Ethics of quantification

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MNF990 19H / Theory of Science and Ethics, Bergen, Thormøhlens gate 51 (VilVite), Konferanserom CD, September 12, 2019

Where to find this talk: www.andreasaltelli.eu

Centre for the Study of the Sciences and the Humanities

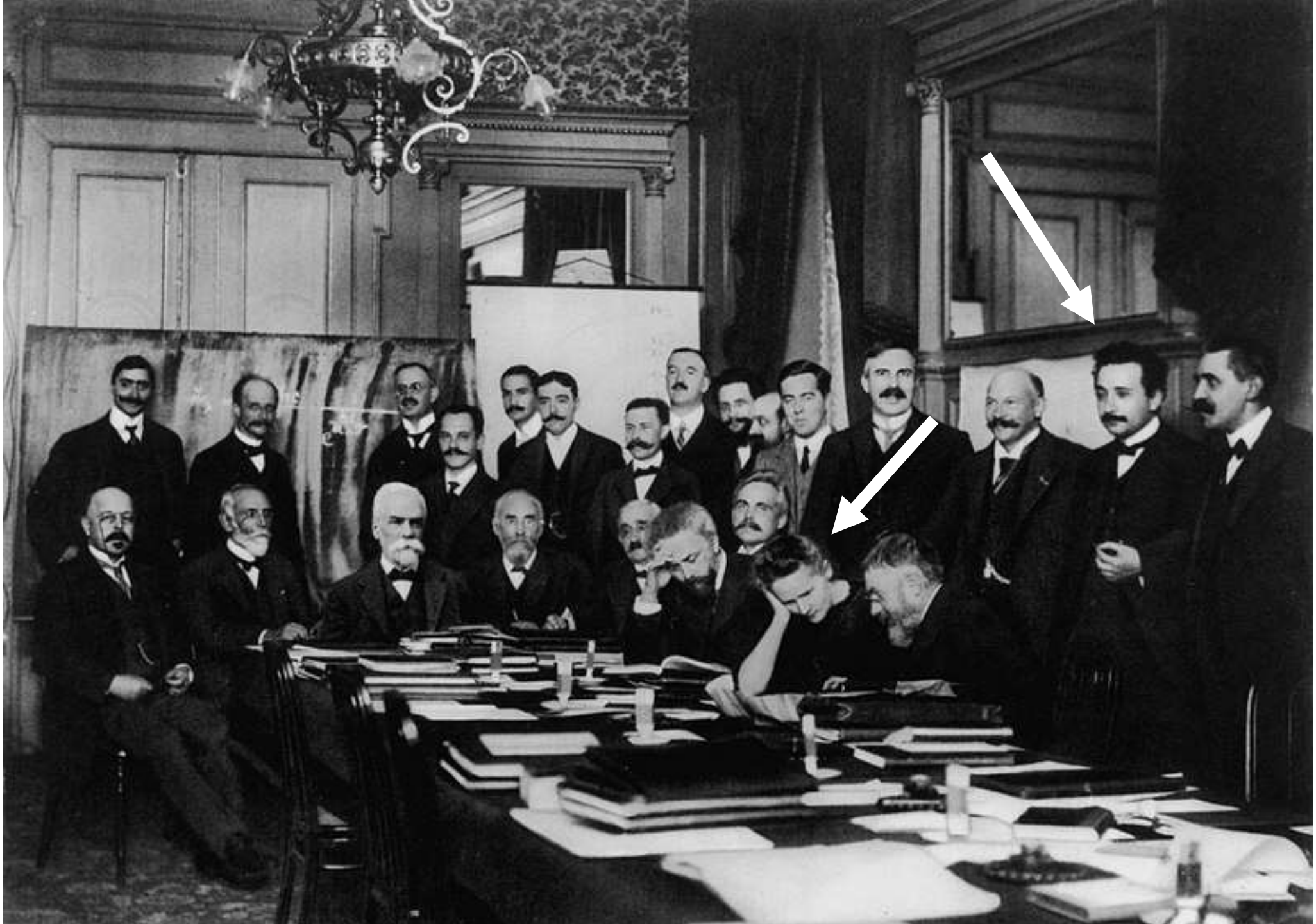
Photo: 123RF

Ethics of quantification

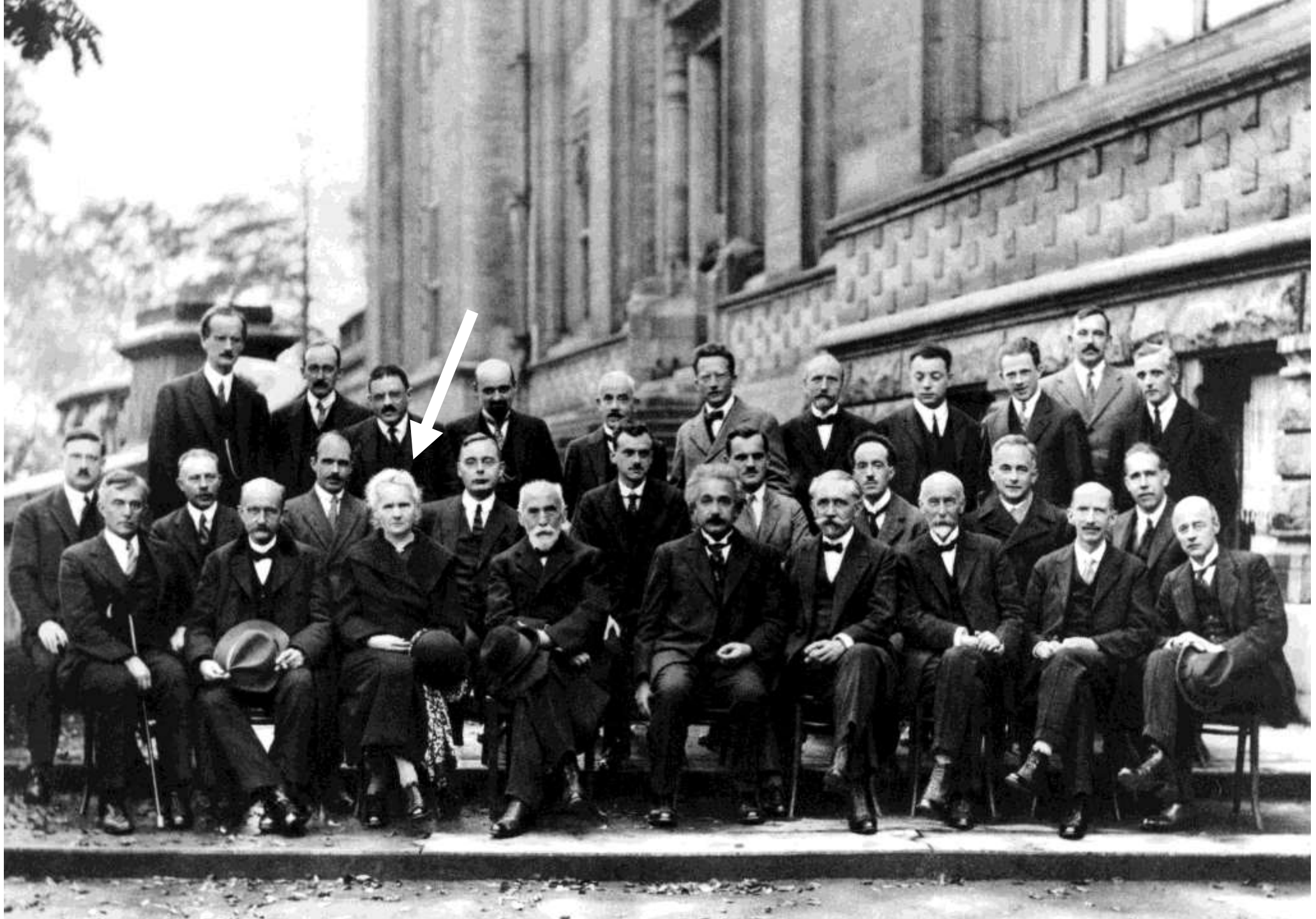
2019 Symposium of the UIB Senter for vitenskapsteori, December 5 and 6, Bergen, opening talk of Theodor Porter

So many men,
so few women

1911



1927



Lise Meitner

The first person to understand nuclear fission;

She did not win the Nobel prize 1944 for chemistry which went to her colleague Otto Hahn

Lise Meitner
1878- 1968

Rosalind Elsie Franklin

Her X-ray images led to the discovery of the DNA double helix structure;

Nobel in Medicine 1962 to J. Watson, F. Crick and M. Wilkins;

Franklin should have ideally been awarded a Nobel Prize in Chemistry (according to J. Watson)

Rosalind Elsie Franklin
1920-1958

Quantifications and the roots of the Cartesian dream

Francis Bacon
(1561-1626)
Magnalia Naturae, in the New Atlantis (1627), '*Wonders of nature, in particular with respect to human use*'

We call Cartesian dream the idea of man as master and possessor of nature, of prediction and control, of Bacon's wonders of science and of Condorcet's mathematique sociale…

René Descartes
(1596-1650)
Discourse on Method
(1637)

Nicolas de Caritat, marquis de Condorcet
(1743- 1794)
'Sketch for a Historical Picture of the Progress of the Human Spirit'

Francis Bacon
(1561–1626)

Magnalia Naturae, in the New Atlantis (1627),

'Wonders of nature, in particular with respect to human use'

The prolongation of life; The restitution of youth in some degree; The retardation of age; The curing of diseases counted incurable; The mitigation of pain; More easy and less loathsome purgings; The increasing of strength and activity; The increasing of ability to suffer torture or pain; The altering of complexions, and fatness and leanness; The altering of statures; The altering of features; The increasing and exalting of the intellectual parts; Versions of bodies into other bodies; Making of new species; Transplanting of one species into another; Instruments of destruction, as of war and poison; Exhilaration of the spirits, and putting them in good disposition; Force of the imagination, either upon another body, or upon the body itself; Acceleration of time in maturations; Acceleration of time in clarifications; Acceleration of putrefaction; Acceleration of decoction; Acceleration of germination; Making rich composts for the earth; Impressions of the air, and raising of tempests; Great alteration; as in induration, emollition, &c; Turning crude and watery substances into oily and unctuous substances; Drawing of new foods out of substances not now in use; Making new threads for apparel ; and new stuffs, such as paper, glass, &c; Natural divinations; Deceptions of the senses; Greater pleasures of the senses; Artificial minerals and cements.

Magnalia Naturae, in the New Atlantis (1627),

'Wonders of nature, in particular with respect to human use'

Francis Bacon (1561-1626)

The prolongation of life; The restitution of youth in some degree; The retardation of age; The curing of diseases counted incurable; The mitigation of pain;
[…]
Drawing of new foods out of substances not now in use; Making new threads for apparel; and new stuffs, such as paper, glass, etc.; Natural divinations; Deceptions of the senses; Greater pleasures of the senses; Artificial minerals and cements.

The study of letters leading to “doubts and errors”;

Comparing “disquisitions of the ancient moralists to very towering and magnificent palaces with no better foundation than sand and mud”;

Condemnation of humanities and exaltation of mathematics.

René Descartes (1596–1650)

Discourse on Method (1637)

“I perceived it to be possible to arrive at knowledge highly useful in life; and in room of the Speculative Philosophy […], to discover a Practical, by means of which, knowing the force and action of fire, water, air, the stars, the heavens, and all the other bodies that surround us, […]we might also apply them […], and thus render ourselves the lords and possessors of nature.”

http://www.bartleby.com/34/1/6.html

René Descartes (1596-1650)

Discourse on Method (1637)

In the formulation of Condorcet: “All the errors in politics and in morals are founded upon philosophical mistakes, which, themselves, are connected with physical errors” (Ninth Epoch)

Nicolas de Caritat, marquis de Condorcet
(1743- 1794)

‘Sketch for a Historical Picture of the Progress of the Human Spirit’

http://oll.libertyfund.org/titles/1669

Overpopulation? War due to scarcity of resources? Will not happen because technical progress and ethical progress will go hand in hand. Man will understand that his duty “will consist not in the question of giving existence to a greater number of beings, but happiness.” (Tenth Epoch)

Nicolas de Caritat, marquis de Condorcet
(1743- 1794)
‘Sketch for a Historical Picture of the Progress of the Human Spirit’

http://oll.libertyfund.org/titles/1669

‘Mathématique sociale’: We still use today terms such as ‘Condorcet method’, ‘Condorcet winner’, ‘Condorcet-ranking procedure’

Nicolas de Caritat,
marquis de Condorcet
(1743- 1794)

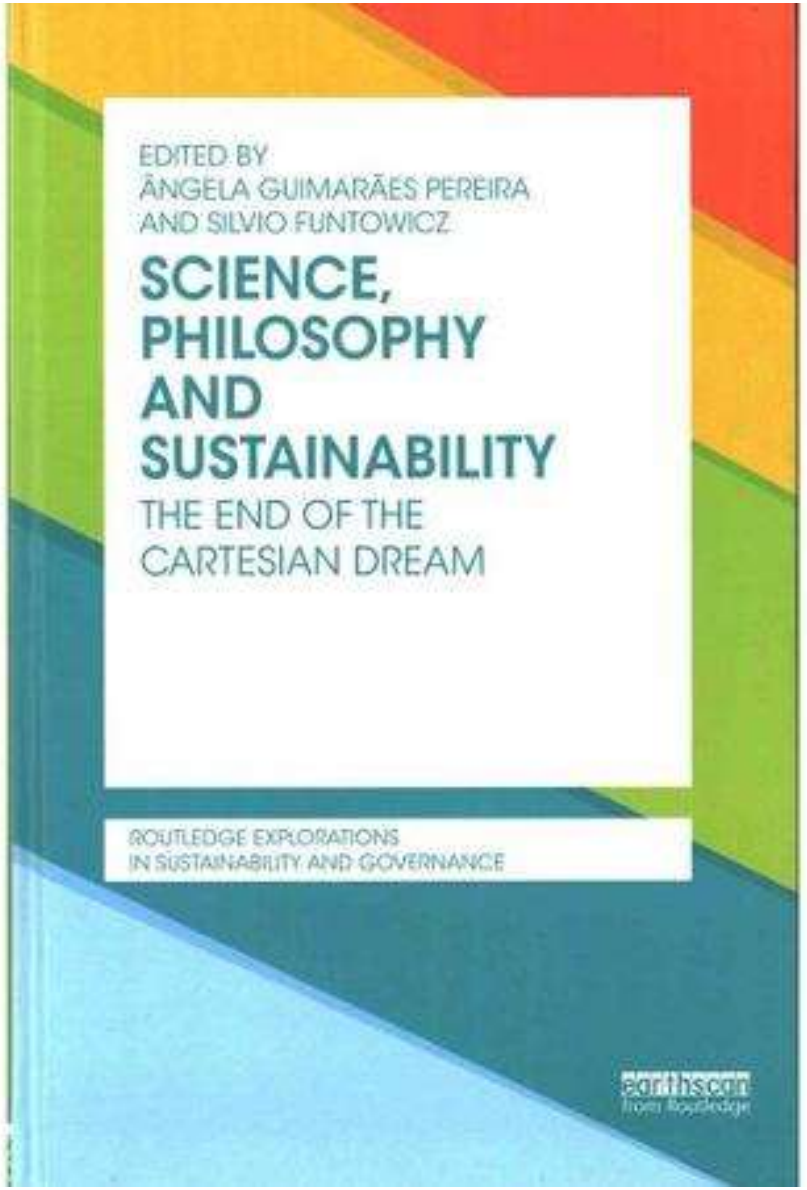
‘

Feldman, J., 2005, Condorcet et la mathematique sociale: enthousiasmes et bemols, Mathematics and Social Sciences, 172(4), 7-41, http://www.ehess.fr/revue-msh/pdf/N172R955.pdf

Munda G. (2007) - Social multi-criteria evaluation, Springer-Verlag, Heidelberg, New York, Economics Series

Condorcet's algorithms and Descartes' Geometry: the dream always had a quantification agenda

Some reading on the Cartesian Dream



Ravetz, J., R., 2015, Descartes and the rediscovery of ignorance, in Guimarães Pereira, Â., and Funtowicz, S., Eds., 2015, The end of the Cartesian dream, Routledge.

Closer to our times the dream was couched in the ‘Endless Frontier’ metaphor by Vannevar Bush, 1945:

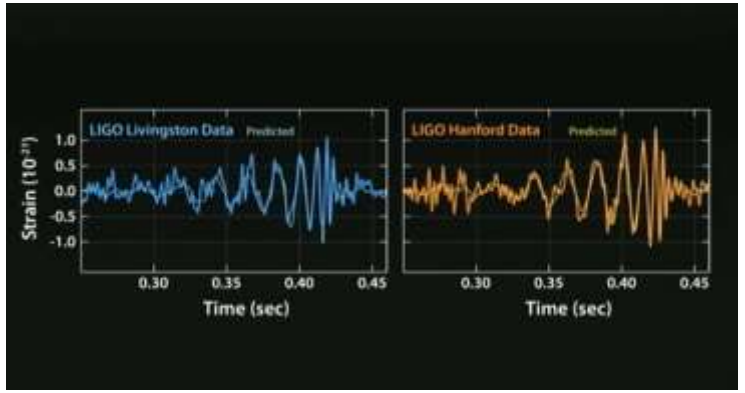
Vannevar Bush
(1890–1974)

“One of our hopes is that after the war there will be full employment. […] To create more jobs we must make new and better and cheaper products […] founded on […] basic scientific research. […the] Government […] opened the seas to clipper ships and furnished land for pioneers. Although these frontiers have more or less disappeared, the frontier of science remains.”

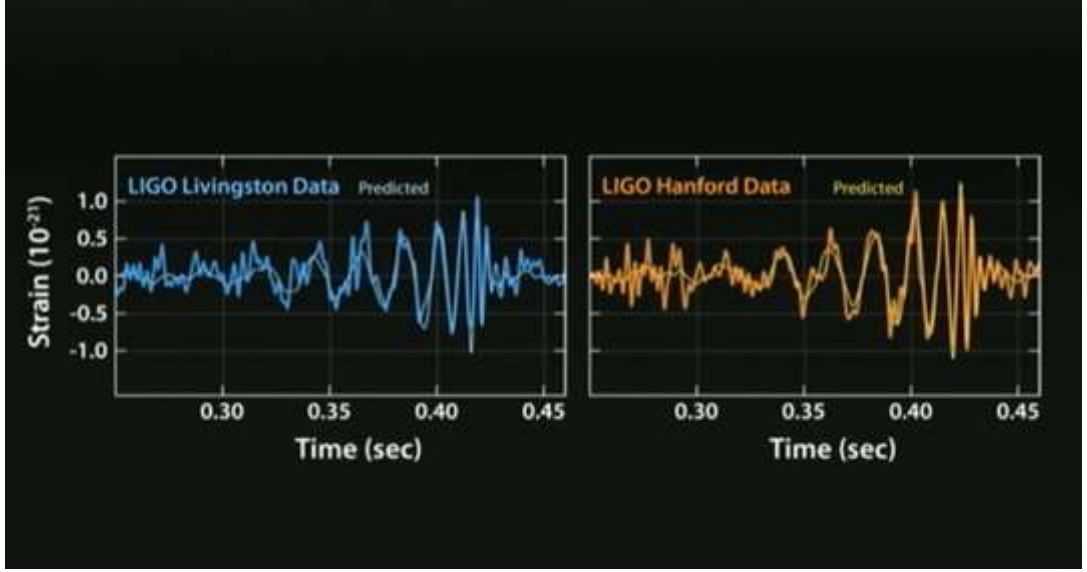
Bush, V. (1945) Science: the endless frontier, United States Office of Scientific Research and Development, U.S. Govt. print office.

The success of the Cartesian dream

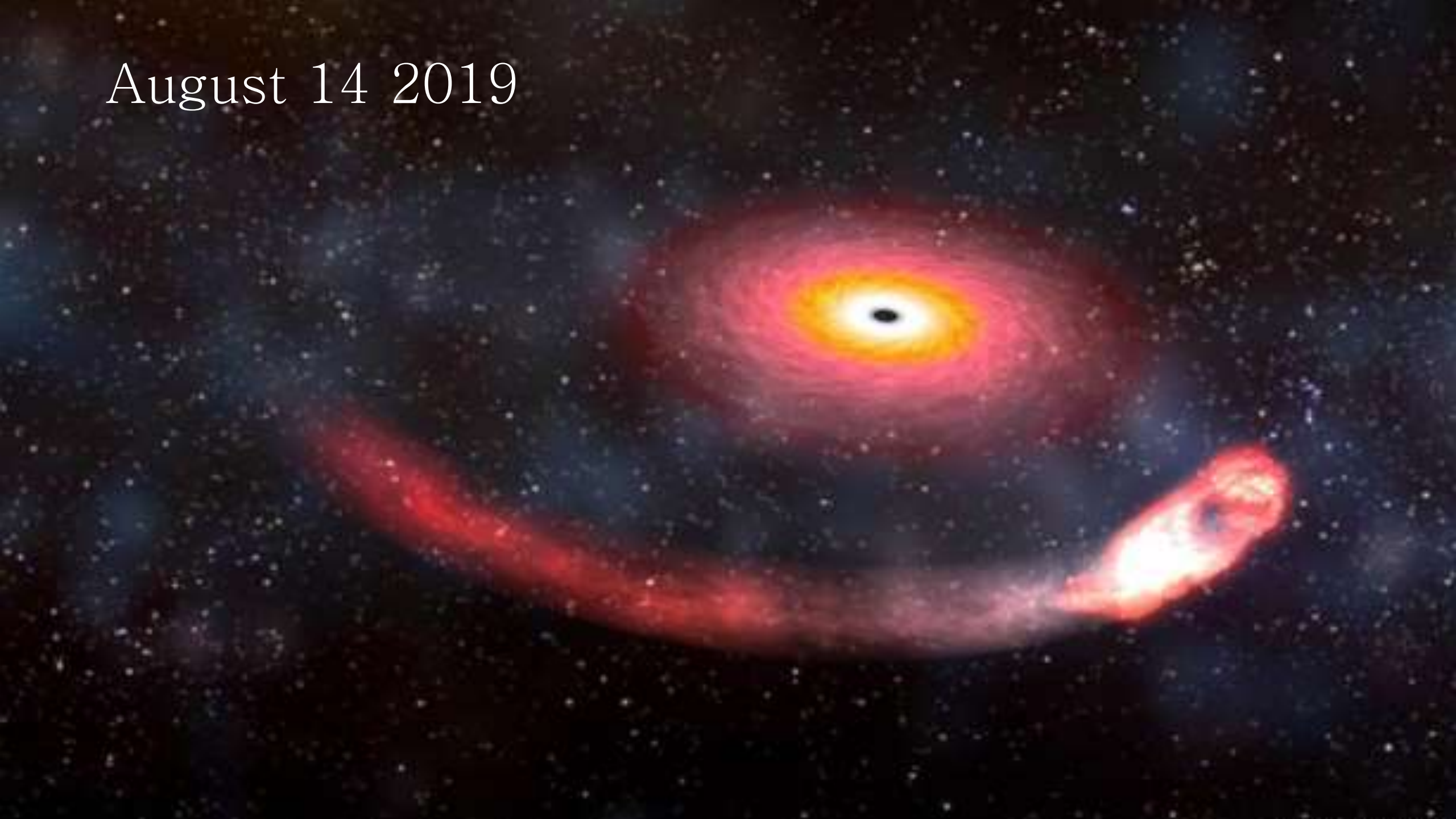
The keeping of the promise: Gravitational waves, from J. Weber's cylinder to LIGO



A Madman Dreams of Tuning Machines: The Story of Joseph Weber, the Tragic Hero of Science Who Followed Einstein's Vision and Pioneered the Sound of Space-Time, By Maria Popova, https://www.brainpickings.org/2016/04/25/black-hole-blues-janna-levin-joseph-weber/



https://www.brainpickings.org/2016/04/25/black-hole-blues-janna-levin-joseph-weber/

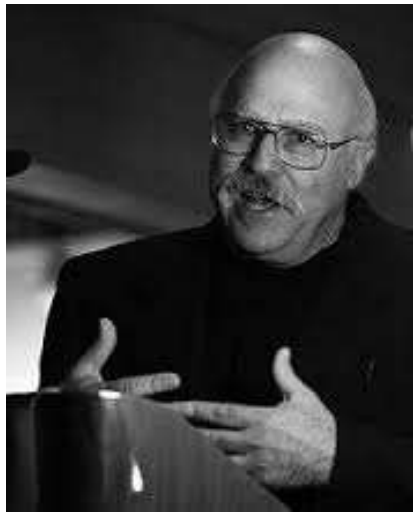

August 14 2019

If you are a natural scientists you were nourished and trained in the Cartesian dream, (S. Toulmin: 'The hidden agenda of modernity')

The dream was spectacularly successful, in all fields of endeavor, leading to what Steven Shapin calls 'invisible science'

Steven Shapin, 2016, Invisible Science, The Hedgehog Review: Vol. 18 No. 3 (Fall 2016).

Stephen Toulmin



Steven Shapin

Quantification today

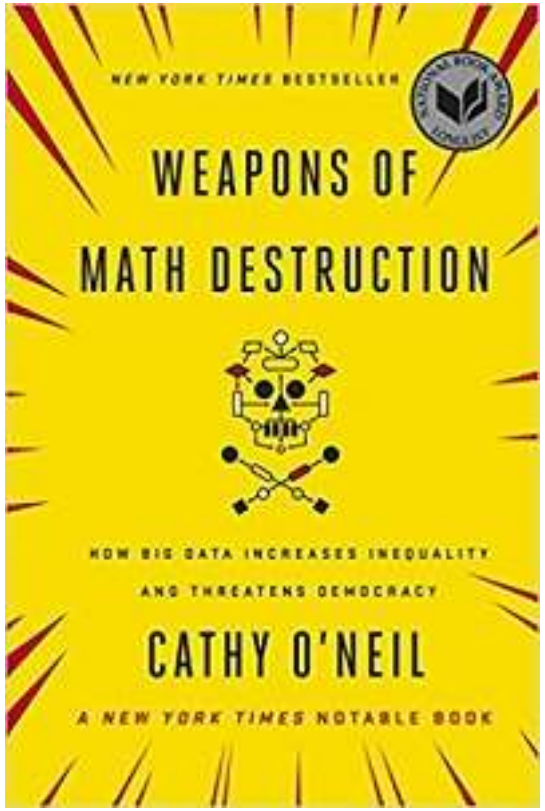
Blurring lines:

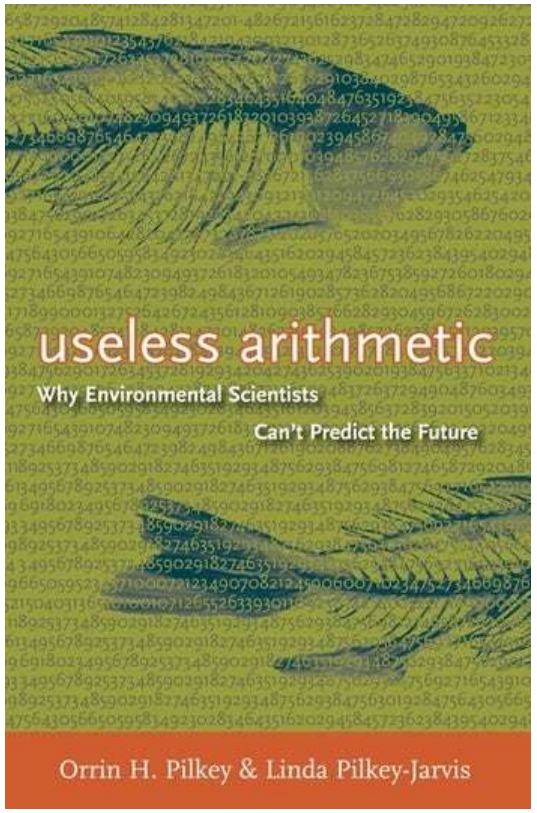
"what qualities are specific to rankings, or indicators, or models, or algorithms?"

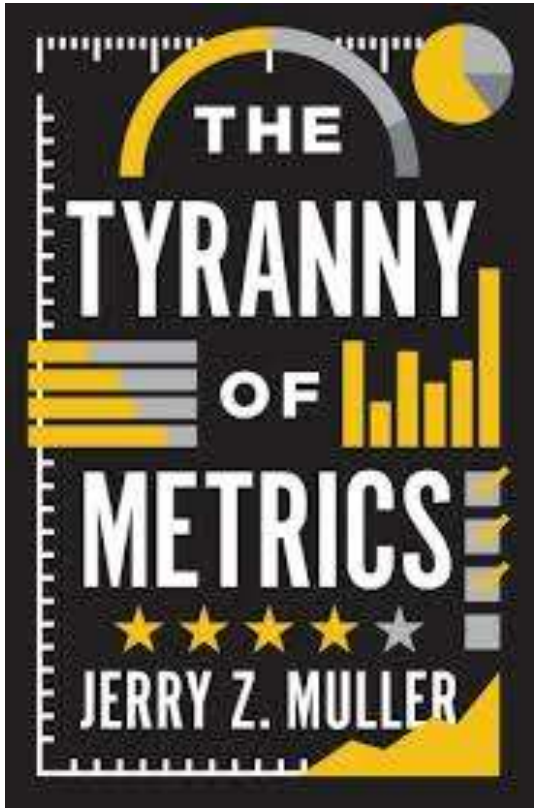
Elizabeth Popp Berman

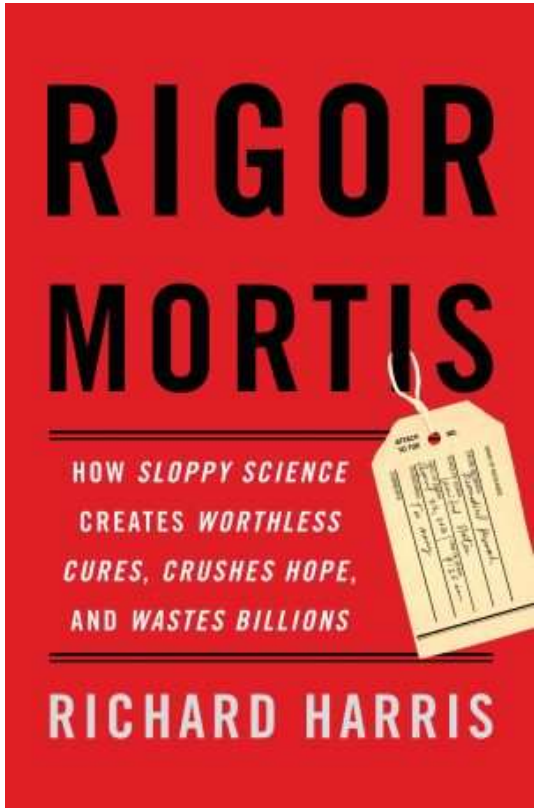
E. Popp Berman and D. Hirschman, The Sociology of Quantification: Where Are We Now?, Contemp. Sociol., vol. in press, 2017.

Algorithms, models, metrics, statistics





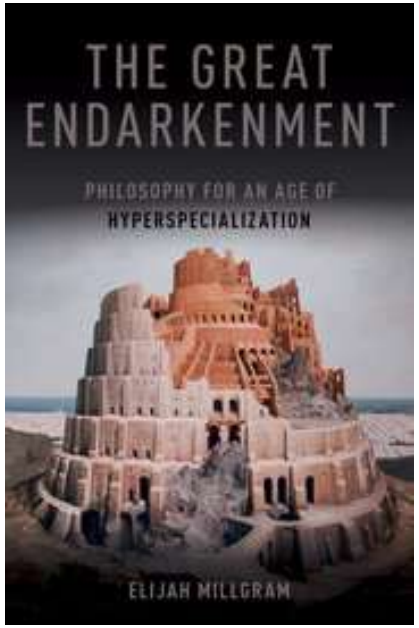




Common root causes?

Back to Elijah Millgram

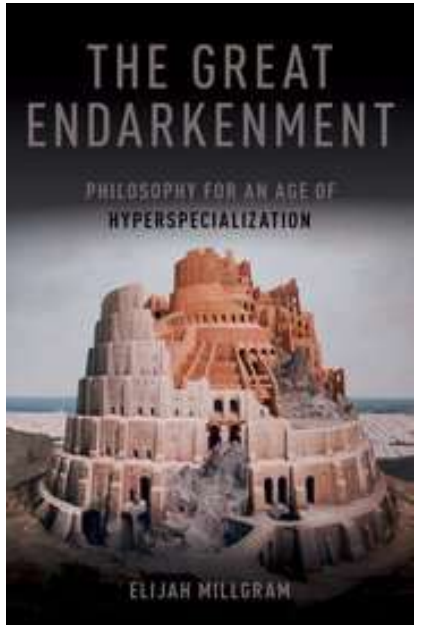
The Great Endarkenment.
Philosophy for an Age of Hyperspecialization
By Elijah Millgram



Describes a world in which all knowledge and products are the result of some form of extremely specialized expertise, and in which expertise is itself highly circumscribed, since experts depend in turn on other experts whose knowledge claims and styles of argumentation cannot be exported from one discipline to the next.

Back to Elijah Millgram

The Great Endarkenment.
Philosophy for an Age of Hyperspecialization
By Elijah Millgram



This is the world of “serial hyperspecializers” (p. 26), where the experts are “logical aliens” (p. 32)

One of the theses of Millgram is that Enlightenment's project of 'thinking for oneself' instead of deferring to authorities – produced a new class of experts (named scientists in the mid XIX century) – who become the hyper-specializers & undid the project of thinking for oneself

E. Millgram The Great Endarkenment, p. 29

Abandon the dream of a “procedural utopia”, a machinery to take the right decision based on a set of logical rules and methods

E. Millgram The Great Endarkenment, p. 23

This dream started with Condorcet's Mathématique sociale; Bentham's utilitarianism;

Today's 'decisionism' (G. Majone) – the idea that decisions can always systematically arrived at given a modicum of computation

E. Millgram The Great Endarkenment, p. 23

The critique of Andrew Stirling:

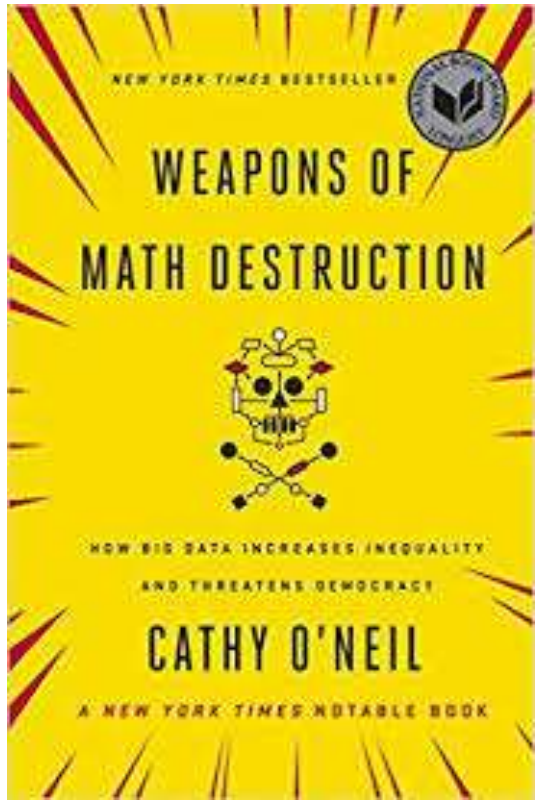
Andrew Stirling

"[…] rhetoric clamour [surrounds] 'expected utility', 'decision theory', 'life cycle assessment', 'ecosystem services' 'sound scientific decisions' and 'evidence-based policy'

[…] Each technique routinely delivers its answers with formidable levels of precision. Yet the resulting impression of accuracy is deeply misplaced"

Alarm for Weapons of Math Destruction

Cathy O’Neil

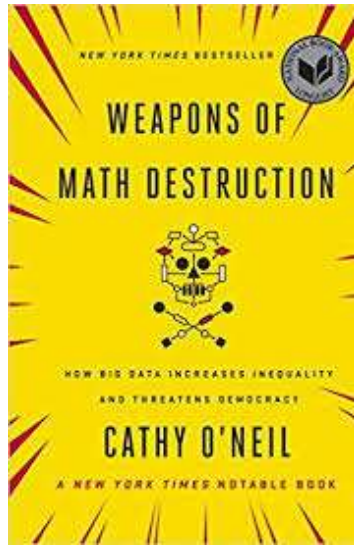


O’Neil, C. (2016). Weapons of math destruction : how big data increases inequality and threatens democracy. Random House Publishing Group.

Opacity (also because of trade secrecy) of algorithms used to decide on recruiting, carriers (including of researchers), prison sentencing, paroling, custody of minors, political campaigns…

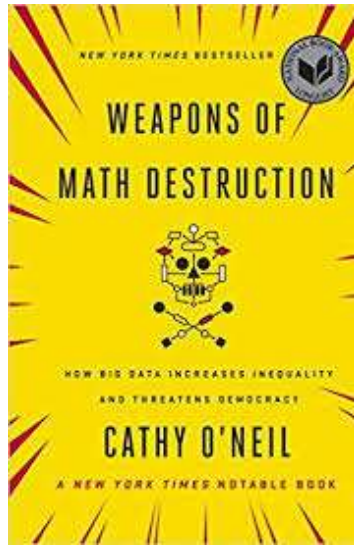
O'Neil, C. (2016). Weapons of math destruction : how big data increases inequality and threatens democracy. Random House Publishing Group.

Brauneis, R., & Goodman, E. P. (2018). Algorithmic Transparency for the Smart City. Yale Journal of Law & Technology, 20, 103–176. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3012499



Opacity coupled with opportunity for scale and damage and with non-appealability make them an instrument of oppression & inequality

Cathy O'Neil Google talk https://www.youtube.com/watch?v=TQHs8SA1qpk



From metrics fixation to the blues of statistics, from algorithmic Far West to dubious mathematical modelling, our relation with quantification needs attention

A. Saltelli, “Should statistics rescue mathematical modelling?,” arXiv, vol. arXiv:1712, no. 06457, 2018

‘Decisionism’ is mainstream

Cass Sunstein, winner of the 2018 Holberg Prize

“In a series of books (The Cost Benefit State, 2002, Risk and Reason, 2002, and The Laws of Fear, 2004), Sunstein shows the ways in which cost benefit analysis can discipline regulatory agencies”

https://www.holbergprisen.no/en/holberg-prize/prize-winners/cass-r-sunstein

Can technocracy be saved? An interview with Cass Sunstein.

Obama's regulation czar makes the case that "the issues that most divide us are fundamentally about facts rather than values."

By Dylan Matthews | @dylanmatt | dylan@vox.com | Oct 22, 2018, 9:00am EDT

https://www.vox.com/future-perfect/2018/10/22/18001014/cass-sunstein-cost-benefit-analysis-technocracy-liberalism

“Often, immersion in the facts often makes value disagreements feel much less relevant”
(C. Sunstein)

https://www.vox.com/future-perfect/2018/10/22/18001014/cass-sunstein-cost-benefit-analysis-technocracy-liberalism

The Sameness of Cass Sunstein

His books keep pushing the same technocratic fixes. But today's most pressing questions cannot be depoliticized.

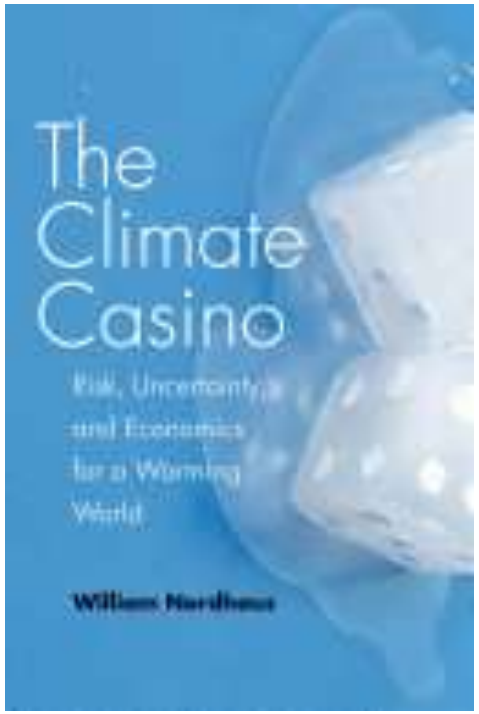
By **AARON TIMMS** | June 20, 2019

A critique of Sunstein's faith in 'nudge' and cost benefit analysis

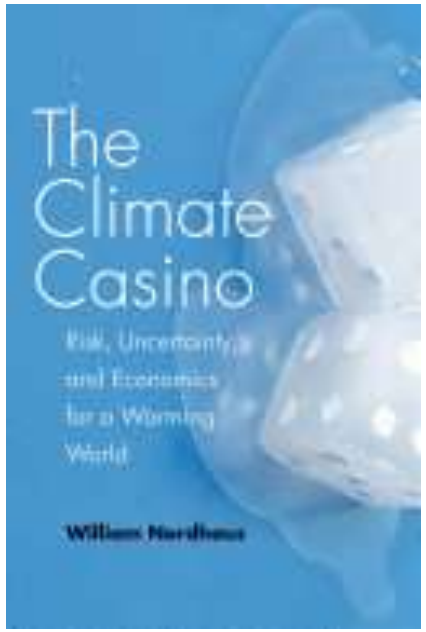
https://newrepublic.com/article/154236/sameness-cass-sunstein

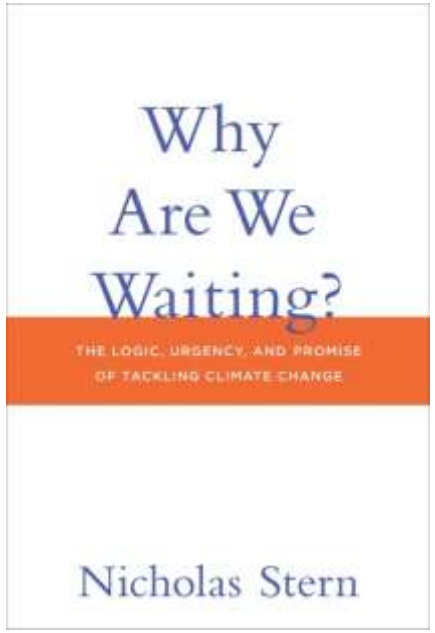
One of the winner of Nobel prize for economics 2018 is Willem Nordhaus, for his work on the economics of climate change.

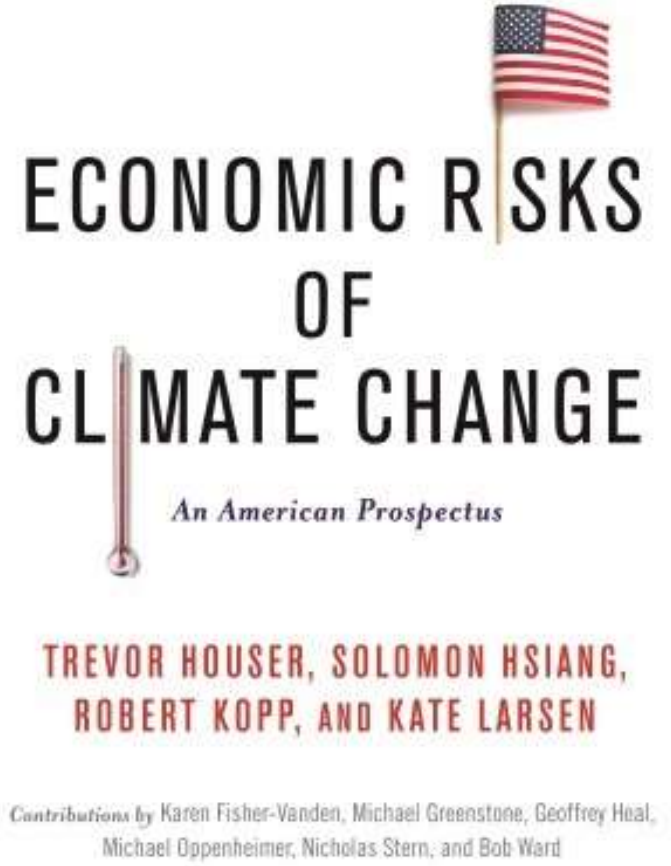
Cost benefit analysis to the year 2100?



Are these licit quantifications?







Saltelli, A., Stark, P.B., Becker, W., and Stano, P. , 2015, Climate Models as Economic Guides. Scientific Challenge or Quixotic Quest? Issues in Science and Technology (IST), Volume XXXI Issue 3, Spring 2015, https://issues.org/climate-models-as-economic-guides-scientific-challenge-or-quixotic-quest/

On modelling

nature COMMUNICATIONS

Comment | Open Access | Published: 27 August 2019

A short comment on statistical versus mathematical modelling

Andrea Saltelli

On the radar: October 2013

Futures
Volume 91, August 2017, Pages 5-11

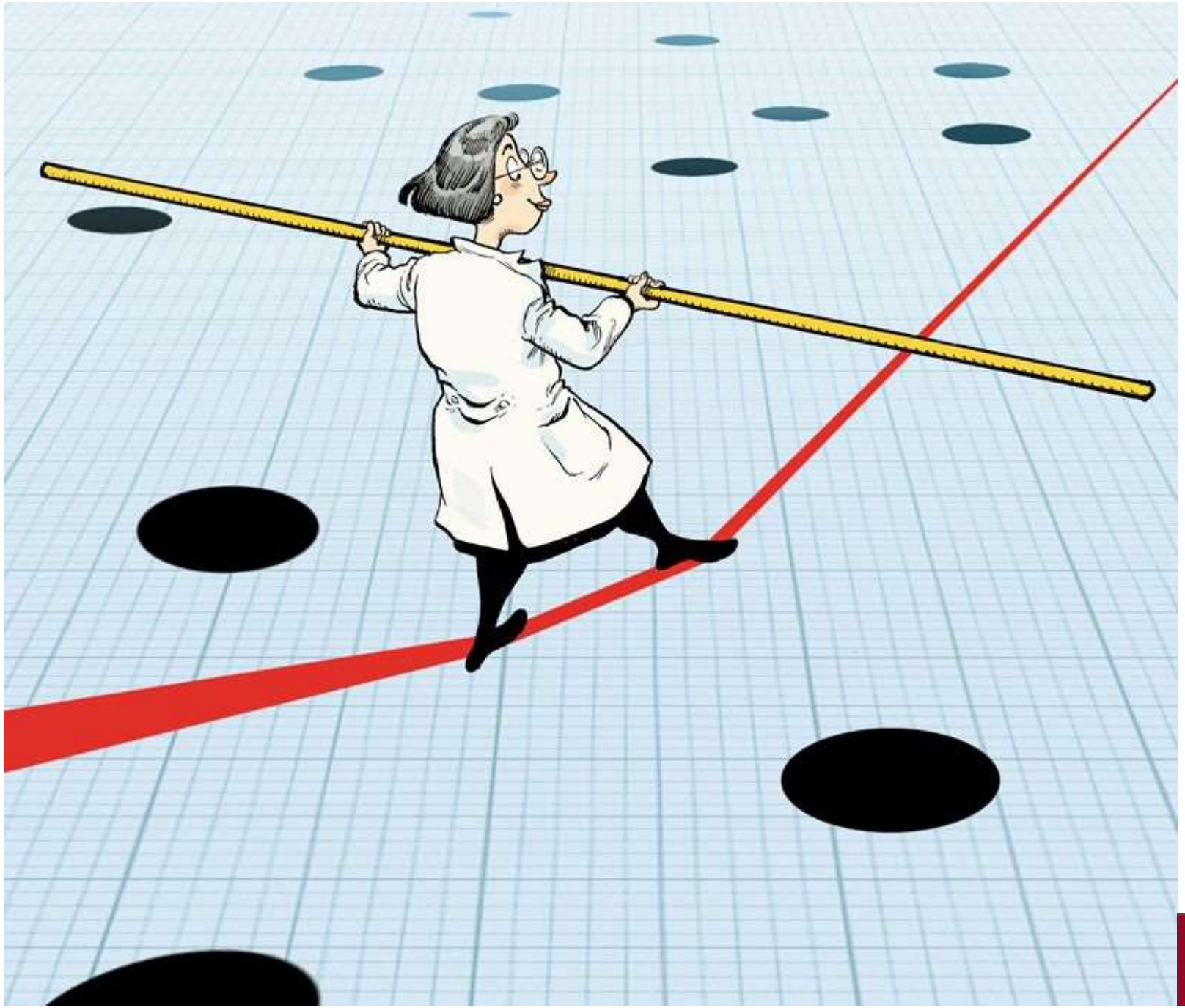
What is science's crisis really about?

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

Futures
Volume 104, December 2018, Pages 85-90

Why science's crisis should not become a political battling ground

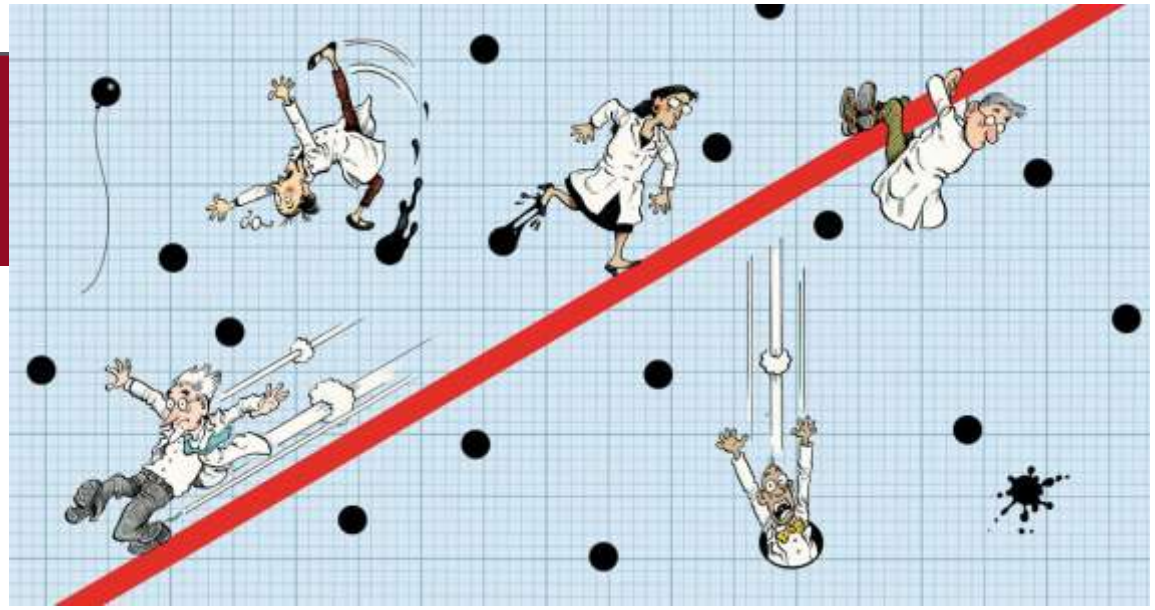
Andrea, Saltelli ✉



Crisis in statistics?

nature
International journal of science

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 ✉

nature
International journal of science

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

nature
International journal of science

CORRESPONDENCE · 16 JANUARY 2018

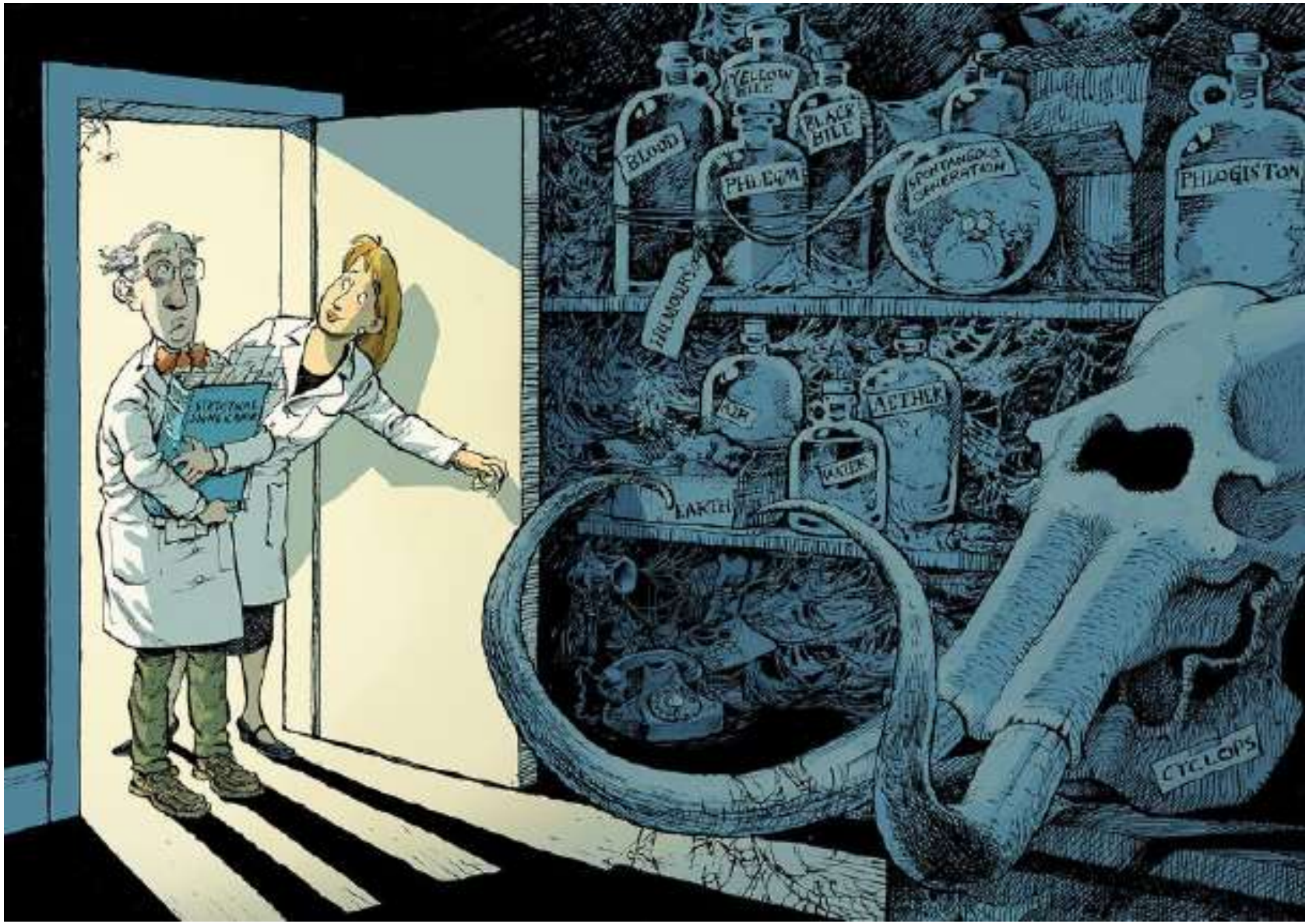
Integrity must underpin quality of statistics

Jerome Ravetz ✉

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

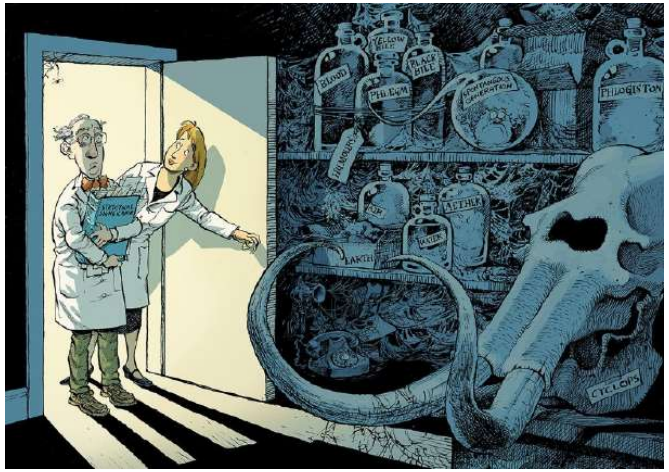
All users of statistical techniques, as well as those in other mathematical fields such as modelling and algorithms, need an effective societal commitment to the maintenance of quality and integrity in their work
(Ravetz, 2018)

If imposed alone, technical or administrative solutions will only breed manipulation and evasion (Ravetz, 2018)



Throw away the concept of statistical significance?

nature
International journal of science



COMMENT · 20 MARCH 2019

Scientists rise up against statistical significance

Valentin Amrhein, Sander Greenland, Blake McShane and more than 800 signatories call for an end to hyped claims and the dismissal of possibly crucial effects.

Valentin Amrhein ✉, Sander Greenland & Blake McShane

See the discussion on the blog of Andrew Gelman https://statmodeling.stat.columbia.edu/

Is mathematical modelling affected?

Need for a more structured, generalized and standardized approach to verification

Padilla, J. J., Diallo, S. Y., Lynch, C. J., & Gore, R. (2018). Observations on the practice and profession of modeling and simulation: A survey approach. SIMULATION, 94(6), 493–506.

Unlike statistics, modelling is not a discipline …

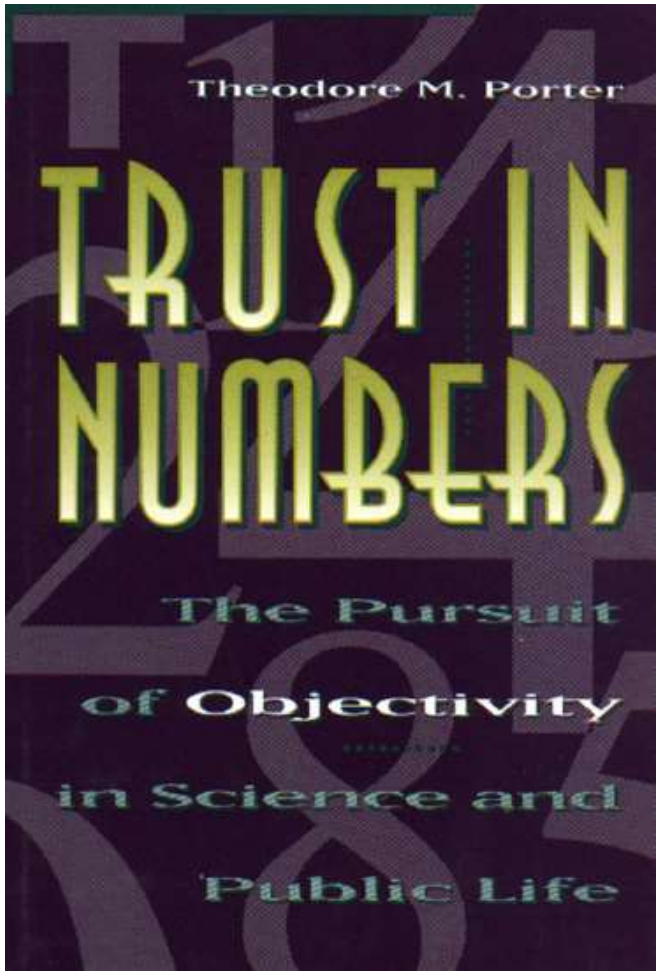
… mathematical modelling cannot do this:

Wasserstein, R.L. and Lazar, N.A., 2016. 'The ASA's statement on p-values: context, process, and purpose', The American Statistician, Volume 70, 2016 - Issue 2, Pages 129-133.

Statistics could help by internalizing techniques for validation and verification (including sensitivity analysis) in its syllabi

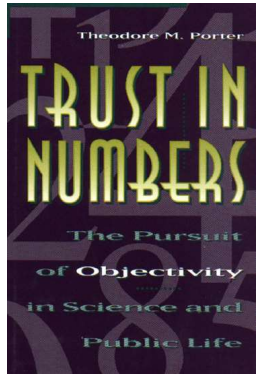
Numbers and trust

Theodor
M. Porter



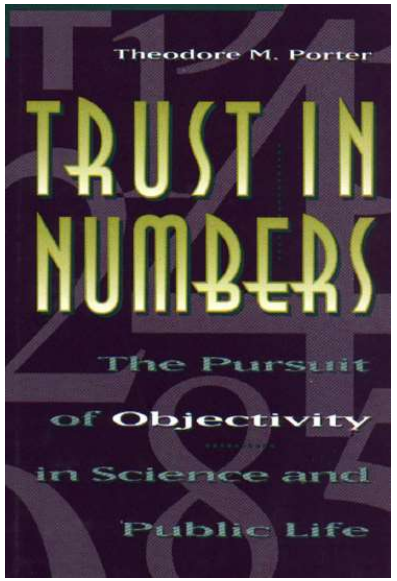
Theodore M. Porter, Trust in Numbers,
The Pursuit of Objectivity in Science and Public Life, Princeton 1995

p. 8: “The appeal of numbers is especially compelling to bureaucratic officials who lack the mandate of a popular election, or divine right.



Arbitrariness and bias are the most usual grounds upon which such officials are criticized.

A decision made by the numbers (or by explicit rules of some other sort) has at least the appearance of being fair and impersonal.”



p. 8: “Scientific objectivity thus provides an answer to a moral demand for impartiality and fairness.

Quantification is a way of making decisions without seeming to decide.

Objectivity lends authority to officials who have very little of their own.”

Trust, authority and styles of quantification: two different stories

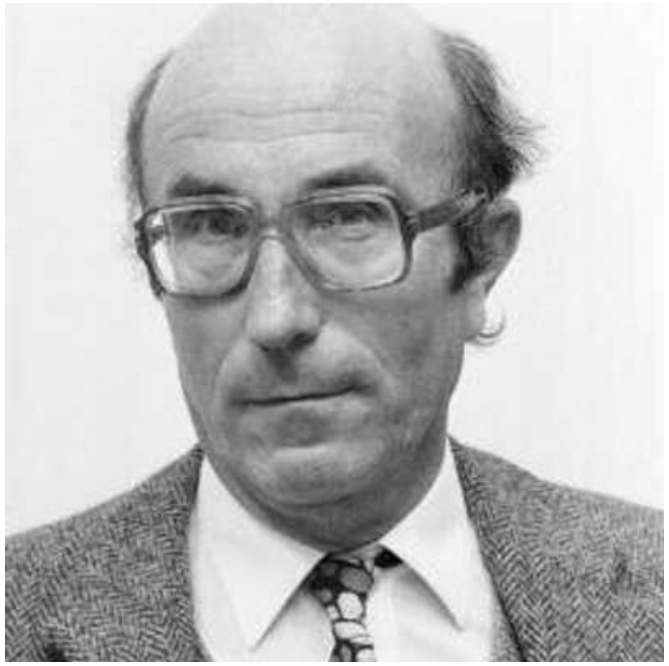
ECOLE NATIONALE
DES PONTS ET CHAUSSEES

US Army Corps of Engineers®

Porter's story: Quantification needs judgment which in turn needs trust …without trust quantification becomes mechanical, a system, and 'systems can be played'.

‘System trust’, is social system theory:

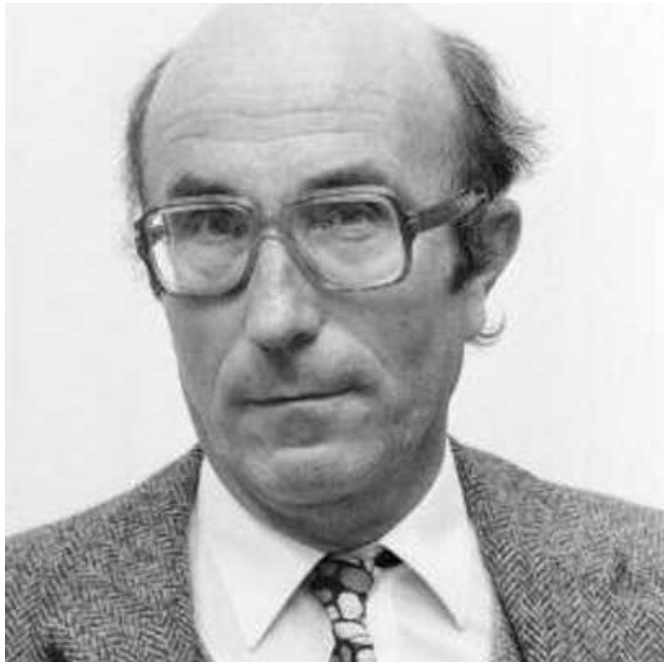
“The reduction of complexity [made possible by generalized media of communication as money, power and truth] **assumes trust** on the part of those who are expecting such reduction and of those who are supposed to accept it once it is accomplished”



Niklas Luhmann

N. Luhmann, Trust and Power. Polity Press, 2017.

"[System trust thus permits] the bank to lend more money than it possess, the state to issue more commands than it can enforce using the police, that more information is divulged in professional advice than could be backed up empirically or logically".



Niklas Luhmann

N. Luhmann, Trust and Power. Polity Press, 2017.

‘the essential fiduciary status’ of science= Trust in science is necessary for the general society to continue to support it, materially and with recruits. And mutual trust within science is necessary for its systems of quality assurance to function

Jerome R. Ravetz

Charles Goodhart

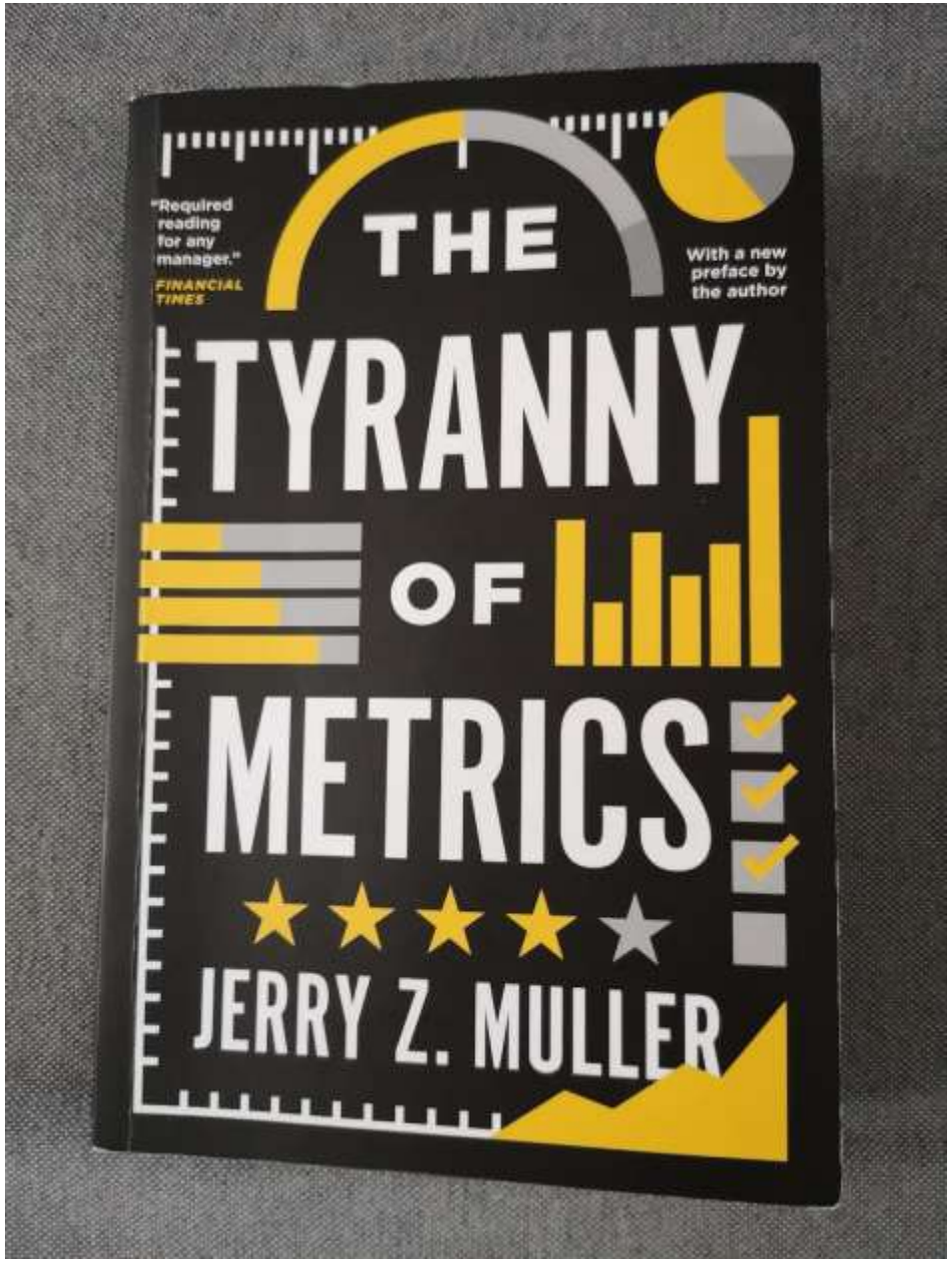
p. 44 “Any … measures necessarily involve a loss of information … [and distorts behavior]” (Porter, 1995)

This is what we normally call Goodhart’s law, from Charles Goodhart. "When a measure becomes a target, it ceases to be a good measure."

Also known as Campbell's law (1976);
https://en.wikipedia.org/wiki/Goodhart%27s_law

For Ravetz (1971, pp. 295–296), when the goals of a task are complex, sophisticated, or subtle, then crude systems of measurements can be played exactly by those persons possessing the skills to execute the tasks properly, who thus manage to achieve their own goals to the detriment of those assigned.

Ravetz, J.R., 1971, Scientific Knowledge and Its Social Problems, 1996 Edition, Transaction Publishers. See plenty of examples in Muller, J.Z., 2018, The Tyranny of Metrics, Princeton.



More reading

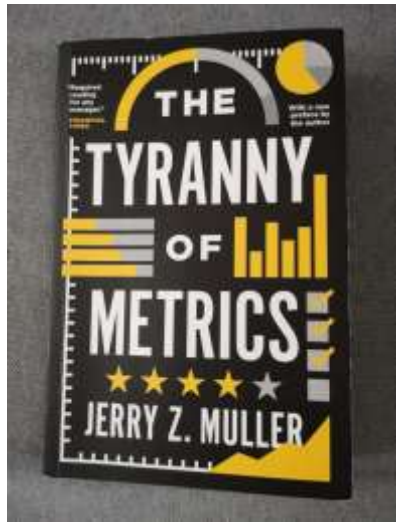
J. Z. Muller, The tyranny of metrics. Princeton University Press , 2018.

Metric fixation, or the irresistible pressure to measure performance

Gaming of metrics (recall Goodhart law)

“The calculative is the enemy of the imaginative”

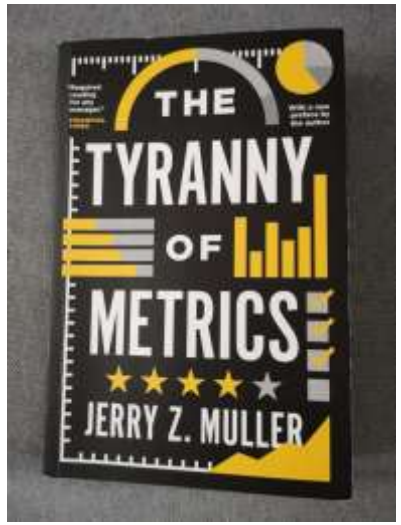
A wealth of case studies from education to war to medicine to foreign aid..



Critiques of metrics

From the left: metric fixation promotes deskilling

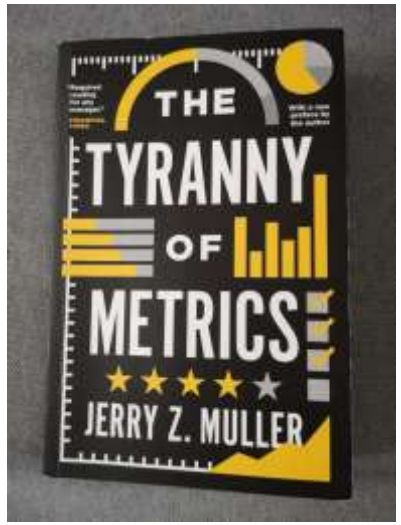
From the right (Friedrich Hayek): metric fixation reproduces features of the soviet system



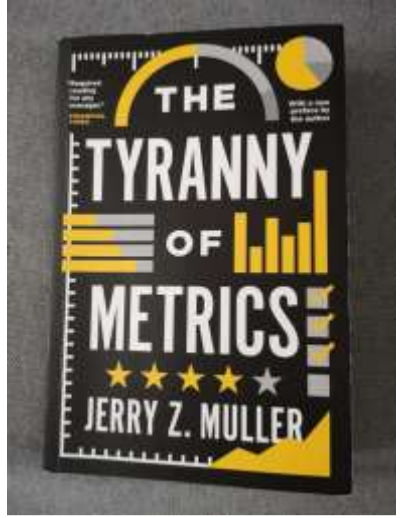
Critiques of metrics

An epistemological critique: metrics privilege abstract and formulaic knowledge against practical and tacit knowledge

(Greek concept of metis)



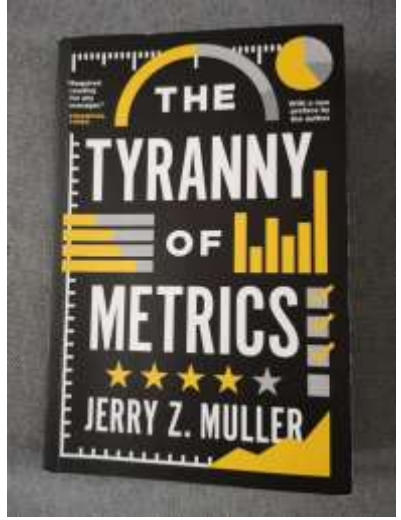
Unintended consequences: a litany



- Goal displacement
- Short termism
- Diminishing utility
- Rule cascade
- Discouraging risk taking
- Discouraging innovation
- Rewarding luck
- Discouraging cooperation and common purpose
- Degrading work
- Time waste
- Loss of productivity

A concluding remark

Considering all of the above keep in mind at every step that “the best use of metrics may be not to use it at all”



Theodor Porter:

“The evasion of goals and corruption of measures tends to make these numbers “funny” in the sense of becoming dishonest, while the mismatch between boring, technical appearances and cunning backstage manipulations supplies dark humor”

T. M. Porter, “Funny Numbers,” *Culture Unbound*, vol. 4, pp. 585–598, 2012

The numbers of neoliberalism

How CEOs profited from the ambiguities and manipulability. “These men did not allow their enterprises to fail until they failed catastrophically”

T. M. Porter, “Funny Numbers,” *Culture Unbound*, vol. 4, pp. 585–598, 2012

“[CEOs] had the power to keep the numbers boring, maintaining a screen in front of this theater of the absurd…”

Tin description (a result of standardization) allow tin prescriptions, a strategy of impersonal regulation, deploying statistics as insurance against casuistry

T. M. Porter, “Funny Numbers,” *Culture Unbound*, vol. 4, pp. 585–598, 2012

Thus onstage we see the boring numbers of thin prescription, which ensure trust and the containment of subjectivity

Offstage we see the resulting intense struggle about how the quantification should be made

T. M. Porter, "Funny Numbers," *Culture Unbound*, vol. 4, pp. 585–598, 2012

E.g. an immediate impact of thin prescriptions in education is “to encourage the reconstruction of school curricula to match the content of the tests, and sometimes to make the temptation to cheat almost irresistible” (➔ J.Z. Muller; ➔ OECD-PISA example)

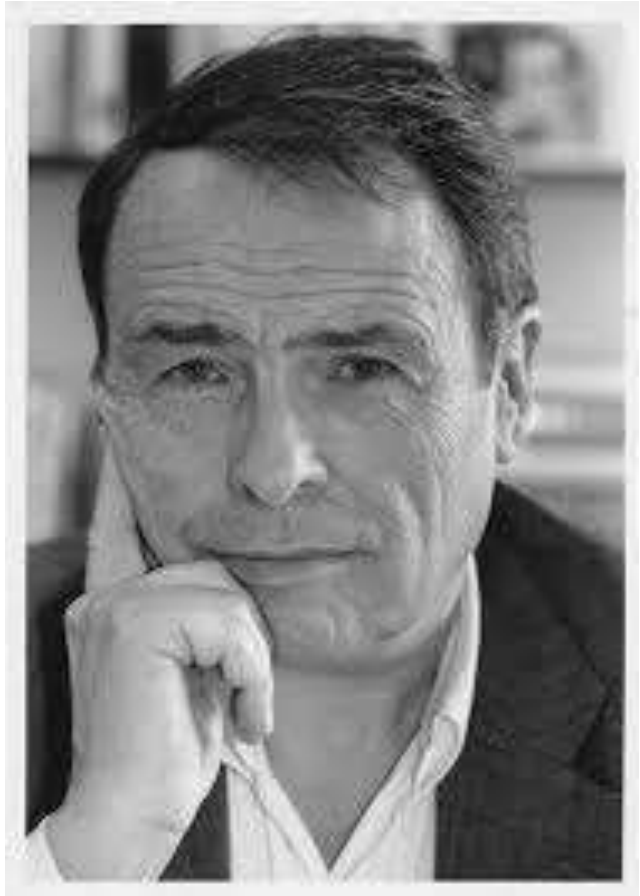
T. M. Porter, “Funny Numbers,” *Culture Unbound*, vol. 4, pp. 585–598, 2012

Do we need a movement of resistance?

I. Bruno, E. Didier, and J. Prévieux, Stat-activisme. Comment lutter avec des nombres. Paris: Zones, La Découverte, 2014

How to be a "statactiviste"?

1. Deconstruct existing metrics, including using irony (Pierre Bourdieu, *Les héritiers*).



La sociologie, ça doit être rigolo

(Sociology must be fun)

How to be a "statactiviste"?

2. Gaming metrics (statistical judo) – use Goodhart's law to your advantage – or make the ruse public.

- Police statistics in NY

How to be a "statactiviste"?

3. Bring to the surface what is hidden / unsaid/ excluded – new social classes, marginalization, minorities:

- ‘Creative class’ or ‘precarious intellectuals’?

How to be a "statactiviste"?

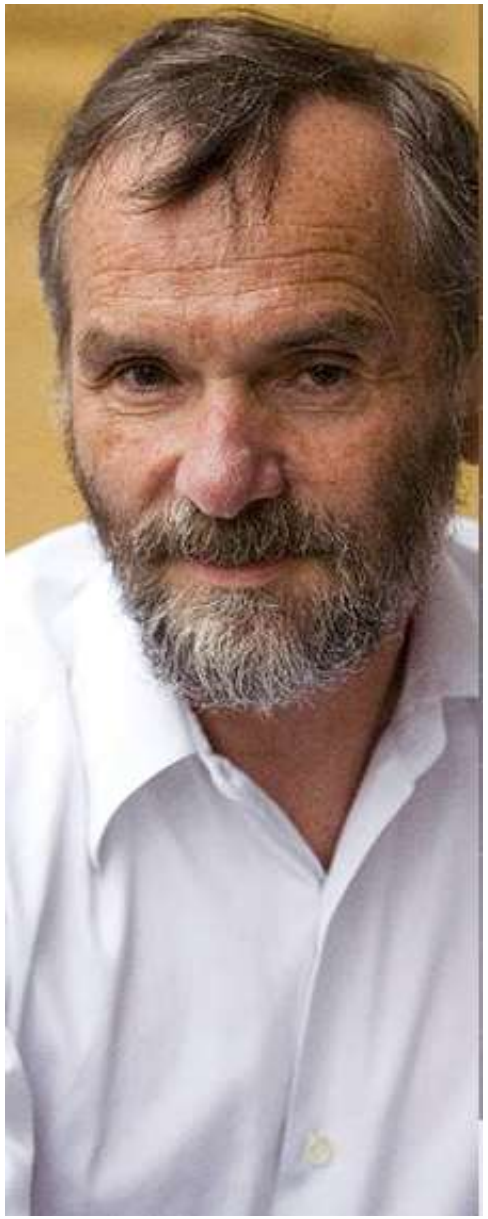
4. Measure something different.

- Suicides at France Telecom;
- BIP 40, a new French measure of poverty/inequality

Important:

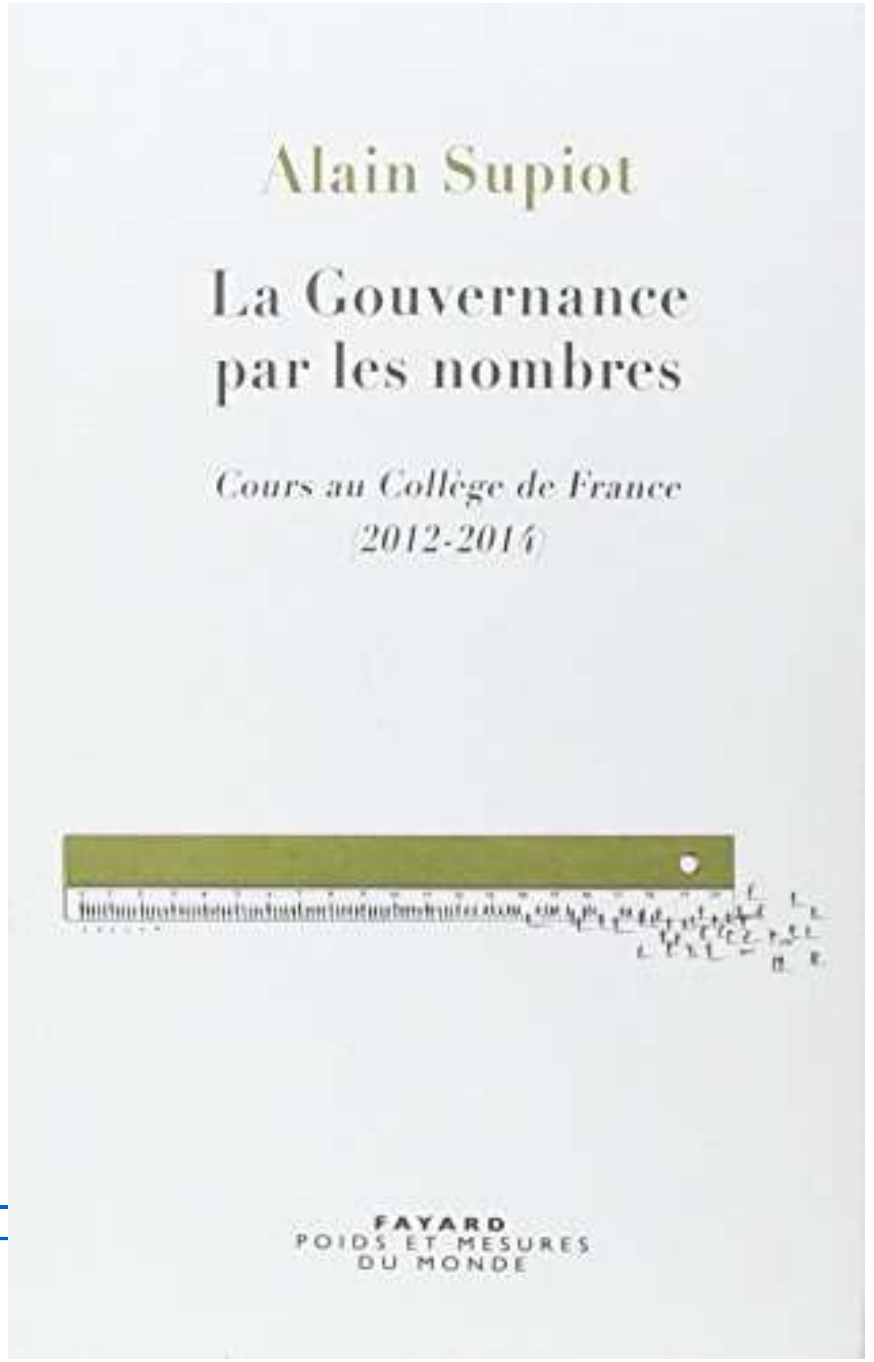
"Quantification should not be abandoned to the advantage of exalting qualities, singularities, and the incommensurable. Such an abandon would be a tactical error"

Alain Supiot

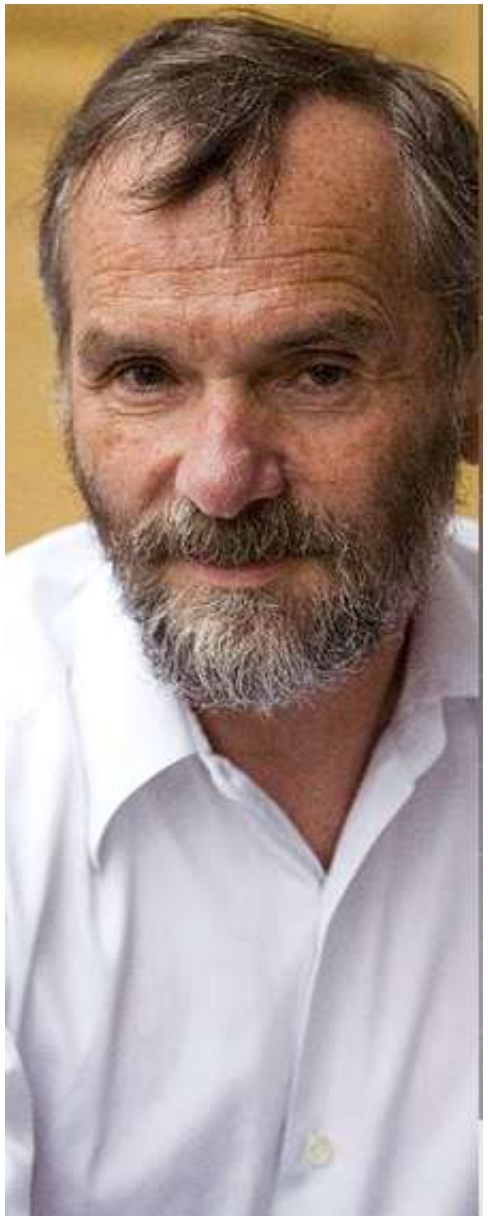


An indictment of the Total Market and the normative uses of economic quantification

https://www.college-de-france.fr/site/en-alain-supiot/Governance-by-Numbers-Introduction.htm



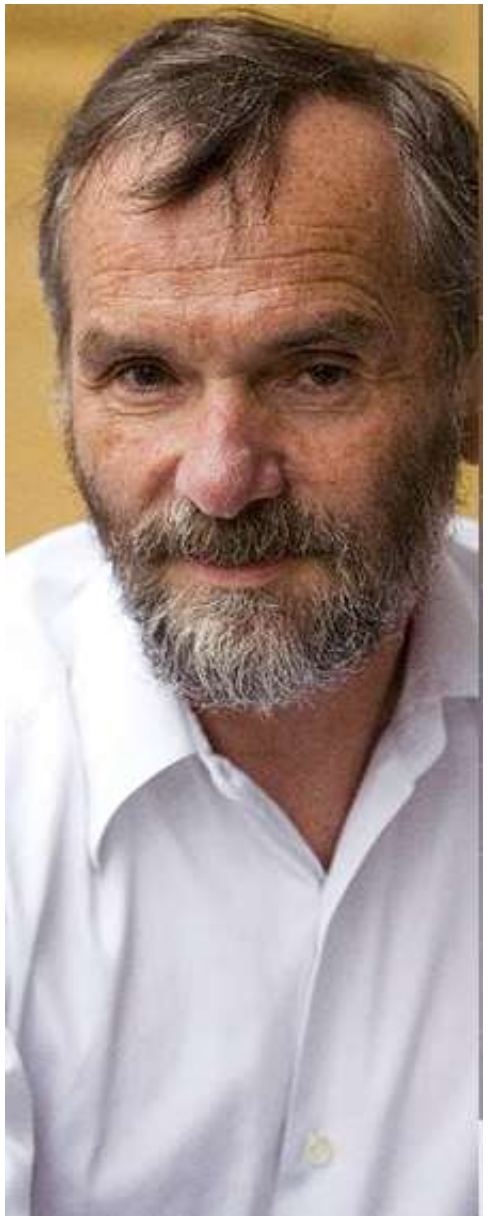
Alain Supiot



…we have entered the era of the cybernetic imaginary, which revives the West's age-old dream of grounding social harmony in calculations.

Repudiating the goal of governing by just laws, this new discourse advocates in its stead the attainment of measurable objectives efficiently

Alain Supiot



… This leaves no option open to populations or countries than to ride roughshod over social legislation, and pledge allegiance to those stronger than they are

Terrible quantifications: consequentialism in action


EARTH
OVERSHOOT
DAY
ABOUT
BLOG
SOLUTIONS
STEPS TO #MOVETHEDATE
NEWSROOM
FOR KIDS & TEACHERS
SUBSCRIBE
EARTH OVERSHOOT DAY WAS JULY 29
On That Day, Humanity Exhausted The Biological Resources Our Planet Can Renew This Whole Year. Check Out Solutions Below So We Stop Increasing The Global Ecological Deficit.

At 8.00 am?

We use 1.75 planets
Or 17.5? 175? 1,750? …Infinity?

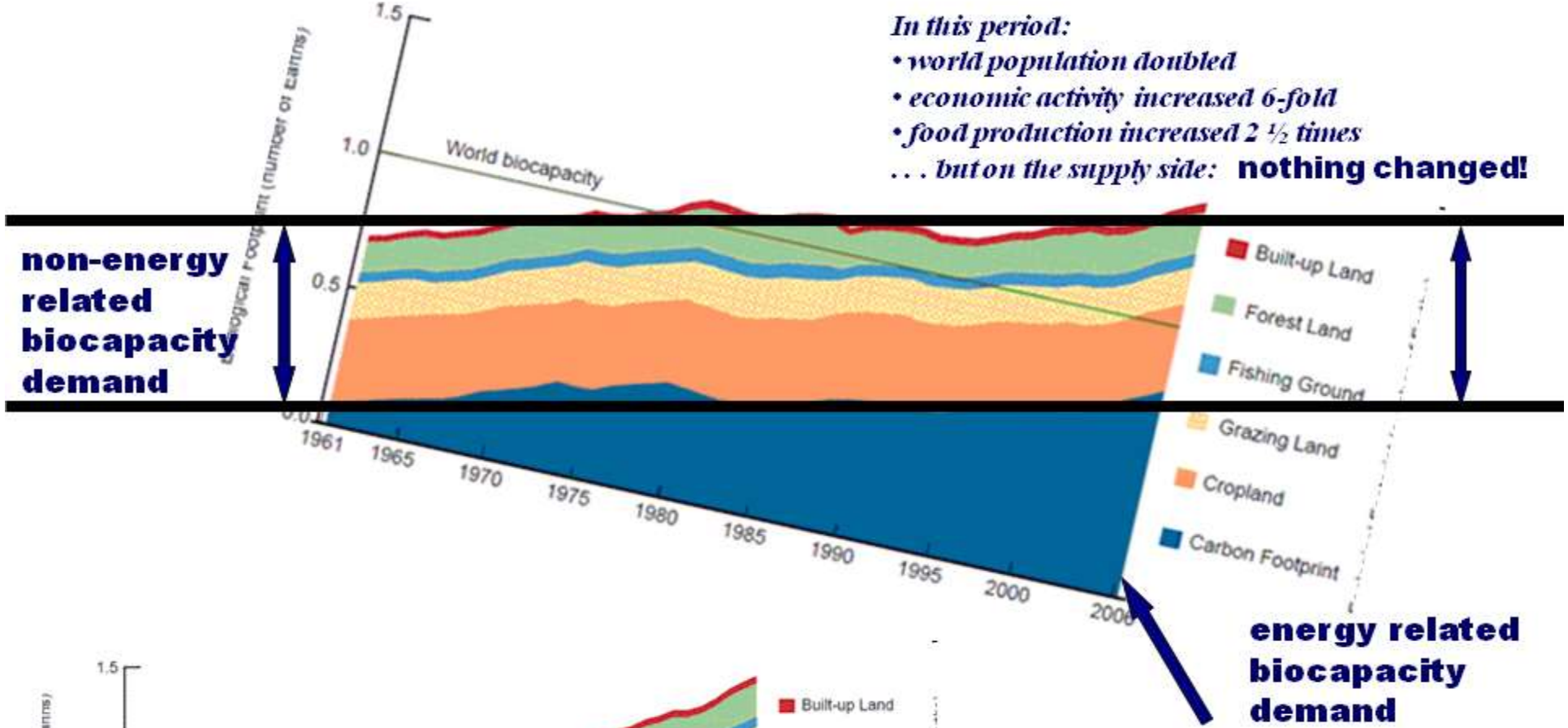
How many plastic bottles are we allowed to throw in the sea in a year?

Try replacing plastic bottles with extinction of a species, or collapse of a fishery, or a Fukushima,…

Move the date forward 5 days every years suggests Mathis Wackernagel

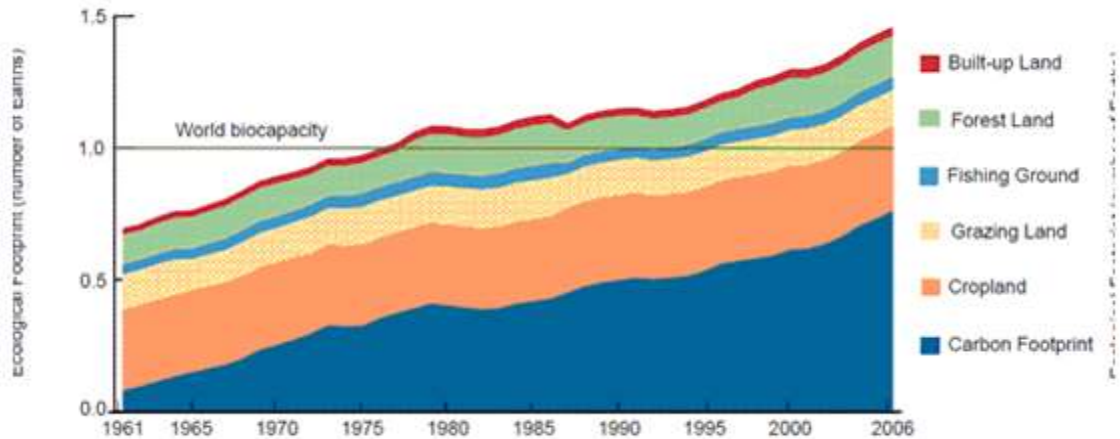
The Ecological Footprint suggests compressing sustainability to a single metric (acres of equivalent land). CO2 emissions from energy demand dominate the output.

The change of world footprint in time (1961-2006)



In this period:
- *world population doubled*
- *economic activity increased 6-fold*
- *food production increased 2 ½ times*

. . . but on the supply side: **nothing changed!**



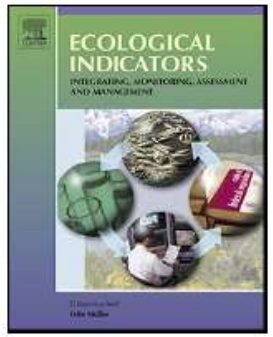
the only measured change in EF is generated by a very creative protocol convert ing energy use into hectares of planet . . .

Ecological Indicators 46 (2014) 610–621

Contents lists available at ScienceDirect

Ecological Indicators

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



Footprints to nowhere

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

[a] Institute of Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain
[b] Institute for the Protection and Security of the Citizen (IPSC), The European Commission, Joint Research Centre, TP 361, 21027 Ispra, VA, Italy
[c] Catalan Institution for Research and Advanced Studies (ICREA), Passeig Lluís Companys, 23, 08010 Barcelona, Spain

Giampietro, M., and Saltelli, A., 2014, Footprints to nowhere, Ecological Indicators, 46, 610–621.

Goldfinger, S., Wackernagel, M., Galli, A., Lazarus, E., Lin, D., 2014, Footprint facts and fallacies: A response to Giampietro and Saltelli (2014) “Footprints to Nowhere”, 46, 622–632.

Giampietro, M., and Saltelli, A., 2014, Footworking in Circles, Ecological Indicators, 46 (2014) 260–263.

Alessandro Galli , Mario Giampietro , Steve Goldfinger, Elias Lazarus, David Lin, Andrea Saltelli , Matthis Wackernagel , Felix Müller, 2016, Questioning the ecological footprint , Ecological Indicators, 69, 224–232.

All the story

… after the practicum on Merton's CUDOS

The same R.K. Merton realized later in life that norms have corresponding counter norms

Mitroff, I. I. 1974, Norms and Counter-Norms in a Select Group of the Apollo Moon Scientists: A Case Study of the Ambivalence of Scientists, American Sociological Review, 39, 579-595.

NORMS AND COUNTER-NORMS IN A SELECT GROUP OF THE APOLLO MOON SCIENTISTS: A CASE STUDY OF THE AMBIVALENCE OF SCIENTISTS*

IAN I. MITROFF

American Sociological Review 1974, Vol. 39 (August): 579-595

This paper describes a three and a half year study conducted over the course of the Apollo lunar missions with forty-two of the most prestigious scientists who studied the lunar rocks. The paper supports the Merton-E. Barber concept of sociological ambivalence, that social institutions reflect potentially conflicting sets of norms. The paper offers a set of counter-norms for science, arguing that if the norm of universalism is rooted in the impersonal character of science, an opposing counter-norm is rooted in the personal character of science. The paper also argues that not only is sociological ambivalence a characteristic of science, but it seems necessary for the existence and ultimate rationality of science.

Three-and-a-half-year study conducted over the course of the Apollo lunar missions with forty-two of the most prestigious scientists who studied the lunar rocks

The paper supports the Merton-E. Barber concept of **sociological ambivalence, that social institutions reflect potentially conflicting sets of norms**

[We must] consider, first, how potentially contradictory norms develop in every social institution; next, how in the institution of science conflicting norms generate marked ambivalence in the lives of scientists; and finally, how this ambivalence affects the actual, as distinct from the supposed, relations between men of science (Merton, 1963a:80).

- Solitariness (secrecy, miserism) is often used to keep findings secret in order to be able to claim patent rights…

Instead of Communalism

- Particularism […] a real issue, particularly when you consider the ratio of researchers in rich countries compared with those in poor countries

Instead of Universalism

- Interestedness arises because scientists have genuine interests at stake in the reception of their research…

Instead of Disinterestedness

- Dogmatism because careers are built upon a particular premise (theory) being true…

Instead of Organized Skepticism

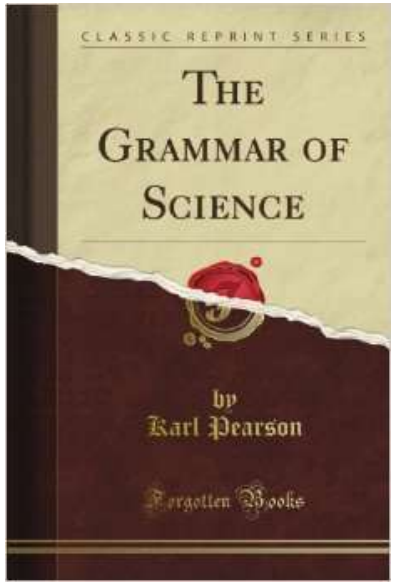
How are we taught our science; the good and the truth; from the Vienna circle to …

How are we taught our science?

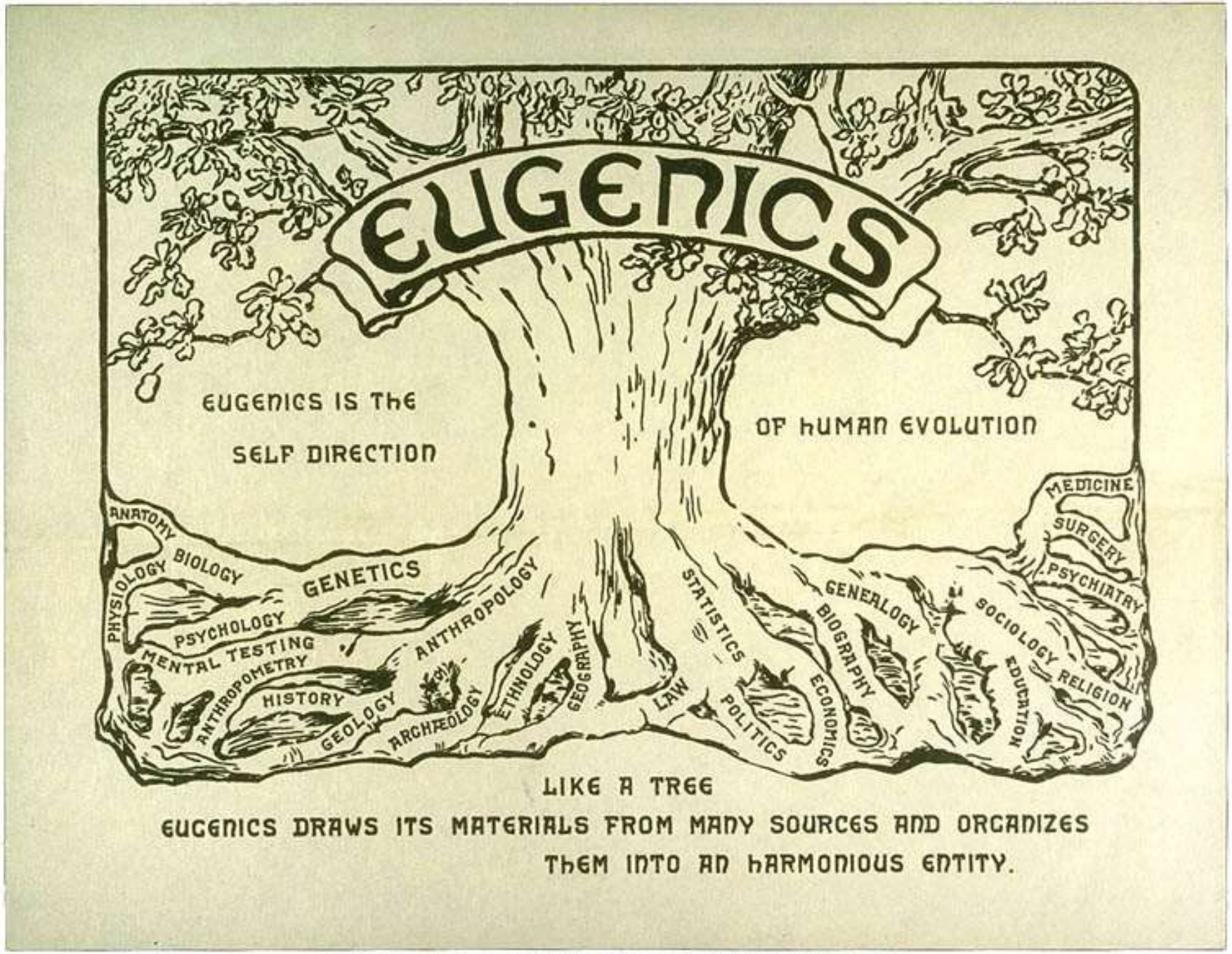
Karl Pearson (a social Darwinist) suggests not wasting resources on social programs as:

"No degenerate and feeble stock will ever be converted into healthy and sound stock by the accumulated effects of education, good laws, and sanitary surroundings"

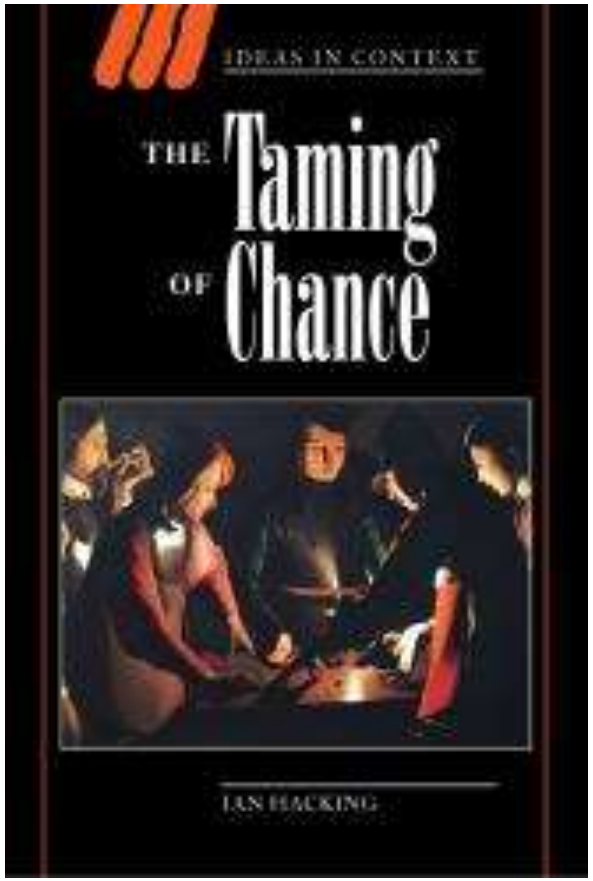
Karl Pearson

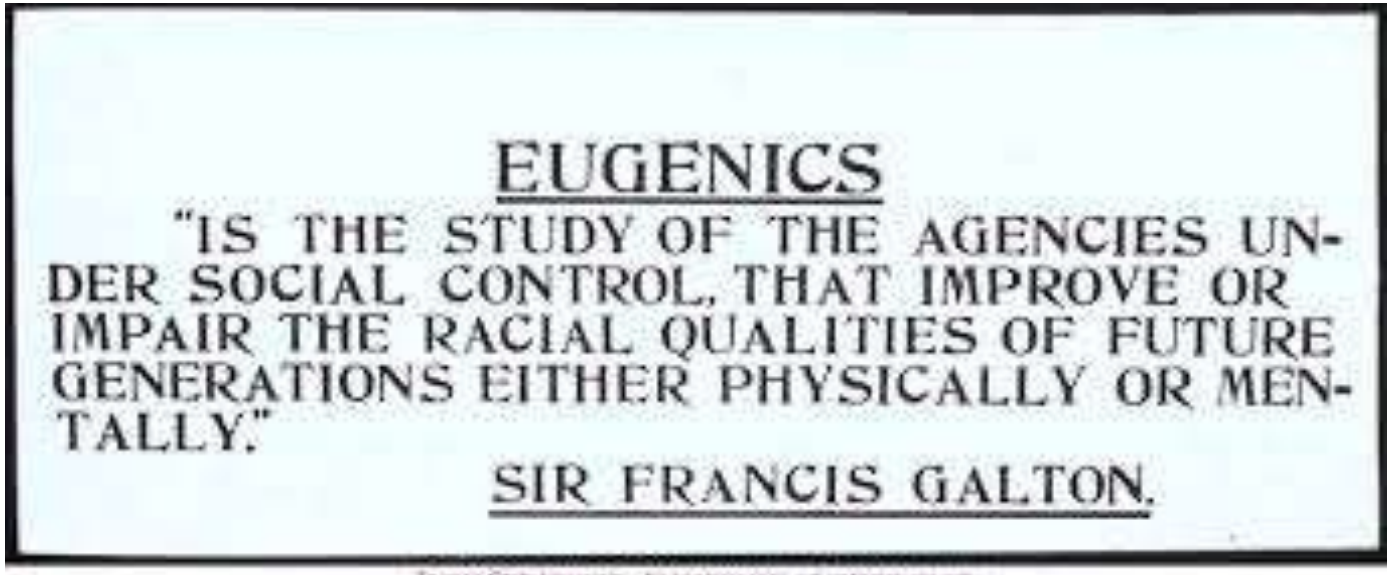


Pearson, K., 1892, The Grammar of Science, Walter Scott Publisher, London, p.32.

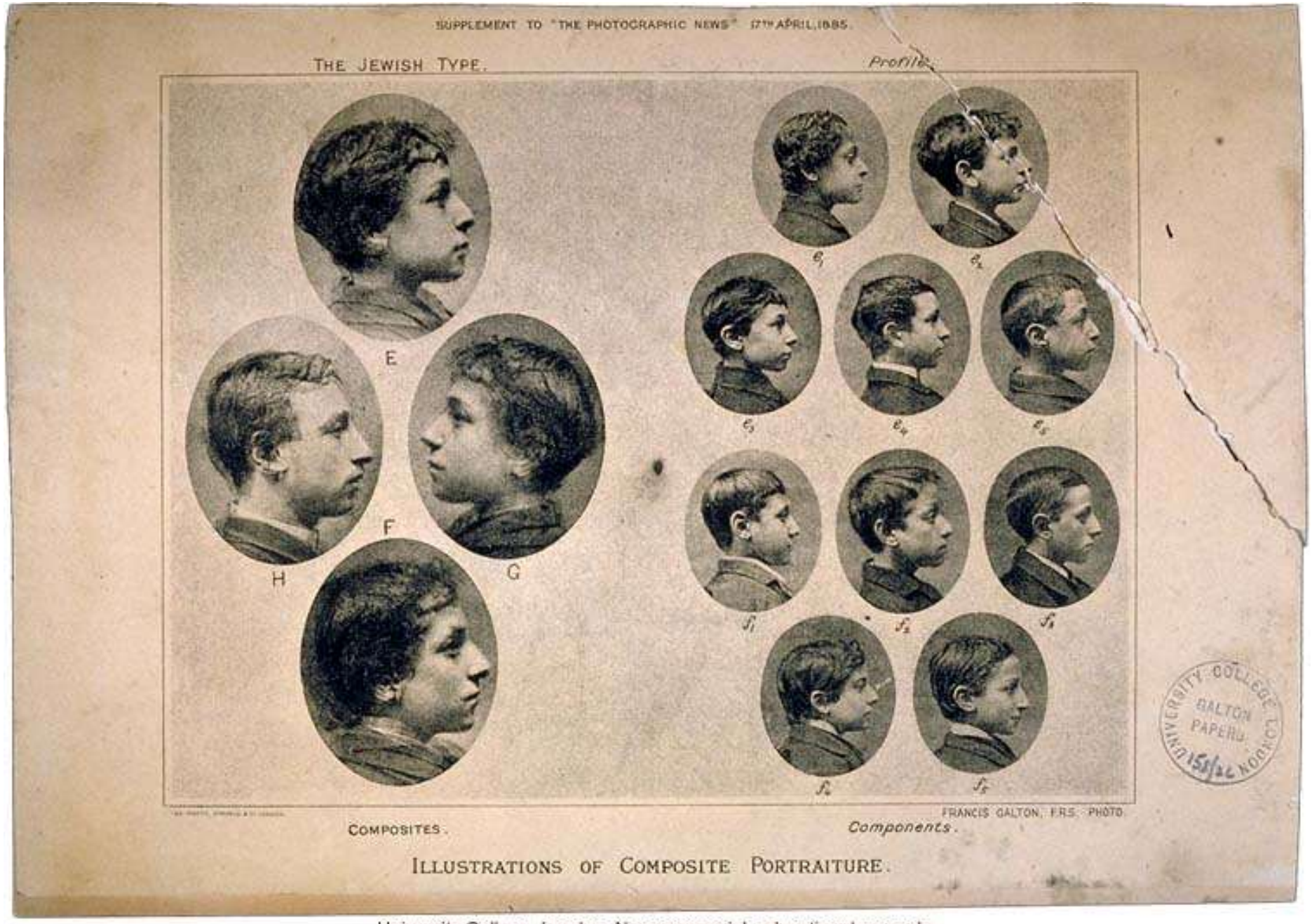


Francis Galton and Karl Pearson (the one of chi-squared); laboratory of biometrics; distinguishing army officers from private soldiers from criminals convicted of murder from non-violent felons from Jews …





The Jewish type …



EUGENICS

C. P. IVES, Jr. Managing Editor CHARLES McALPIN PYLE, Business Manager

"Eugenics is the study of all of the agencies under social control which may improve or impair the inborn qualities of future generations of men, either physically or mentally."

—Francis Galton

VOLUME II AUGUST 1929 NUMBER 8

The first R&D Statistics ever, by Francis Galton (1822-1911)

Measuring the numbers of sons and daughters of ‘great men of science’ will tell us whether a society degenerates toward stupidity (Benoît Godin, 2010)

Godin, B., From Science to Innovation, INRS, Montreal, Canada, Communication presented to the Government-University-Industry Research Roundtable (GUIRR) US National Academy of Sciences, Washington, May 21, 2010.

Kuhn said that the “educational initiation that prepares and licenses the student for professional practice… is both rigorous and rigid”

and “It is a narrow and rigid education [in physics/science], probably more so than any other except perhaps in orthodox theology”

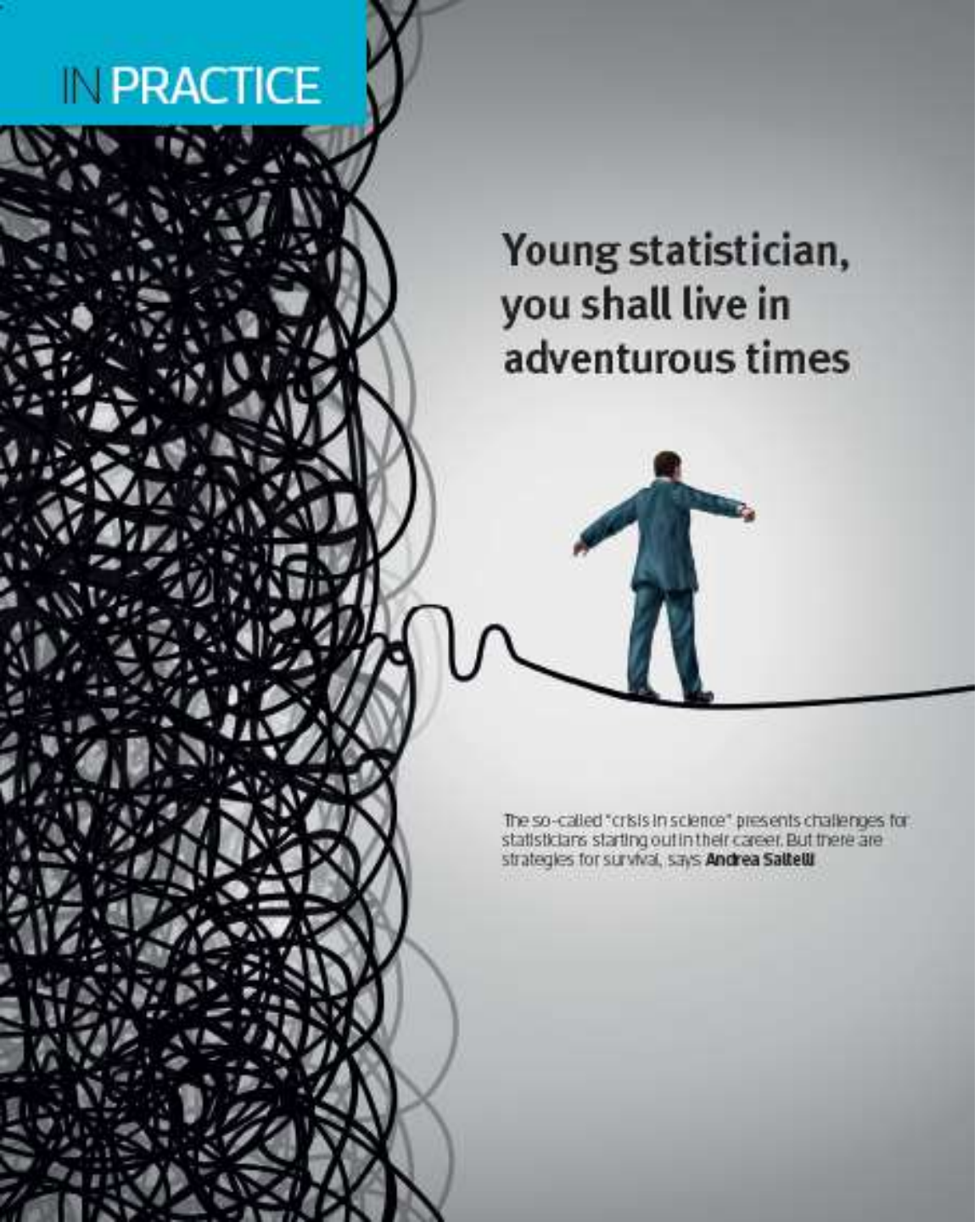
Thomas Kuhn, The structure of scientific revolution, 192, Chapters I and XIII

and “the member of a mature scientific community is, like the typical character of Orwell’s 1984, the victim of a history rewritten by the powers that be.”

Thomas Kuhn, The structure of scientific revolution, 192, Chapter XIII

Thus disciplinary advancements are presented in textbooks as the “perception of the obvious” made by one-eyed men in the kingdom of the blinds (Ravetz, 1971).

Can statisticians ignore their role in Eugenics, can chemists ignore what is phlogiston, or geologists how Alfred Lothar Wegener 1915 theory of Continental Drift was met with skepticism …



SIGNIFICANCE
ROYAL STATISTICAL SOCIETY
ASA AMERICAN STATISTICAL ASSOCIATION

More here

https://rss.onlinelibrary.wiley.com/doi/10.1111/j.1740-9713.2016.00983.x

Why ethics and science cannot be separated?

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issue 037 series 1 Summer 1984

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Ideological Commitments in the Philosophy of Science

With a Comment on Ravetz by Edgley

Jerry Ravetz and Roy Edgley

RP 037 (Summer 1984)

See a clean version here:
http://www.andreasaltelli.eu/file/repository/Ideological_committment.pdf

How science is conceived has important political implications

The **Vienna Circle** and the fight against the 'metaphysical and theologizing' associated with fascism and national socialism (1929). Modern empiricism as a scientific world conception

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Verification or falsification?

Karl Popper

A radical departure from the principle of 'verification' that was at the heart of the Vienna Circle positivism (inductivism)

Verification or falsification?

Karl Popper

Truth cannot be verified: it can only be falsified


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search ...

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RP 037 (Summer 1984)

Socratic ethos

Is Socrates saying that he knows the truth?

And what kind of man am I? One of those who would gladly be refuted if anything I say is not true, and would gladly refute another who says what is not true, but would be no less happy to be refuted myself than to refute, for I consider that a greater benefit … I believe there is no worse evil for man than a false opinion about the subject of our present discussion

Courtesy of Kjetil Rommetveit

Verification or falsification?

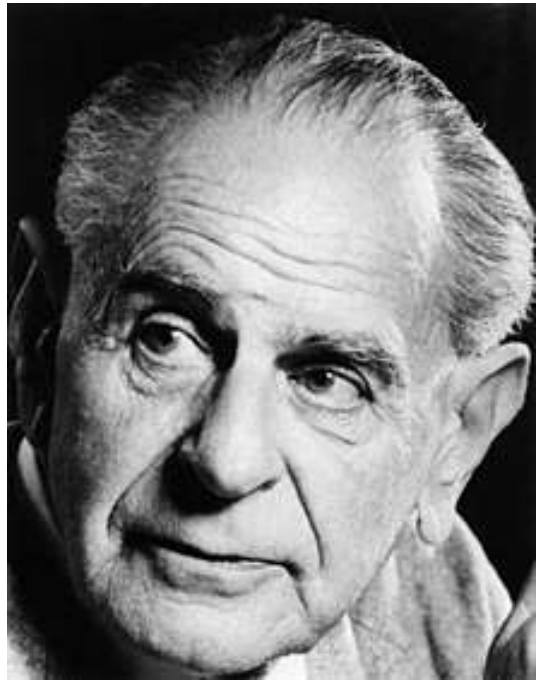
Karl Popper

Demarcation science/non-science ➔ Marxist historiography and psychoanalysis are not science

Verification or falsification?

A champion of liberal democracy at times of cold war; open society as an alternative to totalitarianism

A critical member of the Mont Pelerin society, with Friedrich Hayek, Milton Friedman, Ludwig von Mises and others,



Karl R. Popper
1902–1994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RP 037 (Summer 1984)

Paradigm shifts

Thomas Kuhn: a disenchanted vision of science as alternating between ‘normal’ and ‘revolutionary’

Puzzle solving, dogmatic science, then a paradigm shift … then the same over again

Lost a direction a progress

Imre Lakatos: defending science from its enemies. Remedying the weaknesses in Popper's program

"Proofs and Refutations" revealing the ambiguities of proof even in mathematics, on 'Euler Polyhedron Theorem'; If even mathematics can be ambiguous how can science be dogmatic?

Who remembers the theorem?

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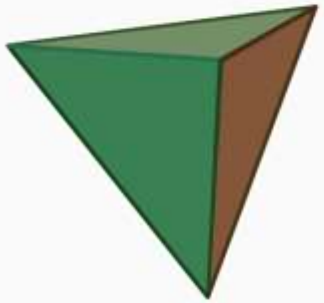
RP 037 (Summer 1984)

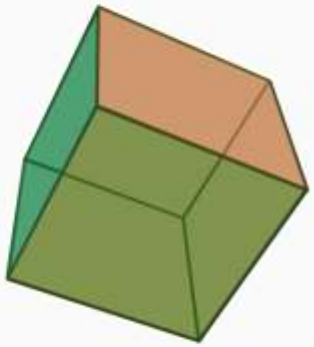
Euler's Polyhedron Formula

Vertices - **E**dges + **F**aces = 2



V = 4 E = 6 F = 4

4 - 6 + 4 = 2

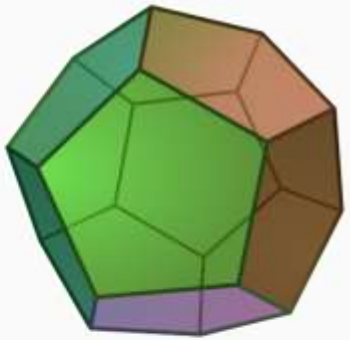


V = 8 E = 12 F = 6

8 - 12 + 6 = 2

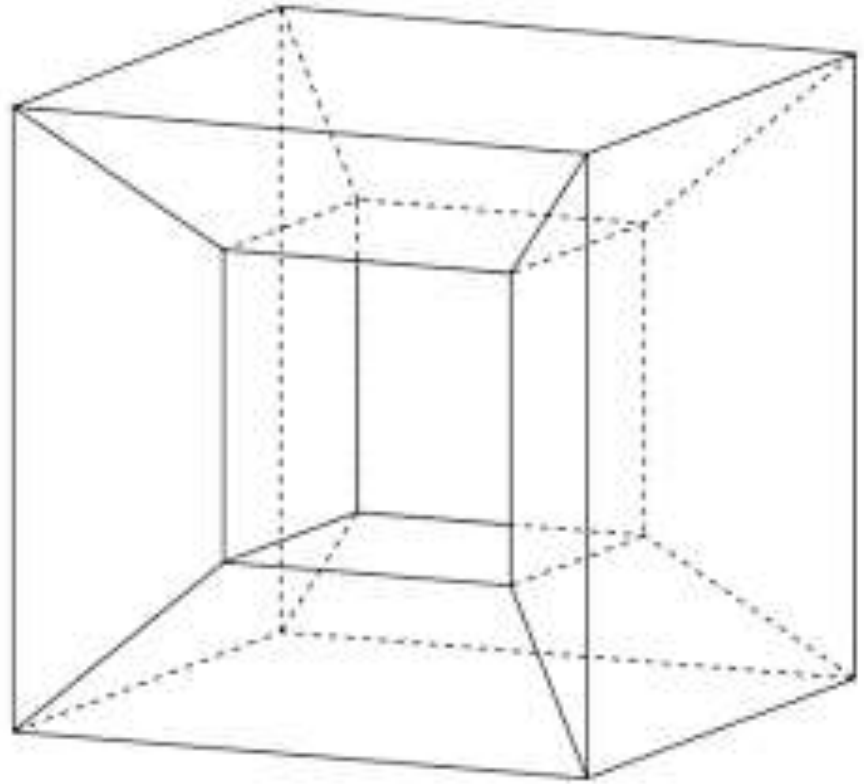
V = 6 E = 12 F = 8

6 - 12 + 8 = 2



V = 20 E = 30 F = 12

20 - 30 + 12 = 2



A monster example?

Imre Lakatos: The idea of ‘decadal’ research programmes to save Popper’s falsificationism from Kuhn’s critique by combining the two visions, abandoning ‘naïve falsificationism’


RADICAL PHILOSOPHY

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Ideological Commitments in the Philosophy of Science

With a Comment on Ravetz by Edgley

Jerry Ravetz and Roy Edgley

RP 037 (Summer 1984)

Paul Feyerabend

Perhaps the most erudite and most philosopher among the four; and the most destructive of any theory of scientific method

In “Against Method” he shows how the best among scientists (e.g. Galileo Galilei) violated any ‘rule’

A court jest, a fascist,
a Zen master? Asks Ravetz


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Paul Feyerabend

Human imperfections of Galileo can 'blow the mind' of a student for whom the authority of science is as absolute

After such a shock the student may be ready to awaken to the truth that there is no truth to awaken to (Feyerabend as a Zen master?)


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For Ravetz, Feyerabend shows to the lay public science's sacred images being sprayed by a philosophical machine gun (Feyerabend as a fascist?)

Killing science as we know it or showing the hypocrisy of this image?


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Ravetz's conclusions

The edifice built by Popper and Lakatos was vulnerable to the critique of Kuhn and Feyerabend, perhaps because of its ideological aspirations

Yet the Enlightenment battle against the church cultural and political hegemony is over, so is a simplistic image of science upholding the Good and the True


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Is this true?

The Enlightenment battle against the church cultural and political hegemony is over, so is a simplistic image of science upholding the Good and the True

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RP 037 (Summer 1984)

The Republic of Science: Its Political and Economic Theory
Michael Polanyi

Science as a market which feeds society's thirst for self improvement

Science as a community of practice capable of self-governance

Michal Polanyi

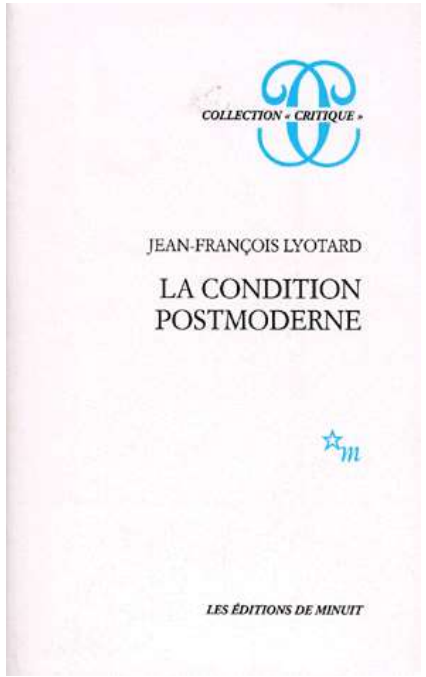
Minerva, I, 1 (Autumn, 1962) , pp. 54- 73, https://mitpress-request.mit.edu/sites/default/files/titles/content/9780262690201_sch_0001.pdf

For Lyotard the grand narrative of the relation between knowledge/science and power has come to an end

Jean-François Lyotard

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

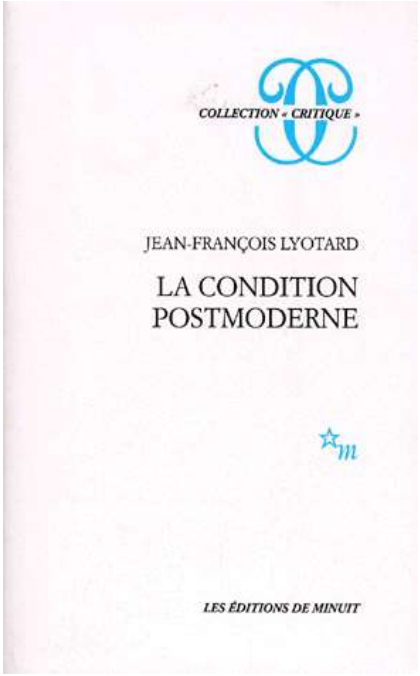
“The question of the legitimacy of science has been indissociably linked to that of the legitimation of the legislator since the time of Plato.”



Jean-François Lyotard

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

“…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 …”



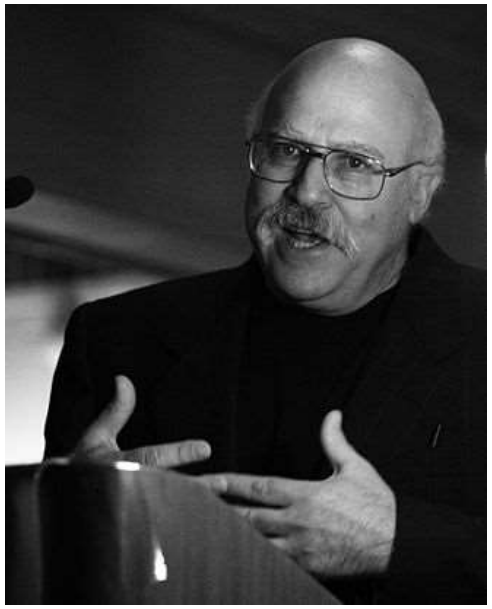
Jean-François Lyotard

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.”

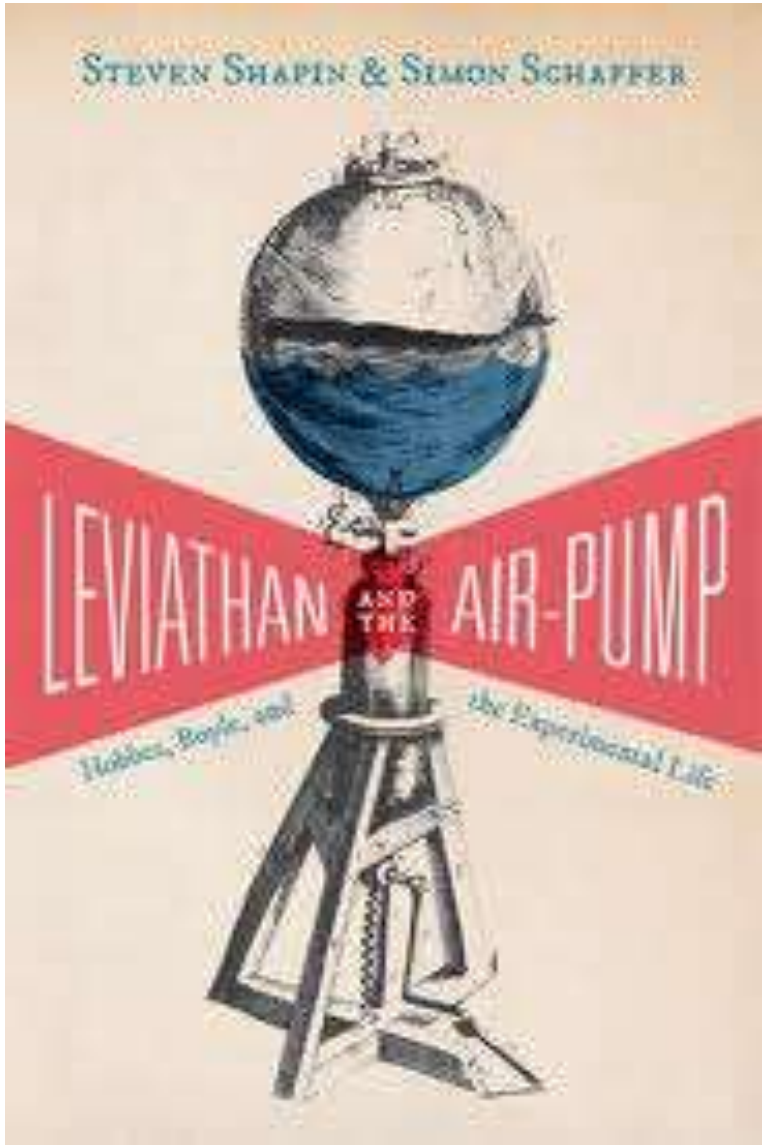
Simon Schaffer



Steven Shapin

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

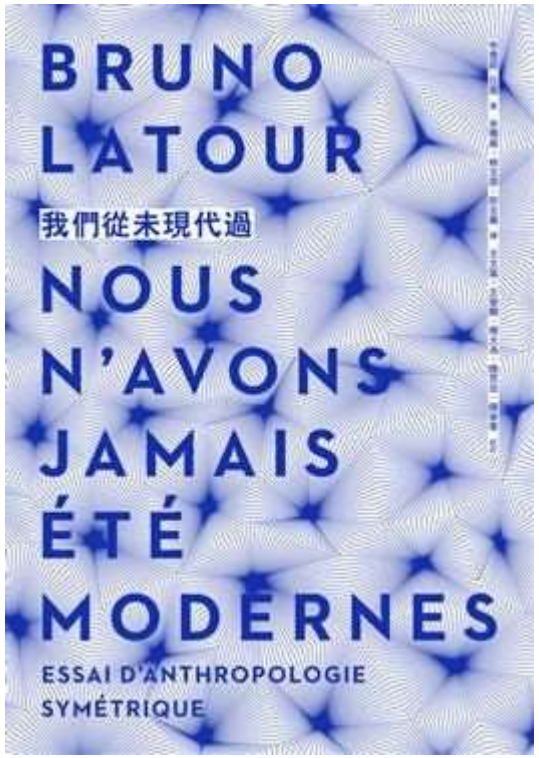
Establishing ‘matter of facts’ under controlled ‘laboratory’ experiments before witnesses as a way to subtract the discourse about knowledge from religious squabbles …



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'.

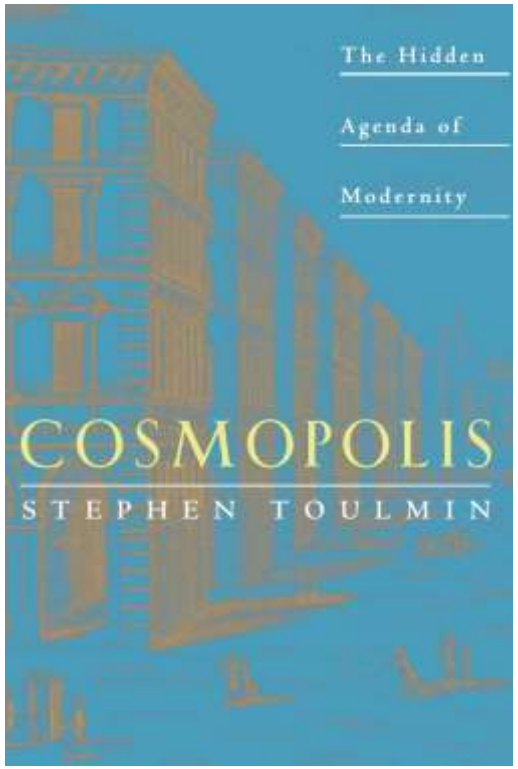
Bruno Latour



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.

The End

@andreasaltelli

What issues for an ethics of quantification?

-The issue of trust.
-A defence against abuse
-To prevent consequentialism in scientific quantification
-To moderate excesses of optimism about the merits of quantification
-For the non-neutrality of the techniques; for the non-separability of facts and values
-For the need to contextualize any quantification
-To deter quantification hubris

What recipes would be offered by an ethics of quantification?

-A license not-to-quantify
-Taming hubris: memento Figure 1.
-Make use of the existing disciplinary arrangements
-Make quantifications interpretable, conveyable in plain English and context specific; use existing pedigrees
-NUSAP
-Sensitivity auditing