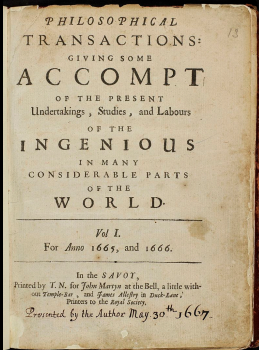


A very brief history of communicating science

Mercè Crosas (IQSS, Harvard University)
@mercecrosas

An introduction to Force2016 panel on Communicating Science
with Steven Pinker, César Hidalgo, and Christie Nicholson

Scholarly output doubles every 20 years, from mid 1750s to 2000



Every 100 -150 new authors = 1 new journal for 500-1000 readers

3 journals

~10 journals

~400 journals

~14,000 journals (peer reviewed)

1665

1700

1800

1900

2000

Now:

- 80,000 total journals (80 GBs)
- 33,000 peer reviewed (20 GBs)

Compared to:

- Library of Congress (10 TB print; few PBs total)
- Tens of trillions web pages
- 1 ZB of All Data (1 trillion GBs)

Science communication adapts to the increase in cognitive complexity

Science from and for enthusiasts

Detailed descriptions

Professionalization and specialization of science

Connect facts to theory

Hedging starts: 1 time every 200 words 2 times every 100 words

1 / 2 of articles cite previous work

2/3 cite; sections introduced
(abstract, methods, ...)

All articles cite previous work

1665

1700

1800

1900

2000

- Story telling, poetic style
- First person, active voice
- Simple noun phrases
- Description of facts
- Accuracy and certainty
- Letter style

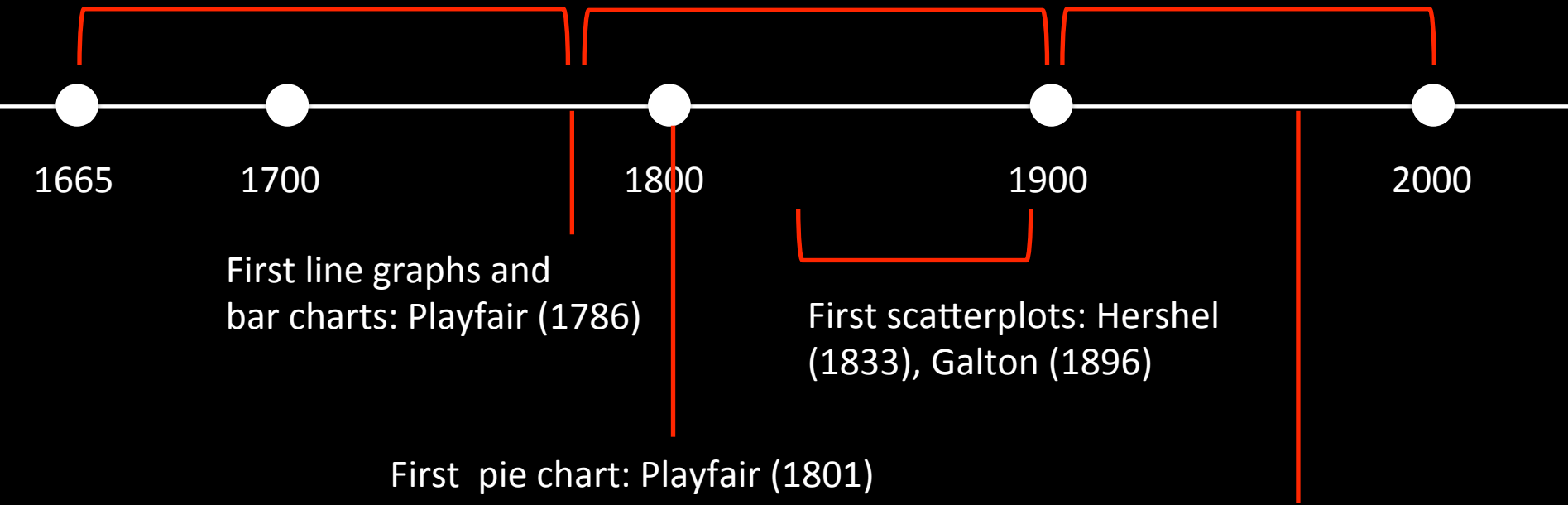
- Systematic, technical vocabulary
- Objective, passive voice
- Complex noun phrases
- Explanation of facts
- Hedging
- Formal presentation elements
(abstract, methods, conclusion)

Visuals evolve from illustrations of observations to scientific arguments

50% of articles with visuals:
illustrate instruments and
measurements

Figures start to provide
scientific explanations

~ 100% of articles
with figures



Golden age of data visualizations

Re-birth of visualizations

“The 21st of April, 1665, about eight in the morning, I bored a hole in the body of a fair and large Birch, and put in a Cork with a Quill in the middle; after a Moment or two it [a sap] began to drop, but yet very softly: Some three Hours after I returned, and it had filled a Pint Glass, and then it droped exceeding fast, viz. every Pulse a Drop: This Liquor is not unpleasant to the Taste, and not thick or troubled; yet it looks as though some few drops of Milk were split in a Bason of Fountain Water.”

(Lister, 1697)

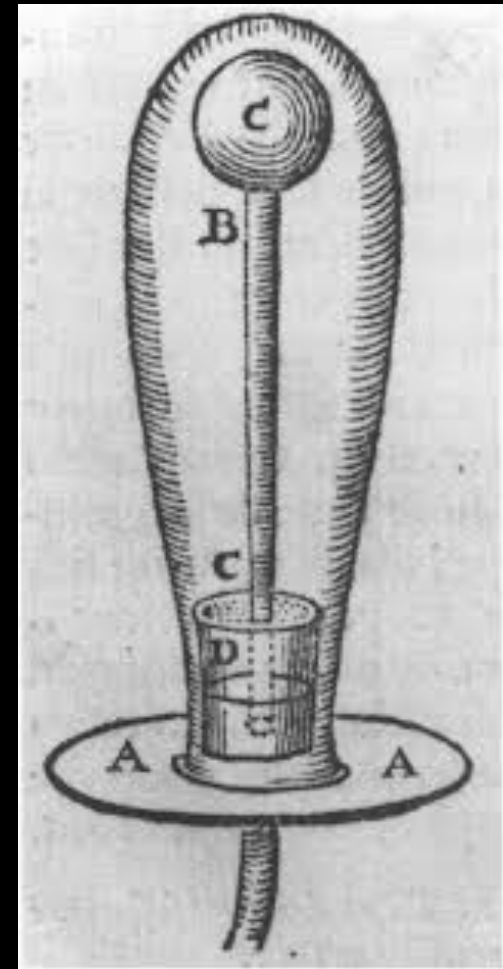


Illustration from Huygens, *Touching the Phenomena of Water from which all Air has been Removed* (1672)