

# Quantitative Story-Telling

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Presented in Bergen at:

8TH ANNUAL S.NET MEETING  
Bergen October 11-14, 2016

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Lovely (also in the sense of 'of love') piece by an Italian scholar [@robertocalasso](https://twitter.com/robertocalasso):

[nybooks.com/articles/2016/...](https://nybooks.com/articles/2016/)



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sensitivity analysis, sensitivity auditing, science for policy, impact assessment

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THE RIGHTFUL  
PLACE OF SCIENCE:  
**SCIENCE ON THE  
VERGE**

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## The Rightful Place of Science: Science on the Verge

Paperback – 20 Feb 2016

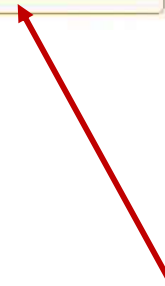
by [Andrea Saltelli](#) (Author), [Alice Benessia](#) (Author), & 7 more

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<http://www.andreasaltelli.eu/science-on-the-verge>



Quantitative story-  
telling and  
responsible  
quantification

## What is quantitative story telling?

- A truism: always listen more than one story
- An exhortation from philosophers
- A development from sensitivity analysis and sensitivity auditing
- A concept implicit in post-normal science's concept of “extended peer communities”

“There is only a perspective seeing, only a perspective “knowing”; and the more affects we allow to speak about one thing, the more eyes, different eyes, we can use to observe one thing, the more complete will our “concept” of this thing, our “objectivity”, be.”



Friedrich Nietzsche, Genealogy of Morals, Third Essay.

Stories, frames / framings, narratives

Some examples

# Frames

Most analyses offered as input to policy are framed as cost benefit analysis or risk analyses.

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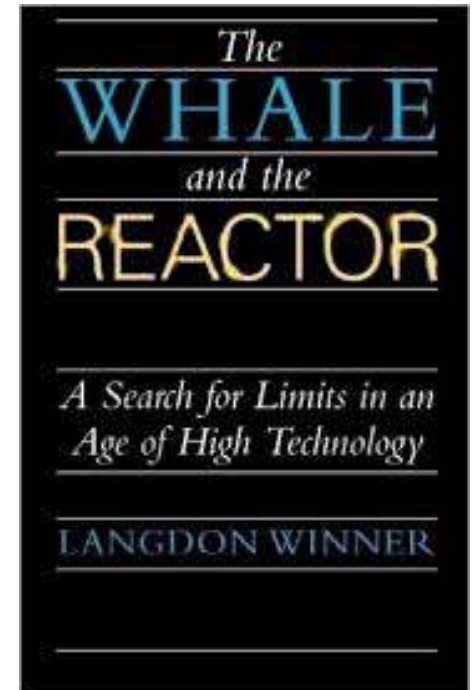
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ON NOT HITTING  
THE TAR-BABY

Winner, L., 1986. *The Whale and the Reactor: a Search for Limits in an Age of High Technology*. The University of Chicago Press, 1989 edition.



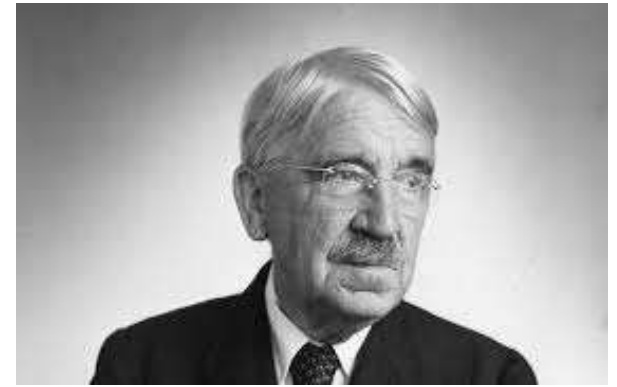
Langdon Winner





# Frames

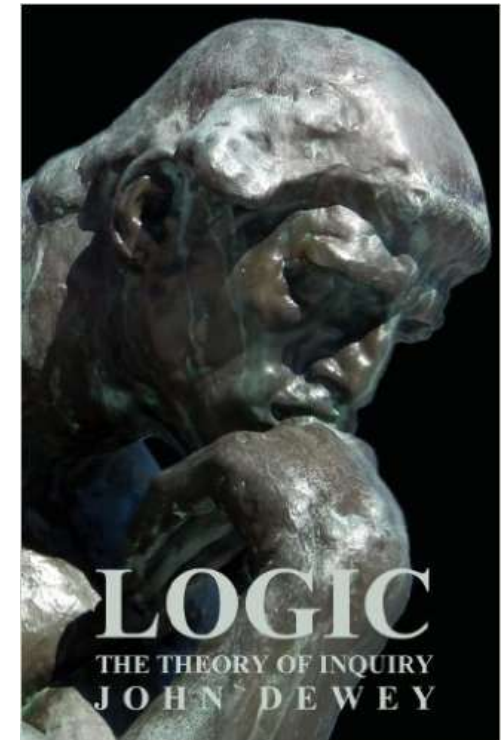
John Dewey suggested the concept of  
'occupational psychosis'



John Dewey  
1859-1952

- Thus CBA = professional psychosis of economists
- Funtowicz and Ravetz's Extended Peer Community because experts have 'lenses'
- Feyerabend's intuition that citizens mature by learning about experts fallibility ...

John Dewey, *Logic: The Theory of Inquiry* (1938), Saerchinger Press (2007)



# Frames

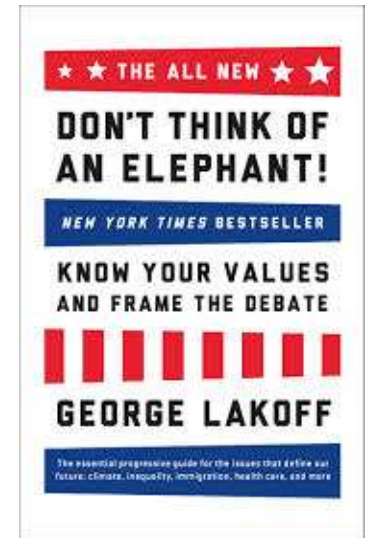
The expression ‘tax relief’ is apparently innocuous but it suggests that tax is a burden, as opposed to what pays for road, hospitals, education and other infrastructures of modern life (Lakoff, 2004).



George Lakoff

Lakoff, G., 2010, Why it Matters How We Frame the Environment, *Environmental Communication: A Journal of Nature and Culture*, 4:1, 70-81.

Lakoff, G., 2004-2014, *Don't think of an elephant: know your values and frame the debate*, Chelsea Green Publishing.



# Frames

Published road accident statistics record the conditions of the driver as to alcohol or drug use but not the make and year of the car or its safety features (Gusfield, 1981).



Gusfield, J. (1981). *The Culture of Public Problems. Drinking-Driving and the Symbolic Order.* The University of Chicago Press.

# Frames

“[...] genetically modified crops, declared safe by the scientific establishment, but reviled as Frankenfoods by the Subaru-and-sandals set”, (The Economist, 2014).



The Economist, Vermont v science, The little state that could kneecap the biotech industry, May 10th 2014



## Why Free Markets Make Fools of Us

Cass R. Sunstein

OCTOBER 22, 2015 ISSUE

*Phishing for Phools: The Economics of Manipulation and Deception*

by George A. Akerlof and Robert J. Shiller  
Princeton University Press, 272 pp., \$24.95



*The Rolls-Royce Silver Cloud — \$13,595*

“At 60 miles an hour the loudest noise in this new Rolls-Royce comes from the electric clock”

*An advertisement for Rolls-Royce from the late 1950s*



# Frames

For Akerlof and Shiller - against what the ‘invisible hand’ would contend - economic actors have no choice but to exploit frames to ‘phish’ people into practices which benefit the actors not the subject phished.



George Akerlof



Robert R. Shiller

# Frames as hypocognition & Socially constructed ignorance

For Rayner (2012) “Sense-making is possible only through processes of exclusion. Storytelling is possible only because of the mass of detail that we leave out. Knowledge is possible only through the systematic ‘social construction of ignorance’ (Ravetz, 1986)”



Steve Rayner



Jerry Ravetz

Ravetz, J., R., 1987, Usable Knowledge, Usable Ignorance, Incomplete Science with Policy Implications, *Knowledge: Creation, Diffusion, Utilization*, 9(1), 87-116.

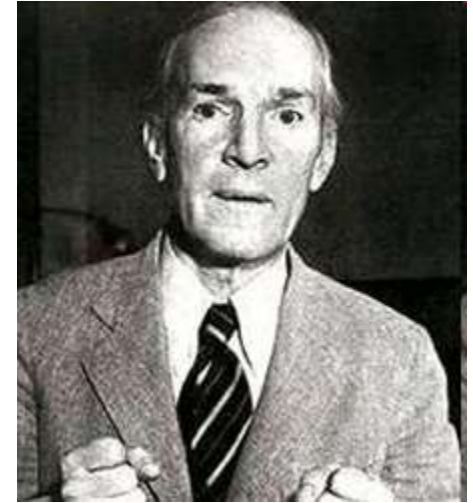
Rayner, S., 2012, Uncomfortable knowledge: the social construction of ignorance in science and environmental policy discourses, *Economy and Society*, 41:1, 107-125.

## Rayner's (2012) strategies societies may use to deal with “uncomfortable knowledge”.

- Denial: “There isn’t a problem”
- Dismissal: “It’s a minor problem”
- Diversion: “Yes I am working on it” (In fact I am working on something that is only apparently related to the problem)
- Displacement: “Yes and the model we have developed tells us that real progress is being achieved” (The focus is now the model not the problem).

## Why frames ‘stick’

“It is difficult to get a man to understand something when his salary depends upon his not understanding it.”



Upton Sinclair



So what does quantitative story telling propose?

Instead of detailed quantification on a single[/few] frame[s] a rough quantitative appraisal of a richer set of frames.



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Andrea Saltelli and Mario Giampietro, The Fallacy of Evidence-Based Policy, in Benessia et al, 2016

Instead of Evidence-based policy: robust policy.

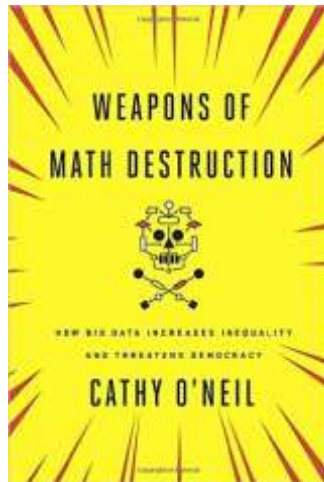
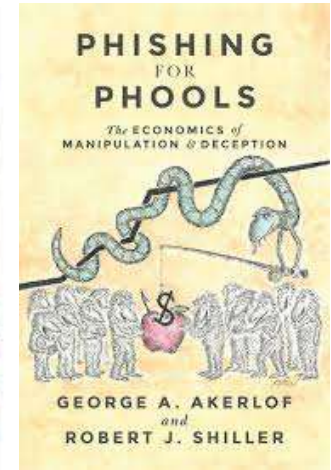
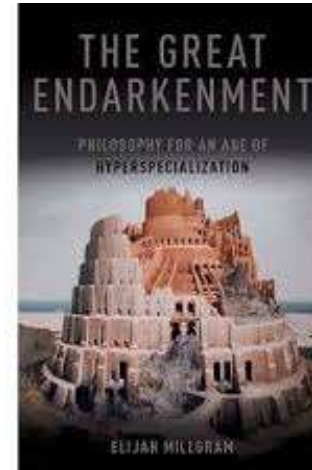
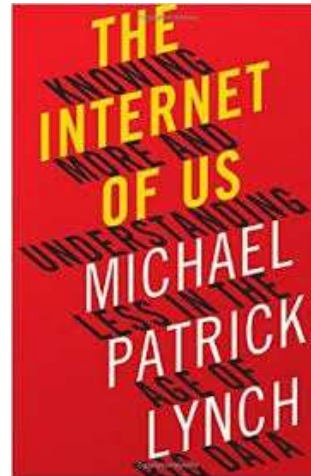
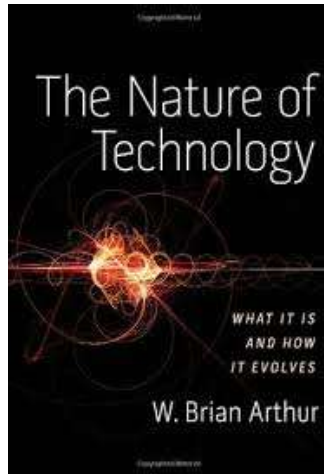
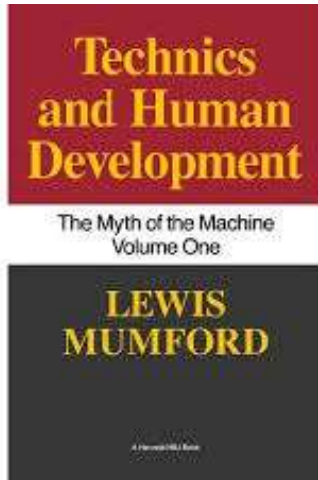
Test for:

- feasibility (compatibility with processes outside human control);
- viability (compatibility with processes under human control, in relation to both the economic and technical dimensions); and
- desirability (compatibility with a multitude of normative considerations relevant to a plurality of actors).

# How would this apply to innovation?

## Innovation between utopia and dystopia

My talk of tomorrow 😊



The screenshot shows the 'INNOVATION UNION' website header with the European Union flag and the text 'A Europe 2020 Initiative'. Below is a navigation menu and a main banner for the 'EU PRIZE for WOMEN INNOVATORS'. The banner includes the text 'FOR THE MOST INNOVATIVE WOMEN ENTREPRENEURS' and a circular graphic listing prize amounts: '4 PRIZES including NEW RISING INNOVATOR Prize', '€100 000', '€50 000', '€30 000', and '€20 000'. At the bottom, a dark blue box contains the text: 'Innovation Union is the European Union strategy to create an innovation-friendly environment that makes it easier for great ideas to be turned into products and services that will bring our economy growth and jobs.'

Techno-science is at the heart of contemporary narratives supporting ways to:

- innovate our way out of the economic crisis;
- overcome our planetary boundaries;
- achieve a dematerialized / circular / decarbonized economy;

Quantitative story telling will be used in the project Magic-Nexus to test the quality of these and others narratives.





# END

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**From the conference's booklet:**

[http://www.uib.no/sites/w3.uib.no/files/attachments/s.net\\_bookofabstractsonline.pdf](http://www.uib.no/sites/w3.uib.no/files/attachments/s.net_bookofabstractsonline.pdf)

**Thematic session**

**THE NEXUS APPROACH TO THE ASSESSMENT OF INNOVATION POLICIES**

**Chair: Zora Kovacic**

Quantitative Story-Telling (**Andrea Saltelli**): The objective of the approach is the verification of the narratives used to promote innovation. Narratives can be defined as frames or stories through which an observer defines what is relevant among a sea of possible perceptions and interpretations.

When choosing a narrative, one is setting the context in which observations have to be interpreted. Quantitative story telling borrows from system ecology, multi-scale analysis, and theoretical ecology in order analyse the Nexus in terms of metabolic pattern of Socio-Ecological Systems.

QST uses the results expected by the chosen innovation policy to check whether these results are feasible, viable and desirable in relation to the nexus (Benessia et al. 2016).

[1] Benessia, A., Funtowicz, S., Giampietro, M., Guimarães Pereira, A., Ravetz, J., Saltelli, A., Strand, R., van der Sluijs, J. (eds.), 2015, Science on the verge, Published by The Consortium for Science, Policy and Outcomes at Arizona State University.