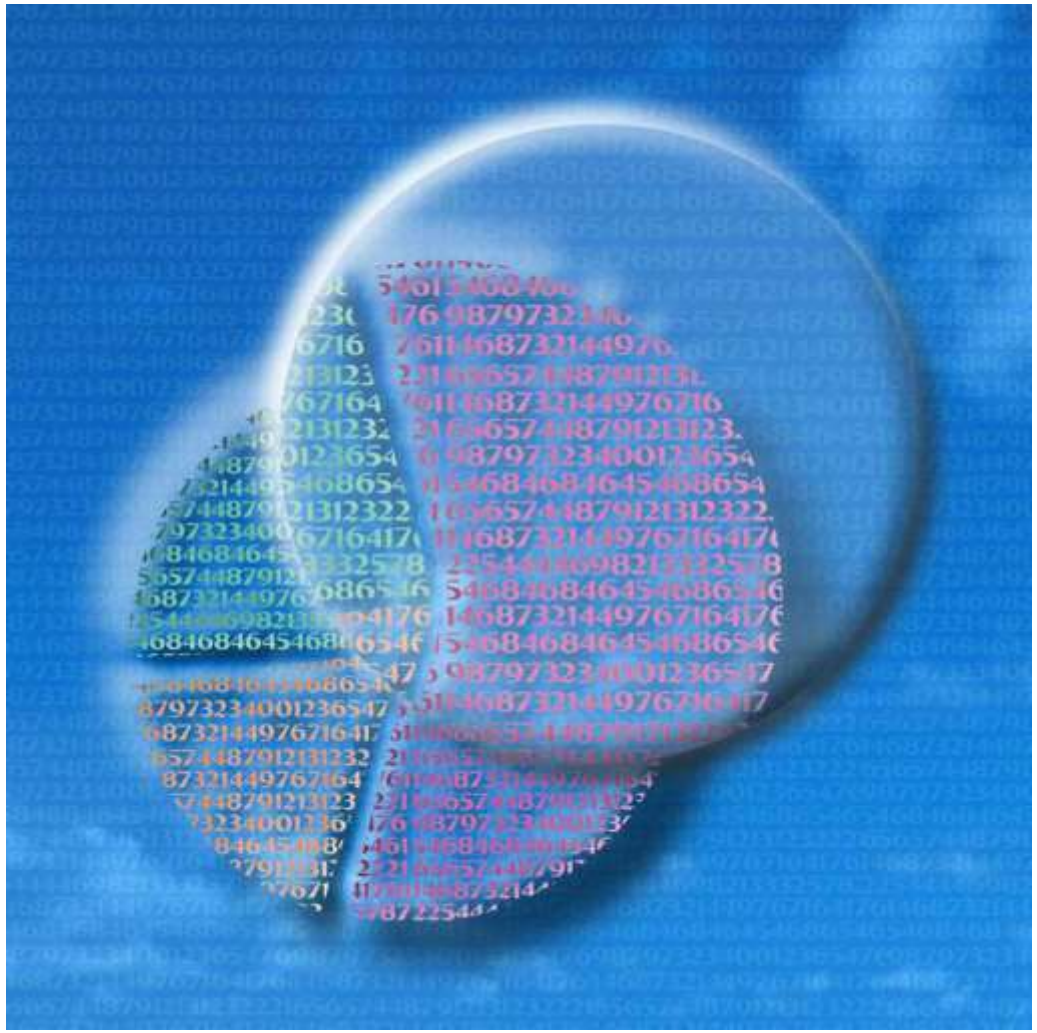


Science: is there a crisis? The case of the p-test

Andrea Saltelli
Centre for the Study of the Sciences and the Humanities (SVT) - University of Bergen (UIB)
& visiting fellow at Open Evidence Research, Universitat Oberta de Catalunya (UOC), Barcelona

Course Practical Problems in Quantification
May 16-17, 2018
Dipartimento di Statistica, Informatica, Applicazioni "G. Parenti"
viale Morgagni 57/59 Firenze, Aula 32

Where to find this talk: www.andreasaltelli.eu

= more material on my web site

= discussion point

The P-test saga

ROYAL SOCIETY OPEN SCIENCE

rsos.royalsocietypublishing.org

Review

Cite this article: Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of *p*-values. *R. Soc. open sci.* **1**: 140216.
http://dx.doi.org/10.1098/rsos.140216

An investigation of the false discovery rate and the misinterpretation of *p*-values

David Colquhoun

Department of Neuroscience, Physiology and Pharmacology, University College London, Gower Street, London WC1 6BT, UK

"If you are foolish enough to define 'statistically significant' as anything less than p=0.05 then… you have a 29% chance (at least) of making a fool of yourself.

Who would take a risk like that? Judging by the medical literature, most people would. No wonder there is a problem"

Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of p-values. R. Soc. Open sci. 1: 140216. http://dx.doi.org/10.1098/rsos.140216

P values by way of an example

- Two groups, one with a placebo, one with the treatment
- Random allocation to groups (+more!)
- The difference *d* between the means of the two groups is tested (is it different from zero?)
- *p=0.05* implies that if there were no effect the probability of observing a value equal to *d* or higher would be *5%*

“At first sight, it might be thought that this procedure would guarantee that you would make a fool of yourself only once in every 20 times that you do a test”

Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of p-values. R. Soc. Open sci. 1: 140216. http://dx.doi.org/10.1098/rsos.140216

"The classical p-value does exactly what it says. But it is a statement about what would happen if there were no true effect. That cannot tell you about your long-term probability of making a fool of yourself, simply because sometimes there really is an effect. In order to do the calculation, **we need to know a few more things**"

Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of p-values. R. Soc. Open sci. 1: 140216. http://dx.doi.org/10.1098/rsos.140216

A classic exercise in screening

You test positive for AIDS (one test only). Time for despair?

Only one 1 in 100,000 has AIDS in your population

The test has a 5% false positive rate

Already one can say: in a population of say 100,000 one will have AIDS and 5,000 (5% of 100,000) will test positive

➔ Don't despair (yet)

Another exercise in screening (Colquhoun 2014)

You test positive for mild cognitive impairment (MCI) (one test only). Time to retire?

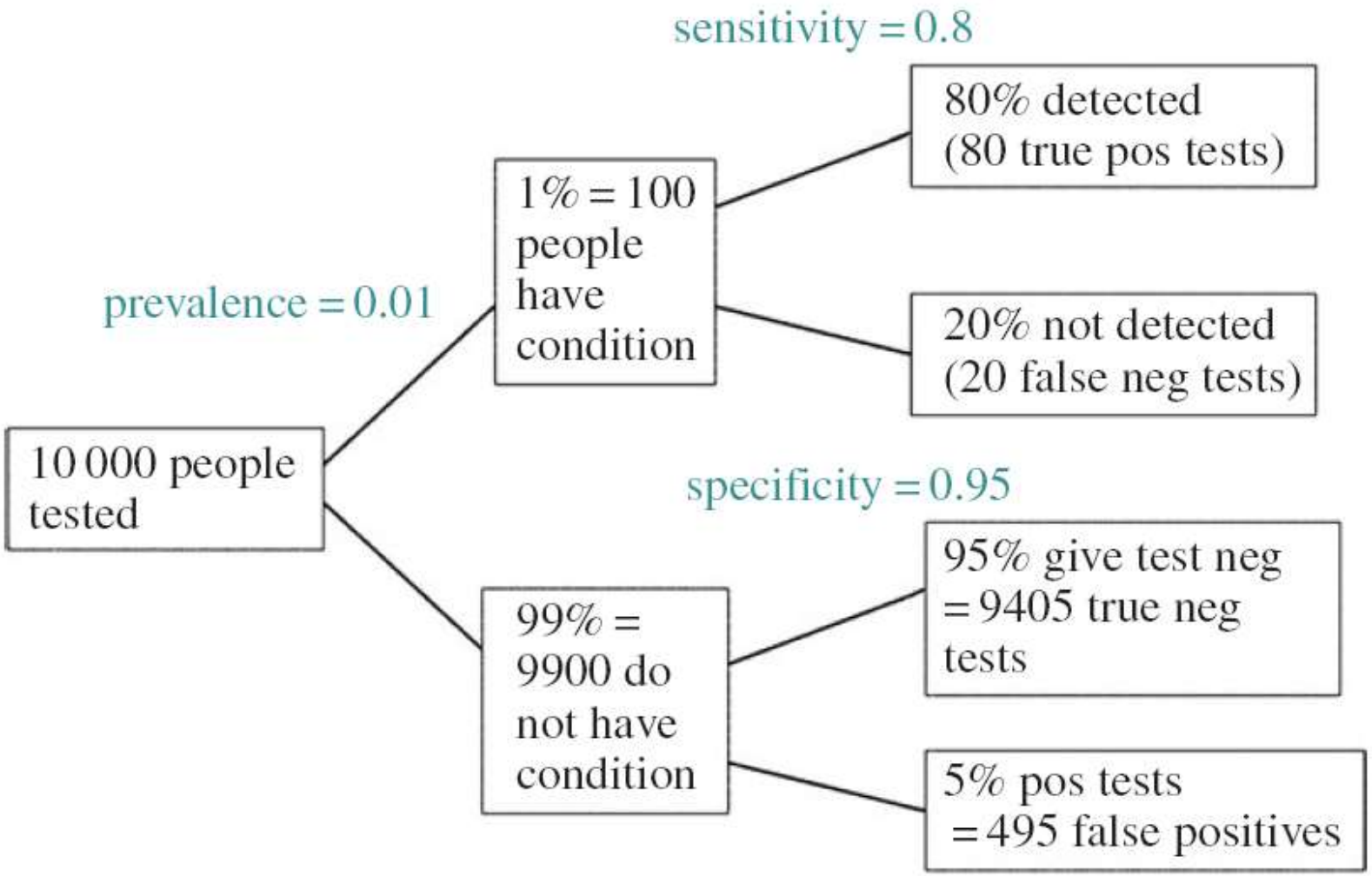
MCI prevalence in the population 1%, i.e. in a sample of 10,000 then 100 have MCI and 9,900 don't

The test has a 5% false positive rate; of the 9,900 who don't have MCI 495 test (false) positive and the remaining 9,405 (true) negative

The test does not pick all the 100 MCI but only 80; there will be 20 false negative. So we see 80+495=575 positive of which only 80 (a 14%) are true and the remaining 86% false

➔ It does not make sense to screen the population for MCI!

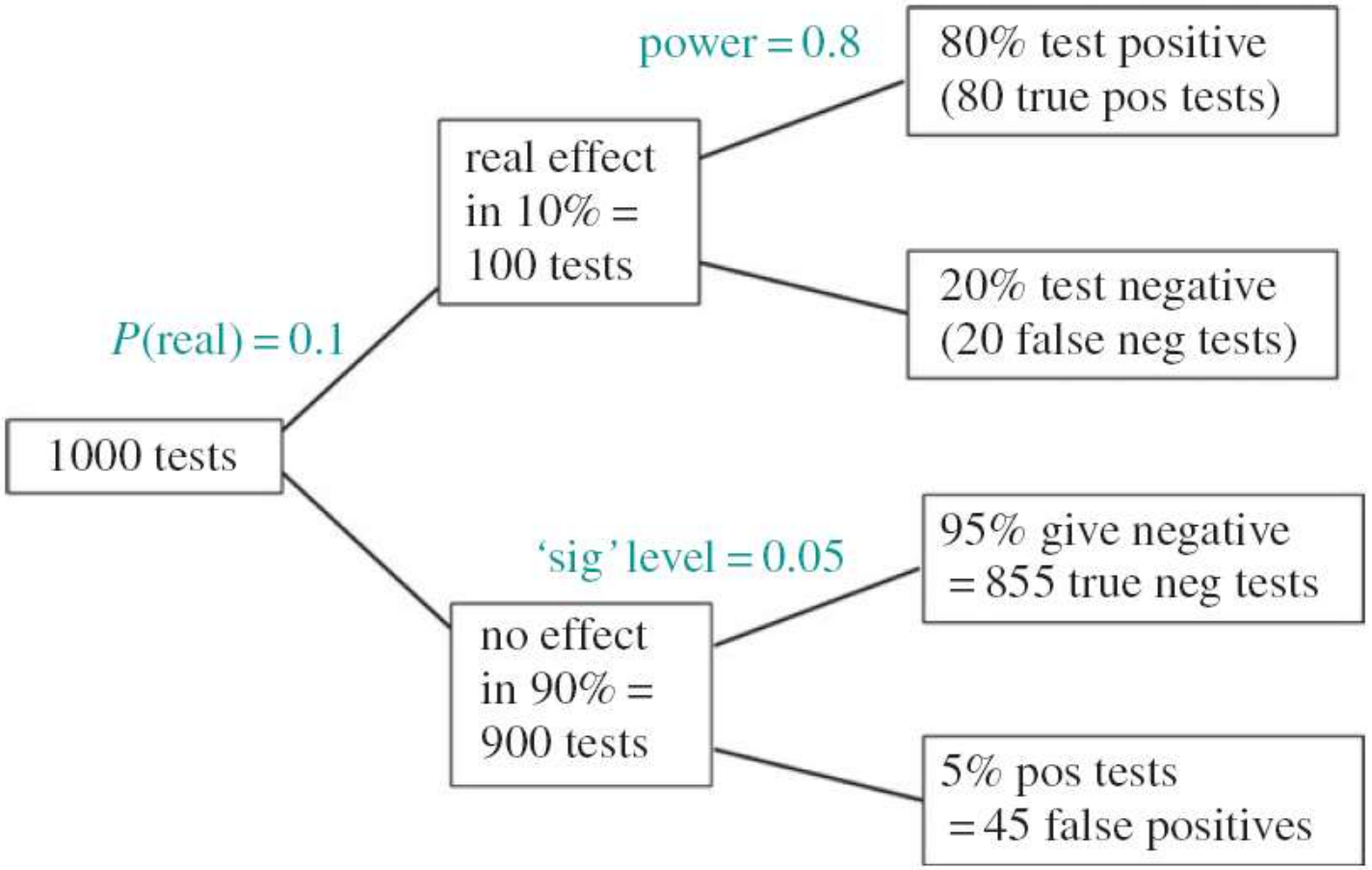
The number 86% = 495/(495+80) is our false discovery rate



Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of p-values. R. Soc. Open sci. 1: 140216. http://dx.doi.org/10.1098/rsos.140216

The same concept of false discovery rate applies to the problem of significance test

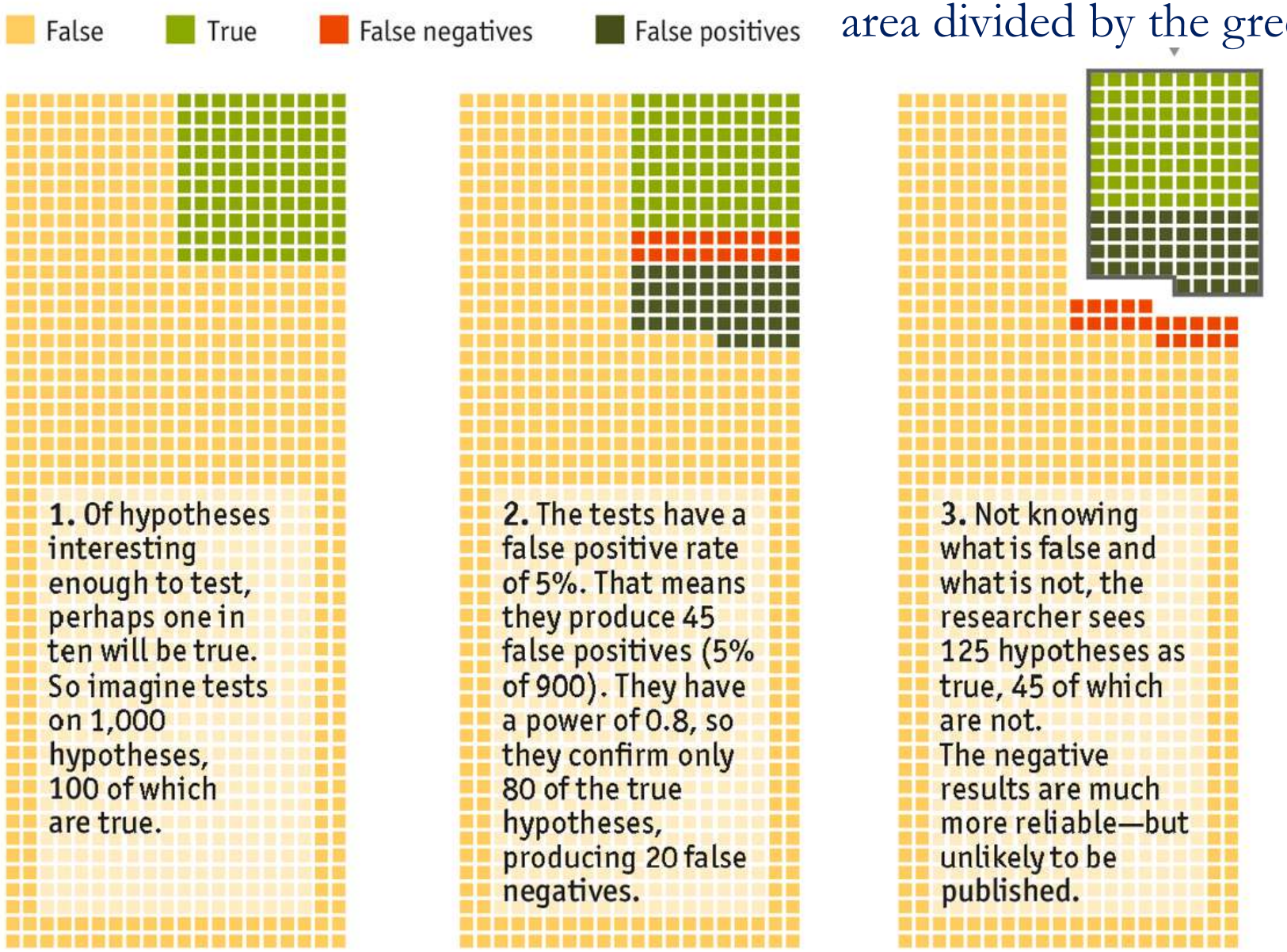
We now consider tests instead of individuals



Colquhoun D. 2014 An investigation of the false discovery rate and the misinterpretation of p-values. R. Soc. Open sci. 1: 140216. http://dx.doi.org/10.1098/rsos.140216

Unlikely results

How a small proportion of false positives can prove very misleading



Source: *The Economist*

The false discovery rate is ~the dark area divided by the green one

➔ We see 125 hypotheses as true 45 of which are not; the false discovery rate is 45/125 = 36%

Significance p=0.05 ➔ false discovery rate of 36%

We now know that p=0.05 did not correspond to a chance in twenty of being wrong but in one in three

How many numbers did we need to know to reach this conclusion?

From P-test to the broader picture

The Economist

HOW SCIENCE GOES WRONG.

Essay

Why Most Published Research Findings Are False

2005

John P. A. Ioannidis

… for most study designs and settings, it is more likely for a research claim to be false than true …

John P. A. Ioannides

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

Snapshots of the crisis: a rich ecosystem and some morbid signs

Failed replications, entire subfields going bad, fraudulent peer reviews, predatory publishers, perverse metrics, statistics on trial, …

… misleading science advice, institutions on denial, post-truth, …

The crisis is methodological, epistemological, ethical and metaphysical

(February 4, 2017)

Risk factor for bias:

small, early, highly cited studies; scientist's early-career status; isolation; lack of scientific integrity; done in the US

No effect:

scientific productivity; male vs female

REPRODUCIBILITY PROJECT CANCER BIOLOGY

REPRODUCIBILITY IN CANCER BIOLOGY

Making sense of replications

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

DOI: 10.7554/eLife.23383.001

BRIAN A NOSEK AND TIMOTHY M ERRINGTON*

(January 19, 2017)

Reproducibility Project – Cancer Biology: “scope for improving reproducibility in pre-clinical cancer research”

nature
International journal of science

Comment

Drug development: Raise standards for preclinical cancer research

C. Glenn Begley & Lee M. Ellis

"scientific findings were confirmed in only 6 (11%) cases in preclinical research, this was a shocking result"
(29 March, 2012)

The 1st most cited journal in Psychology

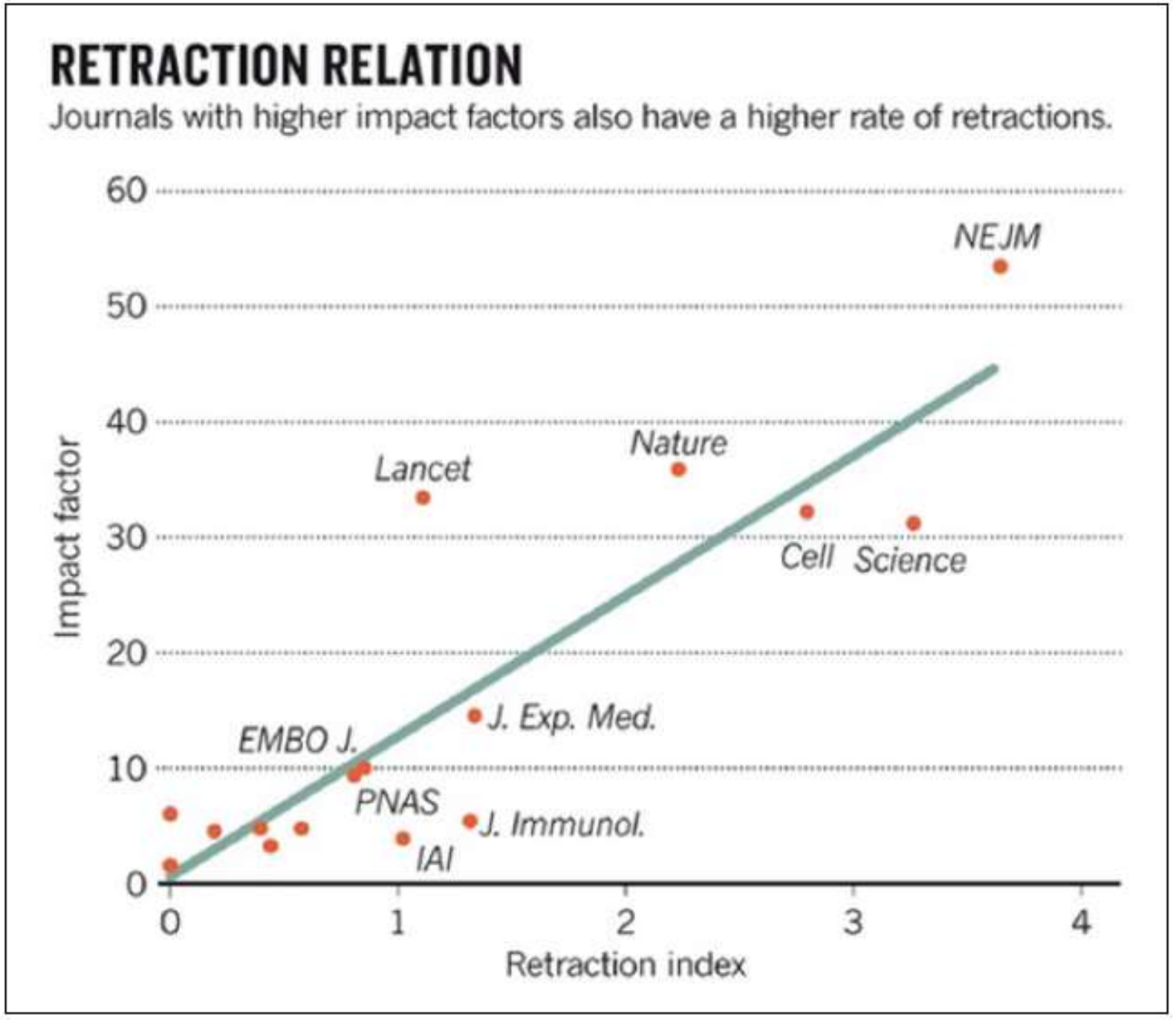
frontiers in Human Neuroscience

Prestigious Science Journals Struggle to Reach Even Average Reliability

"…an accumulating body of evidence suggests that methodological quality & reliability of published research works in several fields may be decreasing with increasing journal rank" (20 February, 2018)

Björn Brembs*

Institute of Zoology—Neurogenetics, Universität Regensburg, Regensburg, Germany



Fang FC, Casadevall A and Morrison R (2011) Retracted science and the retraction index. *Infection and Immunity* 79(10): 3855–3859

ECOSPHERE
AN ESA OPEN ACCESS JOURNAL

Article | Open Access

Do rebuttals affect future science?

Jeannette A. Banobi, Trevor A. Branch, Ray Hilborn

First published: 30 March 2011 | https://doi.org/10.1890/ES10-00142.1 | Cited by: 13

"We examined seven high-profile original articles and their rebuttals, finding that original articles were cited 17 times more than rebuttals, and that annual citation numbers were unaffected by rebuttals"

Brow

The Economic Journal, **127** (*October*), F236–F265. Doi: 10.1111/ecoj.12461 © 2017 Royal Economic Society. Published by John Wiley & Sons, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

OPEN ACCESS

ESSAY

June 21, 2017

Why Most Clinical Research Is Not Useful

John P. A. Ioannidis

Published: June 21, 2016 • https://doi.org/10.1371/journal.pmed.1002049

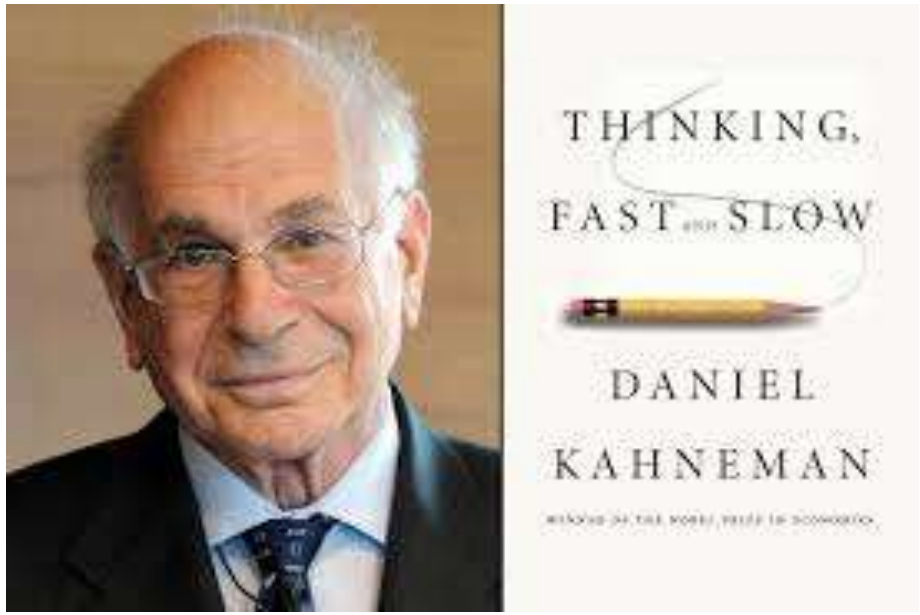
THE POWER OF BIAS IN ECONOMICS RESEARCH*

John P. A. Ioannidis, T. D. Stanley and Hristos Doucouliagos

October 27, 2017

Rather than isolated instances of corruptions now entire fields of research are found diseased

Reconstruction of a Train Wreck: How Priming Research Went off the Rails



"[…]questions have been raised about the robustness of priming results … your field is now the poster child for doubts about the integrity of psychological research…"

https://replicationindex.wordpress.com/2017/02/02/reconstruction-of-a-train-wreck-how-priming-research-went-of-the-rails/comment-page-1/

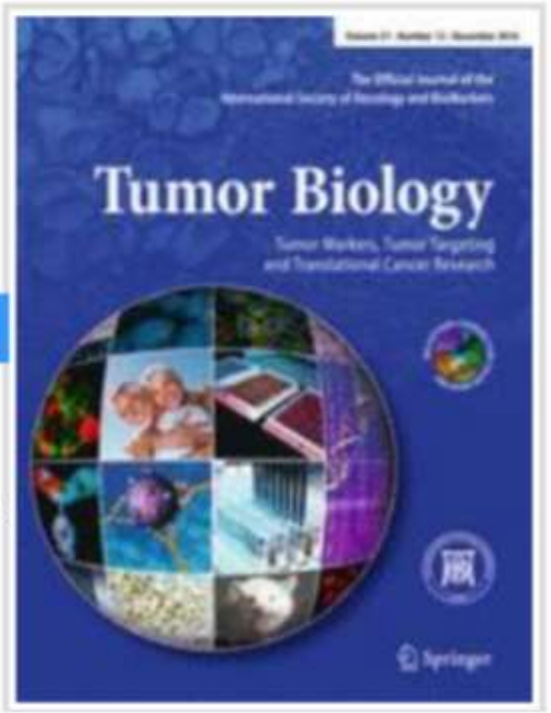
Retraction Watch April 20, 2017 Tracking retractions as a

A new record: Major publisher retracting more than 100 studies from cancer journal over fake peer reviews

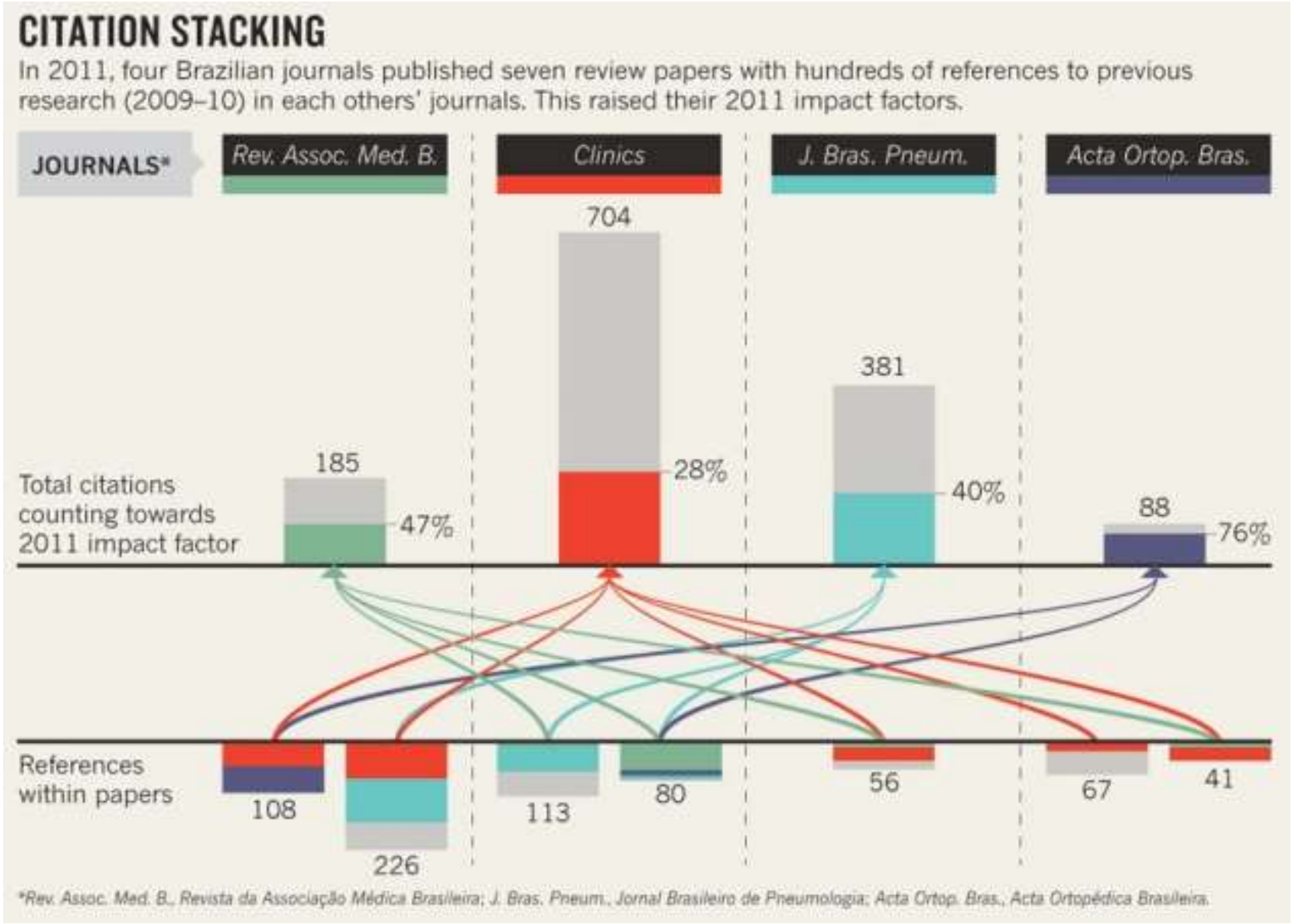
with 11 comments

Springer is retracting 107 papers from one journal after discovering they had been accepted with fake peer reviews. Yes, 107.

To submit a fake review, someone (often the author of a paper) either makes up an outside expert to review the paper, or suggests a real researcher — and in both cases, provides a fake email address that comes back to someone who will invariably give the paper a glowing review. In this case, Springer, the publisher of *Tumor Biology* through 2016, told us that an investigation produced "clear evidence" the reviews were submitted under the names of real researchers with faked emails. Some of the authors may have used a third-party editing service, which may have supplied the reviews. The journal is now published by SAGE.



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

Contents lists available at ScienceDirect

Futures

journal homepage: www.elsevier.com/locate/futures

Original research article

What is wrong with evidence based policy, and how can it be improved?

Andrea Saltelli[a,b,c,*], Mario Giampietro[a,c,d]

Futures 91 (2017) 62–71

Journal of Clinical Epidemiology 73 (2016) 82–86

Journal of Clinical Epidemiology

Evidence-based medicine has been hijacked: a report to David Sackett

John P.A. Ioannidis[a,b,c,d,*]

Power asymmetries in the framing of issues: those who have the deepest pockets marshal the best evidence; Instrumental use of quantification to obfuscate; (Saltelli and Giampietro, 2017)

Evidence based medicine hijacked to serve corporate agendas. “Under market pressure, clinical medicine has been transformed to finance-based medicine” (Ioannidis, 2016)

Futures

Available online 7 February 2017

In Press, Corrected Proof

Original research article

What is wrong with evidence based policy, and how can it be improved?

Andrea Saltelli [a, b, c], Mario Giampietro [a, c, d]

- There is a crisis of science's governance forcing to reconsider evidence based policy as it is being practiced at present.
- The closure of any issue in a pre-established frame used for quantification may correspond to normative and political stances.

Futures

Available online 7 February 2017

In Press, Corrected Proof

Original research article

What is wrong with evidence based policy, and how can it be improved?

Andrea Saltelli [a, b, c], Mario Giampietro [a, c, d]

- The use of mathematical modelling and indicators conveys a spurious impression of precision, prediction and control.
- Better styles of evidence based policy should flag the existence of 'uncomfortable knowledge' usually avoided in policy discussions.

September 12, 2016

See also https://www.theguardian.com/society/2016/apr/07/the-sugar-conspiracy-robert-lustig-john-yudkin, and the story of US President Dwight Eisenhower heart attack,…

“our findings suggest the industry sponsored a research program in the 1960s and 1970s that successfully cast doubt about the hazards of sucrose while promoting fat as the dietary culprit in CHD [coronary hearth disease]”

http://archinte.jamanetwork.com/article.aspx?articleid=2548255

But there are reactions …

Science Home News Journals Topics Careers

SHARE

POLICY FORUM | HISTORY OF SCIENCE

Was there ever really a "sugar conspiracy"?

David Merritt Johns[1], Gerald M. Oppenheimer[1,2]

+ See all authors and affiliations

Science 16 Feb 2018:
Vol. 359, Issue 6377, pp. 747-750
DOI: 10.1126/science.aaq1618

http://science.sciencemag.org/content/359/6377/747

Renewable sources 100% of energy in US by 2050

$10-million lawsuit

Los Angeles Times

A Stanford professor drops his ridiculous defamation lawsuit against his scientific critics

http://www.latimes.com/business/hiltzik/la-fi-hiltzik-jacobson-lawsuit-20180223-story.html

Predatory Publishers

Predatory publishers

Jeffrey Beall, librarian, University of Colorado, Denver.
Monitored predatory open access publishers https://beallslist.weebly.com/

Misleading metrics list includes companies that "calculate" and publish counterfeit impact factors

[…] The hijacked journals list includes journals … stealing another journal's identity and soliciting articles submissions using the author-pays model (gold open-access)

The OMICS Group, based in Hyderabad, India, have threatened to sue

Last year, the US Federal Trade Commission itself sued OMICS for deceiving researchers and hiding publication fees

See
http://www.biochemia-medica.com/system/files/27_2_J.Beall__What%20I%20learned%20from%20predatory%20publishers.pdf

https://www.nature.com/news/controversial-website-that-lists-predatory-publishers-shuts-down-1.21328

Statistics under trial

AMERICAN STATISTICAL ASSOCIATION RELEASES STATEMENT ON STATISTICAL SIGNIFICANCE AND *P*-VALUES

Provides Principles to Improve the Conduct and Interpretation of Quantitative Science

March 7, 2016

+ twenty 'dissenting' commentaries

Wasserstein, R.L. and Lazar, N.A., 2016. 'The ASA's statement on p-values: context, process, and purpose', The American Statistician, DOI:10.1080/00031305.2016.1154108.

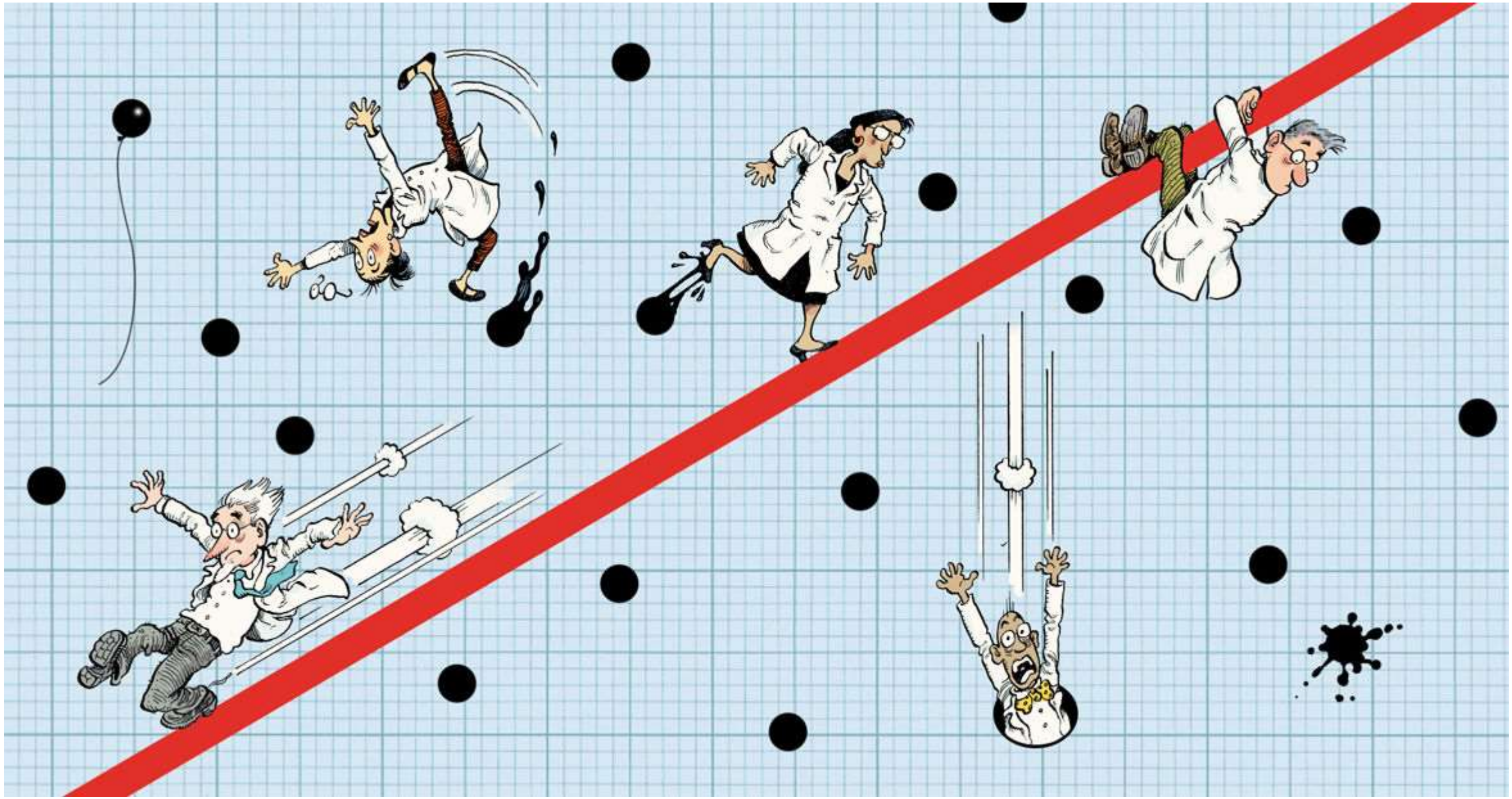
See also Christie Aschwanden at http://fivethirtyeight.com/features/not-even-scientists-can-easily-explain-p-values/

P-hacking (fishing for favourable p-values) and **HARKing** (formulating the research **H**ypothesis **A**fter the **R**esults are **K**nown);

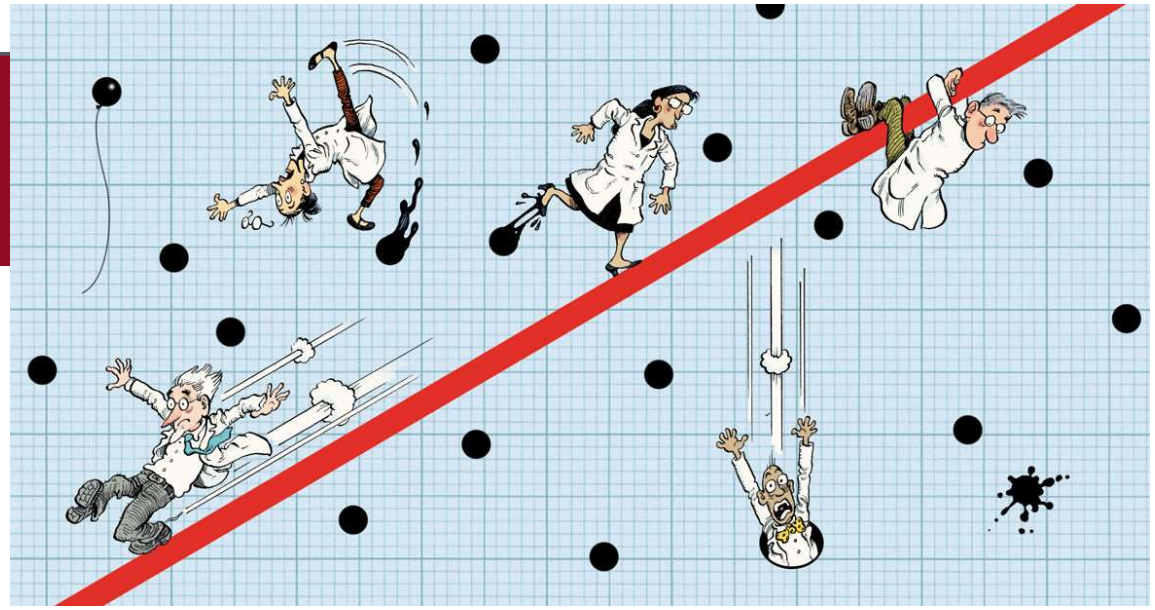
Desire to achieve a sought for – or simply publishable – result leads to fiddling with the data points, the modelling assumptions, or the research hypotheses themselves

Leamer, E. E. Tantalus on the Road to Asymptopia. J. Econ. Perspect. 24, 31–46 (2010).

Kerr, N. L. HARKing: Hypothesizing After the Results are Known. Personal. Soc. Psychol. Rev. 2, 196–217 (1998).



nature
International journal of science



COMMENT · 28 NOVEMBER 2017

Five ways to fix statistics

As debate rumbles on about how and how much poor statistics is to blame for poor reproducibility, Nature asked influential statisticians to recommend one change to improve science. The common theme? The problem is not our maths, but ourselves.

Jeff Leek ✉, Blakeley B. McShane, Andrew Gelman ✉, David Colquhoun ✉, Michèle B. Nuijten ✉ & Steven N. Goodman ✉

CORRESPONDENCE · 16 JANUARY 2018

Fixing statistics is more than a technical issue

Andrea Saltelli ✉ & Philip Stark

https://www.nature.com/articles/d41586-018-00647-9

CORRESPONDENCE · 16 JANUARY 2018

Integrity must underpin quality of statistics

Jerome Ravetz ✉

https://www.nature.com/articles/d41586-018-00648-8

The statistical garden of the forking paths (check Andrew Gelman's blog at http://andrewgelman.com/

Jorge Luis Borges

Andrew Gelman

http://www.stat.columbia.edu/~gelman/research/unpublished/p_hacking.pdf

What happens when experts are no longer trusted?

BULOS

Ni te fumigan ni quieren provocar sequía: vuelve la conspiración de los 'chemtrails'

- El bulo es tan popular que un eurodiputado español llegó a preguntar por él en el Parlamento Europeo

352

PABLO CANTÓ - 2 MAR 2018 - 17:23 CET

EL PAÍS verne

Italy rebuked for failure to prevent olive-tree tragedy

European Commission reveals widespread delays by the country's authorities to halt spread of deadly plant disease.

Alison Abbott

07 June 2017

Xylella fastidiosa

BULOS

Ni te fumigan ni quieren provocar sequía: vuelve la conspiración de los 'chemtrails'

- El bulo es tan popular que un eurodiputado español llegó a preguntar por él en el Parlamento Europeo

352

PABLO CANTÓ - 2 MAR 2018 - 17:23 CET

EL PAÍS verne

Old and new heroes, while history repeats itself (Love canal, Flint…)

Lois Gibbs

Marc Edwards

http://www.andreasaltelli.eu/file/repository/LOVE_CANAL.pdf
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

Fixing science?

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

https://www.wired.com/2017/01/john-arnold-waging-war-on-bad-science/

Different cultures, different reactions

Yoshiki Sasai 1962 – 2014

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

Different cultures, different reactions

Aaron Swartz, 1986 - 2013

https://www.rollingstone.com/culture/news/the-brilliant-life-and-tragic-death-of-aaron-swartz-20130215

Denial, diversion & displacement: a science war against trump, against post truth,

January 27, 2017

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

Andrea Saltelli, *University of Bergen* and Silvio Oscar Funtowicz, *University of Bergen*

Scientists must bear some responsibility for the post-truth era and the current crisis in democracy.

November 16, 2016

Science wars in the age of Donald Trump

Andrea Saltelli, *University of Bergen* and Silvio Oscar Funtowicz, *University of Bergen*

Is the election of Donald Trump going to reignite a futile war between science and anti-science?

… marches for science and persistent scientism.

May 12, 2017

Forcing consensus is bad for science and society

Andrea Saltelli, *University of Bergen*; Mario Giampietro, *Universitat Autònoma de Barcelona*, and Tiziano Gomiero, *Masaryk University*

Insisting that science has a monopoly on the truth invalidates dissent and undermines what should be an open dialogue between science and society.

March 8, 2017

A scientists' march on Washington is a bad idea – here's why

Andrea Saltelli, *University of Bergen*

Trump is not science's biggest problem.

What the present science war looks like:

Opinion: Is science really facing a reproducibility crisis, and do we need it to?

Daniele Fanelli

PNAS March 12, 2018. 201708272; published ahead of print March 12, 2018. https://doi.org/10.1073/pnas.1708272114

"The new "science is in crisis" narrative is not only empirically unsupported, but also quite obviously counterproductive. Instead of inspiring younger generations to do more and better science, it might foster in them cynicism and indifference. Instead of inviting greater respect for and investment in research, it risks discrediting the value of evidence and feeding antiscientific agendas."

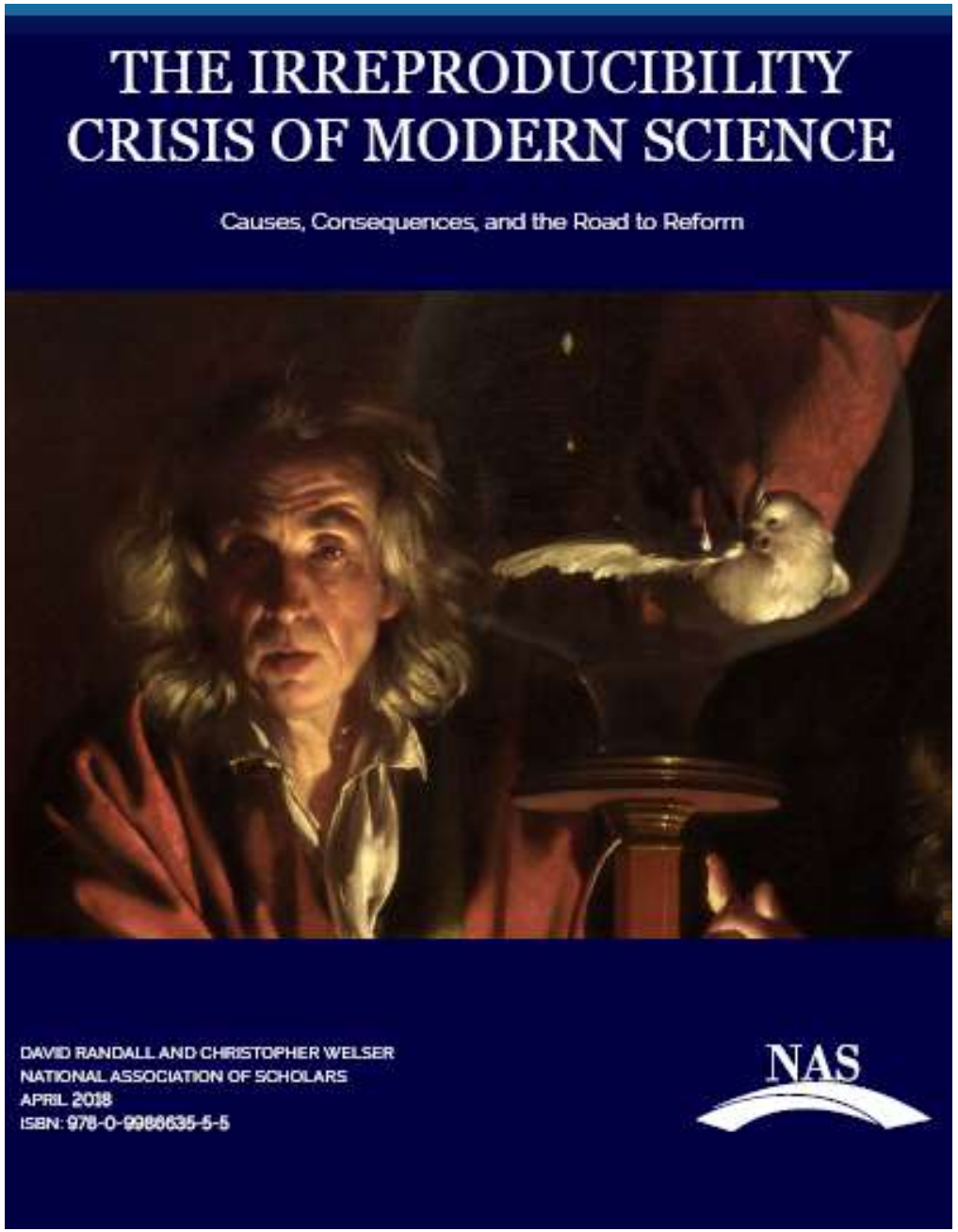
What the present science war looks like:

Crisis or self-correction: Rethinking media narratives about the well-being of science

Kathleen Hall Jamieson

PNAS March 13, 2018. 115 (11) 2620-2627; published ahead of print March 12, 2018. https://doi.org/10.1073/pnas.1708276114

"Because those whose work is prominently cited to certify that science is broken … are spearheading efforts to solve identified problems, their work is evidence of the resilience of science."



On the other side (1):

"31. Congress should pass an expanded Secret Science Reform Act to prevent government agencies from making regulations based on irreproducible research. ..."

National Association of Scholars

Date: 27/10/16 | Global Warming Policy Foundation

PEER REVIEW

Why skepticism is essential

Donna Laframboise

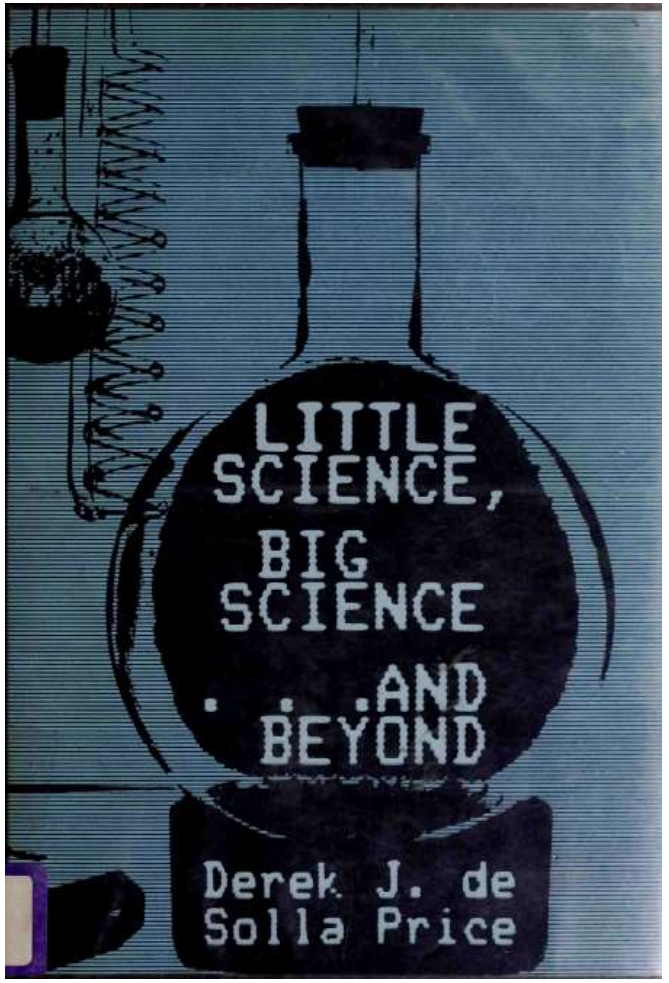
On the other side (2):

"If half of published, peer-reviewed papers 'may simply be untrue', half of the papers cited by the IPCC may also be untrue…."

Scholars who
saw it coming
...

and how they were
vindicated

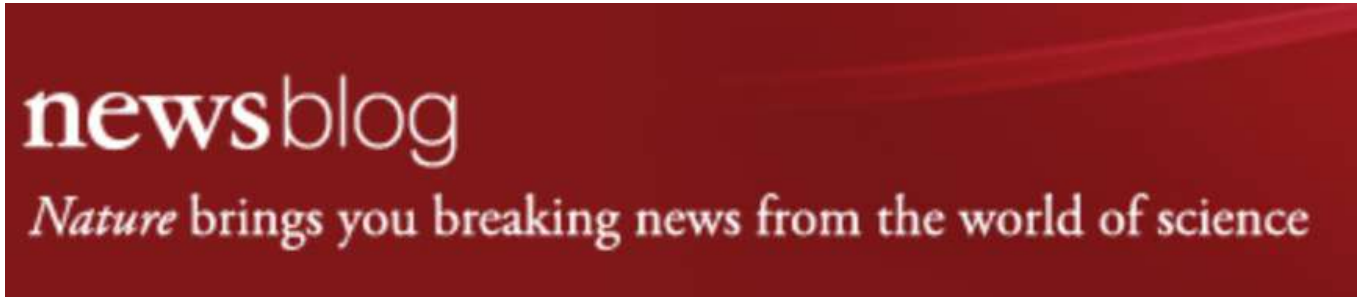
In 1963 Derek J. de Solla Price prophesized that Science would reach saturation (and in the worst case senility) under its own weight, victim of its own success and exponential growth (pp 1-32).



Derek J. de Solla Price

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

~1.5 million articles a year (2009) over ~30,000 journals



NEWS BLOG

Global scientific output doubles every nine years

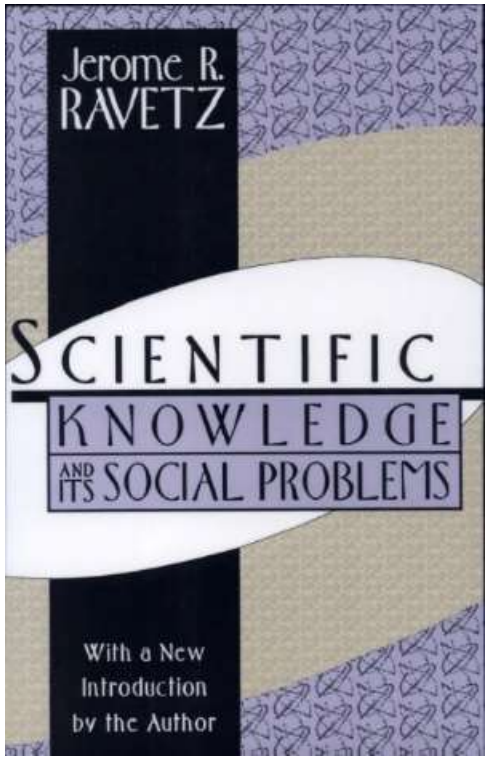
07 May 2014 | 16:46 GMT | Posted by Richard Van Noorden | Category: Policy, Publishing

https://www.researchgate.net/publication/229062236_Article_50_million_An_estimate_of_the_number_of_scholarly_articles_in_existence

http://blogs.nature.com/news/2014/05/global-scientific-output-doubles-every-nine-years.html

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."

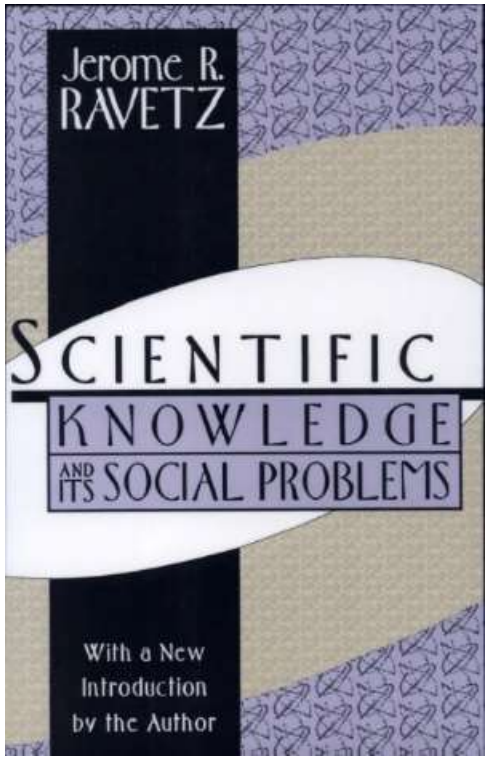
Ravetz, J., **1971**, Scientific Knowledge and its Social Problems, Oxford University Press.



Jerome R. Ravetz

“If [science] fails to resolve this problem […] then the immediate consequences for morale and recruitment will be serious; and those for the survival of science itself, grave”

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

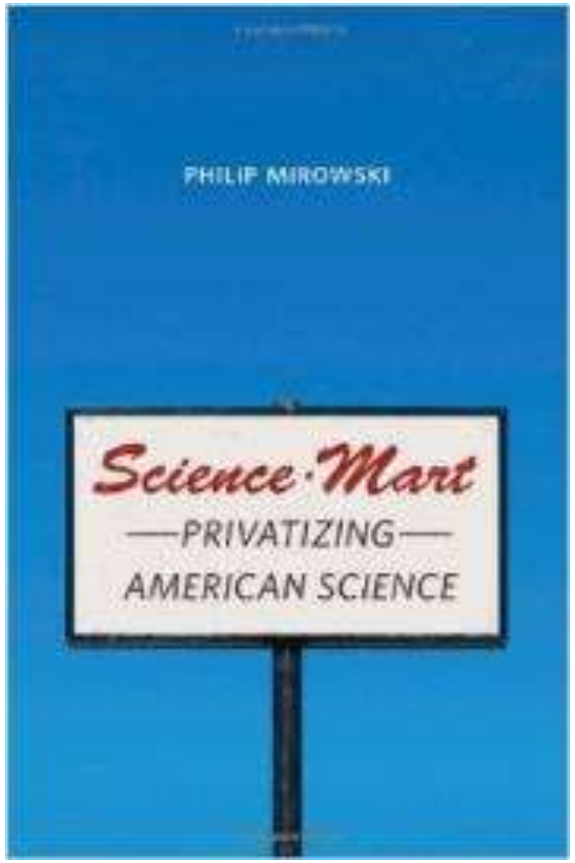


Jerome R. Ravetz

… neoliberal ideologies decreasing state funding of science, which becomes privatized … knowledge as a monetized commodity replaces knowledge as public good … collapse of quality

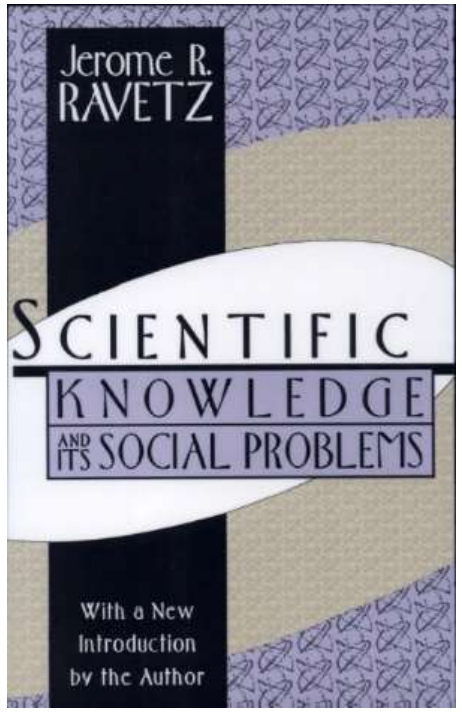
Philip Mirowski

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



p. 179. For it is possible for a field to be diseased […] reforming a diseased field is a task of great delicacy […] not even an apparatus of institutional structures, can do anything to maintain or restore the health of a field in the absence of an essential ethical element operating through the interpersonal channel of communication.

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



Jerome R. Ravetz

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Research

Cite this article: Smaldino PE, McElreath R. 2016 The natural selection of bad science. *R. Soc. open sci.* **3**: 160384.
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Accepted: 17 August 2016

The natural selection of bad science

Paul E. Smaldino[1] and Richard McElreath[2]

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[2]Department of Human Behavior, Ecology, and Culture, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

PES, 0000-0002-7133-5620; RME, 0000-0002-0387-5377

Poor research design and data analysis encourage false-positive findings. Such poor methods persist despite perennial calls for improvement, suggesting that they result from something more than just misunderstanding. The persistence of poor methods results partly from incentives that favour them, leading to the natural selection of bad science. This dynamic requires no conscious strategizing—no deliberate cheating nor loafing—by scientists, only that publication is a principal factor for

The persistence of poor methods results partly from incentives that favour them, leading to the natural selection of bad science. This dynamic requires no conscious strategizing—no deliberate cheating nor loafing—by scientists, only that publication is a principal factor for career advancement.

Smaldino PE, McElreath R., 2016 The natural selection of bad science. R. Soc. open sci. 3: 160384. http://dx.doi.org/10.1098/rsos.160384

As in the real world, successful labs produce more 'progeny,' such that their methods are more often copied and their students are more likely to start labs of their own. Selection for high output leads to poorer methods and increasingly high false discovery rates.

Improving the quality of research requires change at the institutional level.

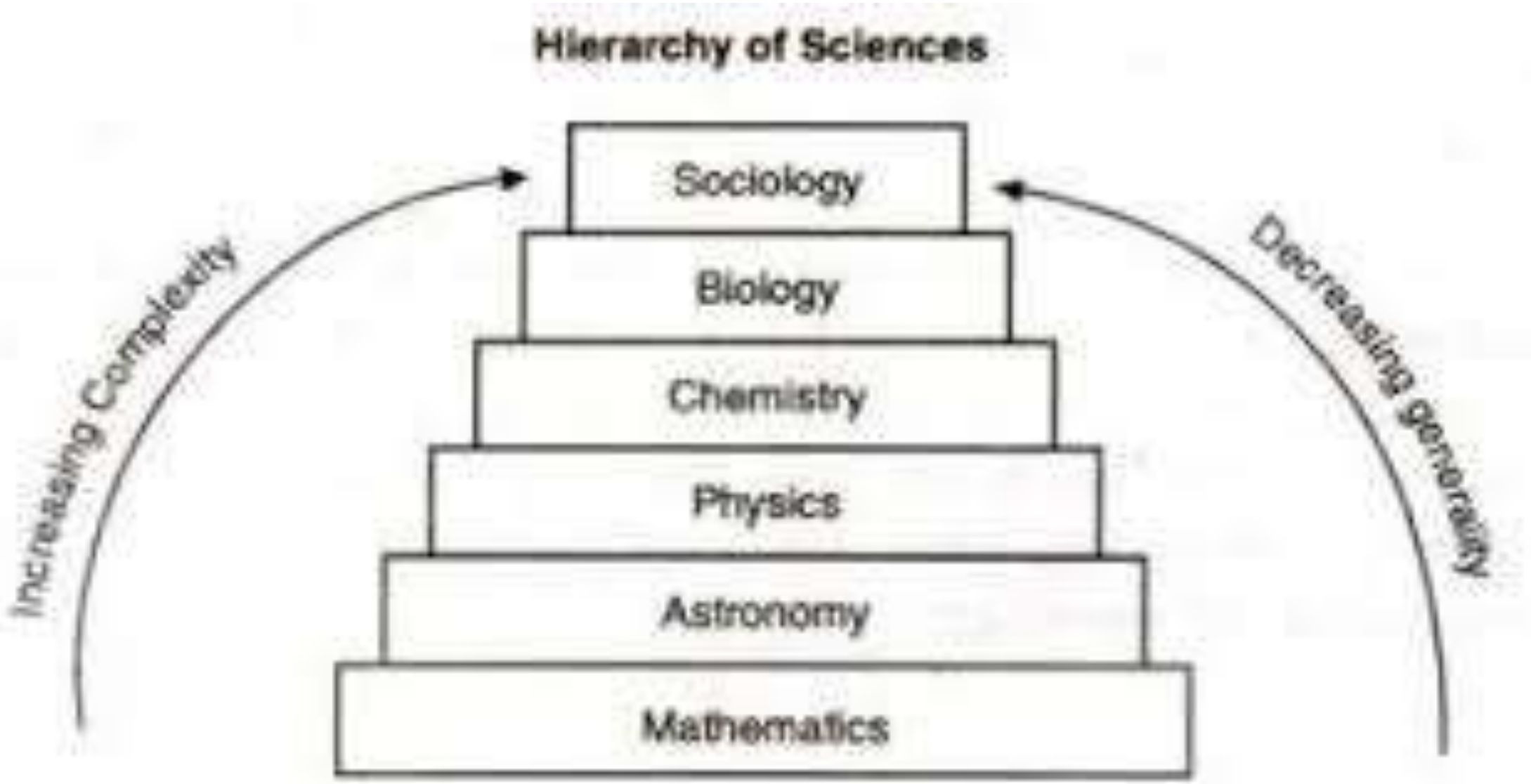
Smaldino PE, McElreath R., 2016 The natural selection of bad science. R. Soc. open sci. 3: 160384. http://dx.doi.org/10.1098/rsos.160384

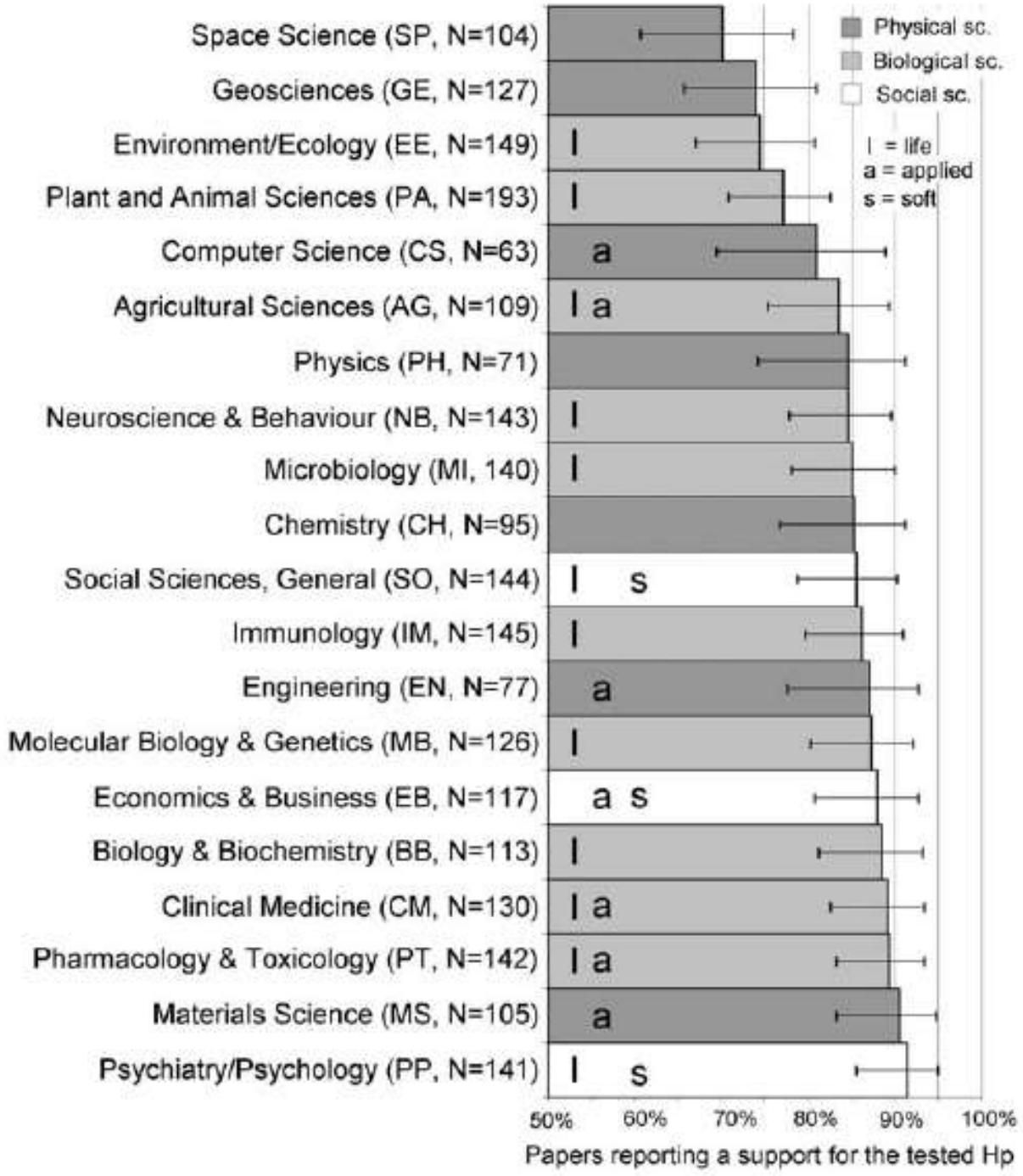
Discussion point of the discussion on the crisis:

In a quest for a solution what to believe: ‘Better incentives’ or ‘shared commitment’?

Are all disciplines the same?

August Comte (1798-1857)





OPEN ACCESS Freely available online
PLoS one

"Positive" Results Increase Down the Hierarchy of the Sciences

Daniele Fanelli*
NNOGEN and ISSTI-Institute for the Study of Science, Technology & Innovation, The University of Edinburgh, Edinburgh, United Kingdom

"odds of reporting a positive result ~5 times higher among papers in the disciplines of Psychology and Psychiatry and Economics and Business than Space Science"

April 7, 2010

Publish or perish, Metrics and peer review

San Francisco Declaration on Research Assessment (DORA),

The Leiden Manifesto

The Metric Tide

Initiatives calling for a step change in the culture of metrics use

http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/Independentresearch/2015/The,Metric,Tide/2015_metric_tide.pdf

Note: this is part of Research Excellence Framework (REF)

San Francisco declaration, (2012), as of today 13/02/2018 signed by 11,740 individuals, and 447 organizations

"Do not use journal-based metrics, such as Journal Impact Factor, as a surrogate measure of the quality of individual research articles to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions"

Declaration: http://ascb.org/dora/ , drafted by publishers, with separate recommendations for institutions, publishers, organizations that supply metrics and researchers.
Lancet, Editorial, 2015, Rewarding true inquiry and diligence in research, 385, p. 2121.
Wilsdon, J., 2015, We need a measured approach to metrics, Nature, 523, 129.
See also http://ethics-and-integrity.net/

How to Make More Published Research True (Ioannides 2014)

John P. A. Ioannides

"Modifications [] in the reward system for science, affecting the exchange rates for currencies (e.g., publications and grants) and purchased academic goods (e.g., promotion and other academic or administrative power) and introducing currencies that are better aligned with translatable and reproducible research"

Ioannidis, J. P. (2014). How to Make More Published Research True. PLoS medicine, 11(10), e1001747.

ROYAL SOCIETY OPEN SCIENCE

rsos.royalsocietypublishing.org

Opinion piece

Cite this article: Morey RD *et al*. 2016 The Peer Reviewers' Openness Initiative: incentivizing open research practices through peer review. *R. Soc. open sci*. **3**: 150547. http://dx.doi.org/10.1098/rsos.150547

Received: 10 October 2015
Accepted: 1 December 2015

The Peer Reviewers' Openness Initiative: incentivizing open research practices through peer review

Richard D. Morey[1], Christopher D. Chambers[1], Peter J. Etchells[2], Christine R. Harris[3], Rink Hoekstra[4], Daniël Lakens[5], Stephan Lewandowsky[6,7], Candice Coker Morey[8], Daniel P. Newman[9], Felix D. Schönbrodt[10], Wolf Vanpaemel[11], Eric-Jan Wagenmakers[12] and Rolf A. Zwaan[13]

How peer reviewers might hold the key to making science more transparent

A new initiative published this week outlines how scientists can make a change to open science practices at an individual level

The Peer Reviewers' Openness (PRO) Initiative is pledge: scientists who sign up to the initiative agree that, from January 1 2017, will not offer to comprehensively review, or recommend the publication of, any scientific research papers for which the data, materials and analysis code are not publicly available, or for which there is no clear reason as to why these things are not available.


How peer reviewers might hold the key to making science more transparent

A new initiative published this week outlines how scientists can make a change to open science practices at an individual level

Article

S|S|S

Social Studies of Science
2018, Vol. 48(2) 171–203

DOI: 10.1177/0306312718772086
journals.sagepub.com/home/sss

SAGE

The future(s) of open science

Philip Mirowski
John J. Reilly Center, University of Notre Dame, Notre Dame, IN, USA

Abstract

Almost everyone is enthusiastic that 'open science' is the wave of the future. Yet when one looks seriously at the flaws in modern science that the movement proposes to remedy, the prospect for improvement in at least four areas are unimpressive. This suggests that the agenda is effectively to re-engineer science along the lines of platform capitalism, under the misleading banner of opening up science to the masses.

…crises of modern science were brought about by neoliberal initiatives in the first place. First off, it was neoliberal think tanks that first stoked the fires of science distrust amongst the populace that have led to the current predicament [tobacco, climate]

It was neoliberals who provided the justification for the strengthening of intellectual property;

it was neoliberals who drove a wedge between state funding of research and state provision of findings of universities for the public good;

it was neoliberal administrators who began to fragment the university into ‘cash cows’ and loss leader disciplines;

it was neoliberal corporate officers who sought to wrest clinical trials away from academic health centers and towards contract research organizations to better control the disclosure or nondisclosure of the data generated.

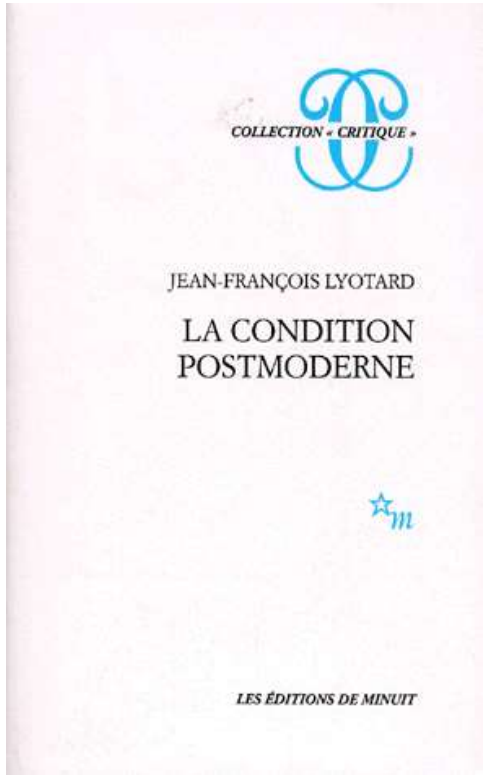
Discussion points of the discussion on publishing, peer reviewing, metrics:

Would you subscribe to pledges such as e.g. not to review certain papers or not to publish in certain journals?

Contradictions between integrity and publish or perish?

The last word to the post moderns

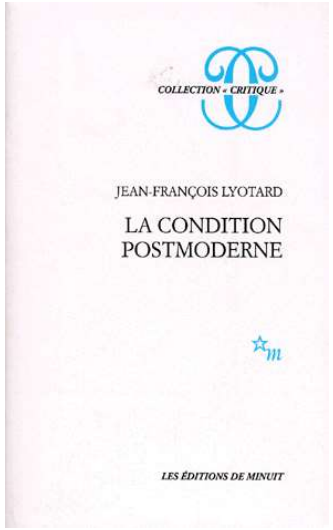
“The question of the legitimacy of science has been indissociably linked to that of the legitimation of the legislator since the time of Plato.



Jean-François Lyotard

Lyotard, J.-F. 1979. La Condition postmoderne. Rapport sur le savoir, Paris : Minuit.

From this point of view, the right to decide what is true is not independent of the right to decide what is just,[…]
there is a strict interlinkage between the kind of language called science and the kind called ethics and politics …”

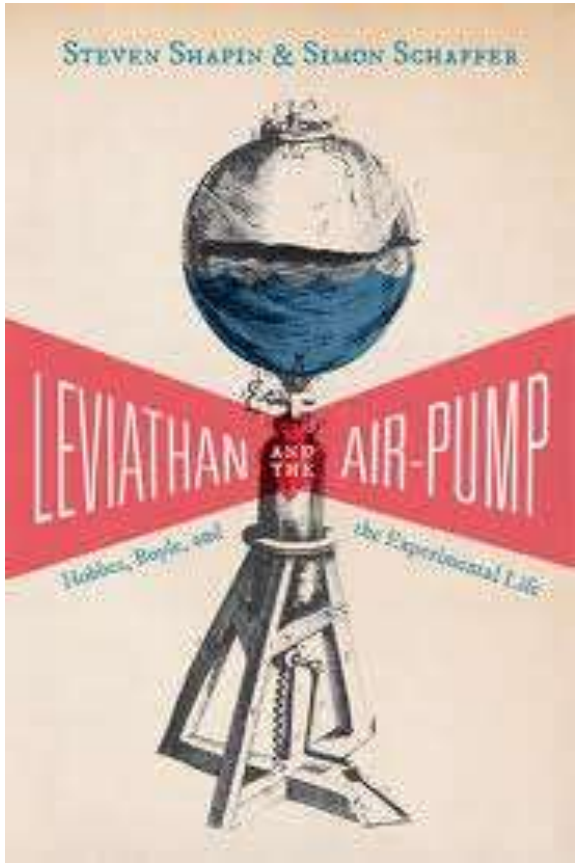


Jean-François Lyotard

Lyotard, J.-F. 1979. La Condition postmoderne. Rapport sur le savoir, Paris : Minuit.

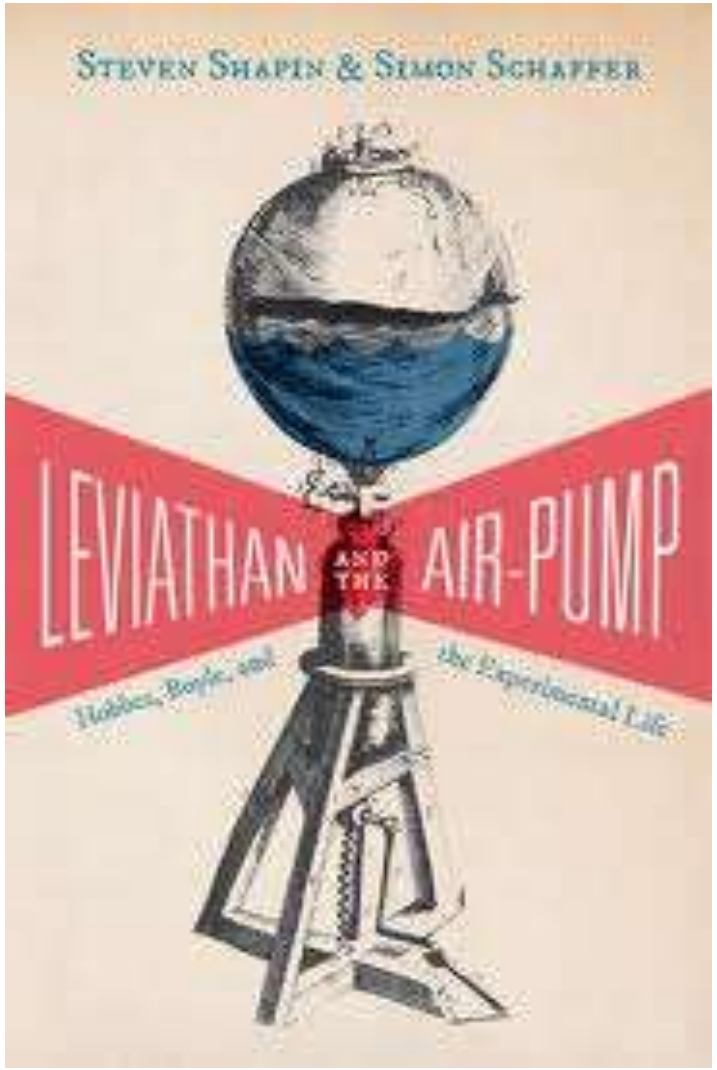
“Solutions to the problem of knowledge are solutions to the problem of social order.

[…] Trust in Science and trust in the prevailing social order are linked.”



Shapin, S., Schaffer, S., 1985, Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life, Princeton, 2011 Edition

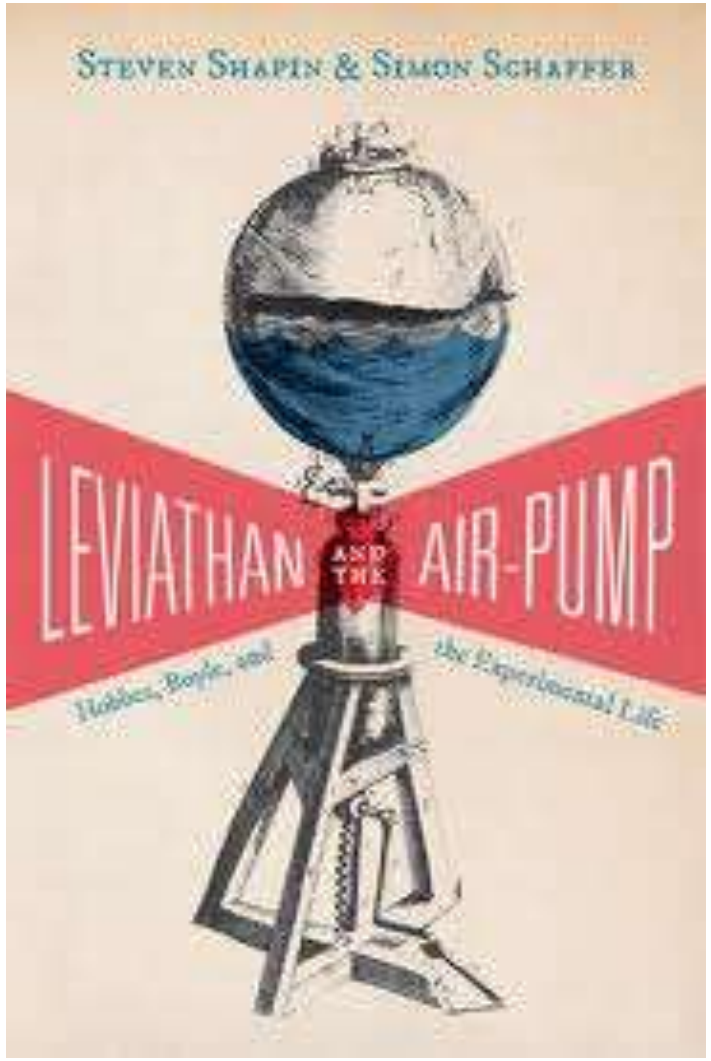
Establishing ‘matter of facts’ under controlled ‘laboratory’ experiments before witnesses as a way to subtract the discourse about knowledge from religious squabbles …



Shapin, S., Schaffer, S., 1985, Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life, Princeton, 2011 Edition

Shapin and Schaffer's book inspired Bruno Latour's 'Nous n'avons jamais été modernes', 1991, and was 'hot' during the 'science wars'.

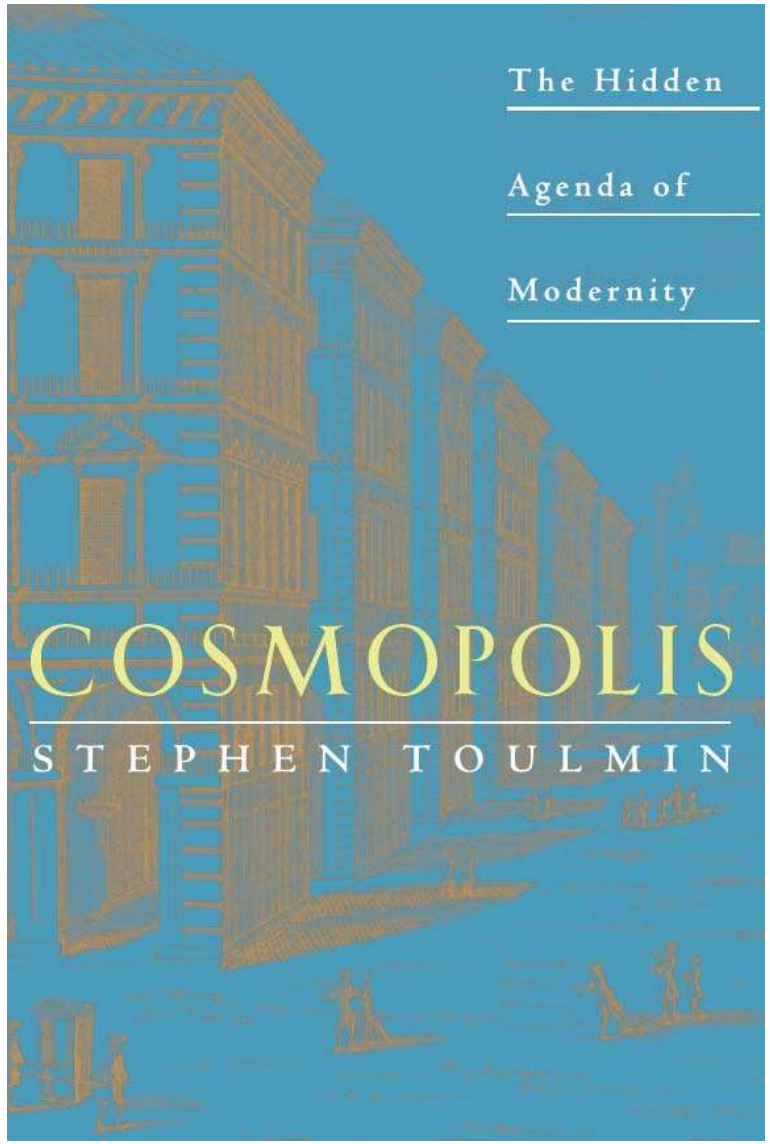
Bruno Latour



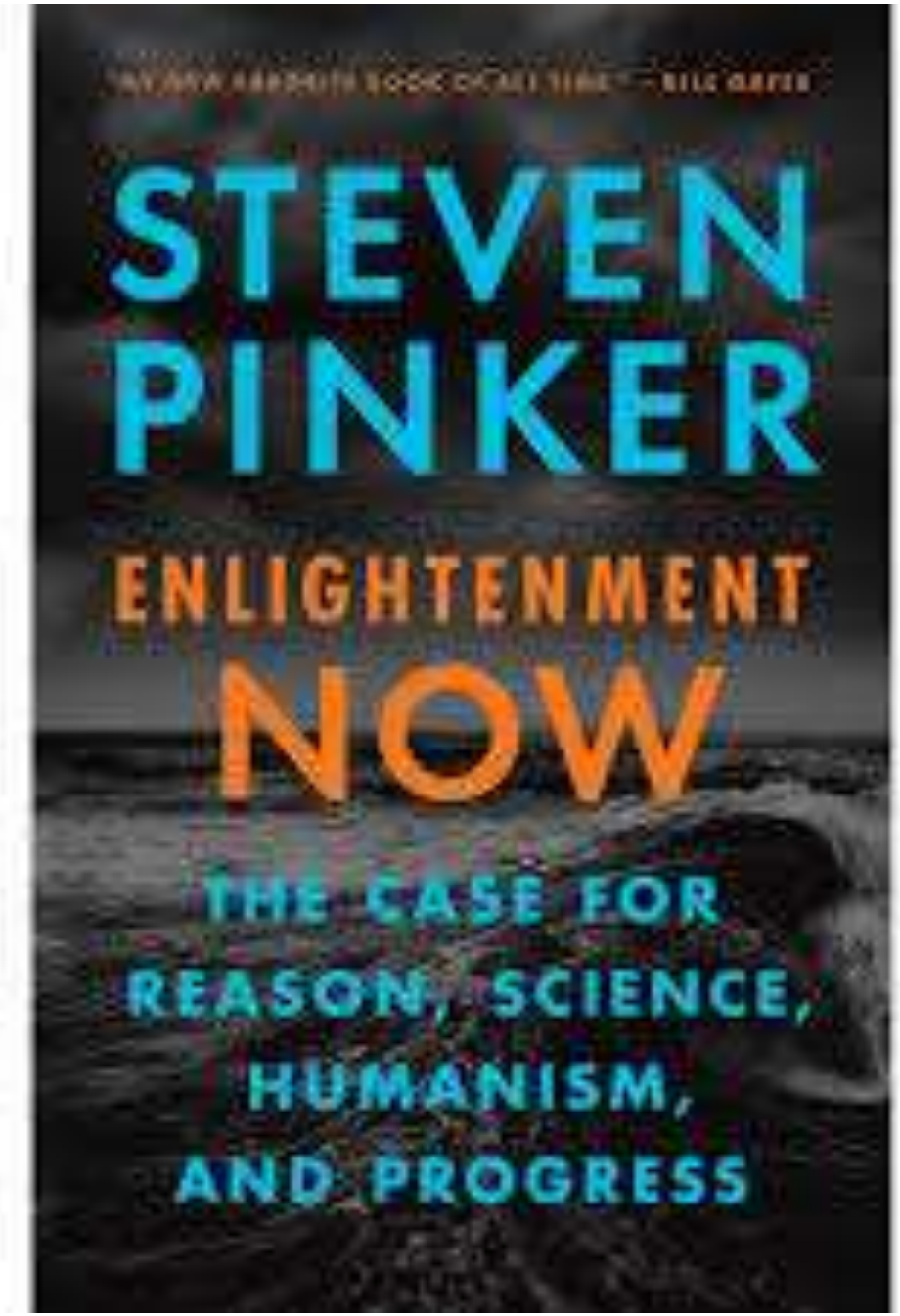
Latour, B., 1991, Nous n'avons jamais été modernes, Editions La découverte, 1993; We Have Never Been Modern. Cambridge, Harvard UP.

Stephen Toulmin: Modernity as a counter-Renaissance; Descartes versus Montaigne; the delusion of a Newtonian view of society

Stephen Toulmin



Stephen Toulmin, 1990, Cosmopolis: The Hidden Agenda of Modernity, The University of Chicago Press



"a monumental apologia for a currently fashionable version of Enlightenment thinking" (John Gray, New Stateman)

https://www.newstatesman.com/culture/books/2018/02/unenlightened-thinking-steven-pinker-s-embarrassing-new-book-feeble-sermon

See also Gunnar Skirbekk's idea of half-modern

More reading

Futures 91 (2017) 5–11

Contents lists available at ScienceDirect

Futures

journal homepage: www.elsevier.com/locate/futures

What is science's crisis really about?

Andrea Saltelli[a,b,*], Silvio Funtowicz[a]

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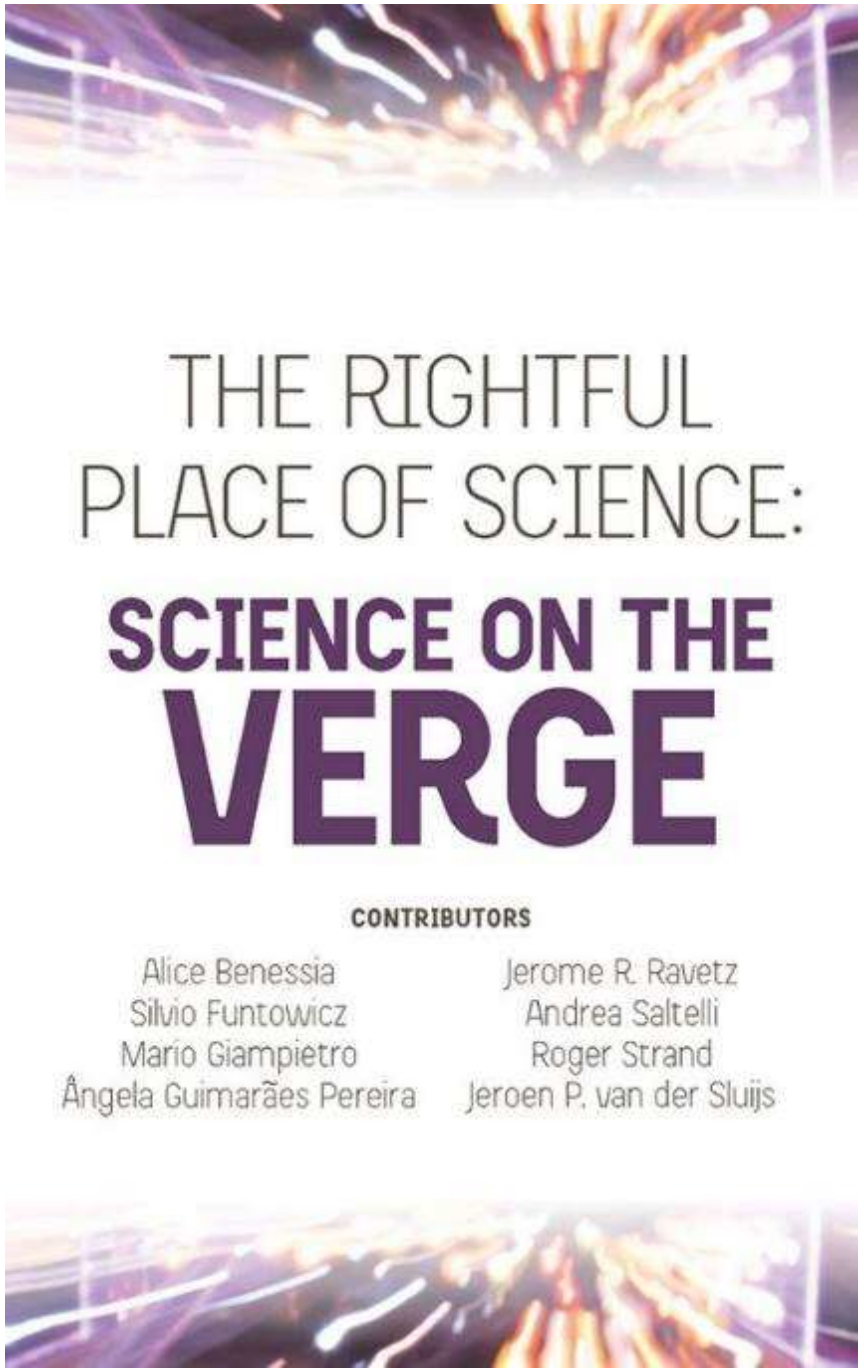
[b] Institute of Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona, Spain



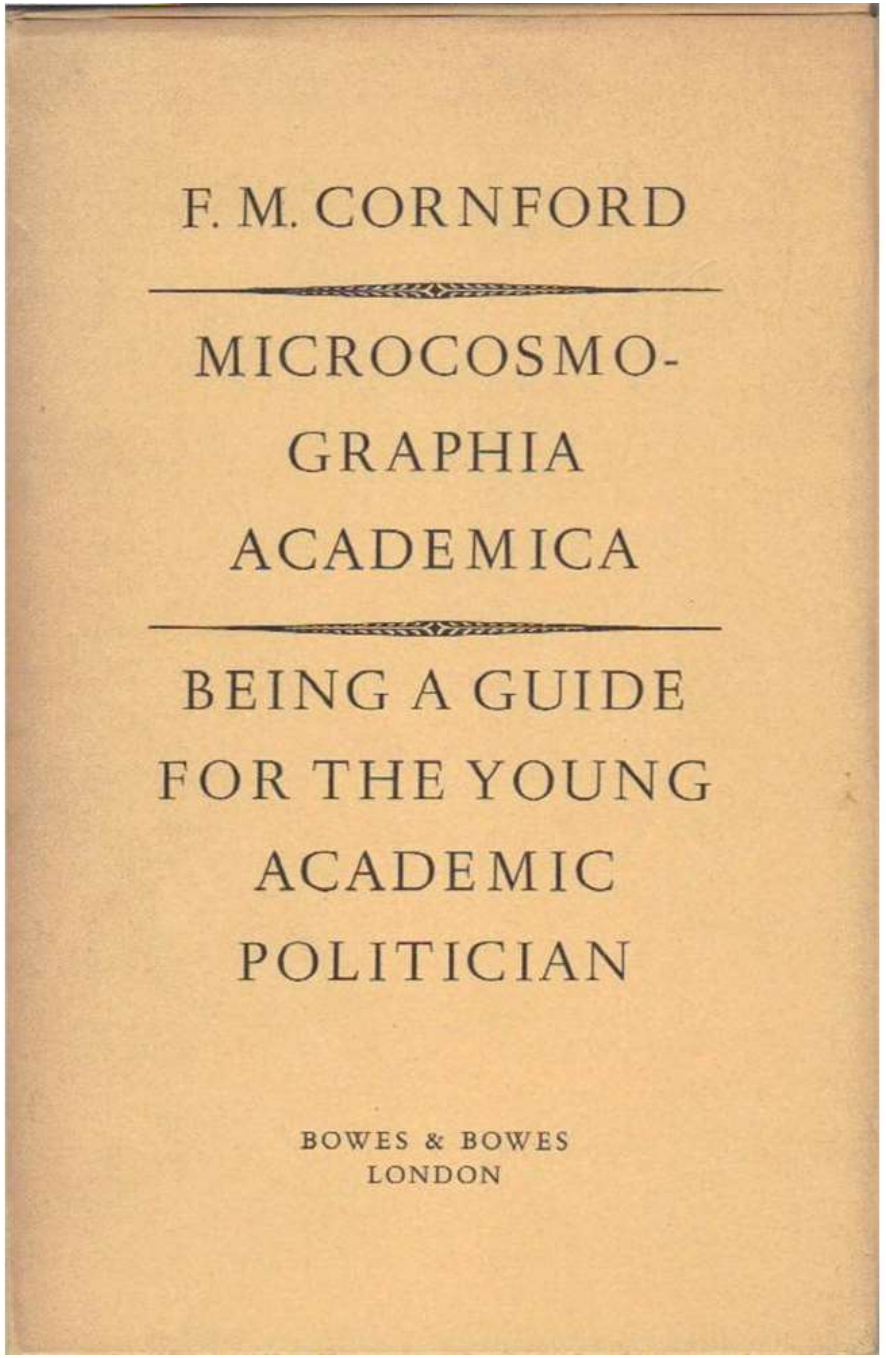
See a review by Deepanwita Dasgupta (2017) in International Studies in the Philosophy of Science, 31:1, 108-110.

December 2017

https://thewire.in/208014/replication-crisis-science/

END

A book written in 1909



How to Make More Published Research True (Ioannides 2014)

John P. A. Ioannides

"[…] adoption of large-scale collaborative research; replication culture; registration; sharing; reproducibility practices; better statistical methods; […] and improvement in study design standards, peer review, reporting and dissemination of research, and training of the scientific workforce"

Ioannidis, J. P. (2014). How to Make More Published Research True. PLoS medicine, 11(10), e1001747.