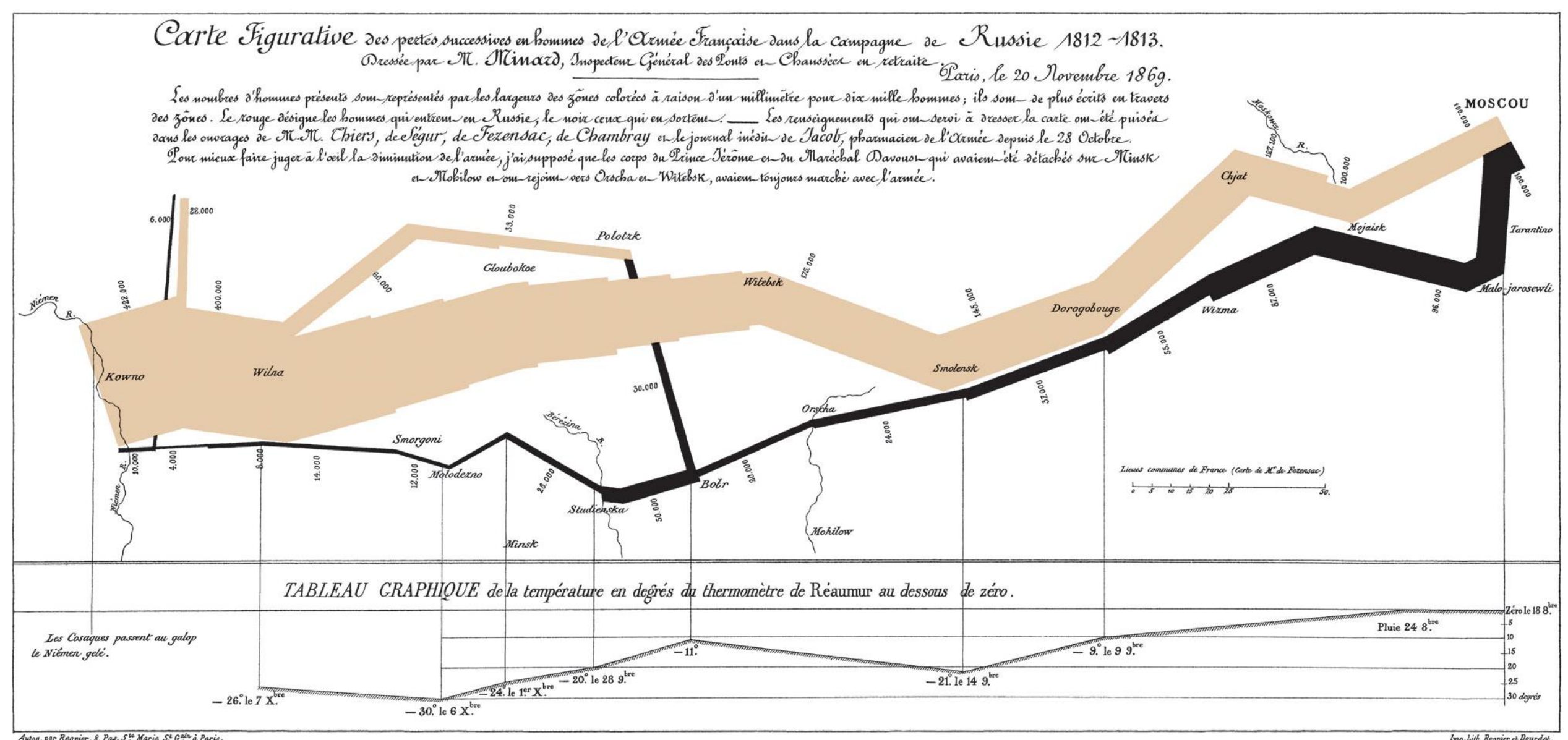

DIAGRAM OF THE CAUSES OF MORTALITY
IN THE ARMY IN THE EAST.

2. APRIL 1855 TO MARCH 1856.   1. APRIL 1854 TO MARCH 1855.

FLORENCE NIGHTINGALE (C. 1858)

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812–1813.

CHARLES MINARD (C. 1869)

13

PTOLEMY (C. 150) 14
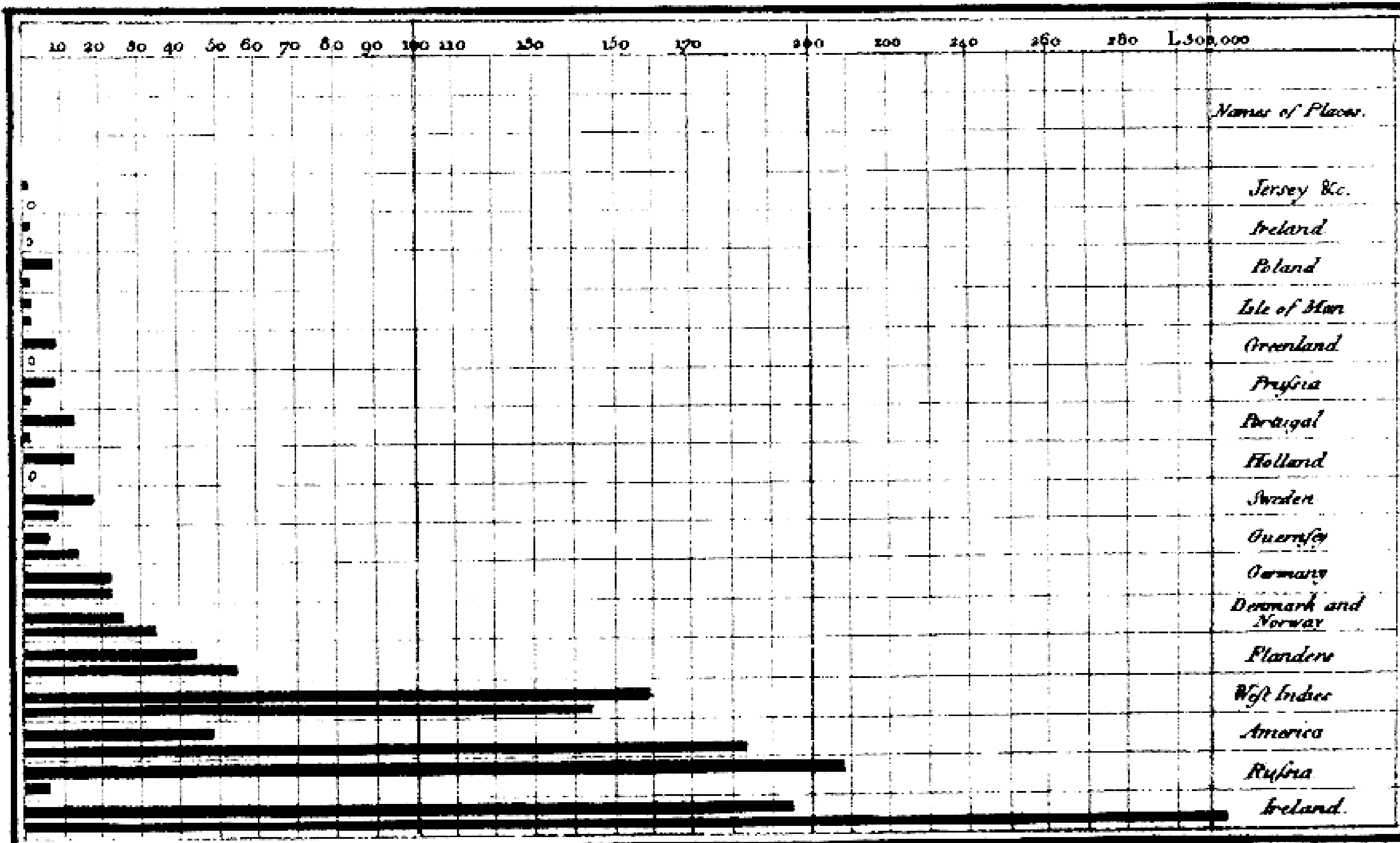
PTOLEMY (C. 150)

WILLIAM PLAYFAIR (C. 1786)

FLORENCE NIGHTINGALE (C. 1858)

CHARLES MINARD (C. 1869)

Exports and Imports of SCOTLAND to and from different parts for one Year from Christmas 1780 to Christmas 1781.
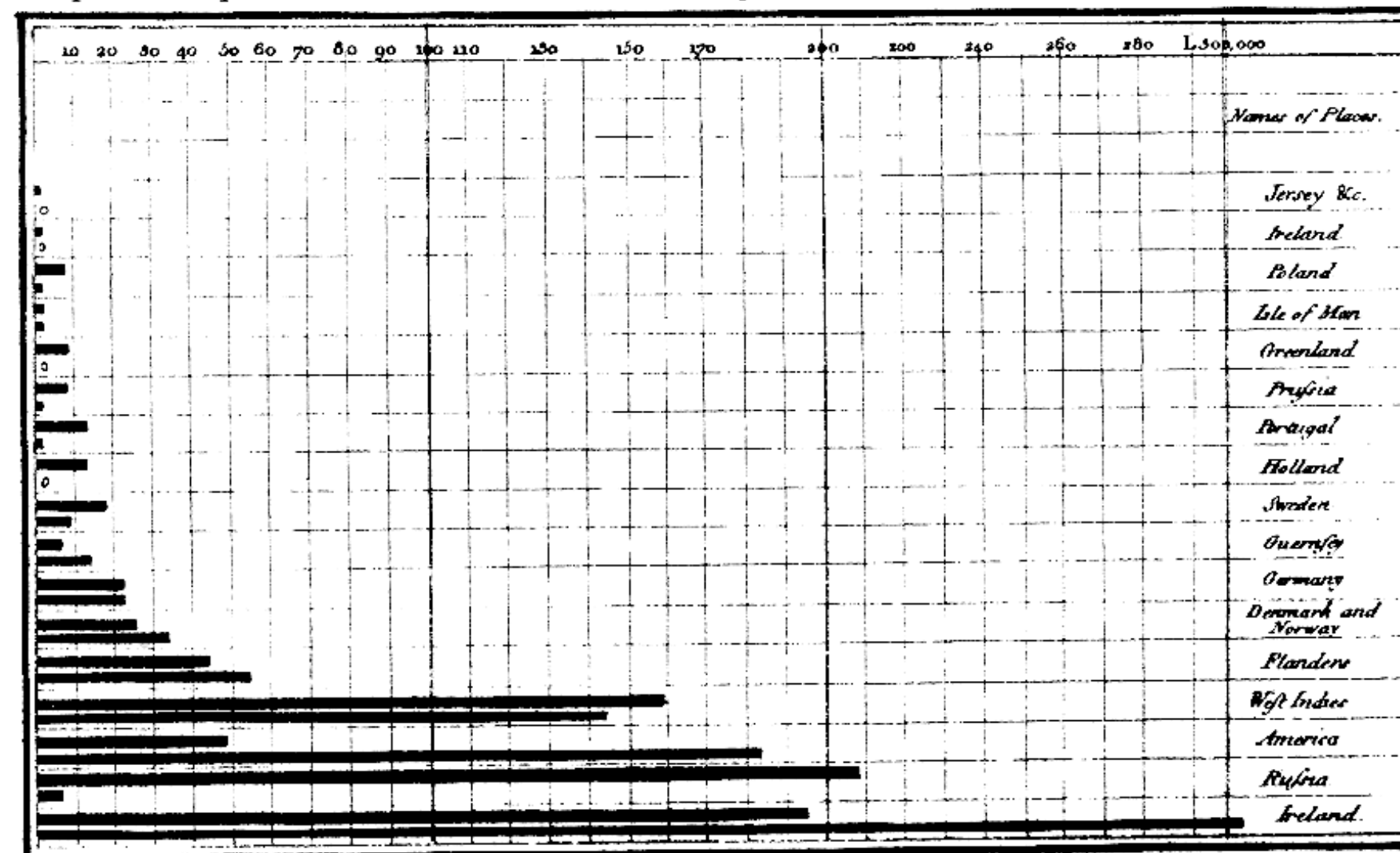

The Upright divisions are Ten Thousand Pounds each. The Black Lines are Exports the Ribbed lines Imports.
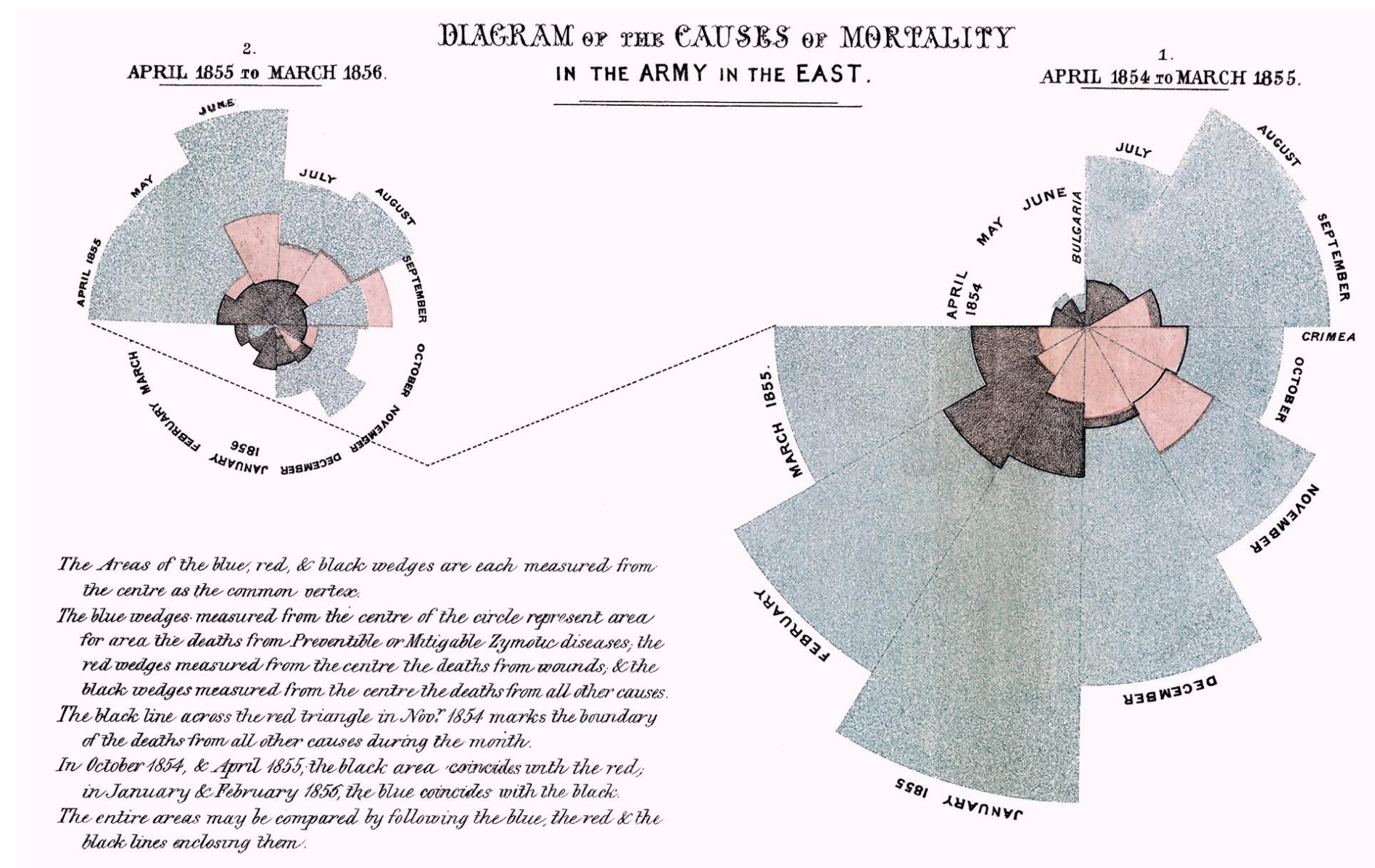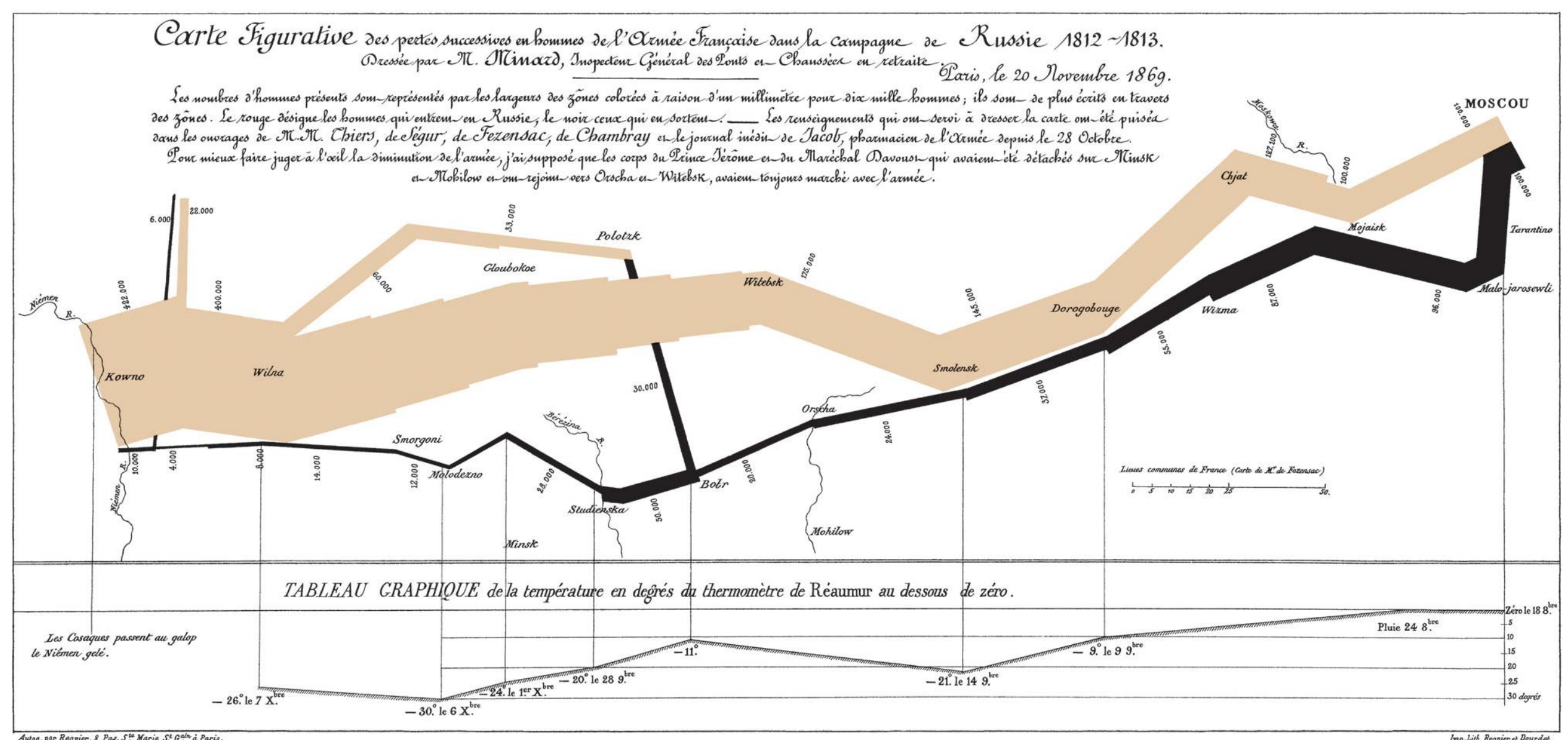
WILLIAM PLAYFAIR (C. 1786)

16

PTOLEMY (C. 150)

WILLIAM PLAYFAIR (C. 1786)
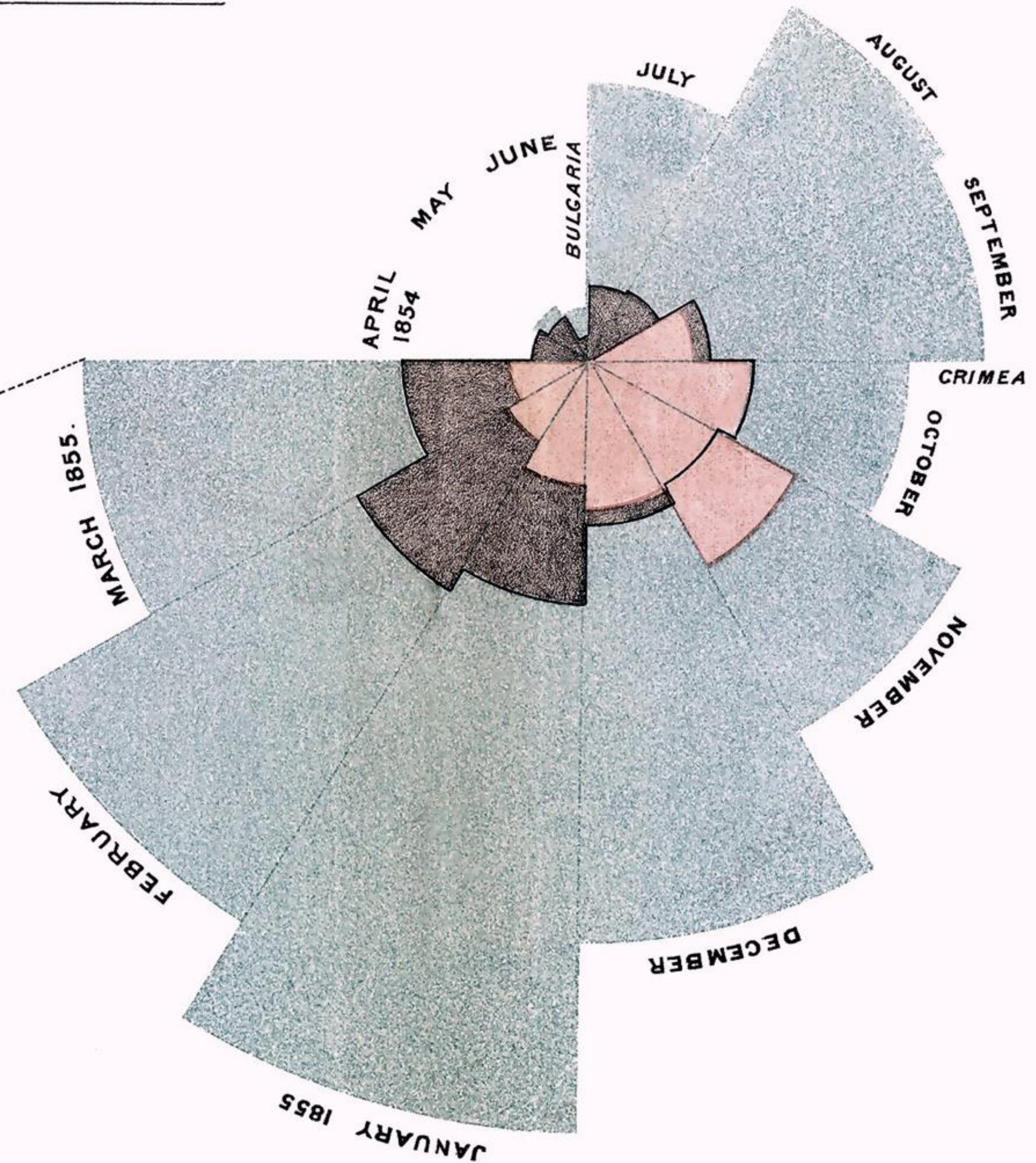
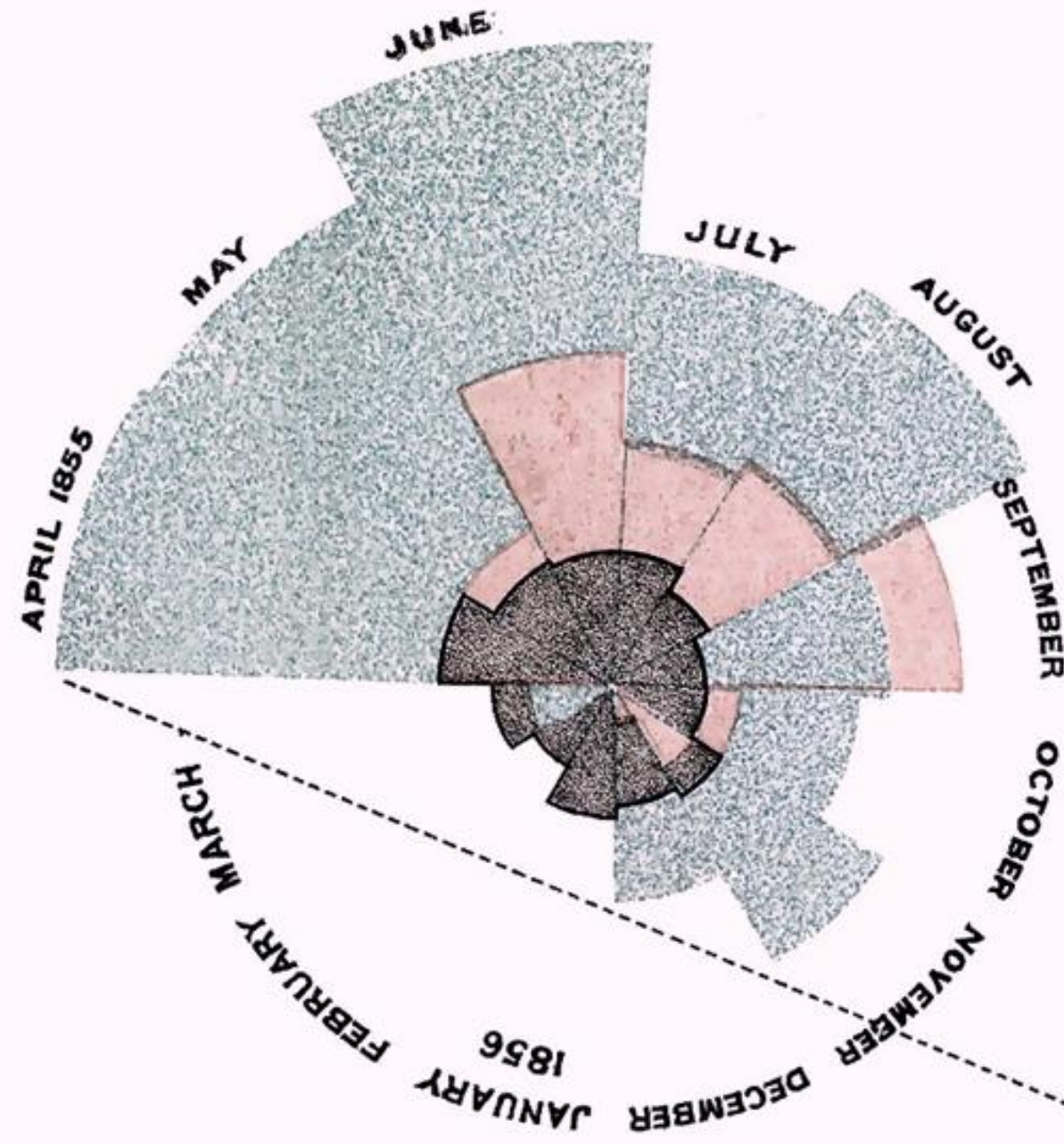FLORENCE NIGHTINGALE (C. 1858)

CHARLES MINARD (C. 1869)

17

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
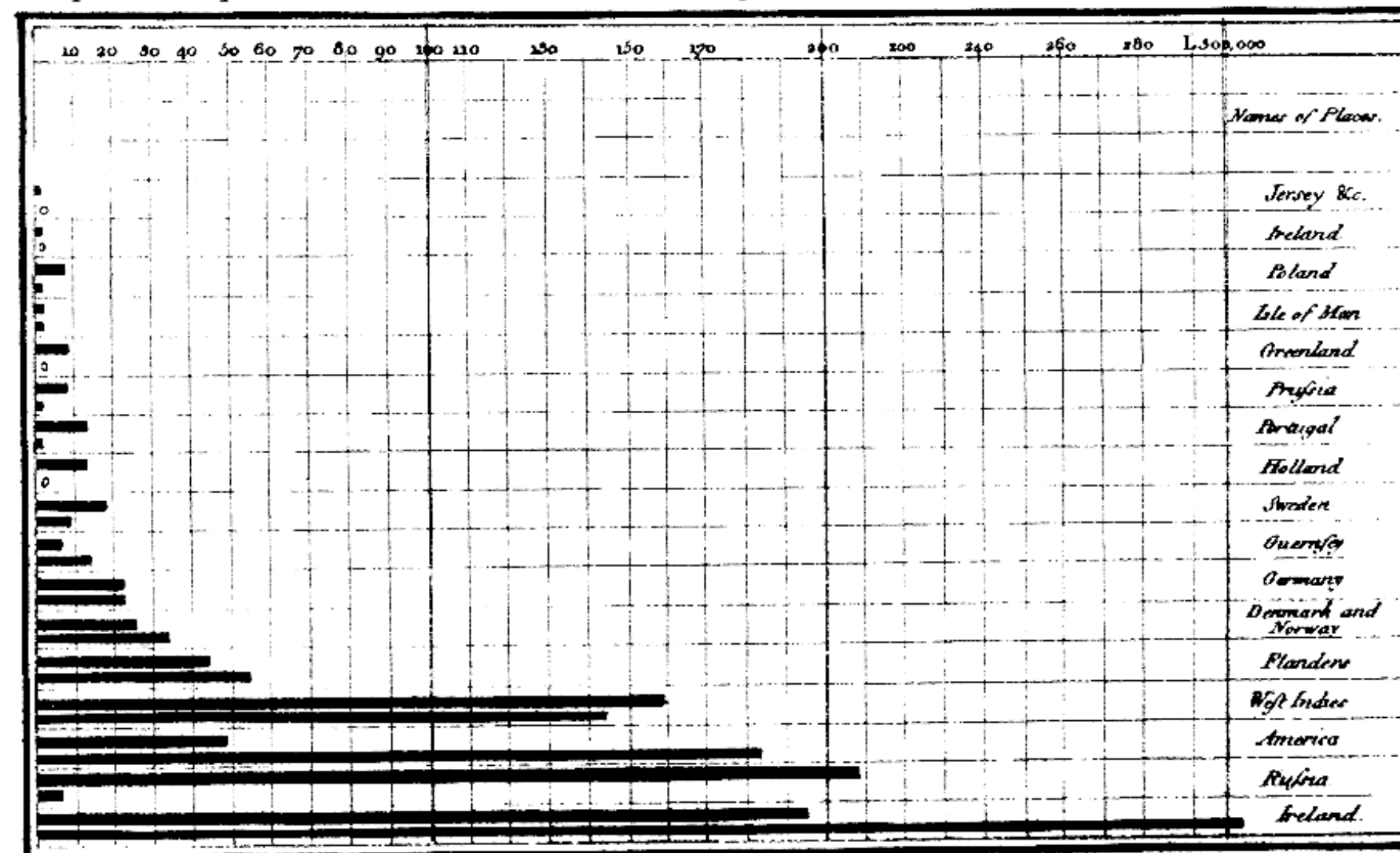of the deaths from all other causes during the month.

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
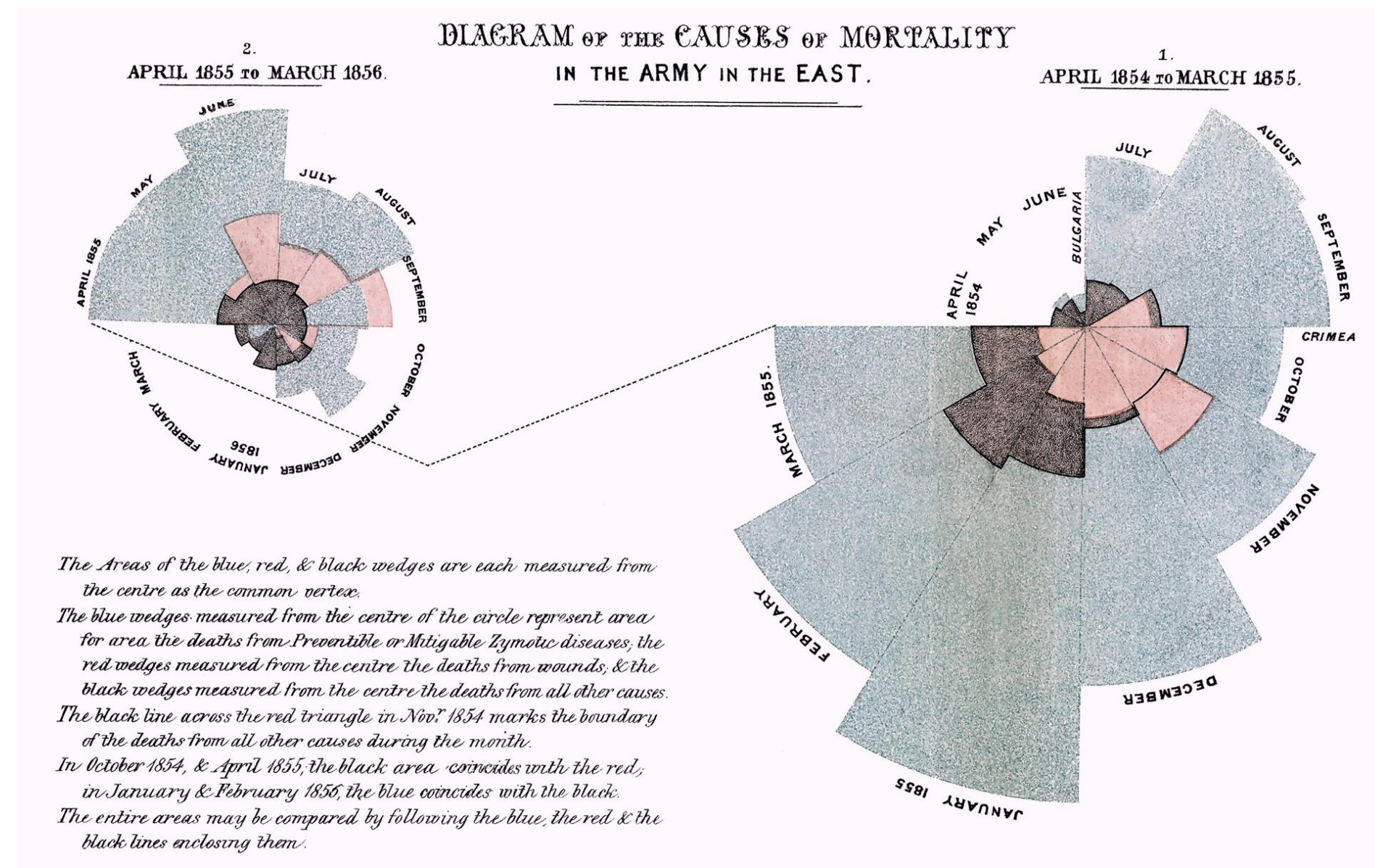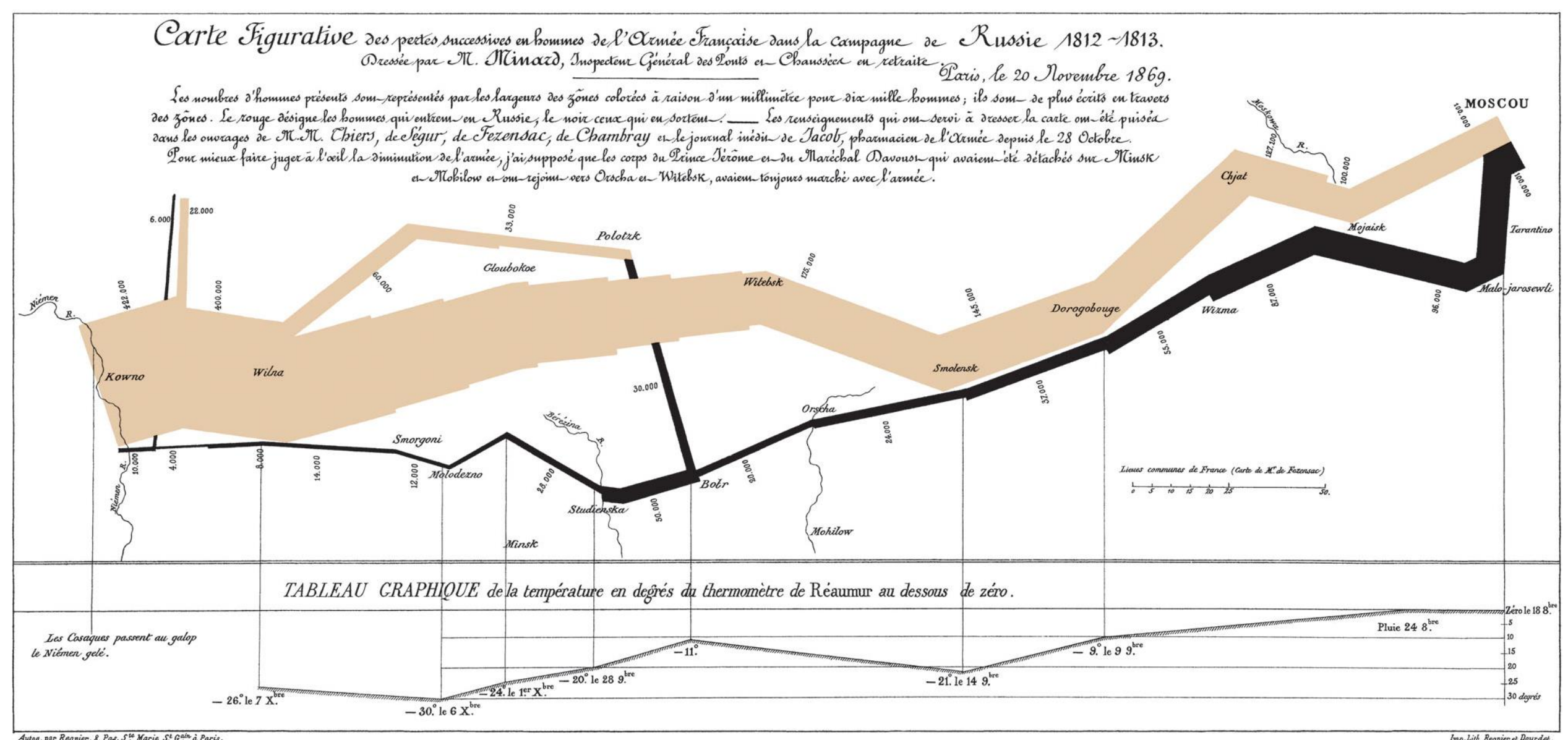black lines enclosing them.

FLORENCE NIGHTINGALE (C. 1858)   18

PTOLEMY (C. 150)

WILLIAM PLAYFAIR (C. 1786)

FLORENCE NIGHTINGALE (C. 1858)

CHARLES MINARD (C. 1869)

CHARLES MINARD (C. 1869)

PTOLEMY (C. 150)

WILLIAM PLAYFAIR (C. 1786)

FLORENCE NIGHTINGALE (C. 1858)

CHARLES MINARD (C. 1869)

computer graphics

visualization

computer graphics

visualization

statistics

computer graphics
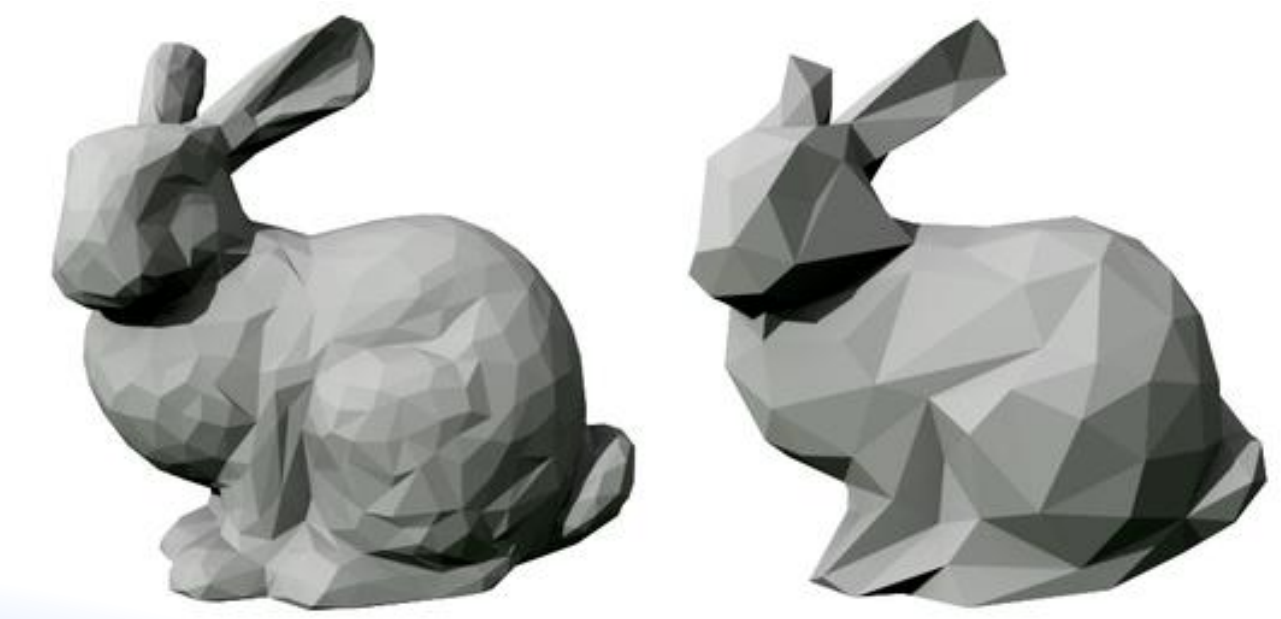
HCI

design

visualization

psychology

art

statistics
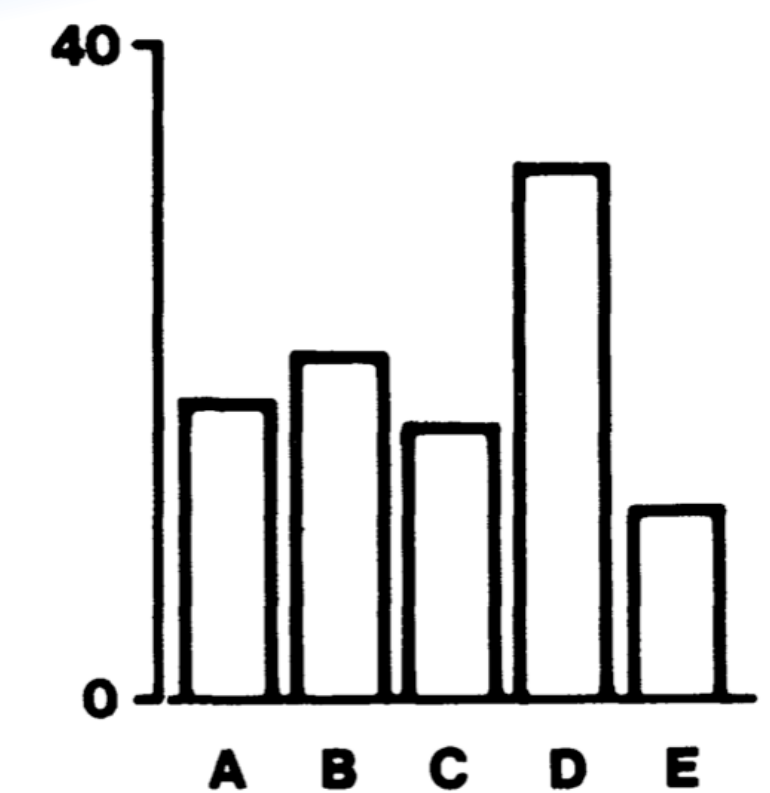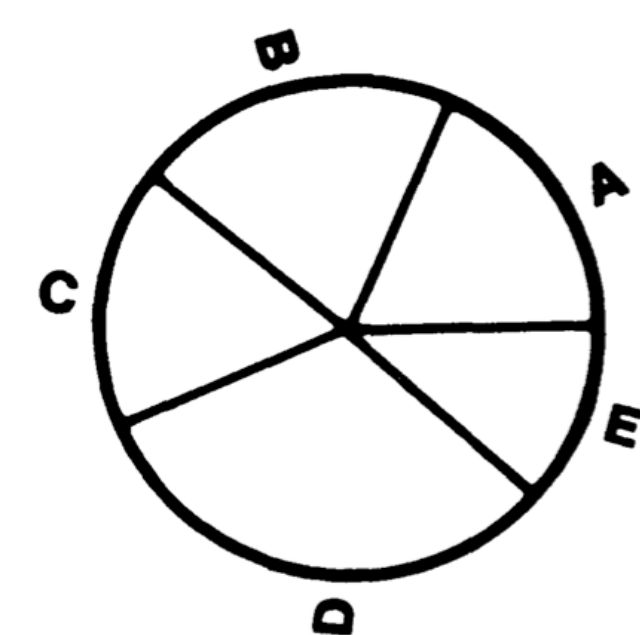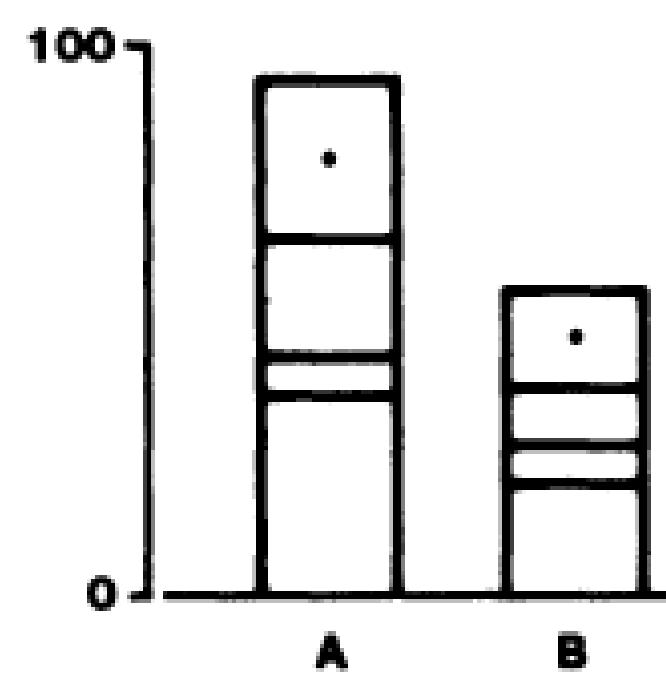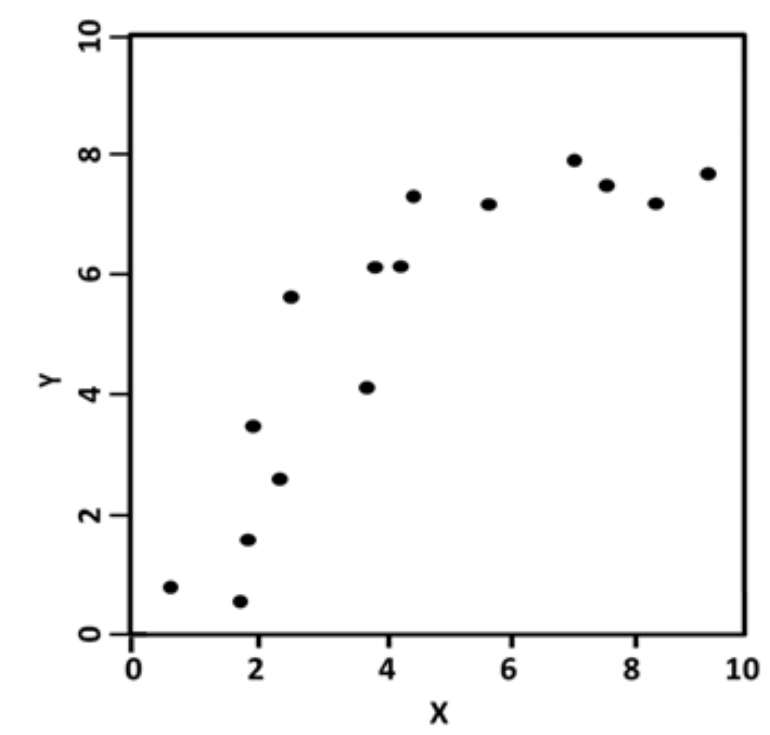
In-Class Sketching — Visualize Me
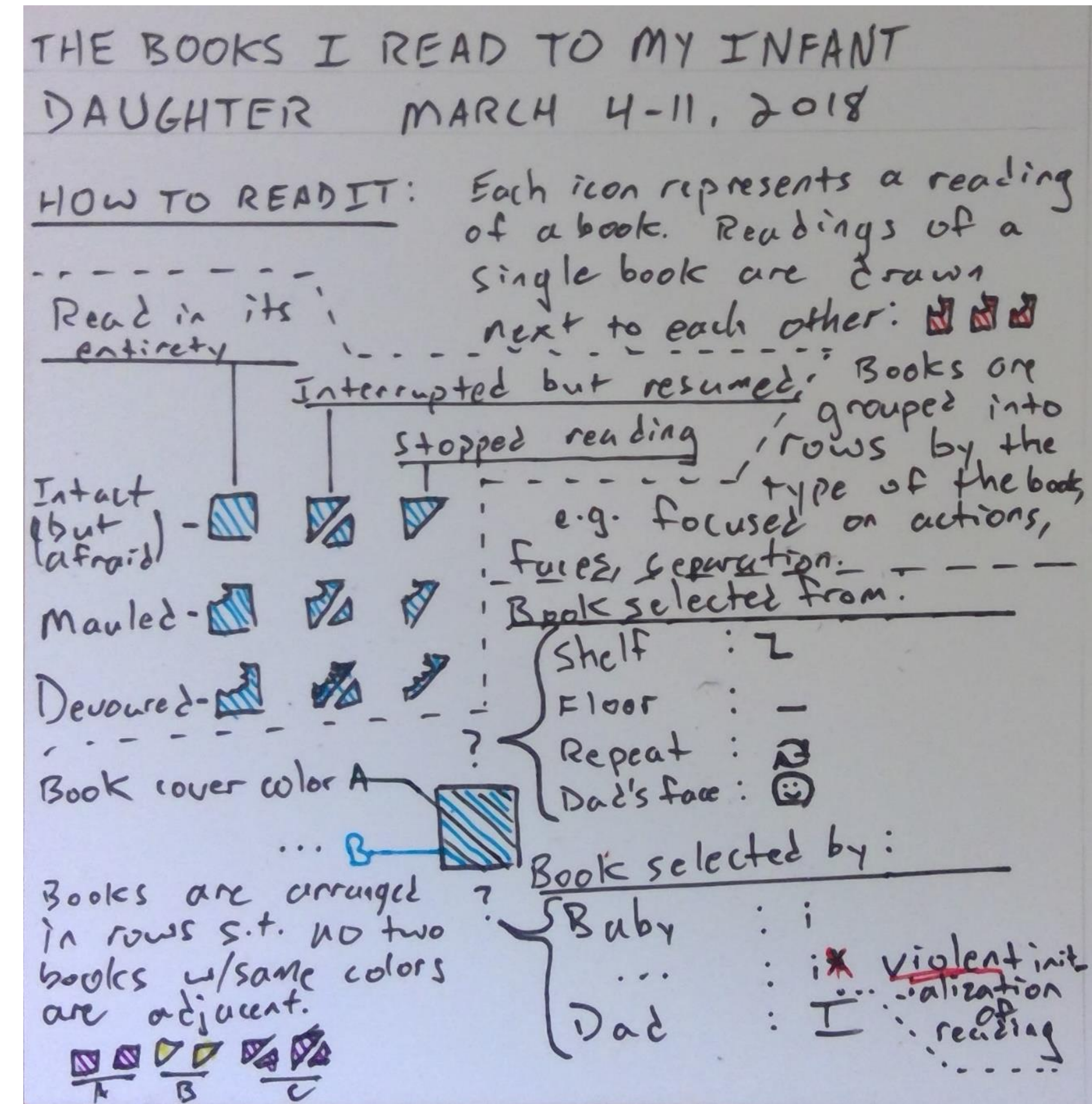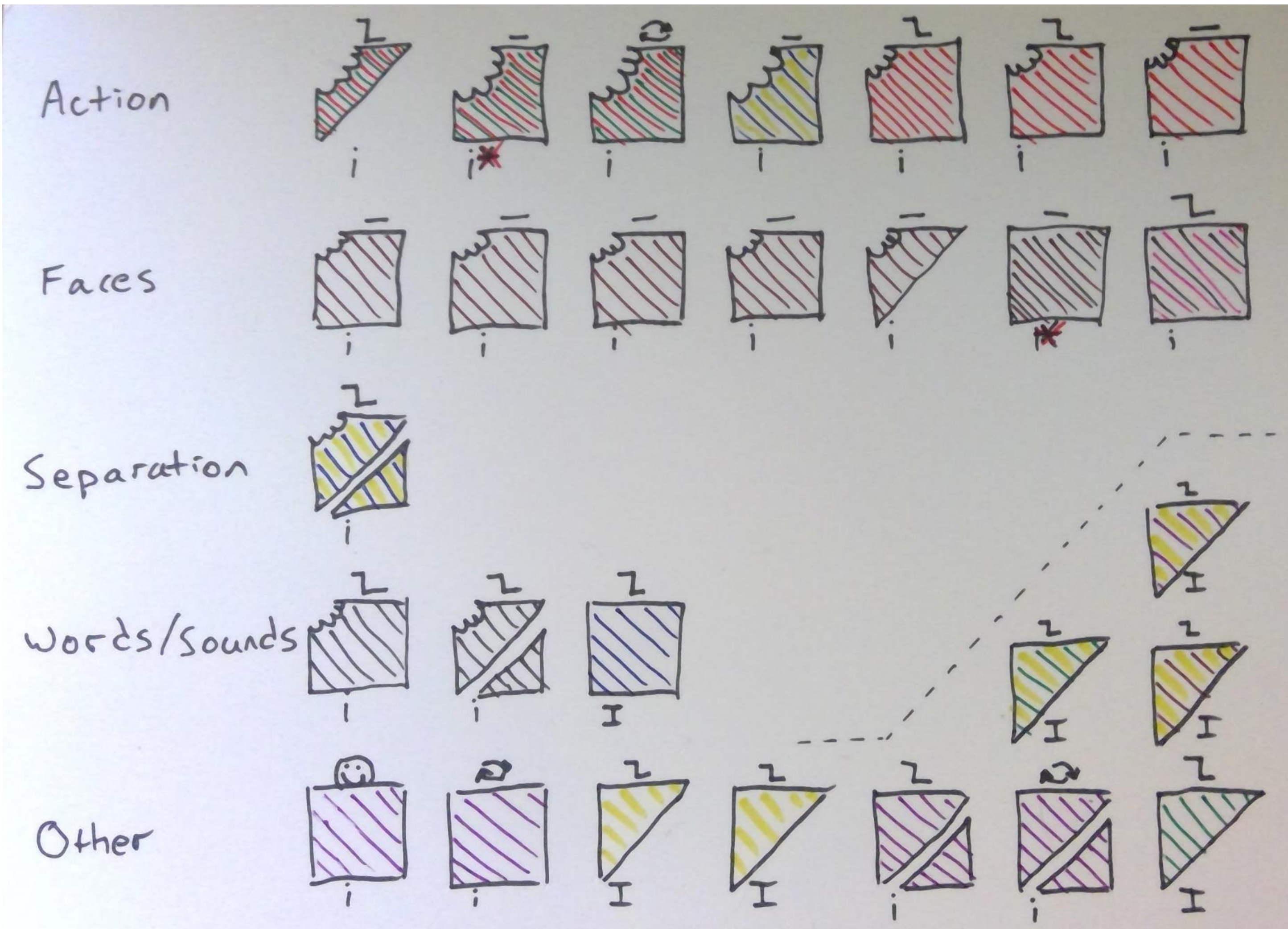
In-Class Sketching — Visualize Me

20 min

1. The staff will use Zoom breakout rooms to put you into groups of ~5 students. In-person students—collaborate in person or online, your choice.

     TAs: please distribute yourselves among rooms to provide feedback.
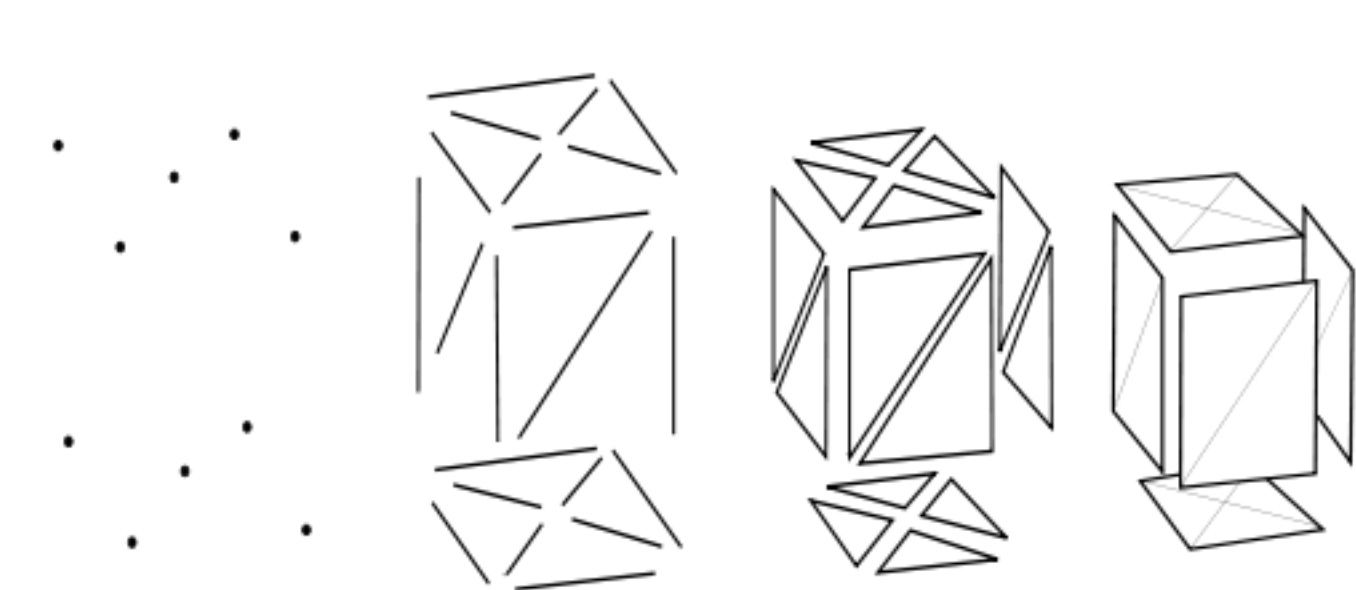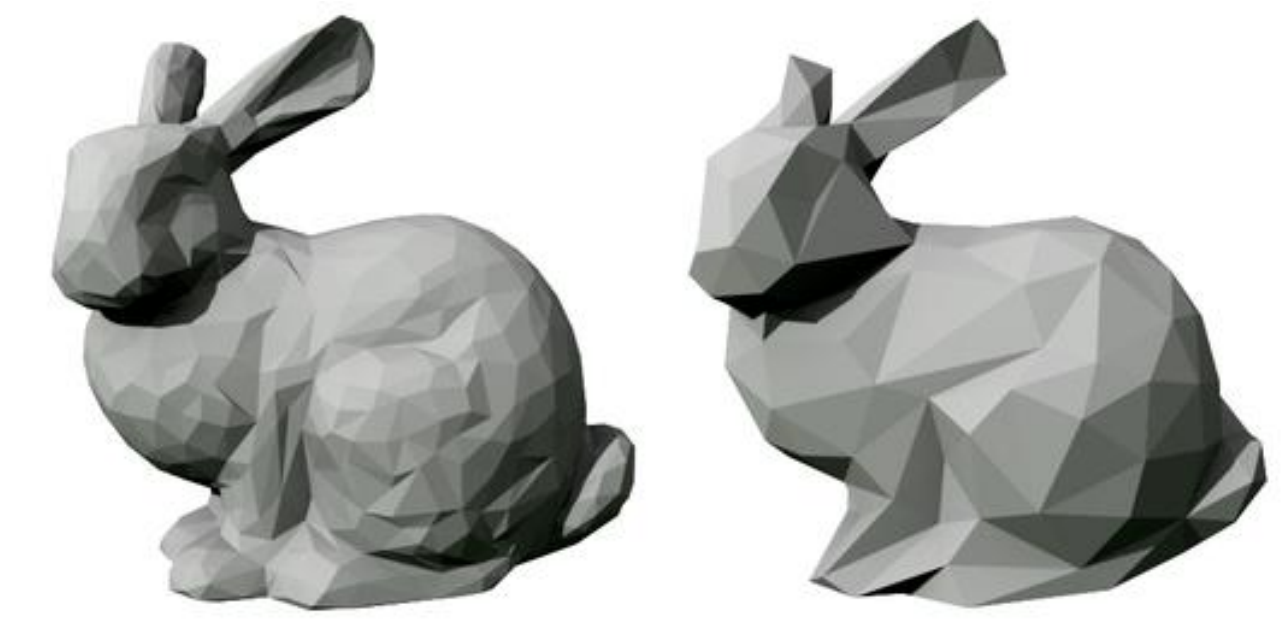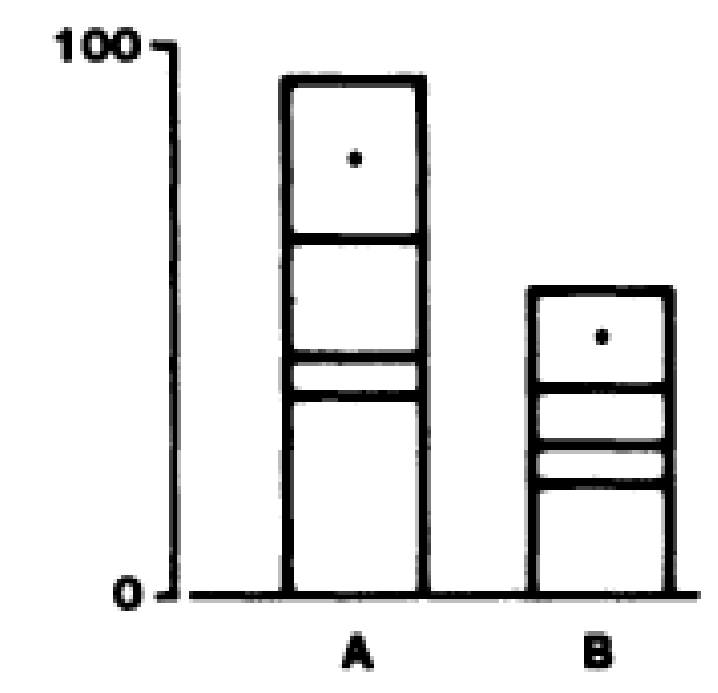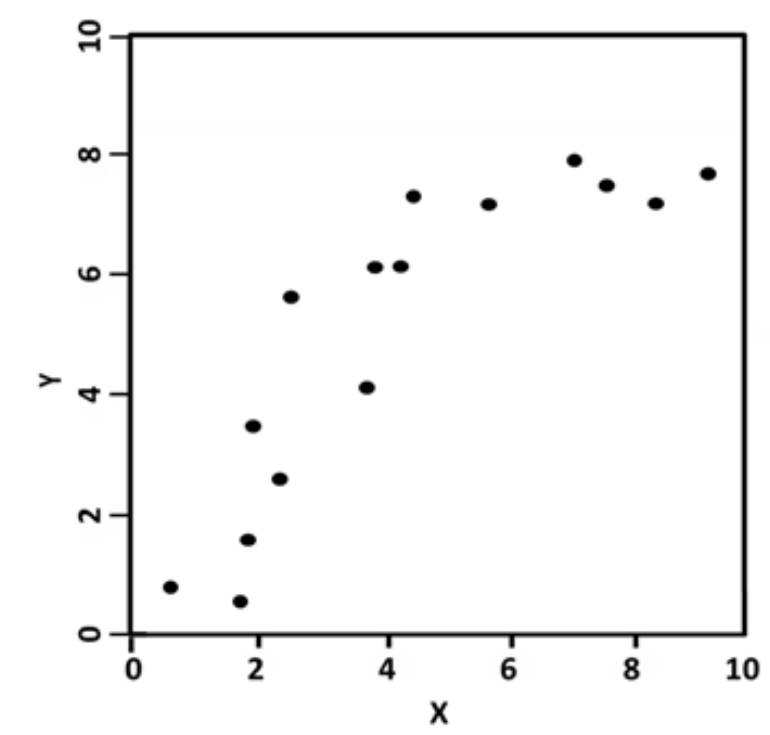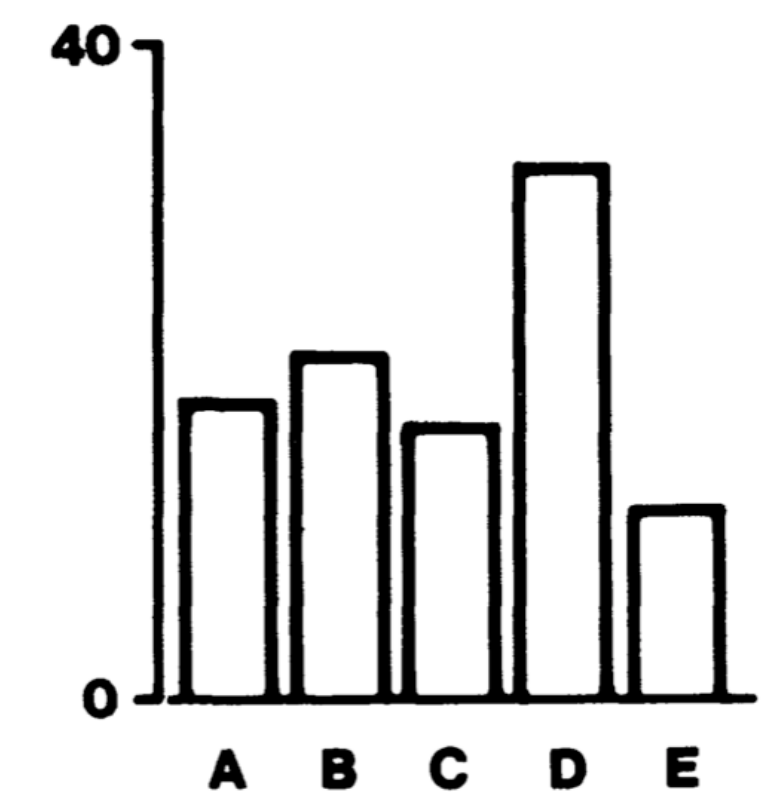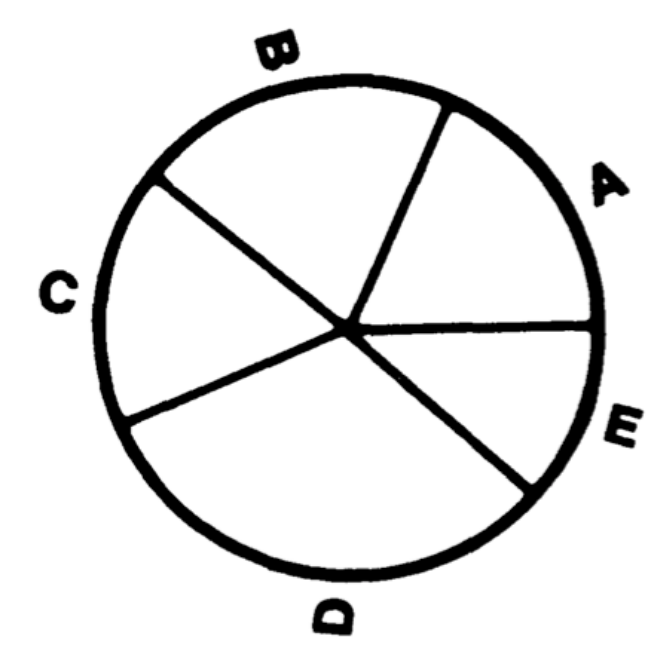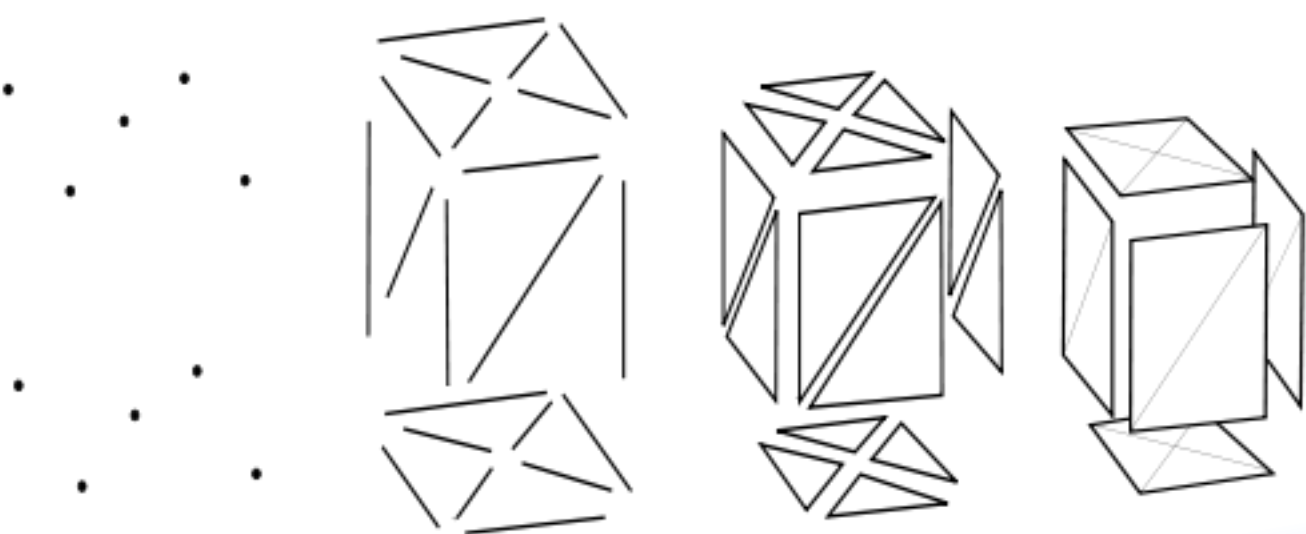1. On a blank piece of paper—not an electronic device—draw a visualization about yourself and some data about your life. You can guess data values rather than looking up specifics.
2. Use spatial layout, color hue, color darkness, shape, angle, enclosure — anything you can think of to encode the data. It should actually encode real data!
3. Be creative! Be personal! Think of this more as an art or design assignment rather than focusing on precision or a scientific approach. E.g., see Cody's drawings here. →
4. In the last 5 minutes, share you're your drawings with your room and discuss.
5. The instructor will announce the end of the activity on Zoom. At this time, return to the main Zoom call. The instructor will call on a few students to share their drawings.
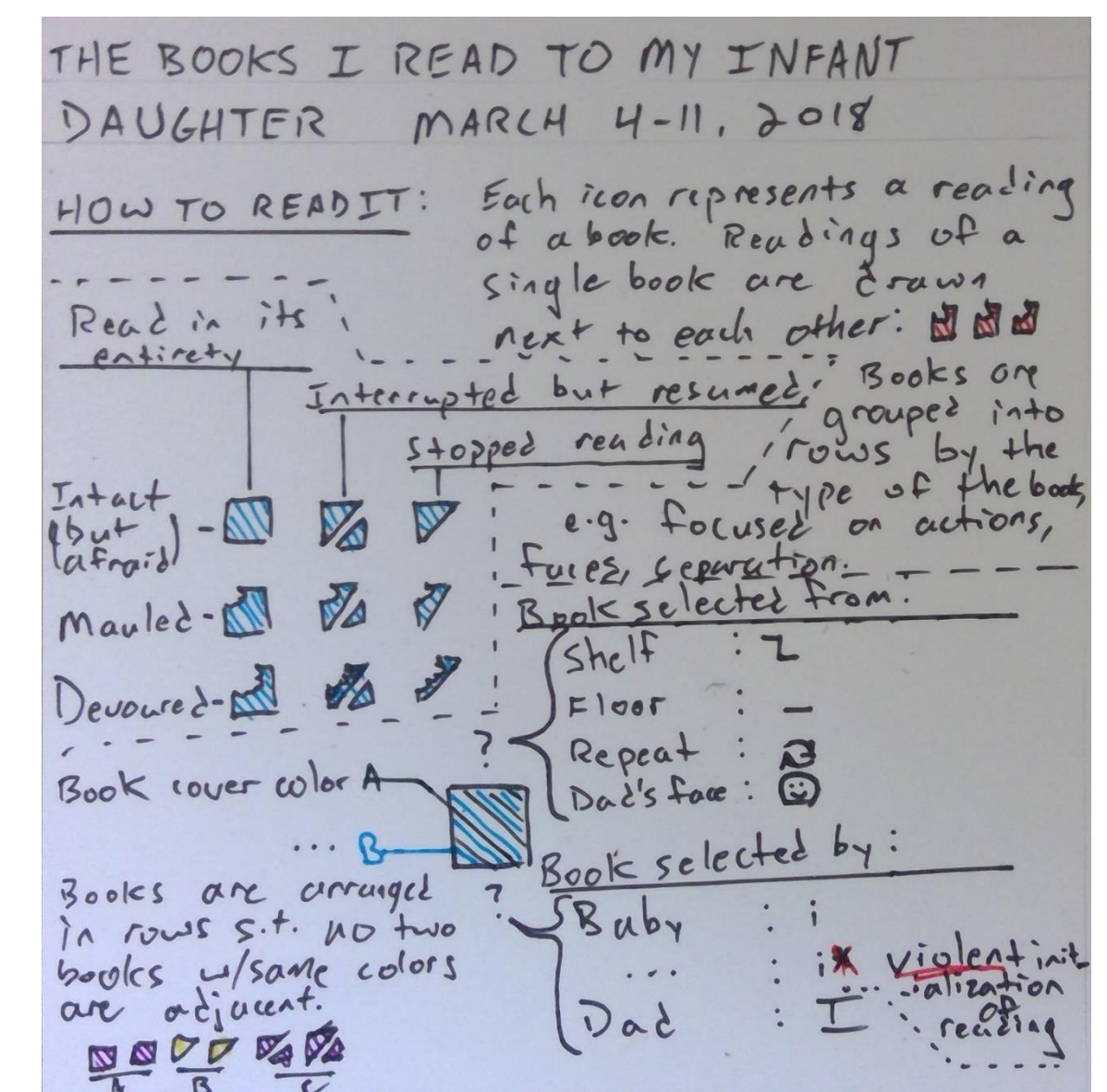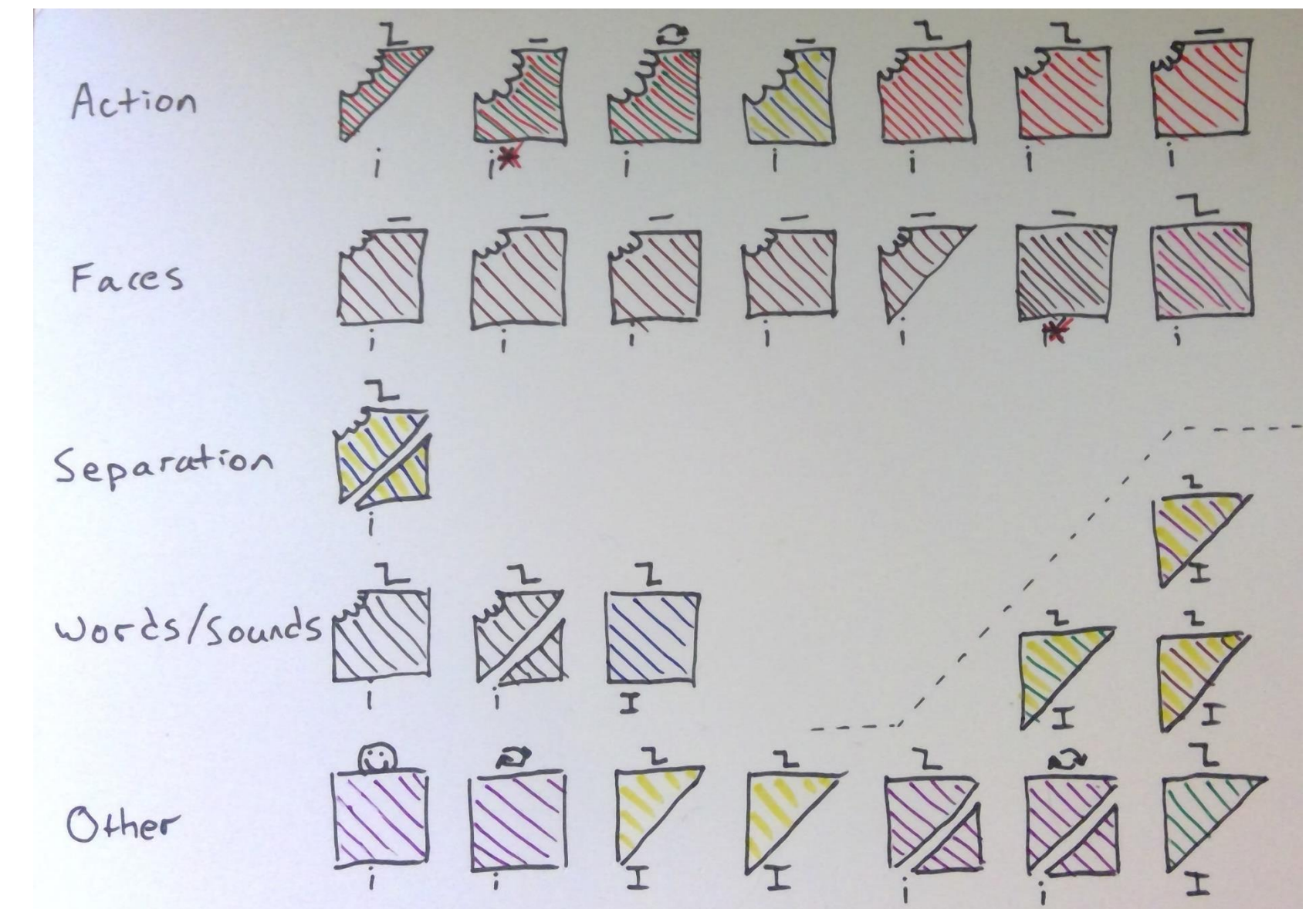
Ok, but why do we need visualization?
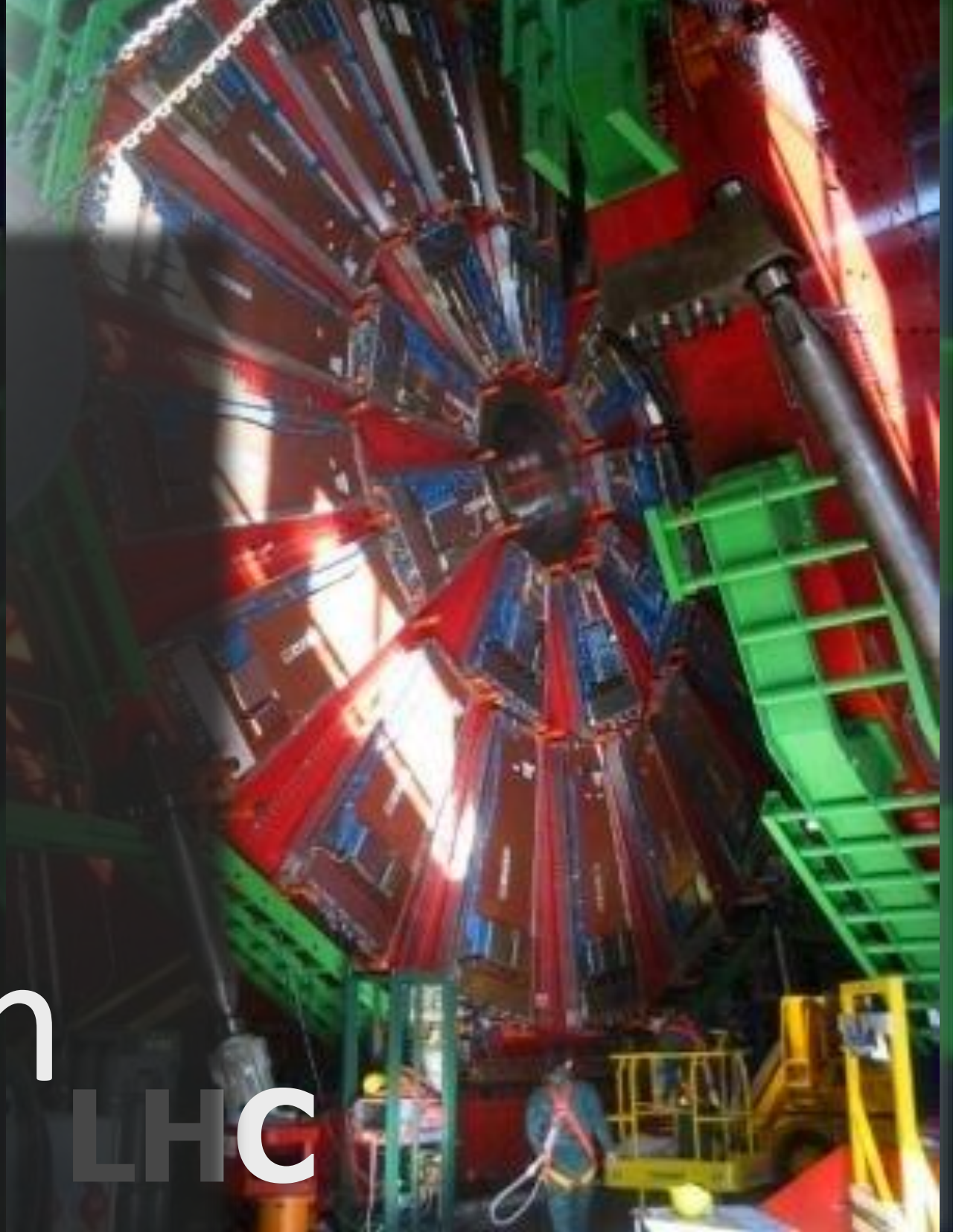
CHALLENGES:
- Scalability
- Complexity reduction
- Humans in-the-loop → human cognition and memory is limited
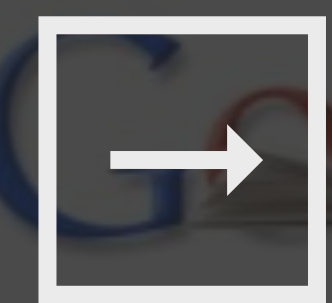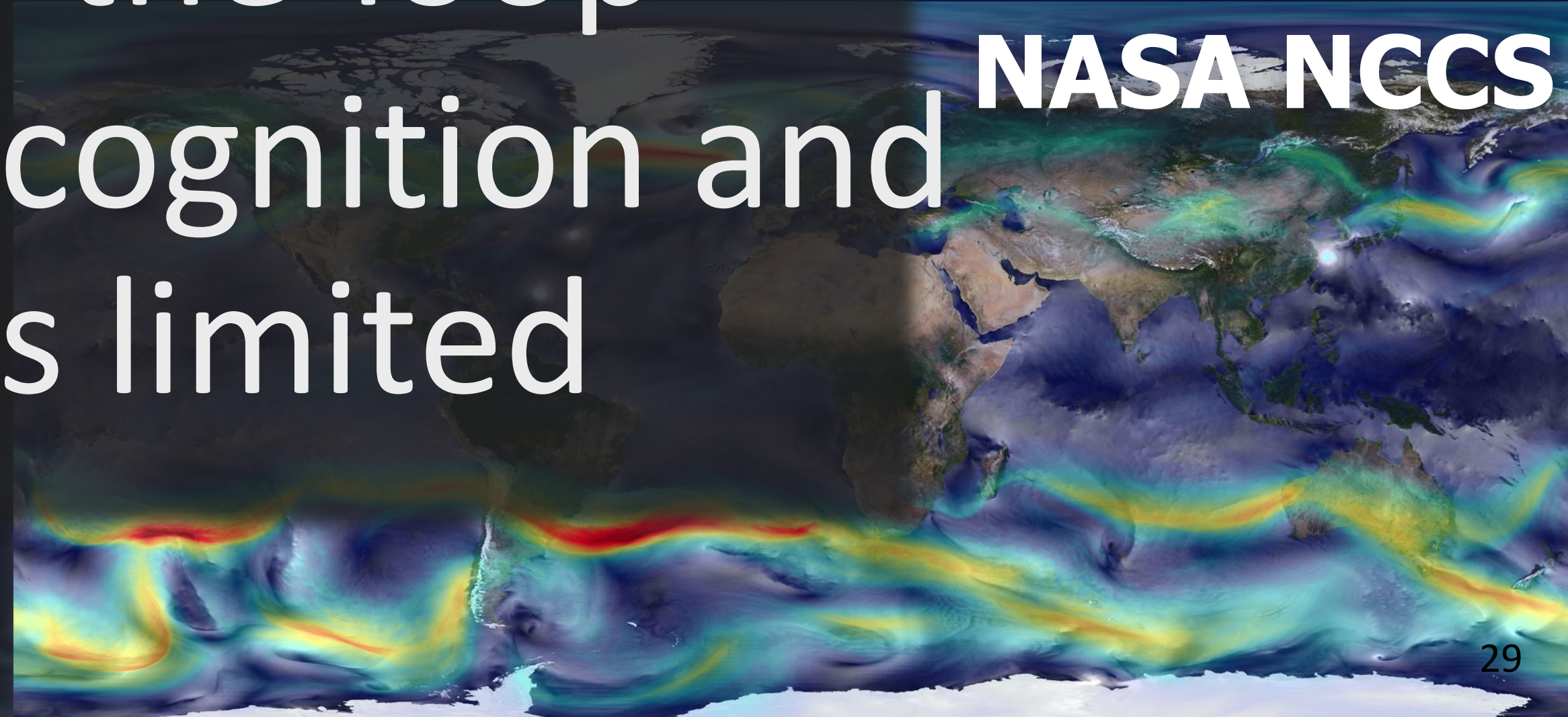
LSST

Financial Markets

LHC

GenBank

NASA NCCS

ngrams

DATA

29

q t f j n i x i x i g j u n a s b b t g r
k c l b v t x j x z x m x r g k l x
q h m z y w t e y j w n o

q t f j n i x i x i g j u n a s b b t g r

k c l b v t x j x z x m x r g k l x

q h m z y w t e y j w n o

q t f j n i x i x i g j u n a s b b t g r

k c l b v t x j x z x m x r g k l x

q h m z y w t e y j w n o

q t f j n i x i x i g j u n a s b b t g r

k c l b v t x j x z x m x r g k l x

q h m z y w t e y j w n o

"change blindness"

The "Door" Study

from Simons & Levin (1998)

"change blindness"

https://www.youtube.com/watch?v=FWSxSQsspiQ

For Next Time

neu-ds-4200-s22.github.io/schedule

Look at the upcoming assignments and deadlines

- Textbook, Readings, & Reading Quizzes—Variable days
- In-Class Activities—If due, they are due 11:59pm the same day as class

Everyday Required Supplies:
- 5+ colors of pen/pencil
- White paper
- Laptop and charger

Use Canvas Discussions for general questions, email codydunne-and-tas@ccs.neu.edu for questions specific to you.

This page shows the overall course schedule. See the page for each week for reading assignments, class slides, and in-class activities. Assignments are generally due on **Fridays by 11:59pm**. The hourglass symbol ⧖ denotes assignments with different due dates. The star symbol ★ denotes "sentinel" project assignments where you will receive more feedback.

Week	Topics	Assignments
#1: Jan 17–21	What is visualization Design rules of thumb	A1—Setting up
#2: Jan 24–28	JS development, projects Marks & channels	A2—Encodings & xenographics
#3: Jan 31–Feb 04	Data types and tasks, Tableau D3 tutorial 1/2	P1—Pitches★
#4: Feb 07–11	In-class group formation D3 tutorial 2/2	
#5: Feb 14–18	Altair and JupyterLab Arrange tables	
#6: Feb 21–25	Color Pop-out, illusions	

Modules / Week 1

Week 1

Learning Objectives

Important Dates and notes
- 2022-01-17—MLK day

T—What is visualization?
- Slides (usually linked by next class)

F—Design rules of thumb
- Slides (usually linked by next class)
- Required readings:
  - VAD Chapter 1—What is Vis, and Why Do It?
  - VAD Chapter 6—Rules of Thumb
- Assignments due (11:59pm):
  - A1—Setting up