What's the Story?

Last updated: 2025/01/14, 17:42:51 EST

Principles of Complex Systems, Vols. 1, 2, & 3D
CSYS/MATH 6701, 6713, & a pretend number, 2024–2025

Prof. Peter Sheridan Dodds

Computational Story Lab | Vermont Complex Systems Center
Santa Fe Institute | University of Vermont

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Story editor

Every can opener is a possible pillow.

Typed by Pratchett the Cat:

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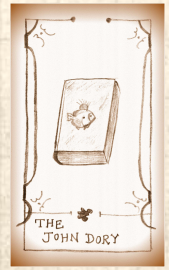

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Burning through stories for fuel in the Experimental Training Laboratory:

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THE DATA POOR
THE POORING DATA
THE CHARMS OF THE MANY WRONG PATHS
THE DOORS THAT SHOULD NOT BE OPENED
THE KNOWLEDGE OF DEAD MANKS
THE EMERGENCE OF STRUCTURE
THE EMERGENCE OF DESTRUCTION
THE EMERGENCE OF THINKING
It was the best of times,
THE EMERGENCE OF STORIES
THE MECHANICS OF TATTUTICAL
TWO THRESHOLDS OF PERCOLATION
THE NETWORKED COMPLEX
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THE BIRDS OF A FEATHER
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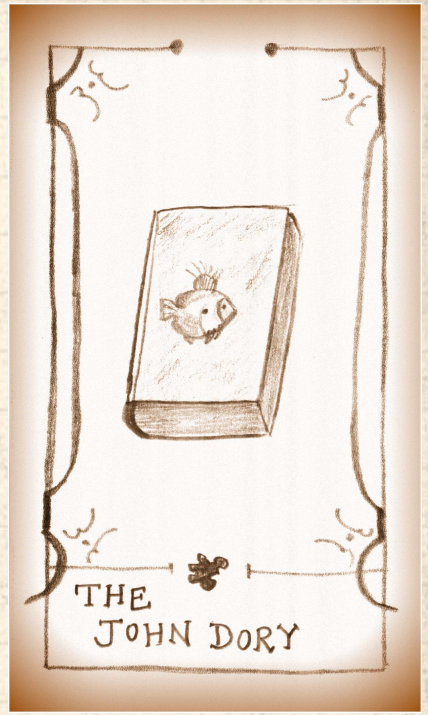
THE UNVEILING OF HIDDEN POWERS
THE BURYING OF SHAPES IN THINGS
THE LIMITS OF ORGANIZATIONS


THE JOHN DORY

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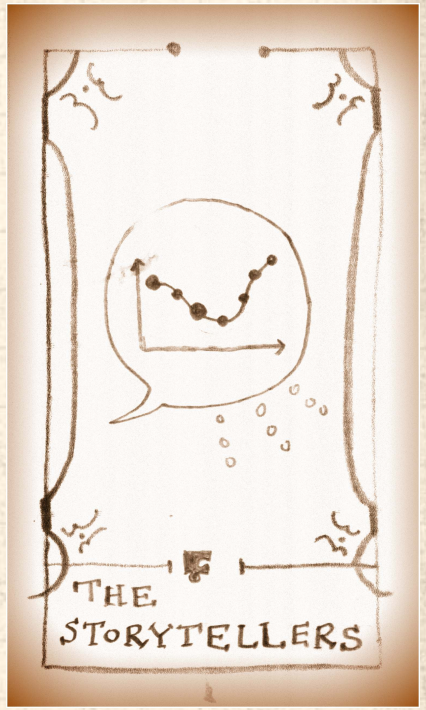
THE STORYTELLERS

Super Survival of the Stories:

The Desirability of Storytellers, The Atlantic, Ed Yong, 2017-12-05.

- Study of Agta, Filipino hunter-gatherers.
- Storytelling valued well above all other skills including hunting.
- Stories encode prosocial norms such as cooperation.
- Like the best stories, the best storytellers reproduce more successfully.

Major competing storytelling entities:

- News.
- Books, magazines.
- Art.
- Music industry.
- Television, movie studios, Netflix, HBO, Disney.
- Social media: Facebook, Instagram, Snapchat, ...
- All sports.
- Video games.
- Religions, ideologies, belief systems, Freemasons, ...
- Enduring coherent groups: Cultures, countries, cities, ...
- Mathematics (partial)

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Pantheon: The most memorable people of history

- HPI: Historical Popularity Index.
- Concept: Measure current importance of a figure based on a composition score derived from Wikipedia quantities.

What is HPI?

HPI stands for Historical Popularity Index. It is a simple an ad-hoc metric that aggregates information on a biography's online popularity. HPI is based on the idea that fame needs to break multiple barriers, like those of time and language. HPI aggregates information on the age and attention received by biographies in multiple language editions of Wikipedia to provide a summary statistic of their global popularity.

HPI is currently made of five components: the "age" of a biography's character (e.g. Jesus is more than 2,000 years old), number of Wikipedia language editions in which the biography has a presence (L), the concentration of the pageviews received by a biography across languages (L*), the stability of pageviews over time (CV), and the number of non-English pageviews received by that biography. We find that combining these metrics provides a more sensible ranking than using these metrics alone. **To validate HPI, we previously showed that it correlates better with accomplishments than single metrics**, when we focus on activities where individual accomplishments are measurable (e.g. Chess, Olympic Swimming, Tennis, Formula One).

While being an ad-hoc metric, HPI also attempts to correct for the internet's English bias. By using non-English page views, and giving a premium to biographies that have a presence in multiple languages, and whose pageviews are not concentrated in only a few of them, HPI tries to move away from a ranking dominated by English pageviews.

Where can I submit a suggestion?

You can use the following form to suggest correction to Pantheon's data. Pantheon's atomic unit of data is the biography, so all corrections should be communicated as corrections to a biography (everything else is an aggregate).

The all timers from the collective view of 2024

Info							Birthplace		Deathplace		Stats								
#		Name	Occupation	Birth	Death	Gender	City	Country	City	Country	L	L*	PVne	CV	HPI 2024	HPI 2022	Rank 2024	Rank 2022	Δ
1		Muhammad	RELIGIOUS FIGURE	570	632	Male	Mecca	Saudi Arabia	Medina	Saudi Arabia	210	26.31	6.2M	3.72	100.00	98.85	1	1	-
2		Isaac Newton	PHYSICIST	1643	1726	Male	Woolsthorpe-by-Colsterworth	United Kingdom	Kensington	United Kingdom	225	29.77	3.3M	3.77	98.73	98.35	2	2	-
3		Genghis Khan	MILITARY PERSONNEL	1162	1227	Male	Khentii Mountains	Mongolia	Yinchuan	China	170	26.45	3.3M	2.88	97.80	96.66	3	4	+1
4		Jesus	RELIGIOUS FIGURE	4 BC	33	Male	Herodian kingdom	Israel	Jerusalem	Israel	265	17.96	5.3M	6.26	97.30	96.89	4	3	-1
5		Leonardo da Vinci	INVENTOR	1452	1519	Male	Anchiano	Italy	Clos Lucé	France	233	18.54	4.0M	5.30	96.43	96.48	5	5	-
6		Ludwig van Beethoven	COMPOSER	1770	1827	Male	Bonn	Germany	Vienna	Austria	203	24.99	2.7M	3.55	96.04	95.23	6	8	+2
7		Aristotle	PHILOSOPHER	384 BC	321 BC	Male	Stagira (ancient city)	Greece	Chalcis	Greece	215	20.43	2.8M	4.74	95.87	96.24	7	6	-1
8		Plato	PHILOSOPHER	427 BC	347 BC	Male	Classical Athens	Greece	Athens	Greece	210	20.64	2.6M	4.79	95.58	95.54	8	7	-1
9		Marco Polo	EXPLORER	1254	1324	Male	Venice	Italy	Venice	Italy	174	26.09	1.5M	3.16	95.49	94.60	9	9	-
10		Galileo Galilei	ASTRONOMER	1564	1642	Male	Pisa	Italy	Arcetri	Italy	198	20.00	2.7M	4.59	95.09	94.55	10	11	+1
11		Napoleon	POLITICIAN	1769	1821	Male	Ajaccio	France	Longwood, Saint Helena	Saint Helena, Ascension and Tristan da Cunha	205	12.49	12M	6.08	94.95	94.47	11	12	+1
12		Socrates	PHILOSOPHER	470 BC	399 BC	Male	Alopece	Greece	Athens	Greece	196	19.64	2.5M	4.67	94.88	94.34	12	13	+1
13		Adolf Hitler	POLITICIAN	1889	1945	Male	Braunau am Inn	Austria	Führerbunker	Germany	234	15.08	8.9M	6.02	94.59	94.10	13	14	+1

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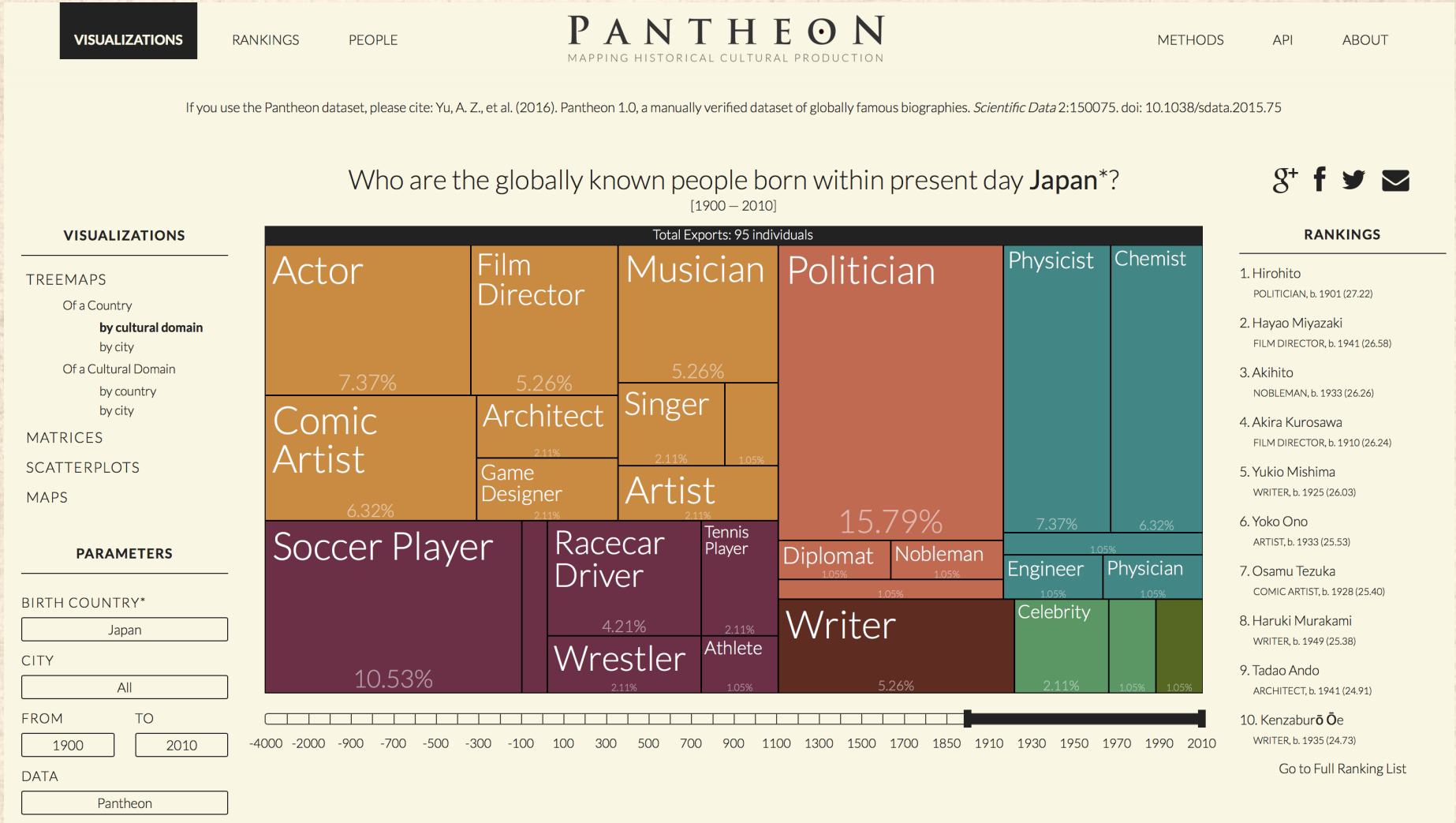
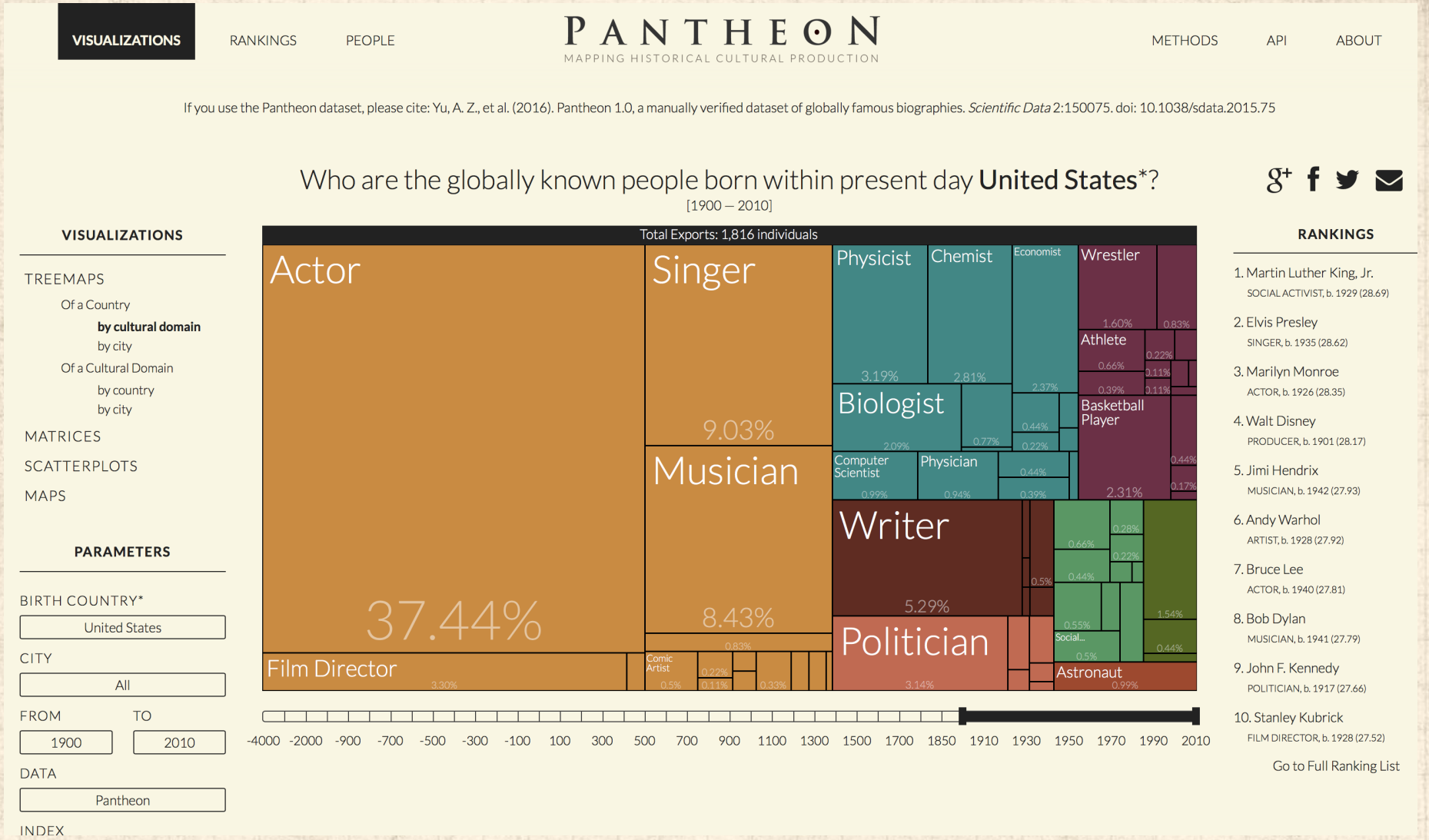
The famous are storytellers—Japan:



For people born 1900–

http://pantheon.media.mit.edu/treemap/country_exports/JP/all/1900/2010/H15/pantheon

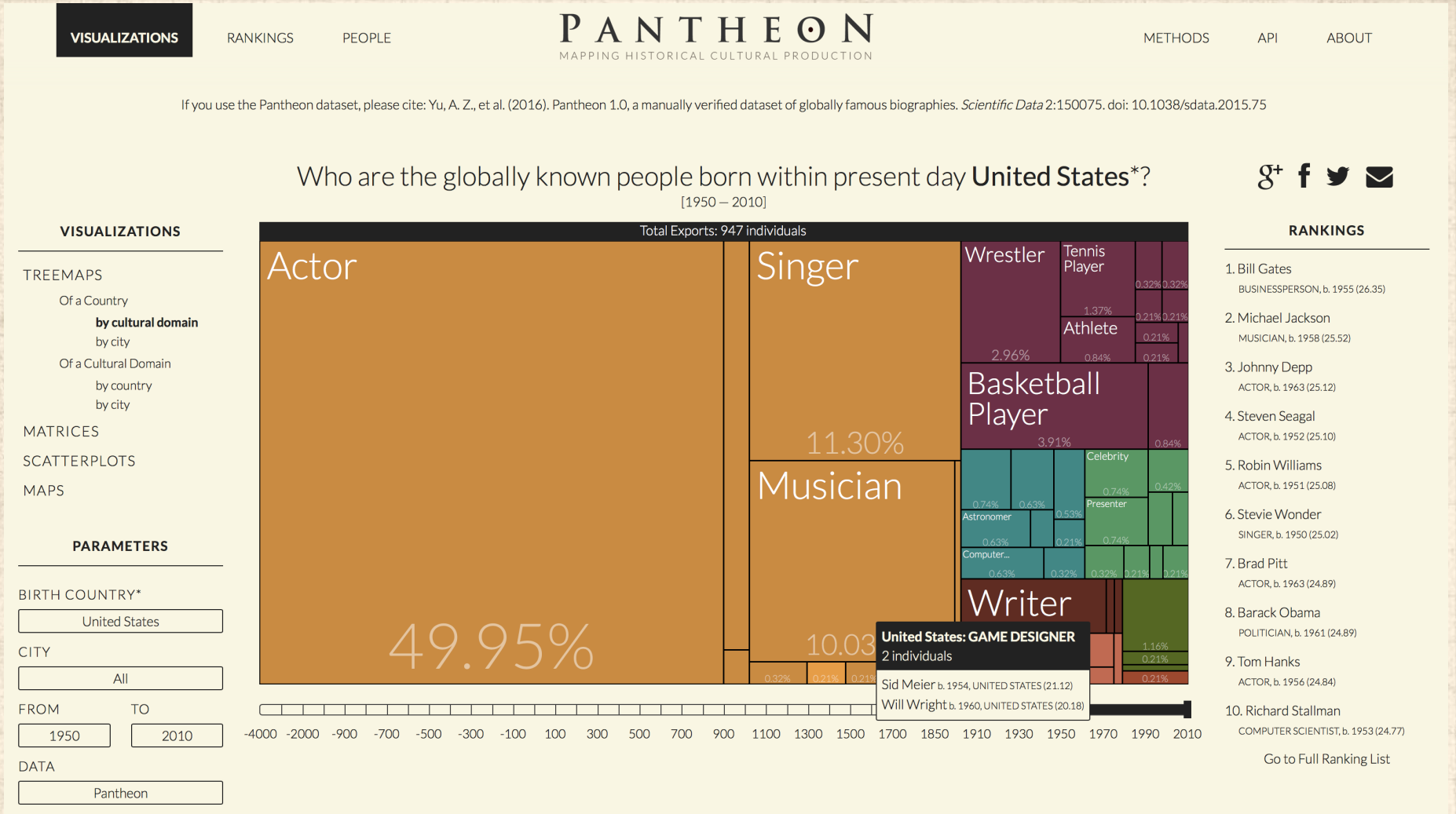
The famous are storytellers—United States:



For people born 1950–

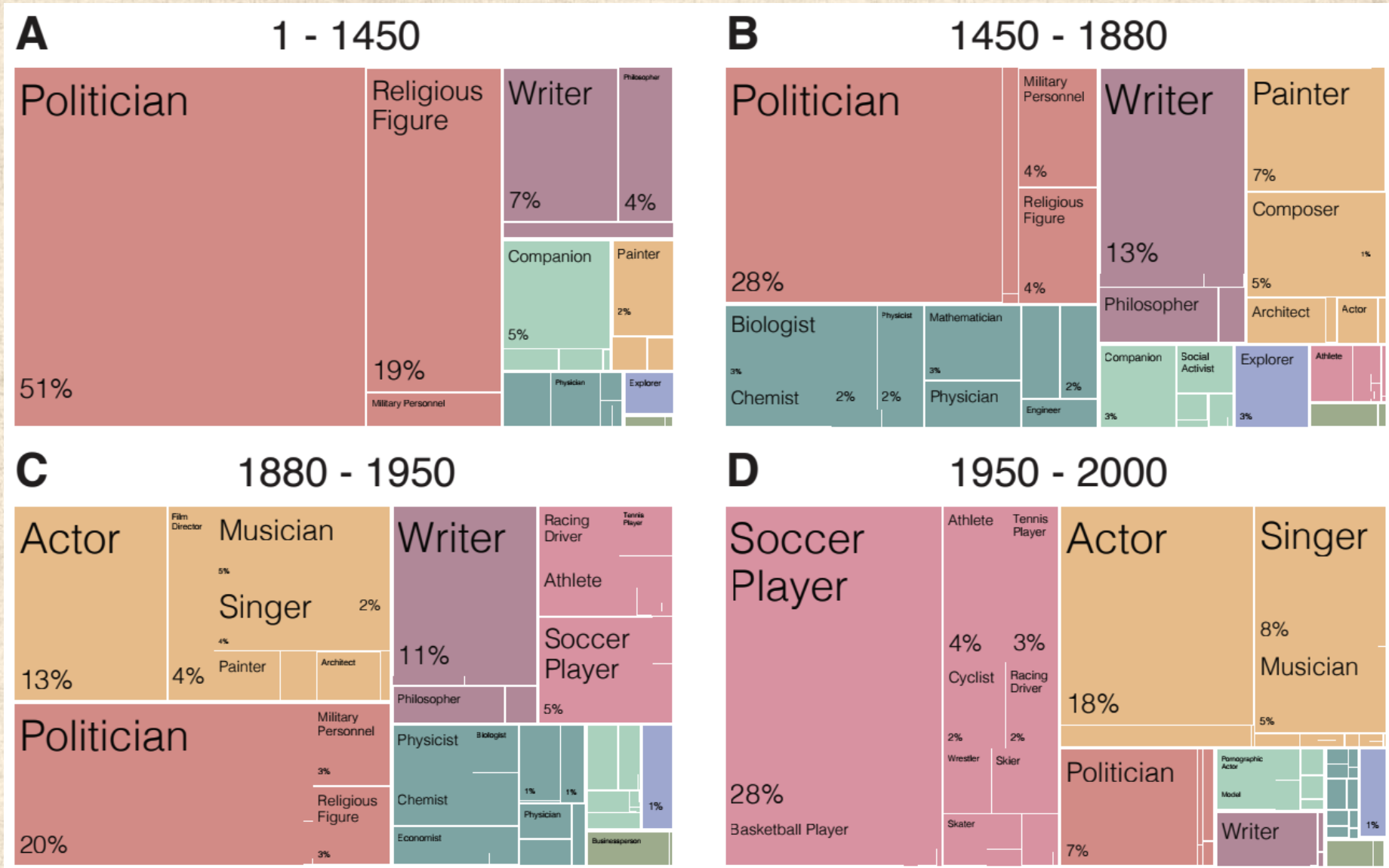
http://pantheon.media.mit.edu/treemap/country_exports/US/all/1950/2010/H15/pantheon

Storytellers win:



For people born 1950–

http://pantheon.media.mit.edu/treemap/country_exports/US/all/1950/2010/H15/pantheon



https://www.media.mit.edu/projects/pantheon-new/overview/

It's all about algorithms (stories):

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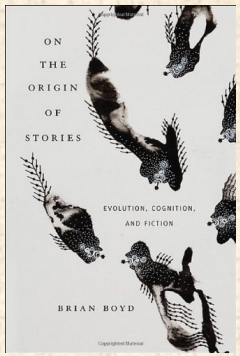
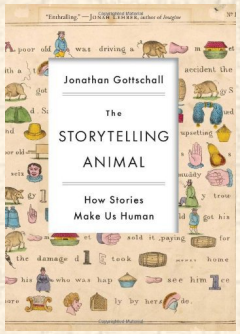
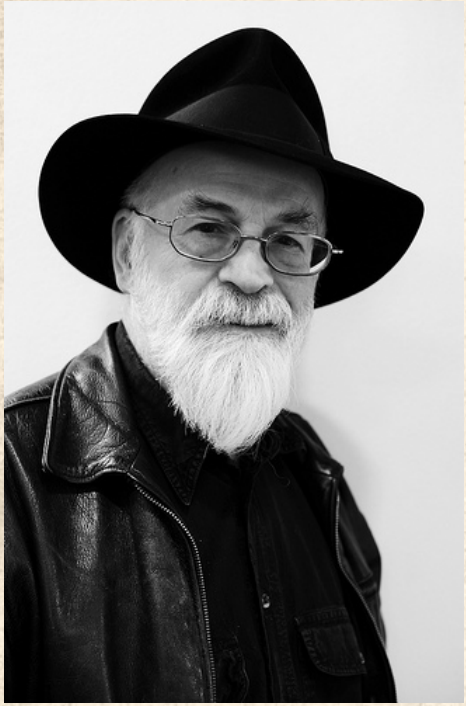


"On the Origin of Stories: Evolution, Cognition, and Fiction"
by Brian Boyd (2010). [4]



"The Storytelling Animal: How Stories Make Us Human"
by Jonathan Gottschall (2013). [12]

(Sir Terry) Pratchett's Narrativium:



- "The most common element on the disc, although not included in the list of the standard five: earth, fire, air, water and surprise. It ensures that everything runs properly as a story."
- "A little narrativium goes a long way: the simpler the story, the better you understand it. Storytelling is the opposite of reductionism: 26 letters and some rules of grammar are no story at all."

- "Heroes only win when outnumbered, and things which have a one-in-a-million chance of succeeding often do so."

Stories are everything

Full torturous scene is here

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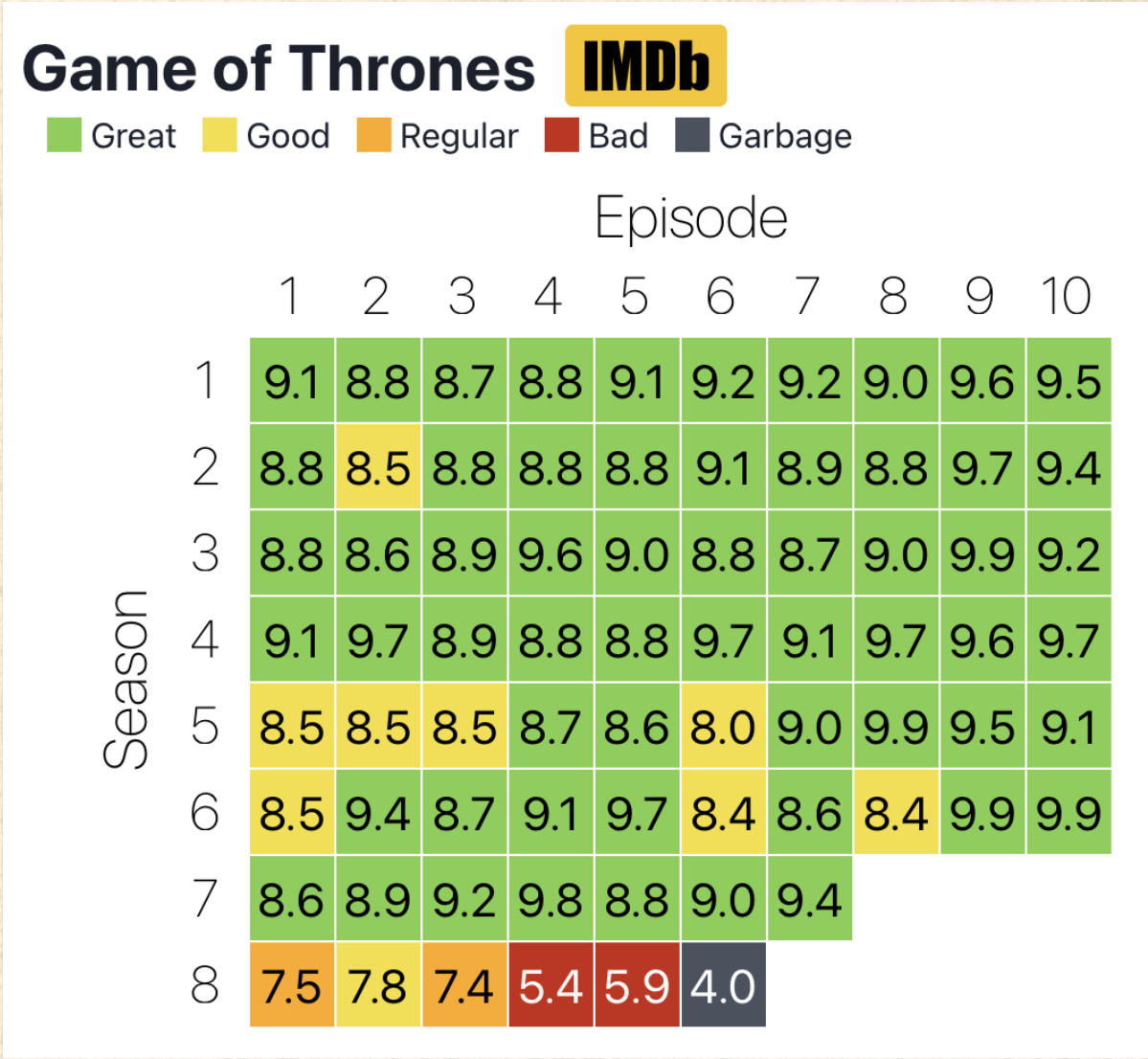
Game of Thrones, S6E06: The Iron Throne

"What unites people? Armies? Gold? Flags?[1] Stories.
There's nothing in the world more powerful than a good story.
Nothing can stop it.
No enemy can defeat it."

[1] Character is the shortcut to story

Stories are the essence of ... oh no, no, no ...

- Except for writers who destroy their own stories.
- Also audiences.
- Basic word of mouth.
- And critics.
- And other, better stories.
- Character assassination works too.



Series Heat for GoT

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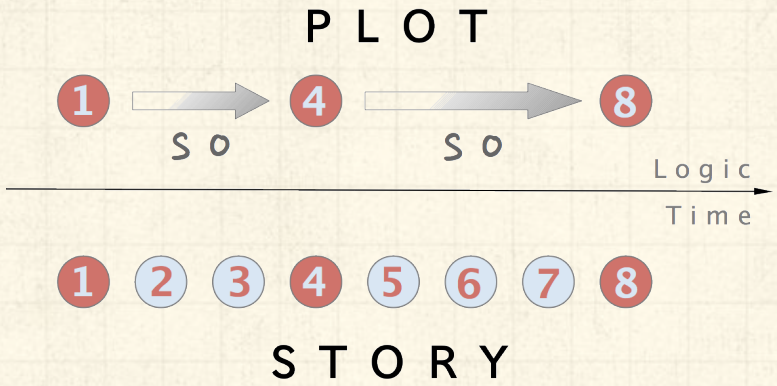
We see (certain kinds of) stories

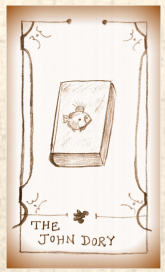
Heider and Simmel, 1944 [13], Source

Simple Definitions:

- Story: a laying out of a temporal sequence of events.
- "Time is a great storyteller" (Irish proverb)
- Events may be any balance of real and imagined.
- Narrative ≡ Story.
- Plot: Essential sequence of a story's elements.[2]

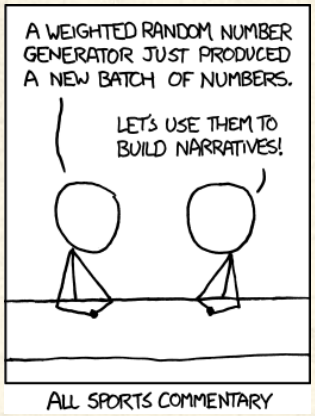


- Plot = Algorithm



[2]By □□□□□□□ — Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=34054522

Understanding the Sociotechnocene—Stories:



xkcd.com/904/

- Goal: a Science of Stories.
- Claim: Homo narrativus—we run on stories.
- "What's the John Dory?"
- "They've lost the plot/thread"
- Maybe: The narrative hierarchy and the Scalability of stories.
- Research: Extraction of metaphors, frames, narratives, and stories from large-scale text/corpora.
- Storywrangler, POTUSometer, ...
- Research: What's the taxonomy of human stories?
- Maybe: Stories ↔ Algorithms

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Algorithms are everywhere:

- Communication/Language.
- Economic systems
  (Shiller: "Narrative Economics" [20])
- Legal systems.
- Social norms, customs, cultures.
- Food:
  growing, harvesting, preparing, distribution, ...
- Safety codes and protocols
- Military.
- Stories ...

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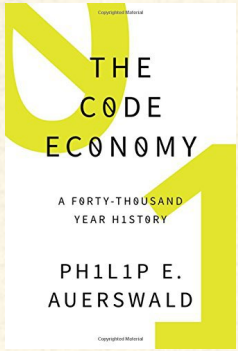
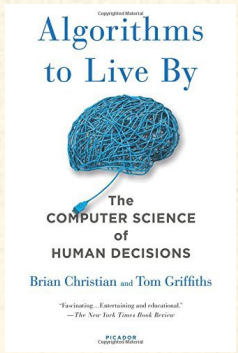
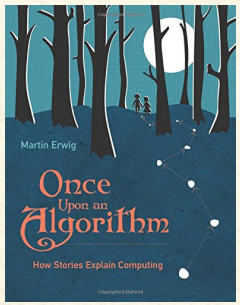
Algorithms, recipes, stories, ...



"The Code Economy: A Forty-Thousand Year History"
by Philip E Auerswald (2017). [2]

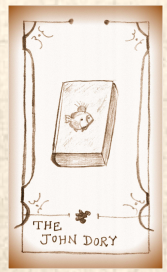


"Algorithms to Live By"
by Christian and Griffiths (2016). [8]



"Once Upon an Algorithm"
by Martin Erwig (2017). [11]

Also: Numerical Recipes in C [17] and How to Bake π [7]



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THE STORIES CONTAGIOUS
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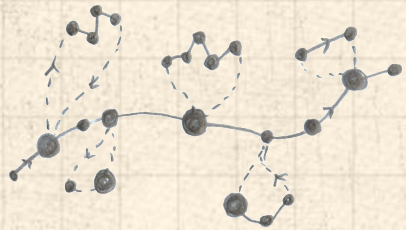
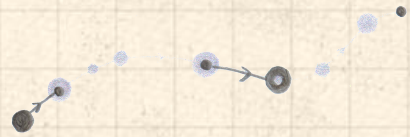
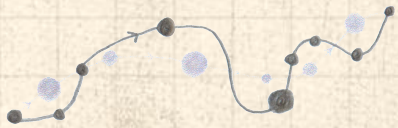
THE STORYTELLERS
THE FATED ASTRAL PATH
THE PATHS OF UNIVERSALITY
THE DEPENDENT PATHS
THE TROUSERS OF BIFURCATING REALITIES
THE UNKNOWN MECHANISM
THE LANDSCAPE OF FORKING PATHS
THE NETWORKS OF BLOOD
THE TREES OF REALITY
THE RIVERS OF STREAMS
THE LAWS OF BRANCHING
THE SCALING OF BROKEN HIERARCHIES
THE BRAID OR THE BRANCH
THE LAW OF OPTIMAL FORKS
THE CHURCH OF QUARTEROLOGY
THE TRUTHICIDE
THE FAMILY OF PANCAKE OWLS
THE FAMILY OF SPHERICAL OWLS
THE IMPERISHABLE PACHYDERM
THE ILLSCALING OF ALLOMETRIC BODIES
THE SUPPLY MOST FAIR
THE SUPPLY TO THE MOST
THE MANY ART OF GENERATING FUNCTIONS
THE RANDOM SUM OF RANDOM SUMS
THE TWO-SIDED WORLDS
THE STORIES AND THE TROPES
THE TRUTH OF DIFFUSION
THE UNVEILING OF HIDDEN POWERS
THE BURYING OF SHAPES IN THINGS
THE LIMITS OF ORGANIZATIONS

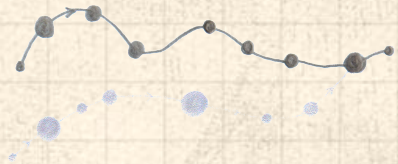
THE ADJACENT NARRATIVES

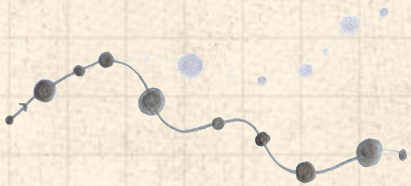
Adjacent narratives—why mistruths and conspiracy theories exist and flourish:

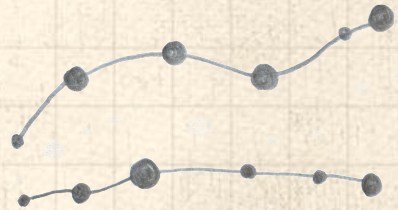


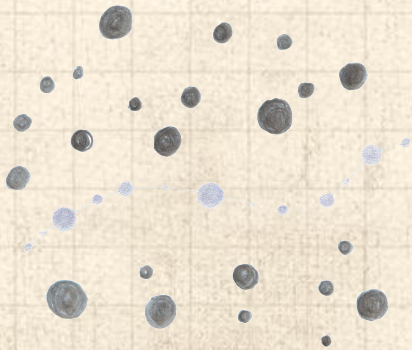












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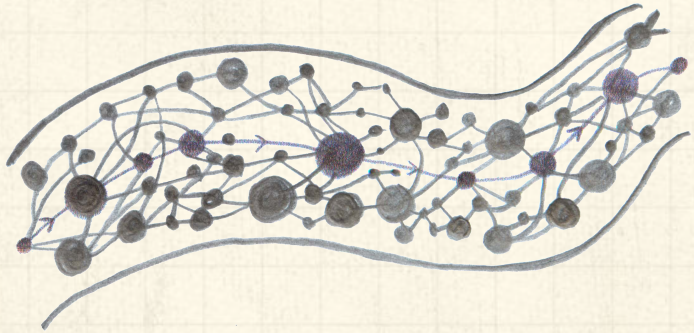
Why adjacent narratives exist and untrue stories flourish:

1/4. A real story is never recorded and retold completely

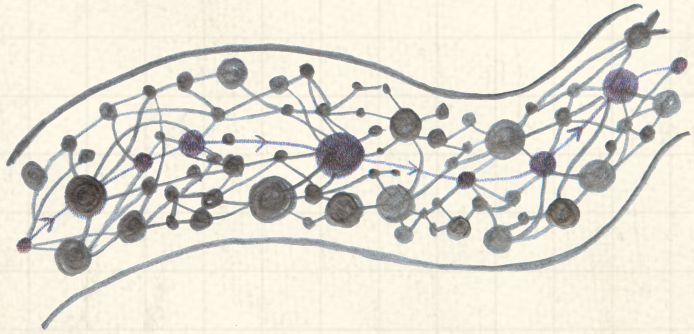
- Impossible to record every detail.
- Recording entails compression to scale of medium (narrative hierarchy).
- Story logic will be favored, and seemingly irrelevant aspects discarded.



Why adjacent narratives exist and untrue stories flourish:

2/4. The infinitude of adjacent stories will afford "better" stories

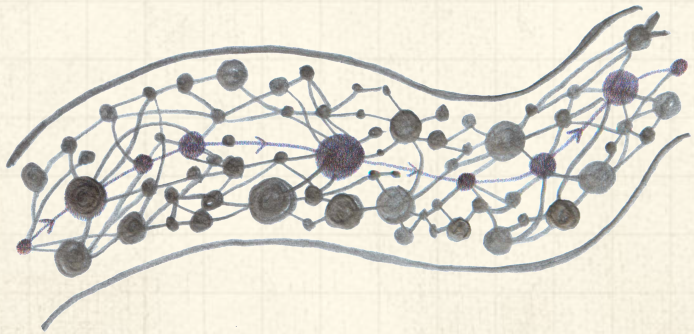
- Better = More engaging, more motivating to spread, more durable under spreading.
- Better stories exist for truthful recorders and retellers (journalists).



Why adjacent narratives exist and untrue stories flourish:

3/4. The infinitude of adjacent stories means "better" stories exist for those who would disinform

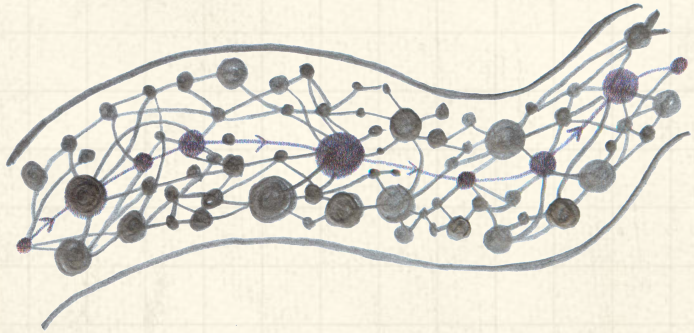
- Adjacent stories may be truth-limited and/or falsehood-bearing.
- There may exist adjacent stories that conform to a world view/ideology.
- Even the seemingly non-adjacent must have some plausibility (Pizzagate).



Why adjacent narratives exist and untrue stories flourish:

4/4. Character is the short cut to story

- The barely implausible can be believed if the character can make it so.
- A believe-to-be evil character can do anything.
- Iterate between character and story to make the character fixed.



Conspiracy theories

1999 Gallup poll:

- 6% of Americans said the lunar landings were fake.
- 5% were undecided.
- Video replay
- "The Comments, the comments, ..."

Buzz Aldrin has enough

Source

JK Rowling doesn't exist: conspiracy theories the internet can't resist, The Guardian, 2017-10-27:

Highlights:

- The Earth is flat. https://www.tfes.org.
- The Beatles never existed: http://www.thebeatlesneverexisted.com.
- Per the title, JK Rowling doesn't exist.
  - Q. "Is it possible that a person can write six thick books that are translated into 55 languages and sell more than 250 million copies in less than 10 years? — Nina Grünfeld"
  - A. "Yes. Yes it is."

Phantom time hypothesis:

- The years 614–911 AD never existed.
- Straight up jump of 297 years orchestrated by a first millennium cabal.
- The year 2017 AD is really 1820 AD.
- Good to know.
- Holy Roman Emperor Otto III (@TheBoss37), Pope Sylvester II (@PSly2) wanted to live in 1000 AD, legitimize power.
- Crushed by reality: Records of solar eclipses, comets, dendrochronology.

Finland does not exist:

Stories influence people, for good or bad:

- Parasocial relationships (Cosplay)
- Allusionist 82. A Novel Remedy
- Agatha Christie type murder mysteries: A salve post the Great War.
- Representation matters—possible future paths (narrative hodology)

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Narrative therapy, 2020s:

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Narrative therapy, 2020s:

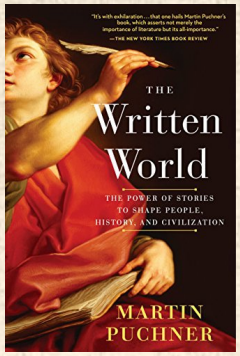
Stories influence people, for good or bad:

- But representation of good is accepted as real, representation of bad is "just entertainment"
- Columbine, references to Natural Born Killers (NBK)
- Natural Born Killers copycat crimes
- Aurora, Colorado shooting (Joker)

Absence of story, meaning, sense:

Las Vegas, 2017/10/01:

- 60 murdered, over 400 injured, 1000 bullets.
- Marked the lowest point ever on the English Twitter Hedonometer at the time.
- Why did the Las Vegas shooter do what he did?
- Why have we forgotten about it?



"The Written World: How Literature Shaped Civilization"
by Martin Puchner (2017). [18]

We are what we read (NYT)

"Storytelling is as human as breathing. When fabulation intersected with writing, stories were empowered to propagate themselves in society and around the world as civilization-forming "foundational texts.""

- NYT review has a flicker of concern at the end that stories can be used for bad ...
- Common strawman frame: Stories as lightweight entertainment
- Not lighting up Google Scholar
- BBC, strawfree: How stories have shaped the world

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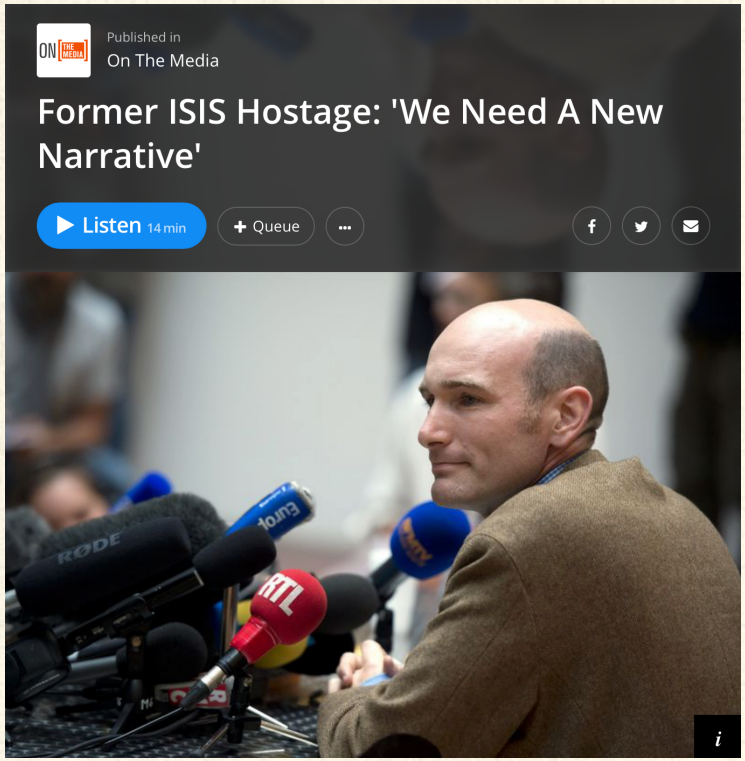
Story Wars:



Nicholas Hénin, French Journalist, held captive for 10 months.

From the end of the interview:

NICOLAS HENIN: No, it was just like in a movie. And, by the way, even the people going to Syria, joining ISIS in Syria to fight, even these people see himself as movie characters. They play their own movie. This is why I think that the most powerful way to fight ISIS are not bombs. It is to kill the narrative. We have to write another movie. We have to build other heroes. And this is why I believe that the French are making big mistakes in the ways they, they fight ISIS.

We created, for instance, accounts on the social media named "Stop Jihadism," and this is [BLEEP], like they did not understand anything. And I did understand why we are so bad. It's just because in France we don't know how to write TV series properly.

[BROOKE LAUGHS]

Just because we have no imagination, we cannot just tell beautiful stories, create beautiful characters, beautiful heroes.

And this is what we have to do because in our world, in our societies what do people want? They want to become heroes. They want to be famous. They want to be, to be recognized.

Stories make us do all kinds of things:

The Comet Ping Pong Gunman Answers Our Reporter's Questions:

- "According to court documents, Mr. Welch said he had come armed to help rescue the children."
- "'The intel on this wasn't 100 percent," he said.'
- He said he did not believe in conspiracy theories, but then added that the Sept. 11, 2001, attacks needed to be re-examined. He has listened to Alex Jones, whose radio show traffics in conspiracy theories and who once said that Mrs. Clinton "has personally murdered and chopped up" children. "He's a bit eccentric," Mr. Welch said. "He touches on some issues that are viable but goes off the deep end on some things.""

The Attack on the United States Capitol

Photo: Evelyn Hockstein for The Washington Post

Washington Post's massive analysis

Red Flags, Bloodshed, Contagion

Senate Chaplain Barry Black:

"These tragedies have reminded us that words matter, and that the power of life and death is in the tongue."

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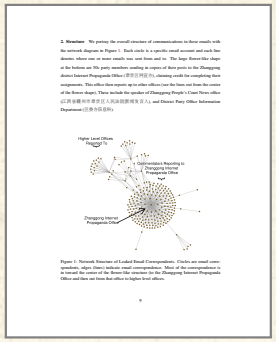
Massive informational misdirection as a cognitive denial of story:



"How the Chinese government fabricates social media posts for strategic distraction, not engaged argument"

King, Pan, and Roberts,
American Political Science Review, , ,
Forthcoming. [16]

- Make the truth a needle in a haystack
- Trump's Reality Distortion Field, http://www.onthemedia.org
- "Surkov turned Russian politics into a bewildering constantly changing piece of theater. He sponsored all kinds of groups, ...no one was sure what was real or fake. ...it is a strategy of power that keeps any opposition constantly confused."

Stories generated the first surveillance state:

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- Low tech, low cost.
- Infrastructure maintained in the Social Wild by storytellers and storybelievers.
- Omnipresence and omniscience: The end of privacy.

Defend the Story:

The Ten Commandments:

I am the LORD thy God
No other gods before me
No graven images or likenesses
Not take the LORD's name in vain
Remember the sabbath day
Honour thy father and thy mother
Thou shalt not kill
Thou shalt not commit adultery
Thou shalt not steal
Thou shalt not bear false witness
Thou shalt not covet

Operating systems:

Windows: "No other installations before me"

Propaganda

"If you're looking to understand what's actually happening in this country, always assume the opposite of whatever they're telling you on the big news stations," — Tucker Carlson

Defend your mind:

If a storyverse—whether it be through storytellers, groups, books, movies—tells you that all other stories are wrong, then that storyverse is false.

Book (story) burning (451°F)

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The American Dream = Rags to Riches

- The story that anyone can become King or Queen.
- Story of individual, not the collective.
- But we know about fame and success:
  The presence of outsized fame in a social system means social imitation is a driver of value.
- Stories of societies can only hold if they have been and remain believable.
- "Entertaining beliefs in economic mobility": Effort to understand if rags to riches stories in popular culture affect people's lives. [15]

The story of Jermaine and Bret: Rags to Rags

Full scene here.

If not Trump, what?, David Brooks, New York Times, 2016-04-29:

"We'll probably need a new national story. Up until now, America's story has been some version of the rags-to-riches story, the lone individual who rises from the bottom through pluck and work. But that story isn't working for people anymore, especially for people who think the system is rigged."

"I don't know what the new national story will be, but maybe it will be less individualistic and more redemptive. Maybe it will be a story about communities that heal those who suffer from addiction, broken homes, trauma, prison and loss, a story of those who triumph over the isolation, social instability and dislocation so common today."

Claim: Stories must have "real" substance to endure over generations[3]

- Enormous disasters: Fabrications of real experiences.
  - Plain old making stuff up: A million little pieces ... Oprah will get you.
  - Wikipedia's has a list of famous fake memoirs.
  - Expansive plagiarism: How Opal Mehta Got Kissed, Got Wild, and Got a Life.
    #kudos
  - Self-plagiarism and more standard badness: Jonah Lehrer.
    Amazingly: Made up Bob Dylan quotes.
  - Lance Armstrong. Also got to meet Oprah.
- Enormous power: Fiction that speaks to real experiences.

[3] Reality is being tested harshly

“The game story space of professional sports: Australian Rules Football”

Kiley, Reagan, Mitchell, Danforth, and Dodds.
Physical Review E, **93**, 052314, 2016. [14]

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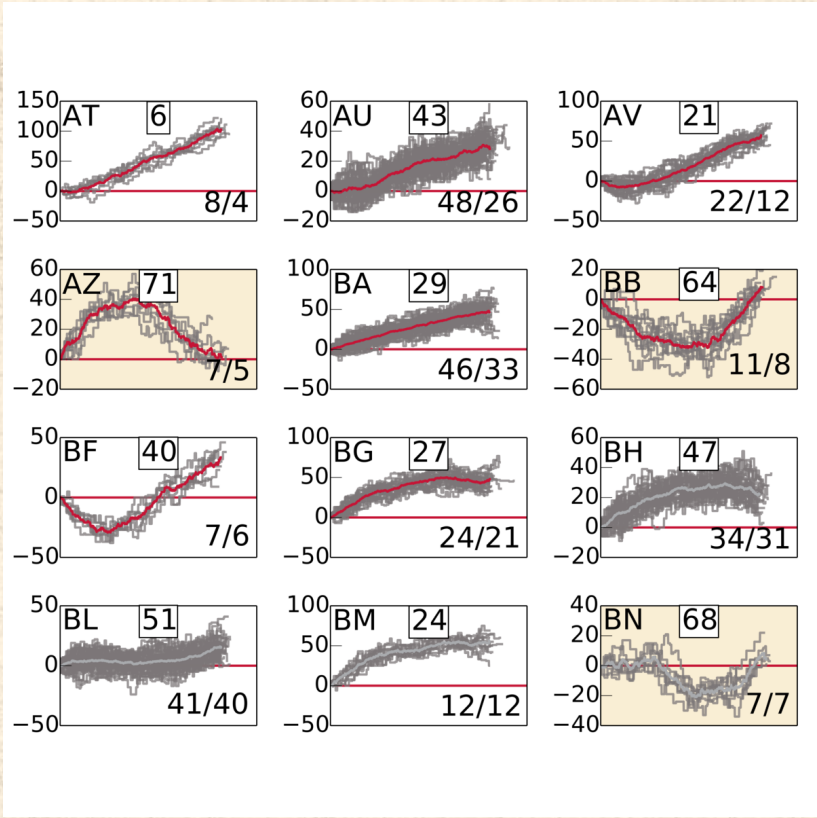
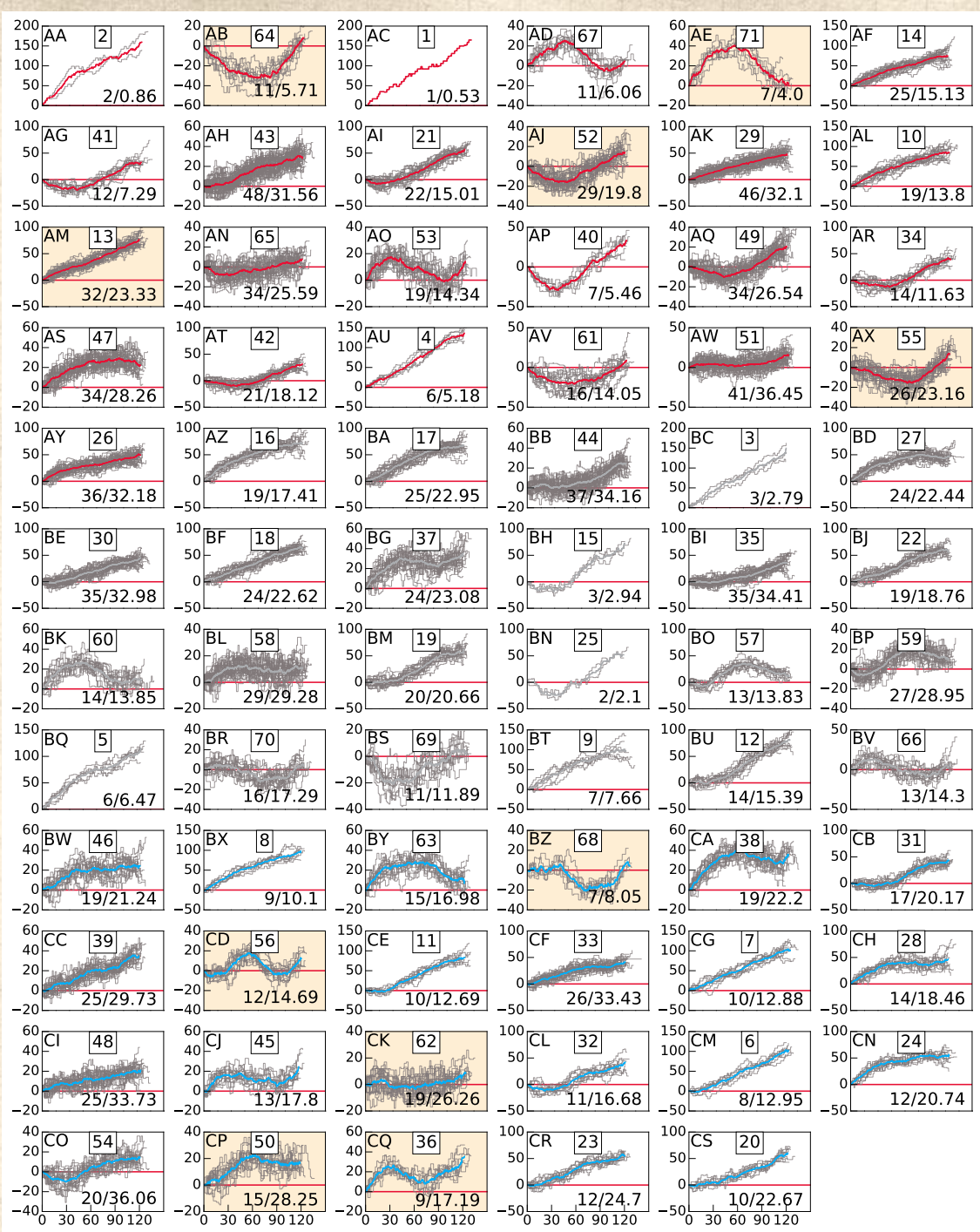


Sports = Spontaneous story producing systems



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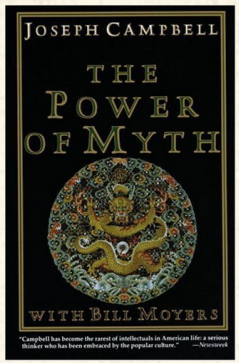
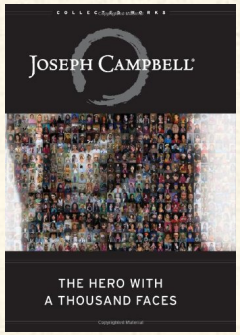
The story trap by Philip Ball, 2015-11-12

- "We use neat stories to explain everything from sports matches to symphonies. Is it time to leave the nursery of the mind?"
- "...we might wonder if the ultimate intelligibility of the universe will be determined not so much by the capacity of our minds to formulate the appropriate concepts and equations, but by whether we can find a meaningful story to tell about it."

The "I wonder who wrote this?" Great Man Theory:



"The Power of Myth"
by Campbell and Moyers (1991). [6]



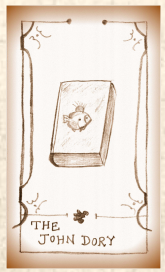
"The Hero with a Thousand Faces"
by Joseph Campbell (2008). [5]

Highly influential but it's a trap!

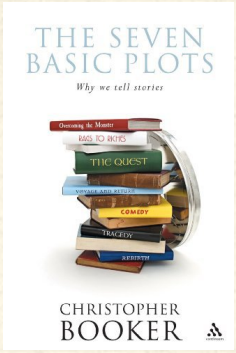
How to write a screenplay:

"Save the Cat!"
by Blake Snyder (2005). [21]

- 9 acts.
- Someone important to the main characters gets toasted in the second act, blah, blah.
- Believes irony is key.
- Logline = one or two sentence summary.
- Logline fails to be a summary of logline.



Seven "good" stories?:



"The Seven Basic Plots: Why We Tell Stories" by Christopher Booker (2005). [3]

- Seven Gateways to the Underworld (?)
- Overcoming the Monster ×2 and the Thrilling escape from Death (plot).
- Rags to Riches (plot).
- The Quest (plot).
- Voyage and Return (plot).
- Comedy ×2 (plot but really structure).
- Tragedy ×3 (plot).
- Rebirth (plot).
- The Dark Power: From Shadow into Light (master structure).

The taxonomy of stories:

- ANIMAL TALES 1-299
  - Wild Animals 1-99
    - The Clever Fox (Other Animal) 1-69
    - Other Wild Animals 70-99
  - Wild Animals and Domestic Animals 100-149
  - Wild Animals and Humans 150-199
  - Domestic Animals 200-219
  - Other Animals and Objects 220-299
- TALES OF MAGIC 300-749
  - Supernatural Adversaries 300-399
  - Supernatural or Enchanted Wife (Husband) or Other Relative 400-459
    - Wife 400-424
    - Husband 425-449
    - Brother or Sister 450-459
  - Supernatural Tasks 460-499
  - Supernatural Helpers 500-559
  - Magic Objects 560-649
  - Supernatural Power or Knowledge 650-699
  - Other Tales of the Supernatural 700-749
- RELIGIOUS TALES 750-849
  - God Rewards and Punishes 750-779
  - The Truth Comes to Light 780-799
  - Heaven 800-809
  - The Devil 810-826
  - Other Religious Tales 827-849
- REALISTIC TALES 850-999
  - The Man Marries the Princess 850-869
  - The Woman Marries the Prince 870-879
  - Proofs of FidelitY and Innocence 880-899
  - The Obstinate Wife Learns to Obey 900-909
  - Good Precepts 910-919
  - Clever Acts and Words 920-929

Folkloristics:

- Academic area formally started around 1900.
- Aarne–Thompson classification systems
- Motif-based taxonomy.
- Online classification database

contributed articles

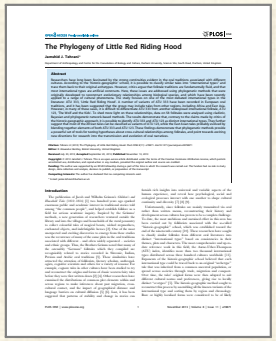
A searchable meta-graph can connect even troublesome house elves and other supernatural beings to scholarly folk categories.

BY JAMES ABELLO, PETER BROADWELL, AND TIMOTHY R. TANGHERLINI

Computational Folkloristics

"Computational folkloristics"
Abello, Broadwell, and Tangherlini,
Communications of the ACM, **55**, 60–70, 2012. [1]

- Motivation: "As a simple, historical example from the Danish materials, no one has yet classified (according to the ATU index) the several thousand fairy tales in the collections of the Danish Folklore Archive (http://www.dafos.dk), nor does it seem anyone ever will."
- 'Imagine a system in which the complexities of a folklore corpus can be explored at different levels of resolution, from the broad perspective of "distant reading" down to the narrow perspective of traditional "close reading."'


The Phylogeny of Little Red Riding Hood

Jamshid J. Tehrani*

Abstract

Research into folktale texts dates back to the 19th century and today scholars in the oral traditions associated with different cultures from Europe to Africa, Asia and Oceania are applying a wide range of sophisticated methods in order to reconstruct the evolutionary histories of particular tales and groups of tales. Despite this activity, few researchers have attempted to test the models developed by their predecessors against new datasets. Here I present a phylogenetic analysis of 58 texts belonging to the Little Red Riding Hood complex (ATU 333), Little Red Riding Hood: A number of variants of ATU 333 have been recorded in European oral traditions, including the well-known tales of Little Red Riding Hood, The Wolf and the Kids (ATU 123) and Little Red Cap (ATU 333). However, no study of these variants has attempted to reconstruct the evolutionary relationships between them. This study uses a dataset composed of 32 Old World texts and 26 African texts, and employs Bayesian and phylogenetic network-based methods. The results demonstrate that, contrary to the claims made by many of the researchers who have described individual tales, the Little Red Riding Hood complex did not originate in Europe. The results support the proposal that the African tales can not be analysed as versions of ATU 123, since the two have very different narrative structures. Rejecting mistaken claims of South ATU 333 and ATU 123. These findings demonstrate that phylogenetic methods provide a powerful framework for testing hypotheses about the evolutionary histories of folktales, and point towards exciting new directions for research into the transmission and evolution of oral narratives.

Citation: Tehrani JJ (2013) The Phylogeny of Little Red Riding Hood. PLoS ONE 8(11): e78871. doi:10.1371/journal.pone.0078871

Editor: Mark Pagel, University of Reading, United Kingdom

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Competing Interests: The author has declared that no competing interests exist.

* E-mail: jamshid.tehrani@dur.ac.uk

Introduction

The publication of Jacob and Wilhelm Grimm's *Children's and Household Tales* (1812–1815) [1] was hardwired into age-related assumptions about the origins and transmission of folktales. Following the Grimms, "the common people" were held to establish folktales and lend for centuries as cultural property. Inspired by the Grimms' example, collectors in many countries began to publish their own versions of stories said to have been told for centuries by the rural peasantry. Folktales were thus considered to be "survivals" of ancient customs, beliefs and traditional objects, and underlying this was the assumption that folktales were the first to emerge in human history [2]. One of the most influential theories of folktales was put forward by Antti Aarne [3], who developed a system of classifying folktales according to their basic plots. Aarne's system, which was later revised by Stith Thompson [4], is known as the Aarne-Thompson-Uther (ATU) classification system, and has been widely employed by folklorists and anthropologists working in Europe and beyond. Aarne's approach was based on the assumption that folktales could be assigned to "historic-geographic" circles, which were established around the areas where they were first told. Aarne's ultimate goal was to identify the archetype of each folktale, that is, the single original version from which all the extant versions were derived. Aarne's method for identifying archetypes was to look for traditional elements that were present in the versions of a tale found in different countries. Those elements that were considered to be present in the earliest forms of the tale could then be identified as the archetype. Aarne's method has been criticised for its lack of objectivity [5], and for its assumption that folktales originated in a single place and time [6]. Nevertheless, his system remains widely employed by folklorists and anthropologists working in Europe and beyond.

Despite the widespread application of Aarne's approach, few researchers have attempted to test the models developed by their predecessors against new datasets. Here I present a phylogenetic analysis of 58 texts belonging to the Little Red Riding Hood complex (ATU 333), Little Red Riding Hood: A number of variants of ATU 333 have been recorded in European oral traditions, including the well-known tales of Little Red Riding Hood, The Wolf and the Kids (ATU 123) and Little Red Cap (ATU 333). However, no study of these variants has attempted to reconstruct the evolutionary relationships between them. This study uses a dataset composed of 32 Old World texts and 26 African texts, and employs Bayesian and phylogenetic network-based methods. The results demonstrate that, contrary to the claims made by many of the researchers who have described individual tales, the Little Red Riding Hood complex did not originate in Europe. The results support the proposal that the African tales can not be analysed as versions of ATU 123, since the two have very different narrative structures. Rejecting mistaken claims of South ATU 333 and ATU 123. These findings demonstrate that phylogenetic methods provide a powerful framework for testing hypotheses about the evolutionary histories of folktales, and point towards exciting new directions for research into the transmission and evolution of oral narratives.

"The phylogeny of Little Red Riding Hood"

Jamshid J. Tehrani,
PLoS ONE, **8**, e78871, 2013. [22]

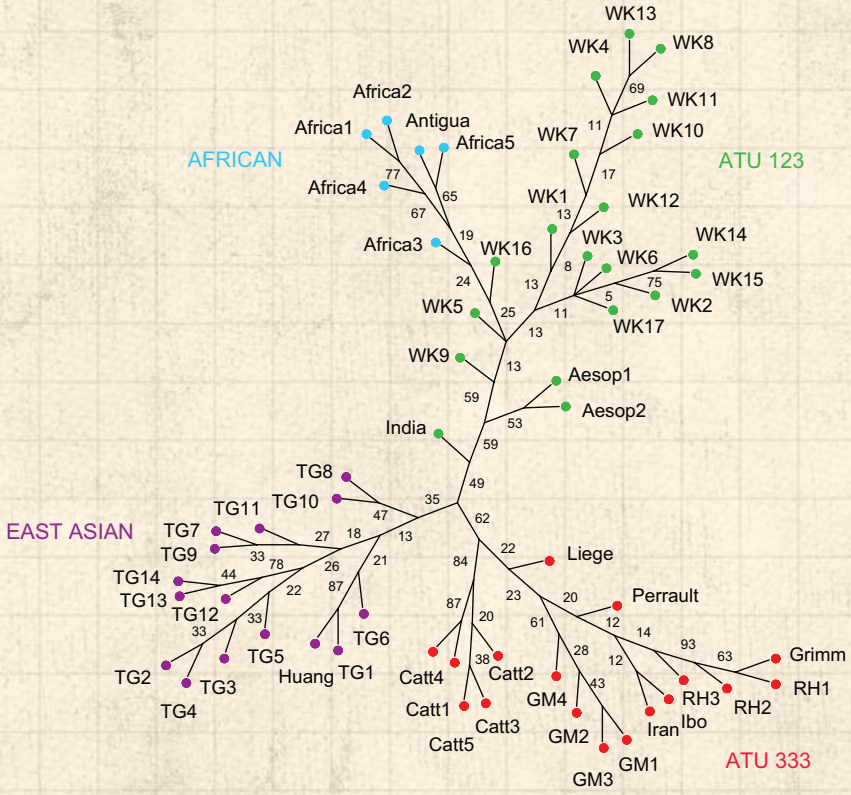
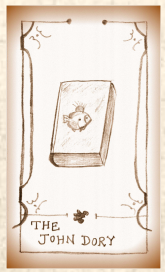


Figure 2. Majority-rules consensus of the most parsimonious trees returned by the cladistic analysis of the tales. Major groupings are labelled by region or ATU international type and indicated by the coloured nodes. Sub-types are indicated in the taxa labels (RH = Little Red Riding Hood; GM = Story of Grandmother; Catt = Catterinella; WK = The Wolf and the Kids; TG = Tiger Grandmother). Variants by particular authors, or from countries/ethnic groups that are discussed in the text have individual labels. Numbers beside the edges represent the level of support for individual clades returned by the bootstrap analysis.
doi:10.1371/journal.pone.0078871.g002



The taxonomy of stories:

Fundamental arcs:

- Kill the Monster.
- Rags to Riches (and Riches to Rags—*Metamophosis*).
- Journey/Odyssey: Search for a salvation, a "Holy Grail".
- Romance.
- Narratives in Left Nullspace: Again, All Stories of The Many.

What about comedies?

- Comedies are not in themselves a story, but a way of telling stories.

Stories are algorithms for life:

Homo narrativus:

- Provide dynamic paths and trajectories.
- If this, then that.
- Convey and reinforce how to behave, how not to behave.
- Full ecology of stories =
  Competing, self-defending operating system for people's minds.

Proverbs as algorithms (hero: Wolfgang Mieder):

- "Pride cometh before the fall."
- "A stitch in time saves nine."
- "Look before you leap."
- "Anti-aphorism: The one who hesitates is lost."
- Understanding randomness: "Shit happens"

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Hatchings, Matchings, and Dispatchings

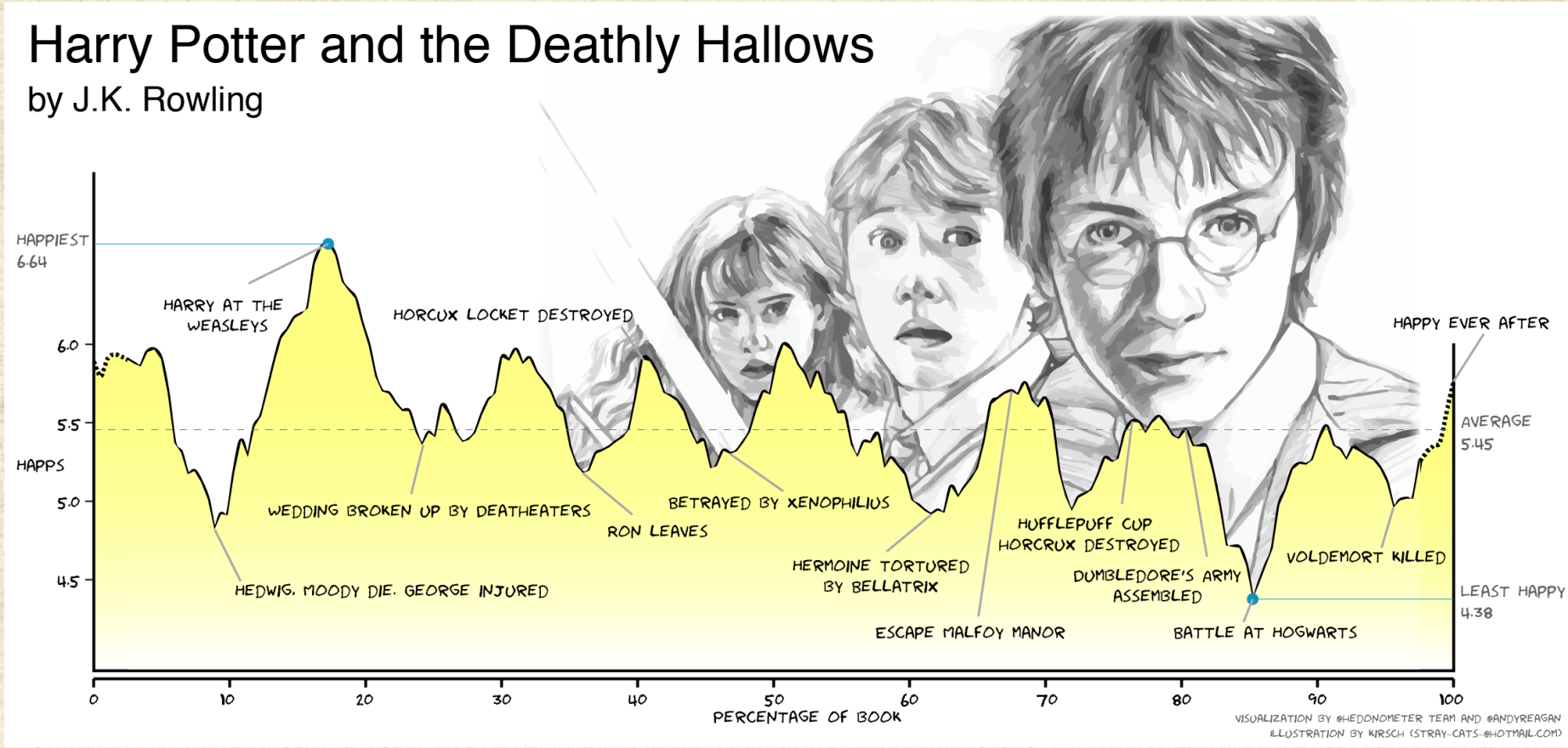
The boiled-down essence of stories:

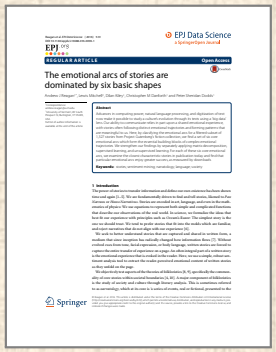
The three fundamental events of (non-clone) life:

- Hatchings, Matchings, and Dispatchings.
- Stories encode survival algorithms.
- Survival algorithms for individuals and groups.
- Dynamic paths: the true, the possible, the unlikely.
- The unifying theme of existence is existence.

Kurt Vonnegut on the shapes of stories

Source: Kurt Vonnegut on the Shapes of Stories.
Longer piece with bonus stories (Metamorphosis and Hamlet).





"The emotional arcs of stories are dominated by six basic shapes"

Reagan, Mitchell, Danforth, Dodds, and Dodds. EPJ Data Science, **5**, 31, 2016. [19]

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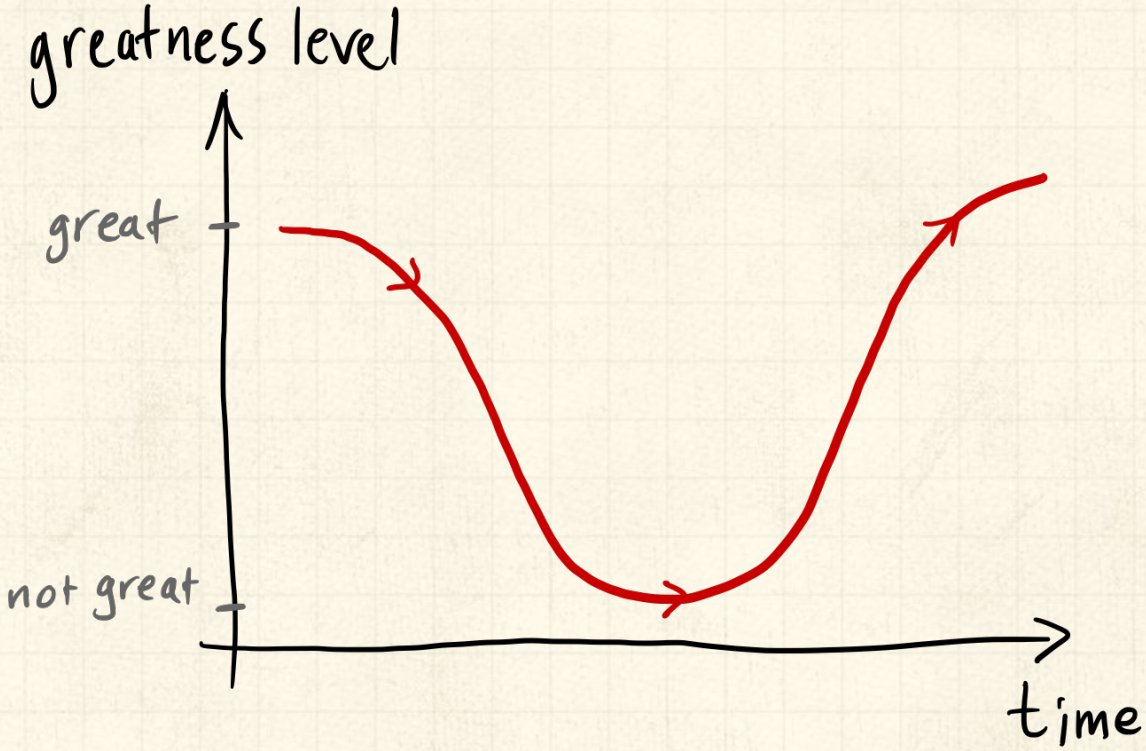
Harry Potter and the Trove of Plot Devices

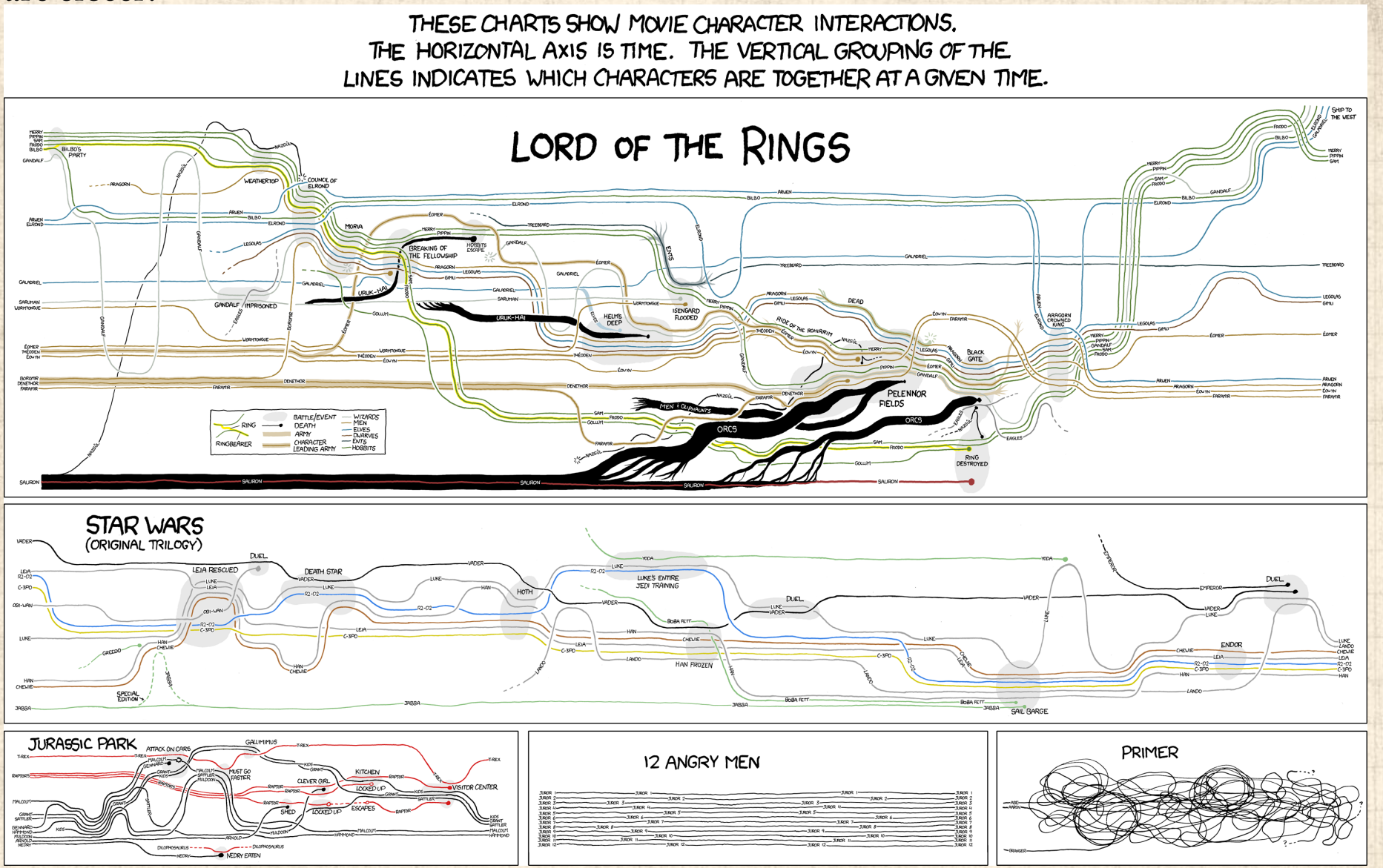
More in PoCS, Vol 2.

Stories matter:

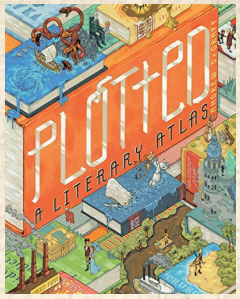


- Used by Reagan and Bush in 1980.
- Template used by many others including Bill Clinton.

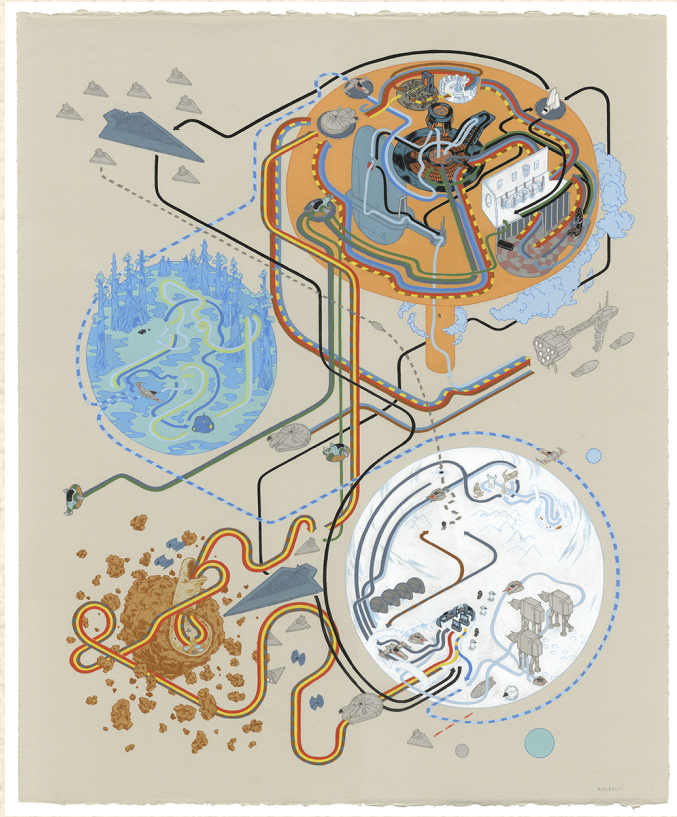
Emotional arcs are not plots. Temporal character interaction networks are closer:



https://xkcd.com/657/



"Plotted: A Literary Atlas" by Andrew DeGraff (2015). [9]



http://www.andrewdegraff.com/moviemaps/

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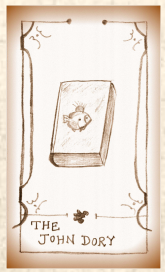

Trope inception:

- Chekhov's gun
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Rules of Story:

	Gun	Cat	Razor	Law
Checkov's	If a gun is introduced in the first act, it must be fired by the third.	If a box is introduced in the first act, a cat must sit in it by the third	The simplest way to fire a gun is to pull the trigger	Every gun in a play will be fired
Schrodinger's	You can't know if a gun is loaded, or not, until the trigger is pulled	An unopened box may contain a dead cat, or an alive one, and you won't know until you open it	An unopened box may contain the solution to your problems	You can't know that things will go wrong, until they do
Occam's	The simplest way to kill off a character is to shoot them	If you hear a strange noise at night, it's probably a cat	The simplest explanation is probably the correct one	Everything that can be explained, will be explained
Murphy's	Any gun that can go off, will go off	Any box that can contain a cat, will contain a cat	Anything that can be simple, will be simple	Anything that can go wrong, will go wrong

Revx, MrBigBux, Halesnail, Venort, ATP

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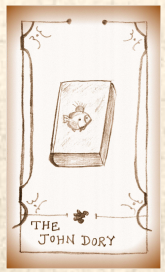


A Science of Stories?

Stories are everything[4]

- Maybe? yes?
- Stories ∼ Characters* + Time.
- One of the most important, dangerous, enjoyable terrifying things we can study.
- Essence: Bare survival to flourishing ("Danger Will Robinson")

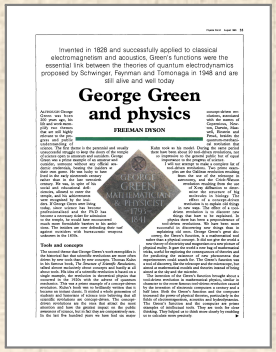
We talk about and study stories everywhere but ...

- We don't have a central place academically.
- Departments of: English, history, political science, folklore, cognitive sciences, arts, musicology, communication, ...

We're we are now:

- SOCKS: Science of Online Corpora, Knowledge, and Stories ($20M, 2023–)

[4] Okay, poems are everything



Invented in 1828 and successfully applied to classical electromagnetism and acoustics, Green's functions were the essential link between the theories of quantum electrodynamics proposed by Schwinger, Feynman and Tomonaga in 1948 and are still alive and well today

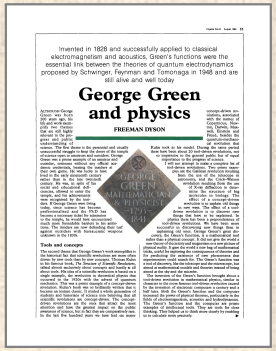
George Green and physics

FREEMAN DYSON

"George Green and physics"

Freeman Dyson,
Physics World, **6**, 33, 1993. [10]

- "... scientific revolutions are more often driven by new tools than by new concepts.
- Thomas Kuhn in his famous book, The Structure of Scientific Revolutions, talked almost exclusively about concepts and hardly at all about tools. His idea of a scientific revolution is based on a single example, the revolution in the theoretical physics that occurred in the 1920s with the advent of quantum mechanics.
- This was a prime example of a concept-driven revolution. Kuhn's book was so brilliantly written that it became an instant classic. It misled a whole generation of students and historians of science into believing that all scientific revolutions are concept-driven."



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George Green and physics

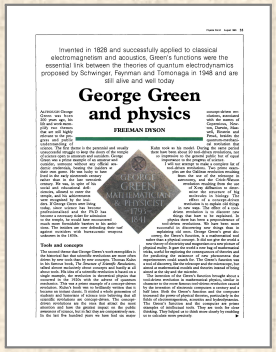
FREEMAN DYSON

GEORGE GREEN MATHEMATICIAN PHYSICIST 1793–1841

Tools and concepts

"George Green and physics"
Freeman Dyson,
Physics World, **6**, 33, 1993. [10]

- "The concept-driven revolutions are the ones that attract the most attention and have the greatest impact on the public awareness of science, but in fact they are comparatively rare.
- In the last five hundred years we have had six major concept-driven revolutions, associated with the names of Copernicus, Newton, Darwin, Maxwell, Einstein and Freud, besides the quantum-mechanical revolution that Kuhn took as his model.
- During the same period there have been about 20 tool-driven revolutions, not so impressive to the general public but of equal importance to the progress of science."



Invented in 1828 and successfully applied to classical electromagnetism and acoustics, Green's functions were the essential link between the theories of quantum electrodynamics proposed by Schwinger, Feynman and Tomonaga in 1948 and are still alive and well today

George Green and physics

FREEMAN DYSON

"George Green and physics"

Freeman Dyson,
Physics World, **6**, 33, 1993. [10]

- "I will not attempt to make a complete list of tool-driven revolutions. Two prime examples are the Galilean revolution resulting from the use of the telescope in astronomy, and the Crick-Watson revolution resulting from the use of X-ray diffraction to determine the structure of big molecules in biology.
- The effect of a concept-driven revolution is to explain old things in new ways.
- The effect of a tool-driven revolution is to discover new things that have to be explained."

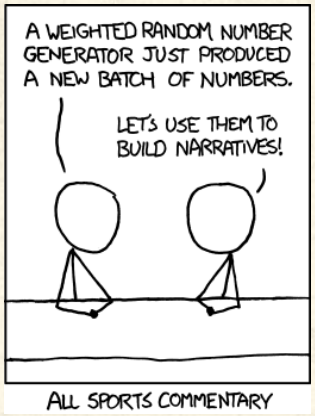
Observations/Claims/Questions:

- Primacy of storytelling and storybelieving in for individuals and populations.
- Maybe: Stories are dynamical paths; plots are algorithms that give rise to stories.
- Internet gives extraordinary power to propaganda, disinformation, conspiracy theories, ...
- Global social media creates a global robust-yet-fragile social system.
  - Failure can be endogenous (infighting) and/or ignited/supported from the outside.

Observations/Claims/Questions:

- Basic social fabric: What is the spectrum of stories in the media being told about classes of people, from within and without.
- Story decoherence: telephone game
- What about stories about global problems like climate change? Government? Journalism?
- All separately powerful: Words, Music/Sound, Visual, ... interplay?
- Outcome: How to communicate scientific findings powerfully.

Understanding the Sociotechnocene—Stories:



xkcd.com/904/

- Goal: a Science of Stories.
- Claim: Homo narrativus—we run on stories.
- "What's the John Dory?"
- "They've lost the plot/thread"
- Maybe: The narrative hierarchy and the Scalability of stories.
- Research: Extraction of metaphors, frames, narratives, and stories from large-scale text/corpora.
- Storywrangler, POTUSometer, ...
- Research: What's the taxonomy of human stories?
- Maybe: Stories ↔ Algorithms

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