

# Post-normal science v České republice

Věda v krizi a jak na ní reagovat? Co je to post-normální věda? Jakým způsobem dovažuje zahrnutí tradičně zanedbávaných aspektů nejistoty, hodnot a plurality legitimních perspektiv při řešení komplexních vědeckých problémů? A jak to souvisí s post-normalitou důvěry? Post-normální vědu představí profesoři z norského výzkumného centra Centre for the Study of the Sciences and the Humanities:

**Silvio Funtowicz** – filosofie vědy, spoluzakladatel post-normální vědy a NUSAP, nástroje pro řízení a komunikaci společnosti ve vědeckém poradenství

**Andrea Saltelli** – environmentální vědy, aplikovaná statistika, vědecké poradenství, sensitivity analysis a sensitivity auditing

**Bruna de Marchi** – sociologie, sociální, psychologické, organizační a kulturní aspekty rizik, pohrom a katastrof

Všechny akce budou probíhat v angličtině na Fakultě sociálních studií Masarykovy univerzity, Joštova 10, Brno.  
**Blíží informace:** Veronika Chvalová (veronika.cha@gmail.com), Katedra environmentálních studií, FSS, MU.

Středa 19. dubna 2017  
FSS MU, místnost P22  
od 13:30 do 15:00

Is there a crisis  
in science and where  
it is coming from  
*Andrea Saltelli*



Čtvrtek 20. dubna 2017  
FSS MU, místnost U32  
od 13:30 do 15:00

The emergence  
of Post Normal  
Science in its context  
*Silvio Funtowicz*



Čtvrtek 20. dubna 2017  
FSS MU, místnost P24  
od 15:15 do 16:45

Social science  
perspectives on  
environmental risks,  
emergencies  
and disasters  
*Bruna de Marchi*



## Marching for science?

Andrea Saltelli

Centre for the Study of the  
Sciences and the Humanities  
(SVT), University of Bergen  
(UIB) and

Institut de Ciència i Tecnologia  
Ambientals (ICTA) – Universitat  
Autònoma de Barcelona (UAB)

Masarykovy university, Joštova  
10, Brno, April 19 2017

Where to find this talk: [www.andreasaltelli.eu](http://www.andreasaltelli.eu)



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CAETERIS ARE NEVER  
PARIBUS

### Tweets by @AndreaSaltelli



andrea saltelli  
@AndreaSaltelli

"Science is not some magic force for progress and democracy"

Almost exactly the words used by J. Dewey:  
[twitter.com/AndreaSaltelli](https://twitter.com/AndreaSaltelli) ...



andrea saltelli  
@AndreaSaltelli

Lecturing today in Brno with @SFuntowicz and @BDMarchi

The crises, the marches, the disasters and beyond

post-normal science  
v České republice

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View on Twitter

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

On the march: the  
spirit of the time  
in the house of  
science





Source: The Conversation, <https://theconversation.com/scientists-march-on-washington-is-a-bad-idea-heres-why-73305>



# MARCH FOR SCIENCE

EARTH DAY

APRIL 22, 2017

#MarchforScience

Join the movement





The March for Science is the first step of a global movement to defend the vital role science plays in our health, safety, economies, and governments.

**It's time to get off the sidelines and make a difference.**

[Register to attend your local march](#)



The March for Science champions robustly funded and publicly communicated science as a pillar of human freedom and prosperity. We unite as a diverse, nonpartisan group to call for science that upholds the common good and for political leaders and policy makers to enact evidence based policies in the public interest.



The March for Science is a celebration of science. It's not only about scientists and politicians; it is about the very real role that science plays in each of our lives and the need to respect and encourage research that gives us insight into the world.





Nevertheless, the march has generated a great deal of conversation around whether or not scientists should involve themselves in politics. In the face of an alarming trend toward discrediting scientific consensus and restricting scientific discovery, we might ask instead: can we afford not to speak out in its defense?

There is no Planet B. Join the #MarchForScience.

1. Science is in a deep existential crisis which has ethical, epistemological, methodological and even metaphysical dimensions
2. Likewise democracy which has with science a legitimacy arrangement
3. Science and its institutions are committed to the status quo & attempt to evade a critical reflection
4. Solutions aren't forthcoming anytime soon
5. There are few areas of 'Reformation' where science and society work together



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

## CONTRIBUTORS

Alice Benessia  
Silvio Funtowicz  
Mario Giampietro  
Ângela Guimarães Pereira  
Jerome R. Ravetz  
Andrea Saltelli  
Roger Strand  
Jeroen P. van der Sluijs



A crisis looms over the scientific enterprise. Not a day passes without news of retractions, failed replications, fraudulent peer reviews, or misinformed science-based policies

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Campaigns ▾

## Feature

### Coca-Cola's secret influence on medical and science journalists

BMJ 2017 ; 357 doi: <https://doi.org/10.1136/bmj.j1638> (Published 05 April 2017)

Cite this as: BMJ 2017;357:j1638

Article

Related content

Metrics

Responses

Paul Thacker, freelance journalist

Author affiliations ▾

[thackerpd@gmail.com](mailto:thackerpd@gmail.com)

# Reproducibility in cancer biology: Making sense of replications

Brian A Nosek, Timothy M Errington

Center for Open Science, United States; University of Virginia, United States

DOI: <http://dx.doi.org/10.7554/eLife.23383>

Published January 19, 2017

Cite as eLife 2017;6:e23383.

## 1–1 Abstract

The first results from the Reproducibility Project: Cancer Biology suggest that there is scope for improving reproducibility in pre-clinical cancer research.

DOI: <http://dx.doi.org/10.7554/eLife.23383.001>

PART OF A  
REPRODUCIBILITY PROJECT  
Cancer Biology

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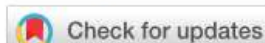
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Proceedings of the National Academy of Sciences of the United States of America

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[Home](#) > [Current Issue](#) > vol. 114 no. 14 > Daniele Fanelli, 3714–3719, doi: 10.1073/pnas.1618569114



## Meta-assessment of bias in science

Daniele Fanelli<sup>a,1</sup>, Rodrigo Costas<sup>b</sup>, and John P. A. Ioannidis<sup>a,c,d,e</sup>

Author Affiliations

Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved February 14, 2017 (received for review November 8, 2016)

## This Issue



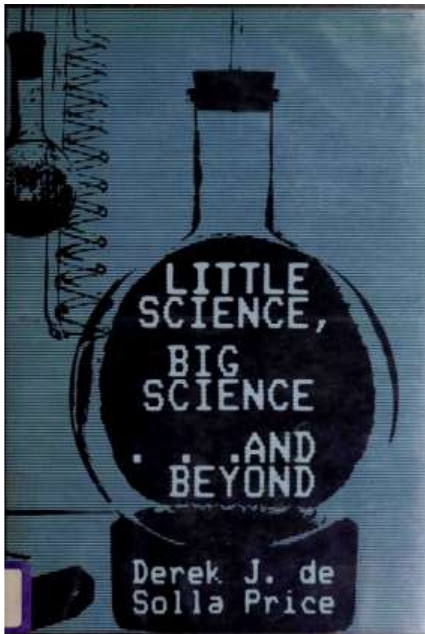
April 4, 2017  
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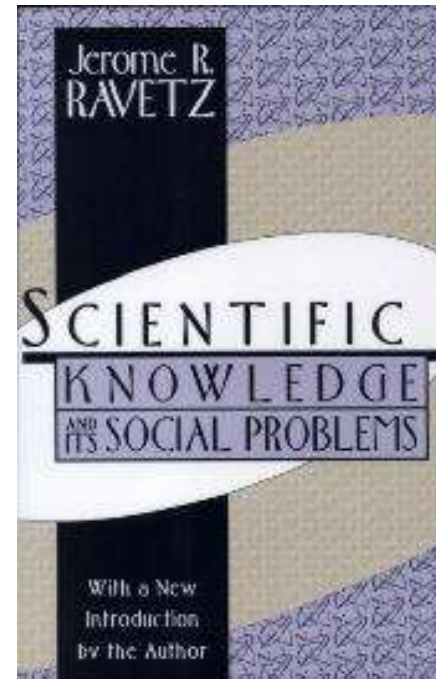
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**First thesis:** Science is in a deep existential crisis which has ethical, epistemological, methodological and even metaphysical dimensions. This was neatly predicted by E. de Solla Price, Jerome R. Ravetz and others five decades ago



Derek J. de  
Solla Price

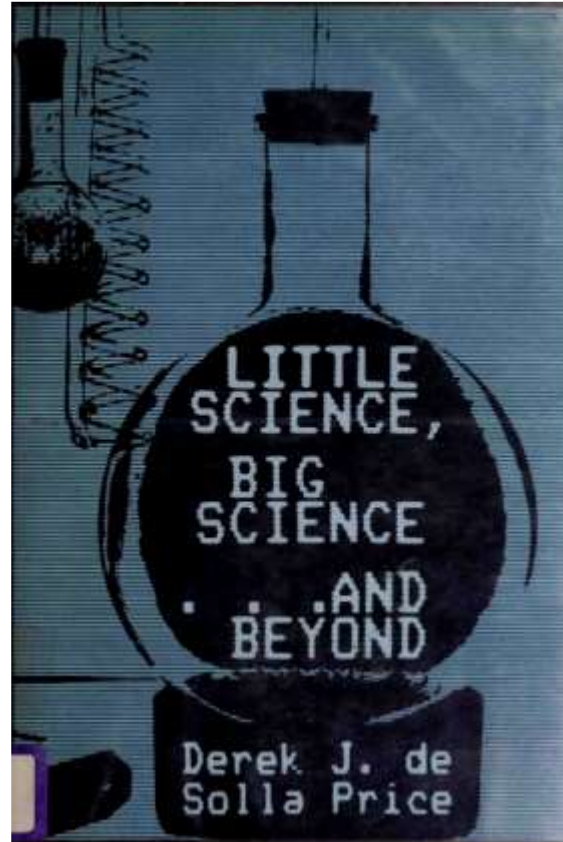


Jerome R.  
Ravetz

de Solla Price, D.J., 1963, Little science big science, Columbia University Press.

Ravetz, J., 1971, Scientific Knowledge and its Social Problems, Oxford University Press.

In 1963 Derek J. de Solla Price prophesized that Science would reach saturation (and in the worst case senility) under its own weight, victim of its own success and exponential growth (pp 1-32).



Derek J. de Solla Price

de Solla Price, D.J., 1963, Little science big science, Columbia University Press.



# Science/knowledge degenerates when it becomes a commodity for Ravetz (1971), and Mirowski (2011).

Ravetz, J., 1971, *Scientific Knowledge and its Social Problems*, Oxford University Press, p. 22.

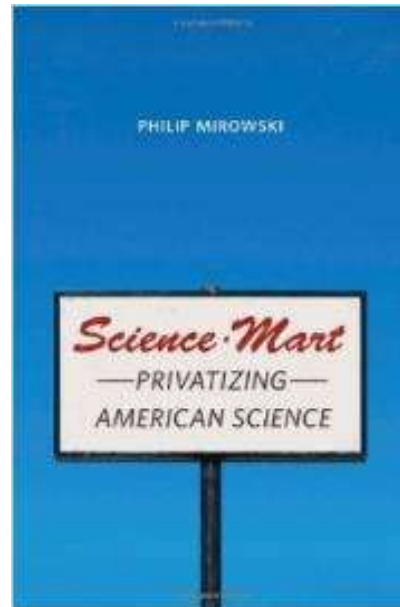
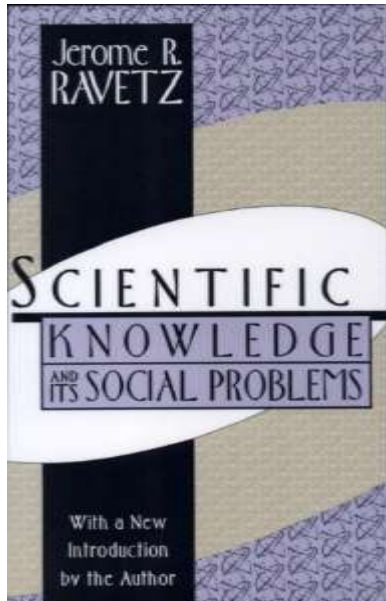
Mirowski, P. 2011. *Science-Mart: Privatizing American Science*, Harvard University Press.



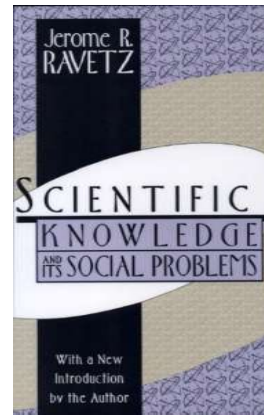
Jerome R.  
Ravetz



Philip  
Mirowski



p.22: [...] The problem of quality control in science is thus at the centre of the social problems of the industrialized science of the present period.”

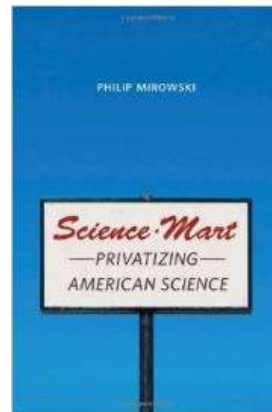


Jerome R.  
Ravetz

Ravetz, J., 1971, Scientific Knowledge and its Social Problems, Oxford University Press, p.22.



In house science labs of major corporation were closed and research outsourced to universities which ... became more and more looking as profit seeking organization (technology transfer offices in every campus) ... then research ended up outsourced again to contract-based research organizations (CRO's)...



Philip Mirowski

Mirowski, P. 2011. Science-Mart: Privatizing American Science, Harvard University Press.



The Economist runs its cover on the crisis (2013) based on a 2005 paper from J.P. Ioannidis

*Open access, freely available online*

Essay

## Why Most Published Research Findings Are False

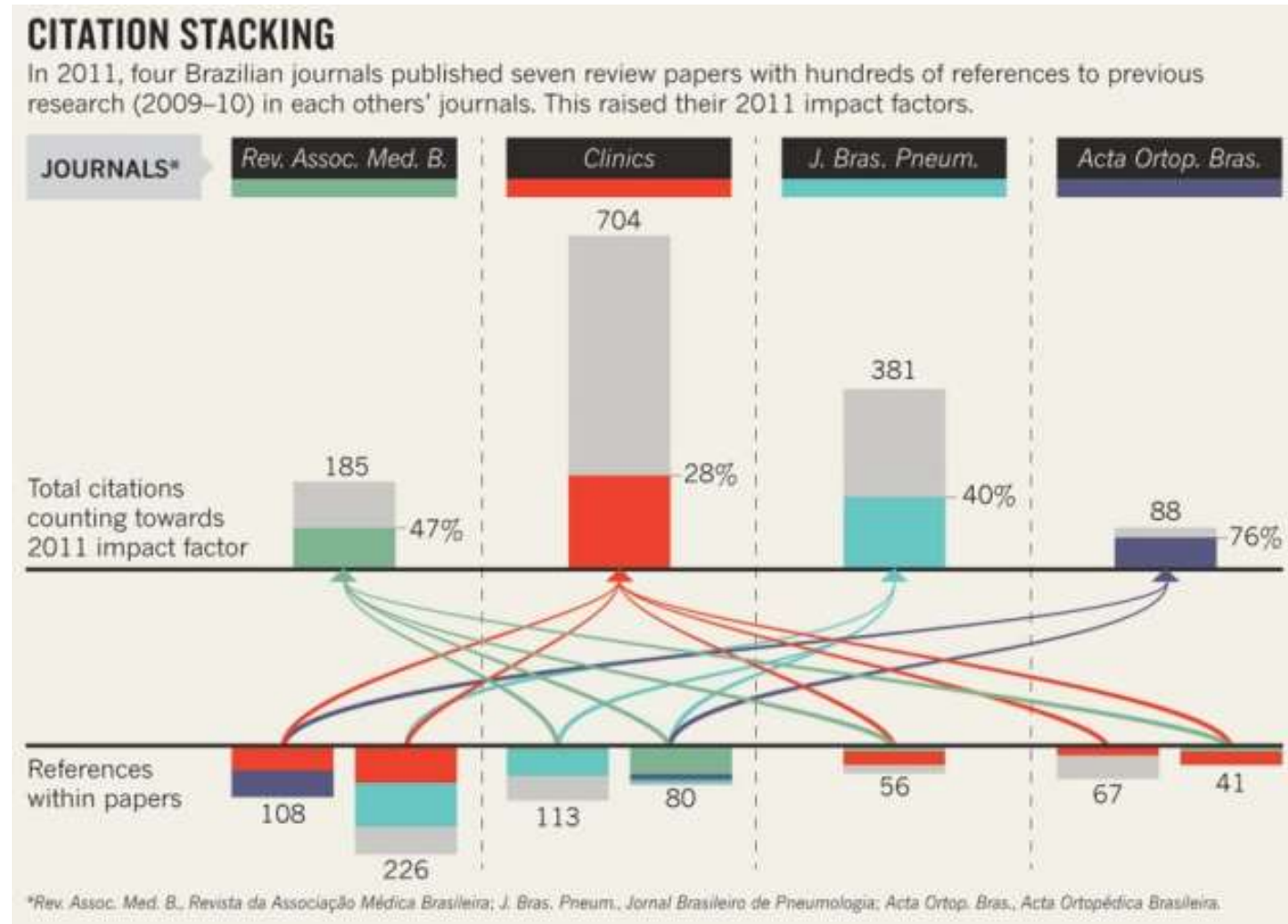
John P. A. Ioannidis



John P. A. Ioannides

J. P. A. Ioannidis, Why Most Published Research Findings Are False, PLoS Medicine, August 2005, 2(8), 696–701.

# Use and abuse of metrics: from self-citation to citation cartels to citation stacking ...



Richard Van Noorden, 2017, Brazilian citation scheme outed. Thomson Reuters suspends journals from its rankings for 'citation stacking'. Nature, 27 August 2013

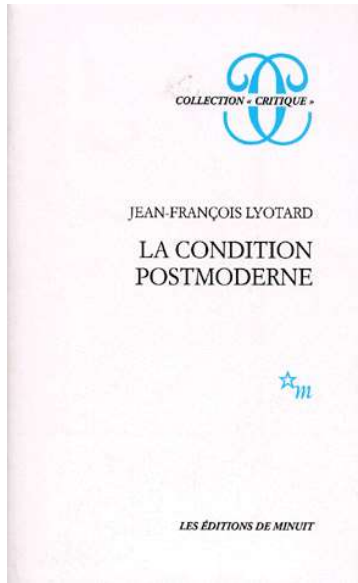
## Science in crisis: from the sugar scam to Brexit, our faith in experts is fading

September 27, 2016 4:43pm AEST

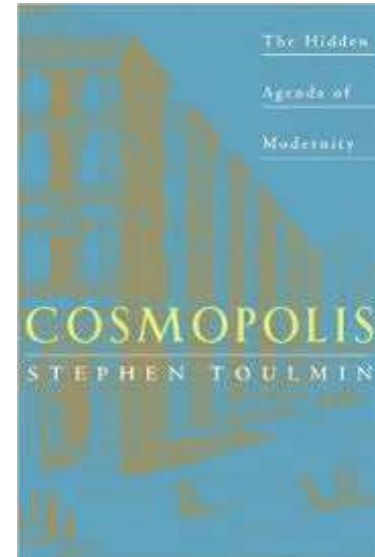




## Thesis 2: Likewise in crisis is democracy which has with science a legitimacy arrangement



Jean-  
François  
Lyotard



Stephen Toulmin

➔ today's post-BREXIT, post-Trump, post-truth brouhaha, the demise of expertise ...

**Thesis 3:** Science and its institutions are committed to the status quo & attempt to evade a critical reflection with:

Denial

Dismissal

Diversion

Displacement

*Economy and Society Volume 41 Number 1 February 2012: 107–125*

**Uncomfortable knowledge:  
the social construction of  
ignorance in science and  
environmental policy  
discourses**

Steve Rayner

# Denial (1)

OECD publishing

Please cite this paper as:

OECD (2015), "Scientific Advice for Policy Making: The Role and Responsibility of Expert Bodies and Individual Scientists", *OECD Science, Technology and Industry Policy Papers*, No. 21, OECD Publishing, Paris.  
<http://dx.doi.org/10.1787/5js3311jcpwb-en>



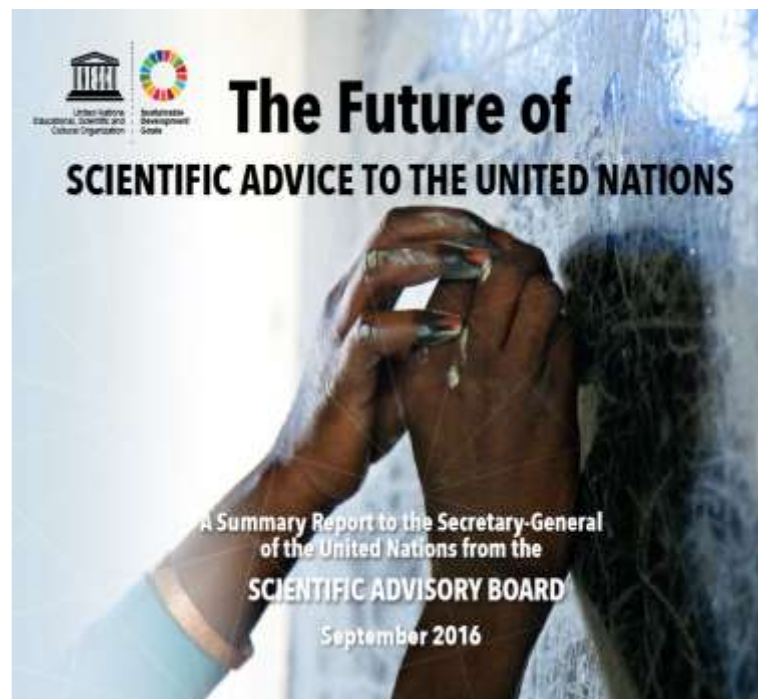
OECD Science, Technology and Industry  
Policy Papers No. 21

## Scientific Advice for Policy Making

THE ROLE AND RESPONSIBILITY OF EXPERT  
BODIES AND INDIVIDUAL SCIENTISTS

OECD

2015



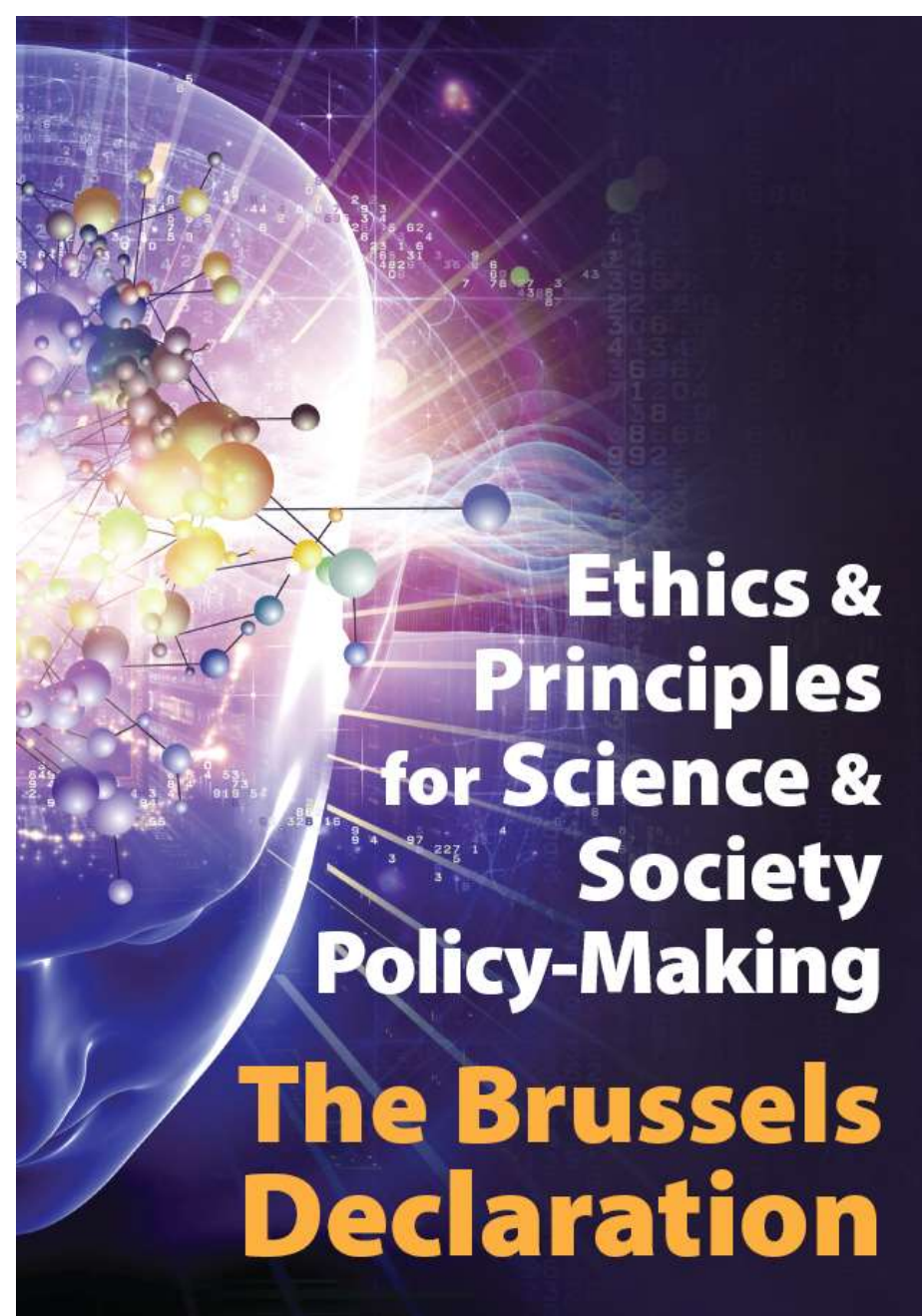
2016

# Denial (2)

Adopted on 17th February, 2017, at symposium of American Association for the Advancement (AAAS) after 5 y gestation, hundreds of experts involved

- No crisis
- No effect of crisis on evidence based policy
- No asymmetries in the use and availability of evidence for policy (citizens same power as lobbyists)

2017





# Dismissal? We can solve it!

nature.com > nature human behaviour > perspectives > article

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## A manifesto for reproducible science

Marcus R. Munafò , Brian A. Nosek, Dorothy V. M. Bishop, Katherine S. Button, Christopher D. Chambers, Nathalie Percie du Sert, Uri Simonsohn, Eric-Jan Wagenmakers, Jennifer J. Ware & John P. A. Ioannidis

*Nature Human Behaviour* **1**,  
Article number: 0021 (2017)  
[doi:10.1038/s41562-016-0021](https://doi.org/10.1038/s41562-016-0021)

Published online: 10 January 2017

“[...] measures [to] improving the transparency, reproducibility and **efficiency** of scientific research”

# But ...can we do it from the inside?

TABLE 1. GROWING PERVERSE INCENTIVES IN ACADEMIA

<i>Incentive</i>	<i>Intended effect</i>	<i>Actual effect</i>
"Researchers rewarded for increased number of publications."	"Improve research productivity," provide a means of evaluating performance.	"Avalanche of" substandard, "incremental papers"; poor methods and increase in false discovery rates leading to a "natural selection of bad science" (Smaldino and McElreath, 2016); reduced quality of peer review
"Researchers rewarded for increased number of citations."	Reward quality work that influences others.	Extended reference lists to inflate citations; reviewers request citation of their work through peer review
"Researchers rewarded for increased grant funding."	"Ensure that research programs are funded, promote growth, generate overhead."	Increased time writing proposals and less time gathering and thinking about data. Overselling positive results and downplay of negative results.
Increase PhD student productivity	Higher school ranking and more prestige of program.	Lower standards and create oversupply of PhDs. Postdocs often required for entry-level academic positions, and PhDs hired for work MS students used to do.
Reduced teaching load for research-active faculty	Necessary to pursue additional competitive grants.	Increased demand for untenured, adjunct faculty to teach classes.
"Teachers rewarded for increased student evaluation scores."	"Improved accountability; ensure customer satisfaction."	Reduced course work, grade inflation.
"Teachers rewarded for increased student test scores."	"Improve teacher effectiveness."	"Teaching to the tests; emphasis on short-term learning."
"Departments rewarded for increasing U.S. News ranking."	"Stronger departments."	Extensive efforts to reverse engineer, game, and cheat rankings.
"Departments rewarded for increasing numbers of BS, MS, and PhD degrees granted."	"Promote efficiency; stop students from being trapped in degree programs; impress the state legislature."	"Class sizes increase; entrance requirements" decrease; reduce graduation requirements.
"Departments rewarded for increasing student credit/contact hours (SCH)."	"The university's teaching mission is fulfilled."	"SCH-maximization games are played": duplication of classes, competition for service courses.

Modified from Regehr (pers. comm., 2015) with permission.

Academic Research in the 21st Century: Maintaining Scientific Integrity in a Climate of Perverse Incentives and Hyper-competition, Marc A. Edwards and Siddhartha Roy, ENVIRONMENTAL ENGINEERING SCIENCE, 34(1), 2017

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## *Incentive*

---

“Researchers rewarded for increased number of publications.”

### *Intended effect*

---

“Improve research productivity,”  
provide a means of evaluating  
performance.

### *Actual effect*

---

“Avalanche of” substandard, “incremental papers”; poor methods and increase in false discovery rates leading to a “natural selection of bad science” (Smaldino and McElreath, 2016); reduced quality of peer review

Academic Research in the 21st Century:  
Maintaining Scientific Integrity in a  
Climate of Perverse Incentives and  
Hyper-competition, Marc A. Edwards  
and Siddhartha Roy,  
ENVIRONMENTAL ENGINEERING  
SCIENCE, 34(1), 2017

Diversion (There is a problem, and this is due to an ongoing war on science between the educated liberal left and the ignorant conservative right)



#### Authors



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<https://theconversation.com/science-wars-in-the-age-of-donald-trump-67594>

# Displacement (This is the post-truth era)

## THE CONVERSATION

Academic rigour, journalistic flair

Arts + Culture Business + Economy Education Environment + Energy Health + Medicine Politics + Society **Science + Technology** Brexit

### To tackle the post-truth world, science must reform itself

January 27, 2017 7:33am GMT



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<https://theconversation.com/to-tackle-the-post-truth-world-science-must-reform-itself-70455>



# Displacement (This is the post-truth era)



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Adjunct Professor Centre for the Study of the Sciences and the Humanities, University of Bergen

Was policy based on evidence before Brexit and Trump?

“Trump is not science’s problem. Science is.”

<https://theconversation.com/to-tackle-the-post-truth-world-science-must-reform-itself-70455>

Thesis 4: Solutions aren't forthcoming anytime soon, but:

Church stays to indulgencies as ...

Science stays to: predatory publishers, citation cartels & stacking, trade in authorship, domination of corporate interests in science from sugar to GMO...



Martin Luther



Johann Tetzel

# Thesis 5: Areas of resistance and ‘Reformation’ where science and society work together – emergence of a new polity of science, including citizen scientists and scientist–citizens



Jeffrey Beall



Lois Gibbs



Timothy Gowers



Marc Edwards

<http://scholarlyoa.com/2015/01/02/bealls-list-of-predatory-publishers-2015/#more-4719>

<https://www.bu.edu/lovecanal/canal/>

<http://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0127502>

[https://en.wikipedia.org/wiki/Flint\\_water\\_crisis](https://en.wikipedia.org/wiki/Flint_water_crisis); <http://flintwaterstudy.org/>;

<http://www.nytimes.com/2016/08/21/magazine/flints-water-crisis-and-the-troublemaker-scientist.html>

# Has science become an endeavor where attempts to fix a diseased system lead you to disgrace?



Jeffrey Beall



<http://www.npr.org/sections/thetwo-way/2013/05/15/184233141/publisher-threatens-librarian-with-1-billion-lawsuit>

<http://retractionwatch.com/2017/01/17/bealls-list-potential-predatory-publishers-go-dark/>

# An even newer sort of heroes?



John and Laura  
Arnold



Brian Nosek, the  
Reproducibility  
Project.



John Ioannidis,  
Meta-research  
innovation  
centre at  
Stanford



Ben  
Goldacre,  
alltrials.net



Gary Taubes, The  
case against sugar



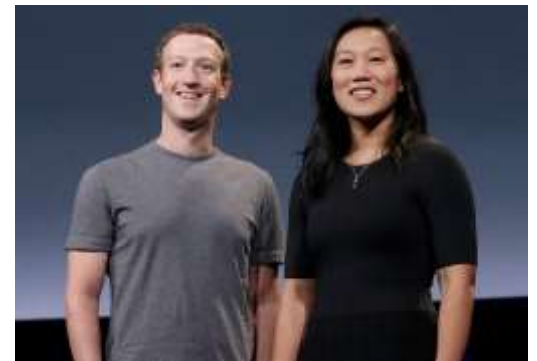
“Bill & Melinda Gates ... the world’s biggest source of charitable money for scientific endeavours (\$4bn a year) [...its research] must be freely available to all [...and] will pay the cost of putting such research in one particular repository of freely available papers.



Bill & Melinda Gates

... offered the publishers of *Science*, \$100,000 to make papers published this year about Gates-sponsored research free to read from the beginning.

Mark Zuckerberg & Priscilla Chan will disburse \$50m to 47 local scientists on condition they made their work available as preprints.”



Mark Zuckerberg & Priscilla Chan

<http://www.economist.com/news/science-and-technology/21719438-about-change-findings-medical-research-are-disseminated-too>



Yoshiki Sasai

<http://www.nature.com/news/stem-cell-pioneer-blamed-media-bashing-in-suicide-note-1.15715>

## Scientists' march on Washington is a bad idea – here's why

March 8, 2017 6.54pm AEDT

Author



**Andrea Saltelli**

Adjunct Professor Centre for the Study of the Sciences and the Humanities, University of Bergen, University of Bergen



Some questioned the concept of the Women's March on Washington. Now scientists will march against Donald Trump. Is that a good idea?

# **The Republic of Science: Its Political and Economic Theory**

## **Michael Polanyi**

[This article originally appeared in *Minerva* 1:54-74, 1962 and is put on WWW with kind permission from Kluwer Academic Publishers (<http://www.wkap.nl>) and John C. Polanyi.]

### Polanyi's theses:

Science as a market driven by higher principles

...

Which feeds society's thirst for self improvement

...

Science as a community of practice capable of self-governance ...



Michal Polanyi

<https://theconversation.com/scientists-march-on-washington-is-a-bad-idea-heres-why-73305>

## Scientists' march on Washington is a bad idea – here's why

March 8, 2017 6:54pm AEDT



Some questioned the concept of the Women's March on Washington. Now scientists will march against Donald Trump. Is that a good idea?

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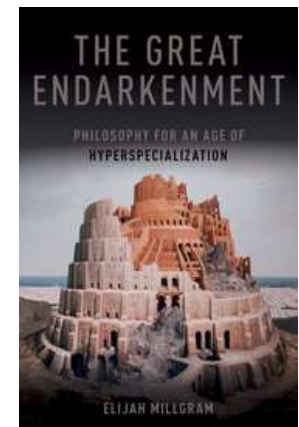
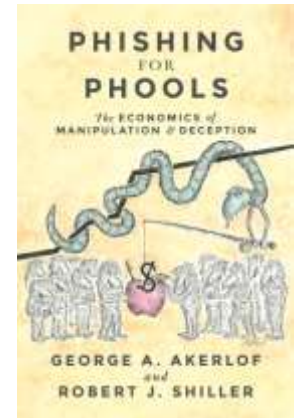
Today:

Science and innovation driven by imperfect markets

Society's self improvement likewise entrusted to market forces

Science divided by practices (methodological aliens)

<https://theconversation.com/scientists-march-on-washington-is-a-bad-idea-heres-why-73305>





## Scientists' march on Washington is a bad idea – here's why

March 8, 2017 6:54pm AEDT



Some questioned the concept of the Women's March on Washington. Now scientists will march against Donald Trump. Is that a good idea?

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“Our activism would be better inspired by the radical 1970s-era movements that sought to change the world by changing first science itself. They sought to provide scientific knowledge and technical expertise to local populations and minority communities while giving those same groups a chance to shape the questions asked of science.”

<https://theconversation.com/scientists-march-on-washington-is-a-bad-idea-heres-why-73305>



# END

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