Decolonising the Statistics Curriculum

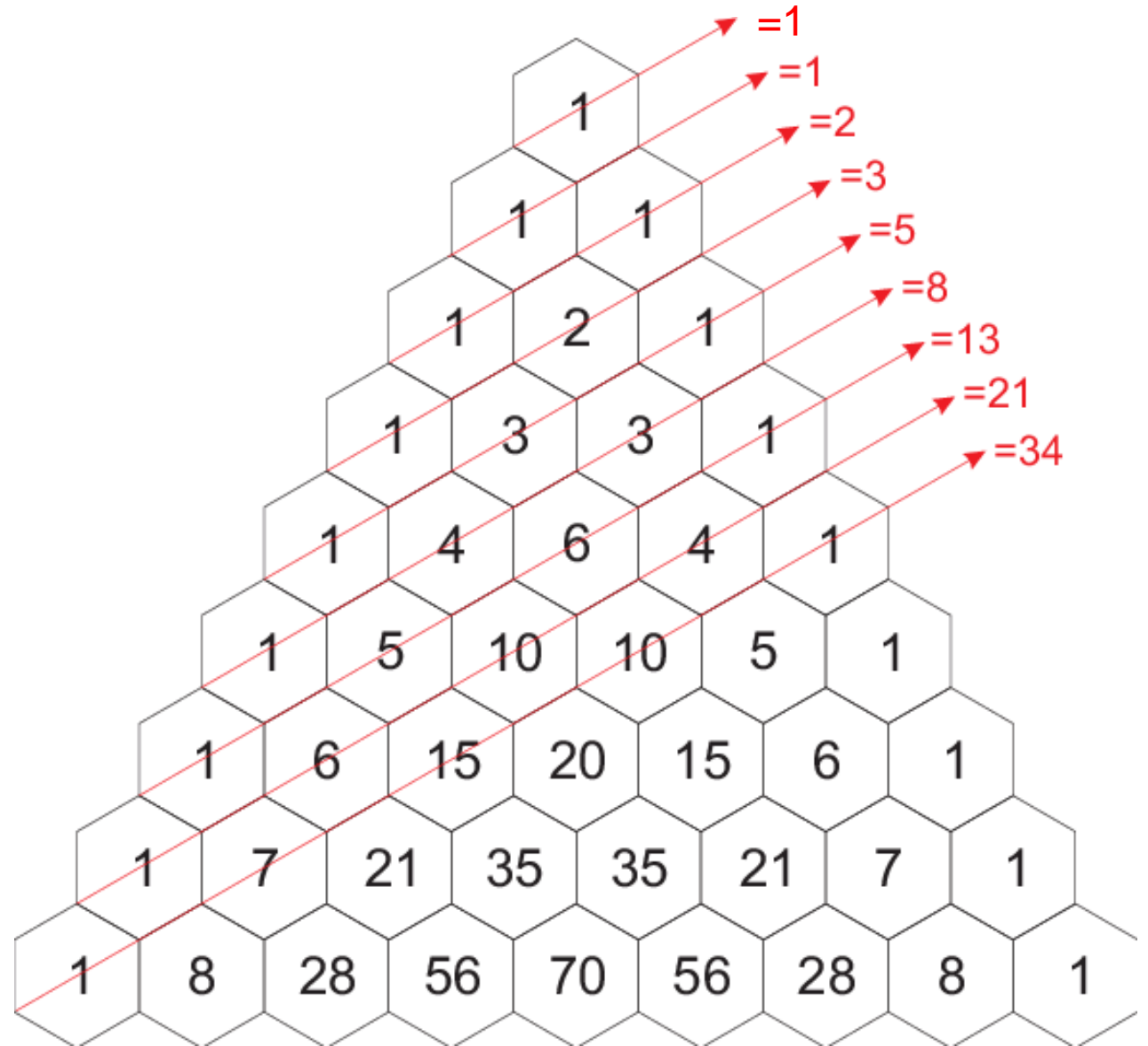Donald Reid   School of Life Sciences

Definitions

- 'decolonizing the curriculum means **creating spaces and resources for a dialogue** among all members of the university on how to imagine and **envision all cultures and knowledge systems in the curriculum**, and with respect to **what is** being taught and how it frames the world.'

Keele University, "Keele Manifesto for Decolonising the Curriculum"

Can you remember what this is?

- Pascal's triangle (Europe)
- Yang Hui's triangle (China)
- Khayyam triangle (Iran)
- Meru Prastaara/Staircase of Mount Meru (India)
- Tartaglia's triangle (Italy)

- Fibonacci numbers
- Mātrāmeru (Pingala, India)

"Why is My Curriculum White?"
(Mariya Hussain, 2015)

- Critique rings true across disciplines where white males voices are predominant (Begum, Neema and Saini 2019)

- Recognition where this is the case and how the social and historical context behind subject knowledge can be responsible is key (Hemmings 2021)

- What about statistics?
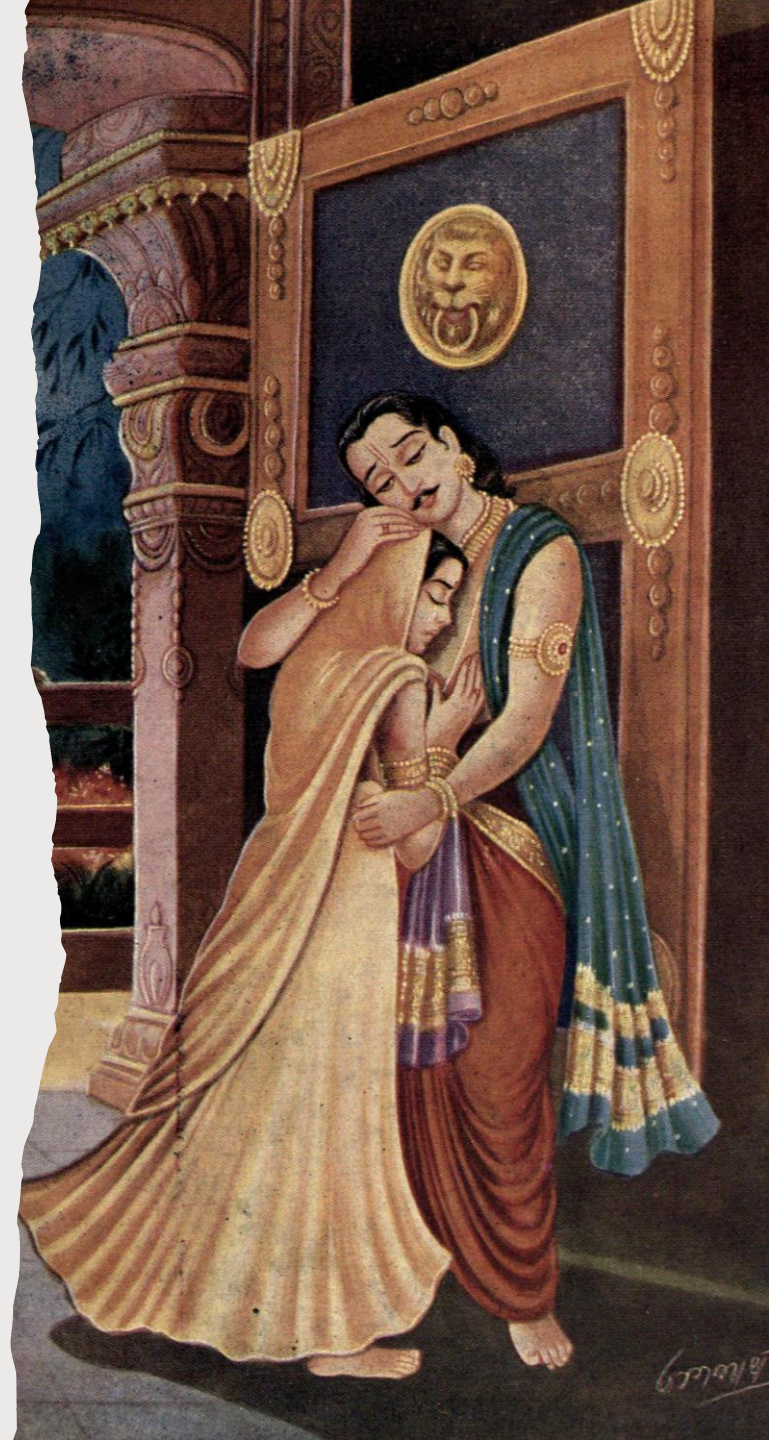
A history of Modern Statistics

- Since 1660 in terms of "political arithmetic" or since 1700 in terms of "inference" (Kendall, 1960)
- Since 1700 in terms of "uncertainty, accuracy and variability" (Stigler, 1986)
- Since 1660 in terms of "probability" and since 1750 in terms of "statistical methods" (Fienberg, 1992)
- ~17th Century (Salkind and Frey, 2021)

- *statisticum collegium* (council of state ~1500)
- *Statistik* (data about the state, 1749)

Mahabharata
(400BCE~400CE)

- Nala seeks advice on numbers from the King

- The King teaches him how to estimate the number of leaves and fruit on Vibhitaka tree from a single twig
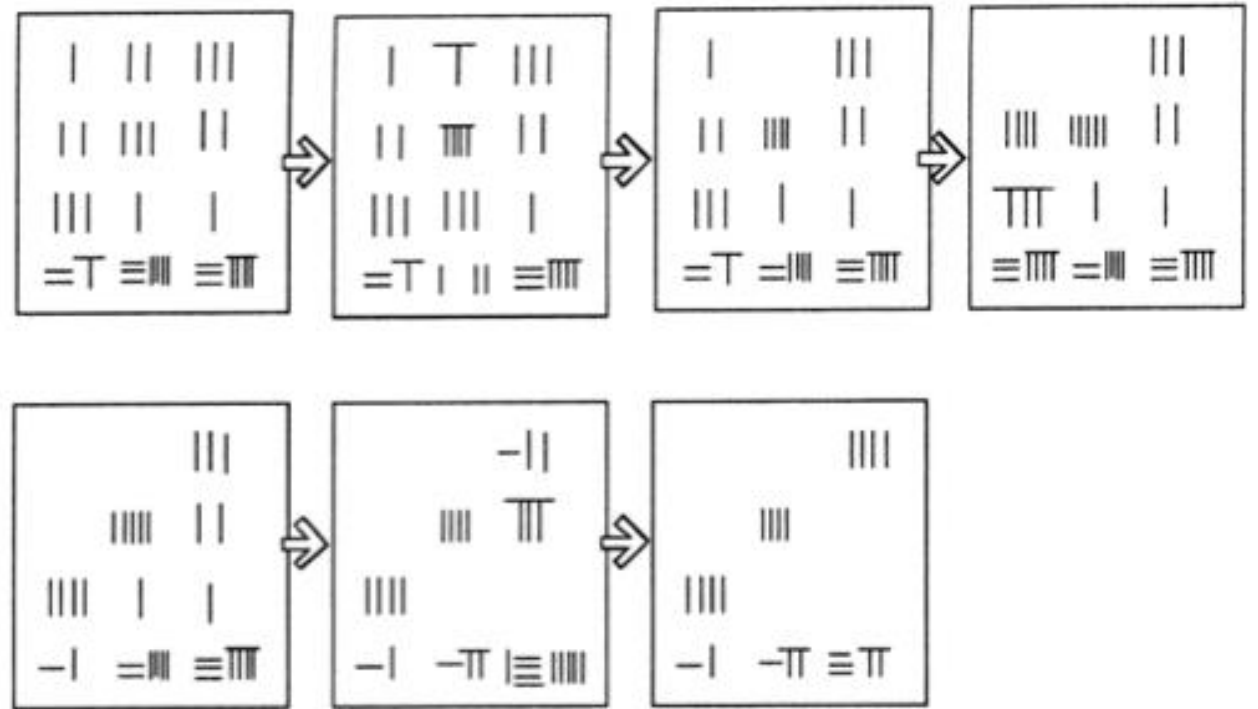
- They estimate the same number

Statistical concepts

- Which concepts does this example demonstrate
  - Extrapolation
  - Consistency in prediction
  - Measures of centrality
  - Sampling

- Which concepts could we add
  - Error and variation
  - Random sampling

The Nine Chapters on the Mathematical Art
九章算術
(10th–2nd century BCE)

- "Fang Cheng Shi"
- Method of solving linear equations
- Gaussian elimination

$$x + 2y + 3z = 26$$
$$2x + 3y + z = 34$$
$$3x + 2y + z = 39$$

Summary statistics: Census

- Babylon ~ 3800BCE

- Egypt ~1800BCE

- India ~ 330BCE

- China 423BCE, 2CE

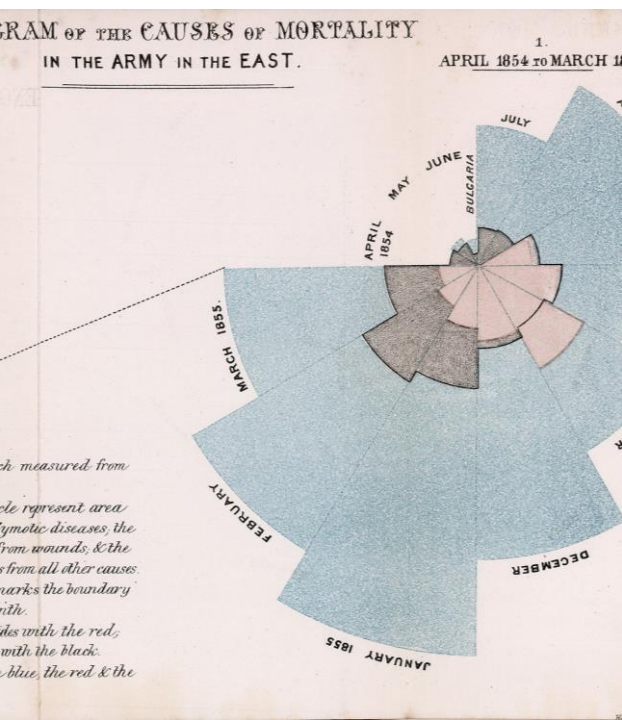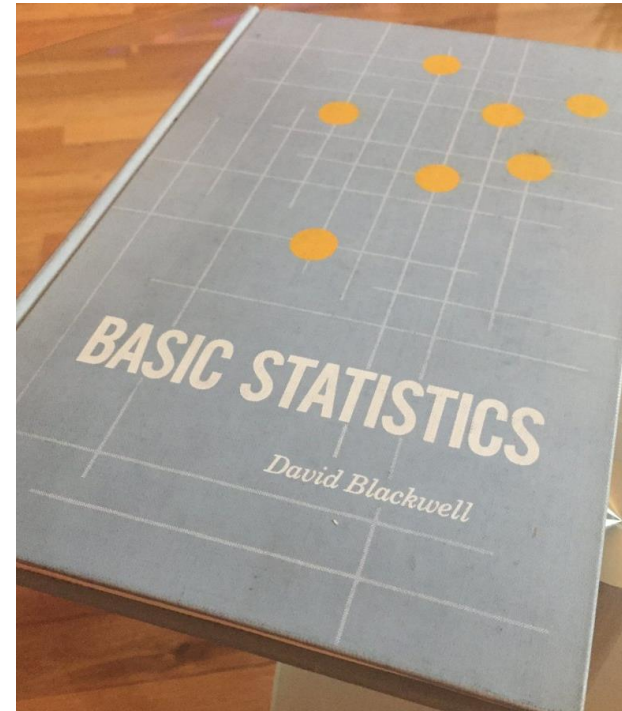- Population

- Taxes

- Logistics

Cryptography

- Al-Kindi (801–873)
- Solving encrypted messages with frequency analysis
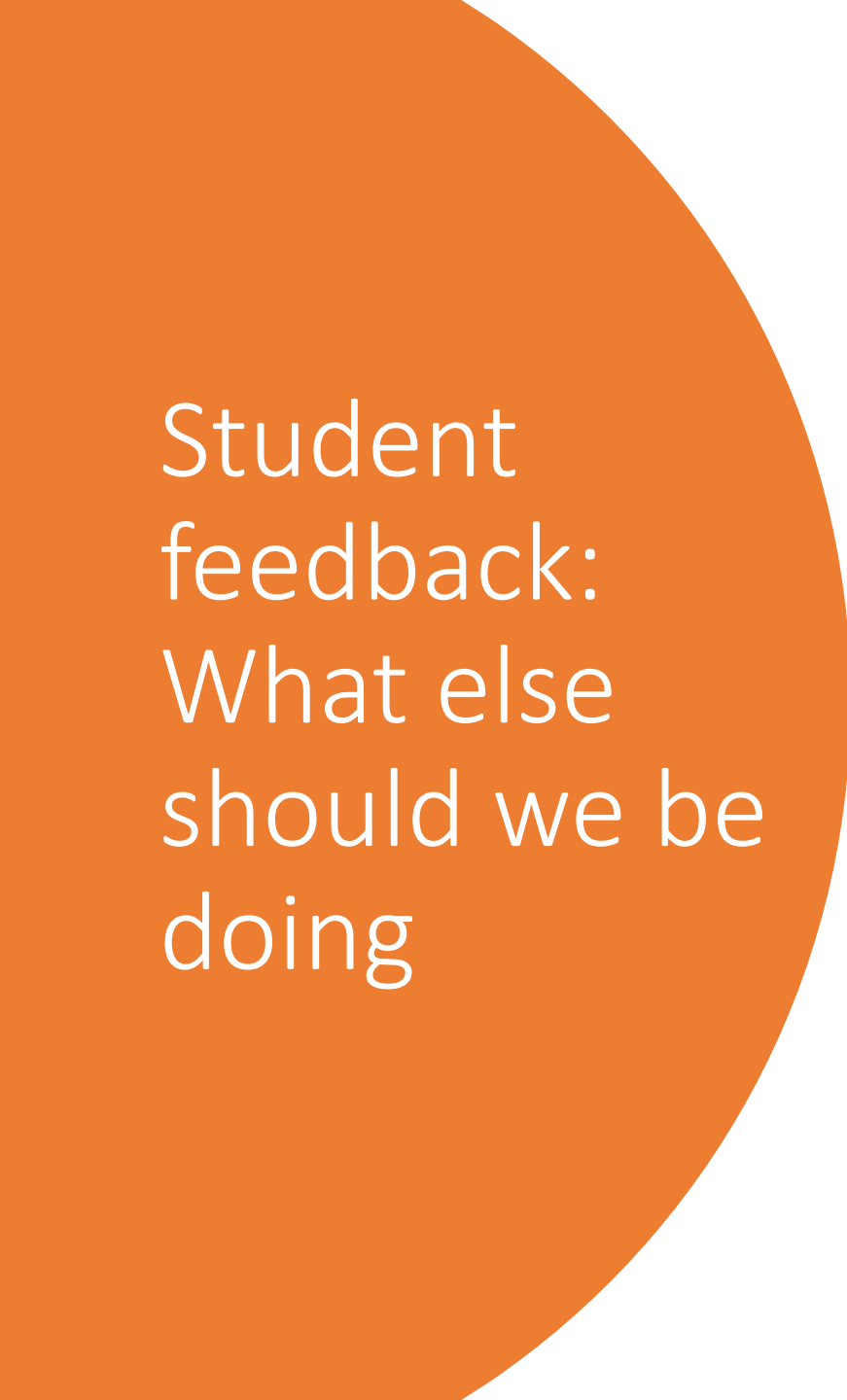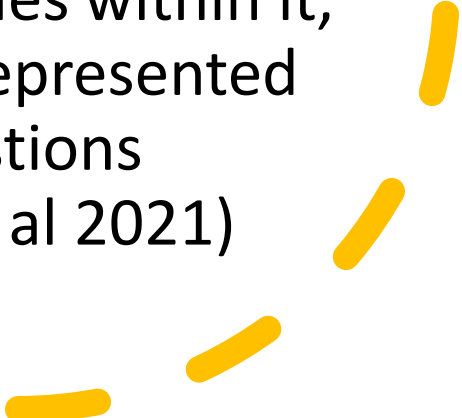
(Broemeling 2011)

Great communicators

- **Florence Nightingale**
  - Data visualisation

- **Maria Gaetana Agnesi**
  - Unified treatment of algebra, Cartesian geometry and calculus

- **David Blackwell**
  - Accessible and early Bayesian textbook

Student feedback: What else should we be doing

- Highlight Eurocentrism
- Highlight the current work of global statisticians and diverse data problems
- Highlight traditional statistical knowledge/application
- Continue critiquing datasets

- "Today, structural racism influences the data science workforce and the hierarchies within it, the datasets collected and who is represented within them, and the research questions pursued and prioritised." (Knight et al 2021)

Student feedback

- "Giving… concept in each lecture"

- "More information and examples of eurocentrism relevant to the student's curriculum could be given that way."

- "I don't agree that a statistics skills course needs to have a political agenda."

- "While things should always be critiqued for being eurocentric or outdated… I don't think the course structure should become about holding space for people to discuss the highly sensitive topic of race and identity. It should be a neutral and atmosphere-free learning opportunity."

- "using more diverse datasets"

- Most considered themselves to have a poor understanding of the 'Decolonize the Curriculum' movement

- Large range of opinions on importance and concern

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