

Technoscience, policy and the new media. One or many crises?



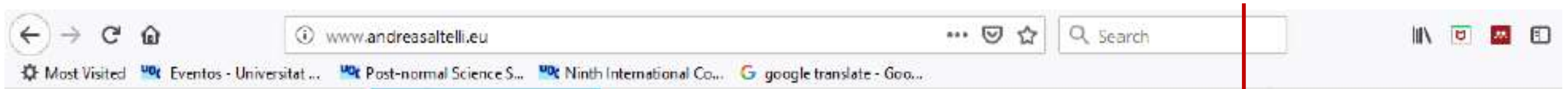
Andrea Saltelli

Centre for the Study of the Sciences and the Humanities (SVT),
University of Bergen (UIB), and Open Evidence Research, Open
University of Catalonia

Seminar at the Senter for vitenskapsteori, SVT–UIB, Parkveien
9, Bergen

Monday the 18th of March 2019

Where to find this talk: www.andreasaltelli.eu



Andrea
Saltelli

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CAETERIS ARE
NEVER PARIBUS

Tweets by @AndreaSaltelli



andrea saltelli

@AndreaSaltelli

Nice piece but... is Harari a doomsayer? 🤔

Tech C.E.O.s Are in Love With Their Principal
Doomsayer nyti.ms/2yZjbM3



Tech C.E.O.s Are in Love With Their Prin...
The futurist philosopher Yuval Noah Hara...
nytimes.com



2h

Plan of the talk

Our 'now' is in a deep and rapid transformation where science, policy and technology are tightly coupled

The new media enhance both speed and coupling

Social system theory helps diagnosing

Science holds important responsibilities

Reformation is impossible. Resistance?

There is a crisis in the quality control of science
which won't be fixed soon

Science's establishment between denial & technical
fixes

PNS predicted and diagnosed the crisis and its
ethical dimension

What to do?

http://timms.uni-tuebingen.de/tp/UT_20170925_001_pns3_0001

EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



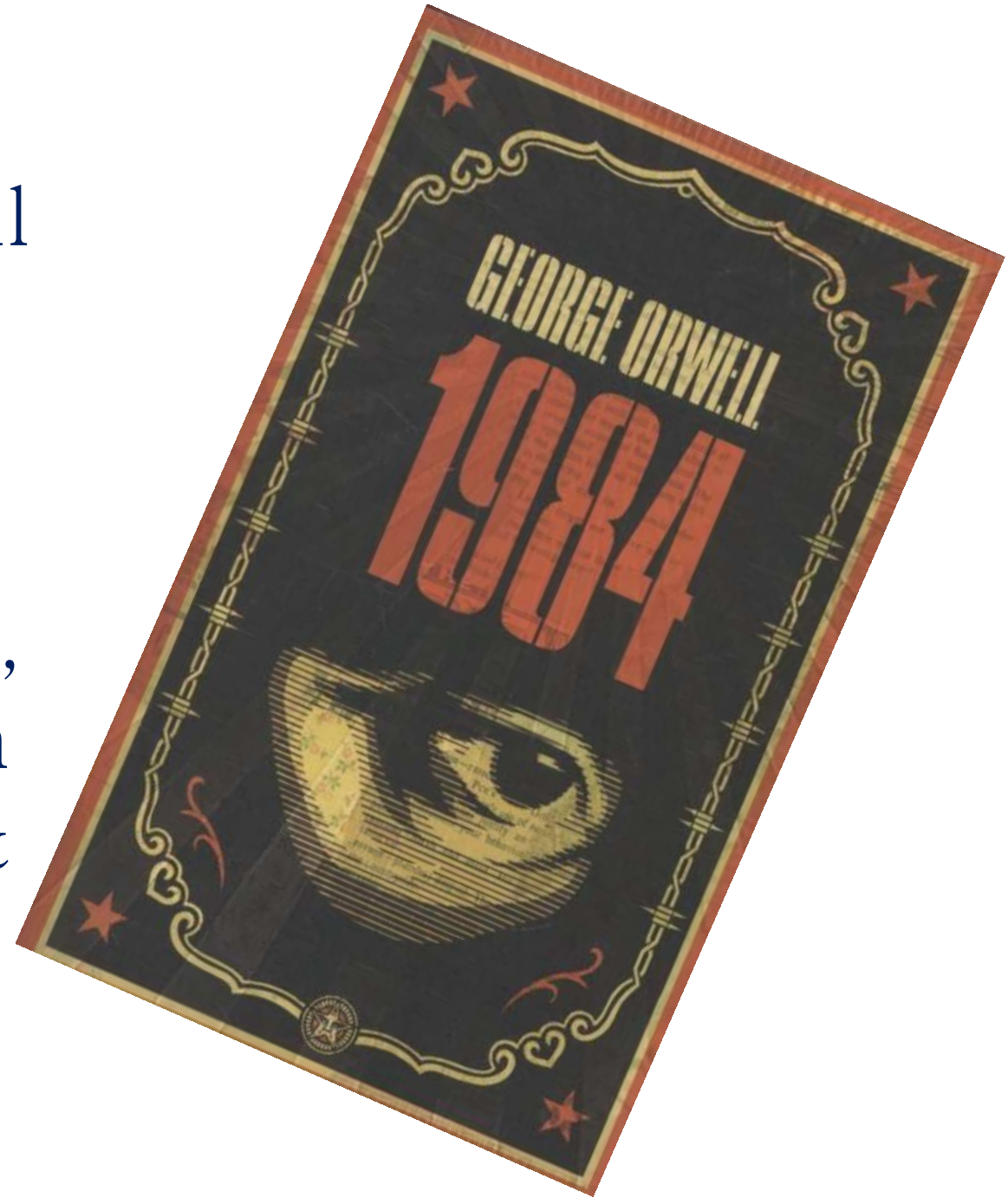
A triple crisis

Whose dystopia:
Huxley or Orwell?



George Orwell

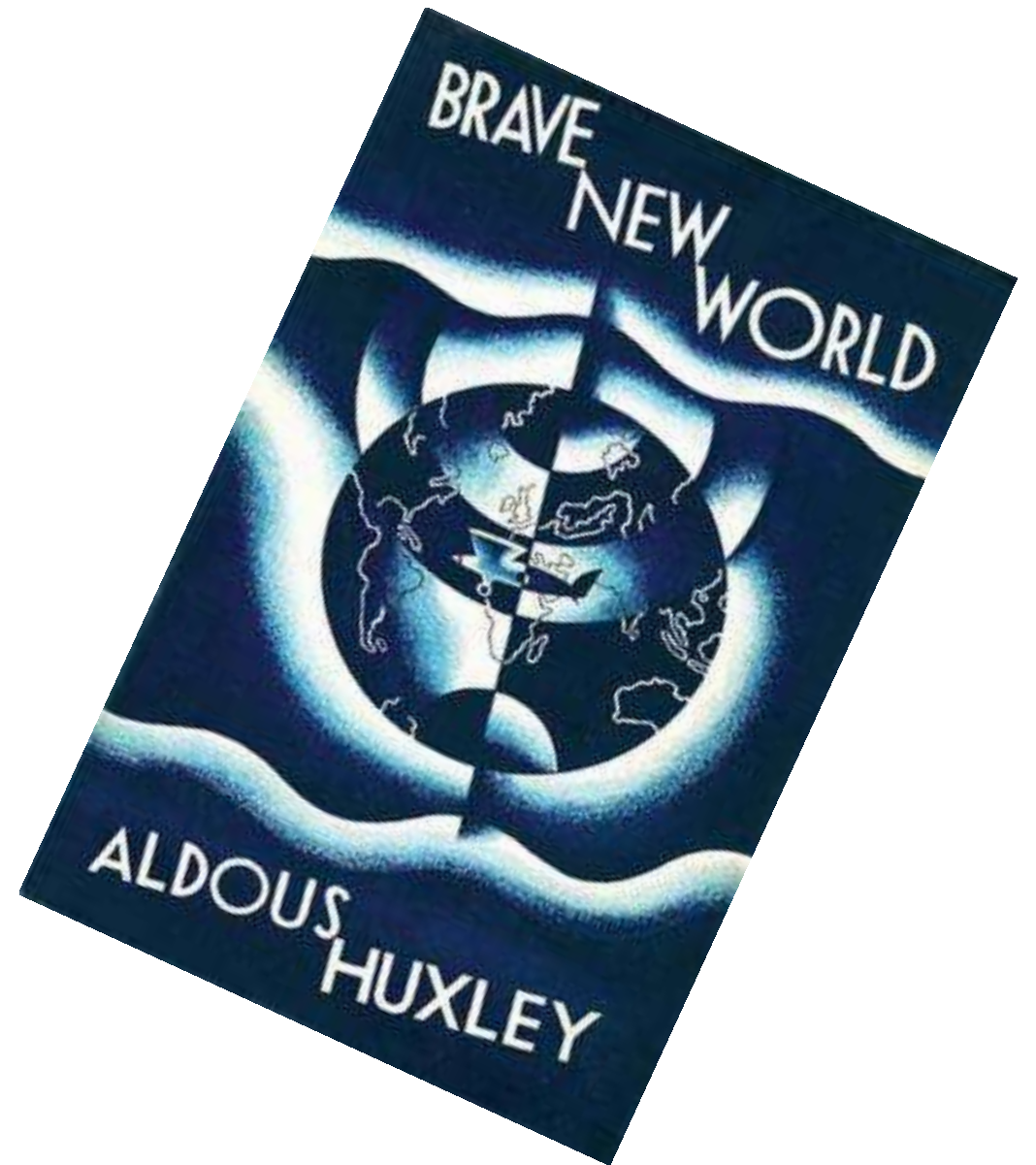
1949; a regimented society,
Big Brother in charge of an
omnipresent surveillance &
propaganda machine





Aldous Huxley

1932; a regimented
world where drug takes
care of consent



There was once upon a time
an interface between science,
policy and technology

This is no longer an interface.
It has filled all the available
space...



...permeating all discussions
on human condition

Majone, G. Evidence, argument, and persuasion in the policy process. Yale University Press, 1989.

A social system theory reading

Social evolution leads us toward
functionally differentiated societal
systems enhancing communication



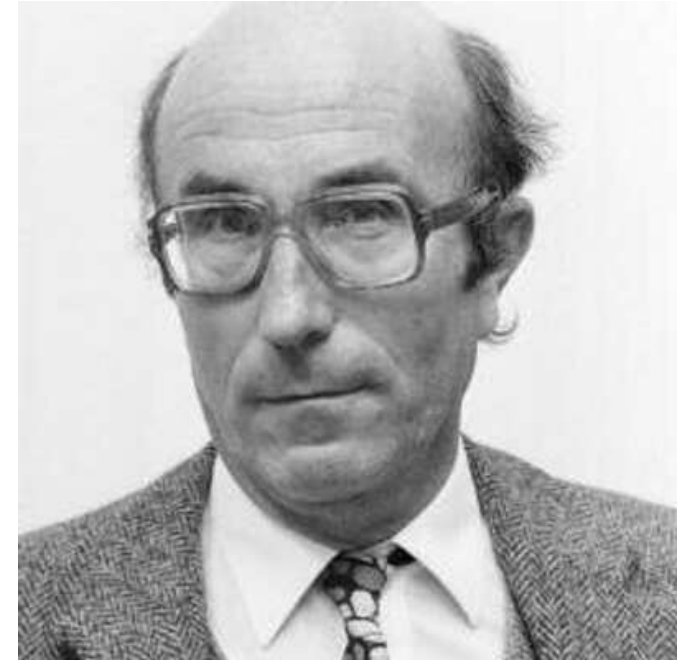
Niklas Luhmann

Moeller, H. G. Luhmann explained. Open Court Publishing Company, 2006.

For social system theory (Niklas Luhmann) our present society is functionally differentiated in systems such as law, science, the economy, the media, and politics.

This differentiation is what distinguishes our modernity from previous stratified social structure, whereby each individual had a role assigned at birth.

In a functionally differentiated society individuals inhabit and function in a plurality of systems.



Niklas Luhmann

System	Function	Efficacy	Code	Program	Organizations
Law	Elimination of the contingency of normative expectations	Regulation of conflicts	Legal/illegal	Laws, constitutions, Etc.	Courts
Politics	Making collectively binding decisions	Practical application of collectively binding decisions	Government/opposition Power/no-power	Political parties' programs, Government's programs	Parties
Science	Production of knowledge	Supply of knowledge	True/false	Theories, methods	Laboratories, universities
Religion	Elimination of contingency	Spiritual and social services	Transcendence/Immanence	Holy scriptures, dogmas	Churches, sanctuaries in general
Economy	Prevention of shortages	Satisfaction of needs	Payment/non-payment	Budgets Investments	Firms
Etc. (Mass media, Education, Health...)	Adapted from Moeller 2006 p.29, courtesy of Paul Marie Boulanger				

Generalized symbolic media of communication, such as money (for the economy), power (for politics) and truth for science allow simplifying complexity, and expediting transactions and communications.

Love as passion is itself, for Luhmann, a generalized symbolic medium of communication permitting enhanced levels of intimacy and communication.



Niklas Luhmann

Niklas Luhmann, *Love as Passion*, 1987, Harvard University Press

Science is mediatized, commoditized and politicized – even in its manifestation of internal crisis.

Social system theory → the structural coupling between different systems, the capacity of these systems to ‘irritate’ and ‘resonate with’ one another, and finally the capacity of one system to grow at the expenses of others.



Niklas Luhmann

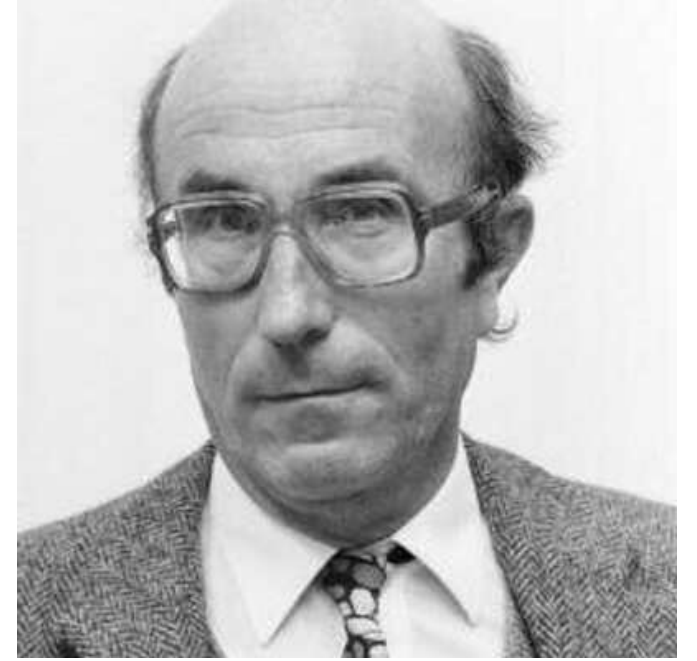
A. Saltelli and S. Funtowicz, “What is science’s crisis really about?,”
Futures, vol. 91, pp. 5–11, 2017.

Moeller, H. G. Luhmann explained. Open Court Publishing Company, 2006.

Science as structurally coupled with
technology, policy, media

What do system do? They communicate to
maintain their 'improbable' existence.

Human cultural evolution as moving toward
increasing the efficiency and the intensity
of communication



Niklas Luhmann

Humans as compulsive communicators

Lewis Mumford's 'Technological compulsiveness'



Niklas Luhmann



Lewis Mumford



Is the Brave New World
what we are entitled to?

Compulsive? Who
controls whom

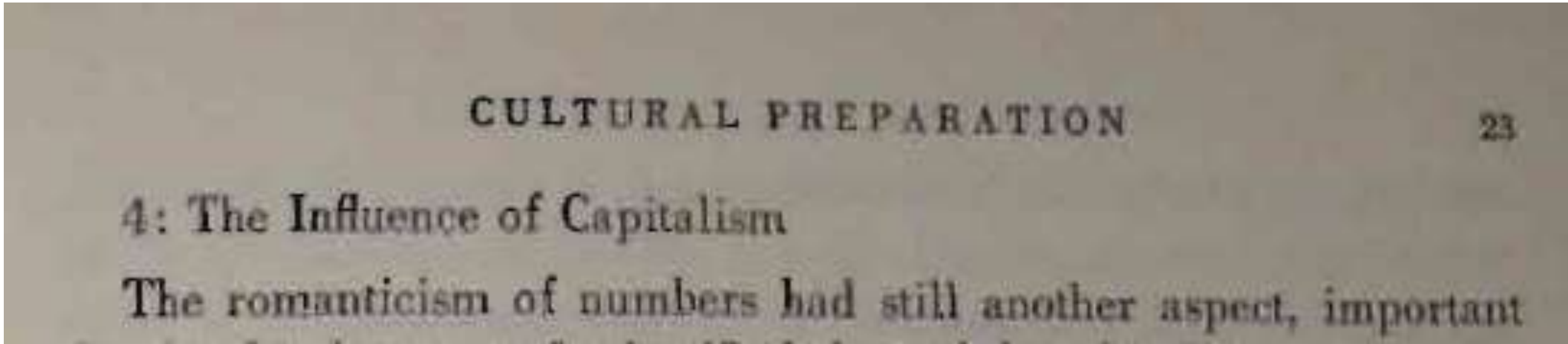
"Have you seen those zombies who roam the streets with their faces glued to their smartphones? Do you think they control the technology, or does the technology control them?"

Yuval Noah
Harari



Yuval Harari, 21 Lessons for the 21st Century, 2018, Jonathan Cape publisher; for autopoietic technology see also W. Brian Arthur, 2010, The Nature of Technology, Free Press.

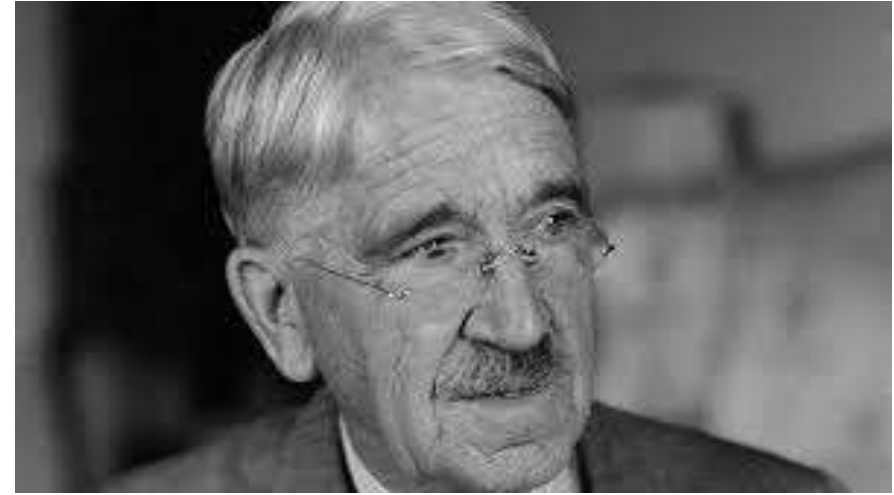
Lewis Mumford explained in 1934 how well the
'machine' integrates with capitalism



Lewis Mumford, **1934**, Techniques and Civilization, ROUTLEDGE & KEGAN PAUL LTD, p.
23-31 of the 1955 edition.

From pragmatists to anarchists (Peter Kropotkin, Mikhail Bakunin), from the fathers of the ecological movement to post-modern thinkers: a common concern about mastering science and technology

“Here lies the contradiction of our civilization. The potentiality of science as the most powerful instrument of control which has ever existed puts to mankind its one outstanding present challenge”



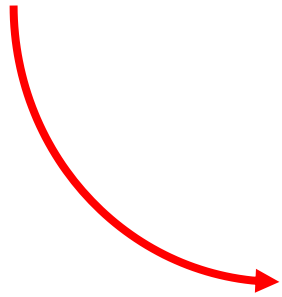
John Dewey

J. Dewey, Science and society, in ‘John Dewey: The Later work , 1931–1932 Vol. 6

“Science, which should have been the wind of truth to clear the air, has polluted the air, helped to brainwash, and provided weapons for war.”



Paul Goodman



Now resurgent concern for
military/authoritarian apps

Techies' fury at being drafted for Trump army

Working for the Pentagon is prompting staff revolts in Silicon Valley

Danny Fortson, San Francisco

November 4 2018, 12:01am, The Sunday Times

“From Amazon to Google, rank-and-file employees are revolting against their employers for taking the powerful tools they helped to build and selling them for unexpected purposes, from apprehending illegal immigrants to supercharging America’s war machine”



Doubts about the scientific quantification of the impact of new technologies



Fritz Schumacher

Langdon Winner



E. F. Schumacher, 1973, *Small Is Beautiful. Economics as if People Mattered*, Penguin Perennial.

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

Funtowicz, S.O. and Ravetz, J.R. (1994). The worth of a songbird: Ecological economics as a post-normal science. *Ecological Economics* 10(3), 197–207.

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



Jean-François Lyotard

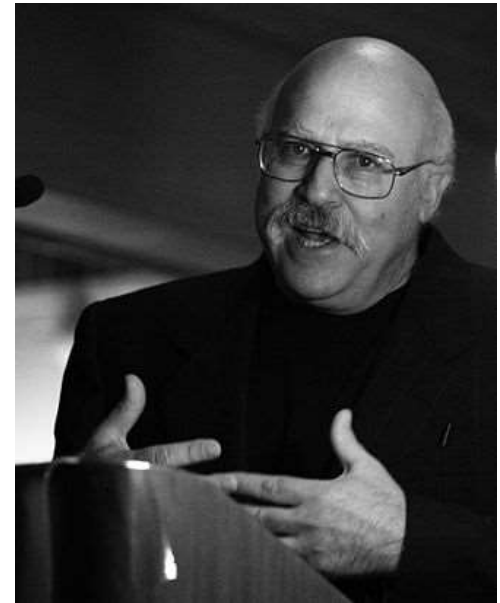
Lyotard, J.-F. 1979. La Condition postmoderne. Rapport sur le savoir, Paris : Minuit.

“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

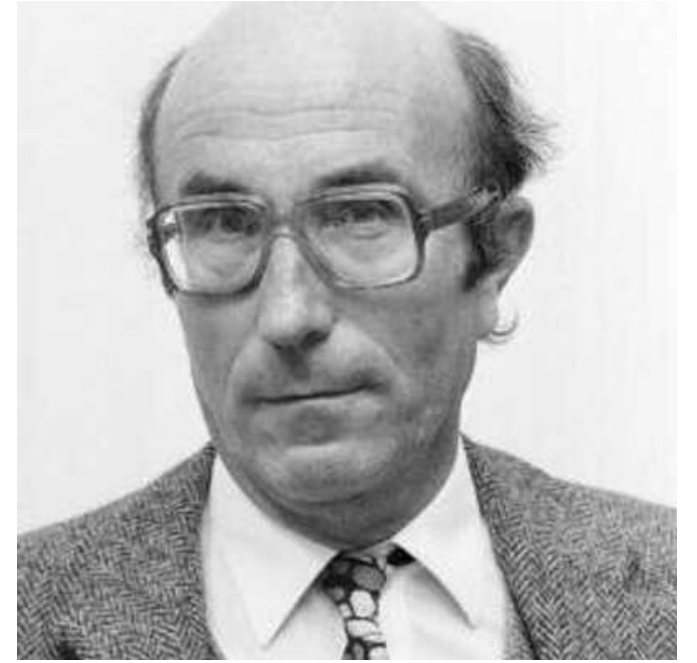


Steven Shapin

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

Trust in the form of ‘system trust’, is a fundamental ingredient of 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.

So far:

The crisis is triple: science, technology and policy;
it has to be the way it is

Communication our destiny, made ineluctable by a
self-organizing 'machine' (technoscience) efficiently
coupled to capital

Systemic effects of trust erosion

Divided we stand

For different publics: all becomes a conspiracy

For the science community: denial

For the lobbyists: exploit crisis to cut regulation

STS scholars repenting and atoning

Saltelli, A., 2018, Why science's crisis should not become a political battling ground, *Futures*, 104, 85–90.

Saltelli, A., Funtowicz, S., 2017, What is science's crisis really about? *Futures*, 91, 5–11.

A new breed of science wars



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?

What the present science war looks like:

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

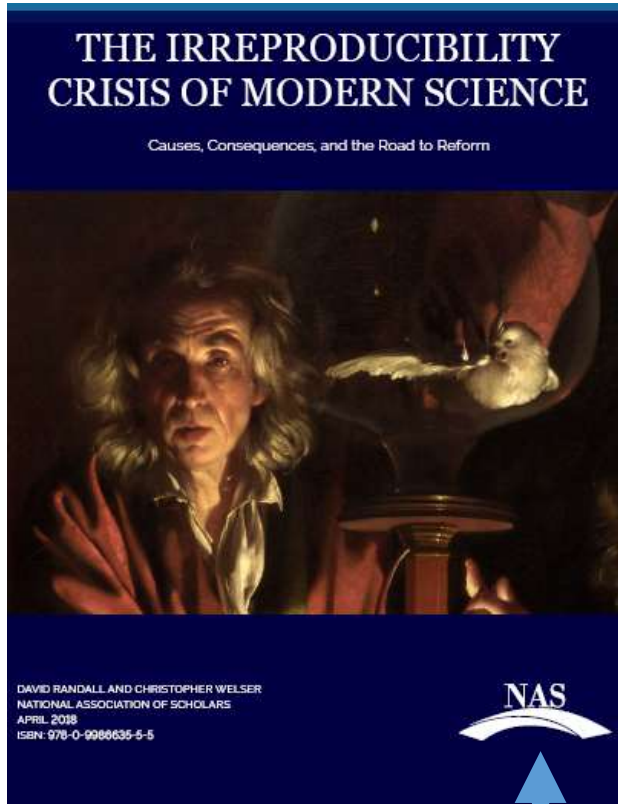
Daniele Fanelli

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.”

On the other side:(conservatives, corporations)



Crisis? Yes, due to progressives' assault on higher education with ideologies such as “neo-Marxism, radical feminism, historicism, post-colonialism, deconstructionism, post-modernism, liberation theology”

National Association of Scholars

THE IRREPRODUCIBILITY CRISIS OF MODERN SCIENCE

Causes, Consequences, and the Road to Reform



DAVID RANDALL AND CHRISTOPHER WELSER
NATIONAL ASSOCIATION OF SCHOLARS
APRIL 2018
ISBN: 978-0-9988635-5-5



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

**THE GLOBAL WARMING
POLICY FOUNDATION**

Director: Dr Benny Peiser



Common Sense on
Climate Change

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

PEER REVIEW

Why skepticism is essential

Donna Laframboise

“If half of published, peer-reviewed papers ‘may simply be untrue’, half of the papers cited by the IPCC may also be untrue”

Bruno Latour: regret and atonement

The New York Times Magazine

“It was as though the ice was sending me a message...”



Ava Kofman, Oct. 25, 2018, Bruno Latour, the Post-Truth Philosopher, Mounts a Defense of Science, New York Times. <https://www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html>

Old or new?

... and science's role in it



Salem witch
trials



#jewsdid911

Zion protocols



13. Cover of a popular French edition of the *Protocols*, c. 1934



14. Cover of another popular French edition, c. 1934

deepfake



Instead of cultural
evolution of the mind →
mind hacking

Jaron Lanier



Instead of science fostering social discovery →
poisonous algorithms (purposeful or otherwise)

Yuval Noah Harari, Homo Deus 2015 & 21 Lessons for the 21st Century, 2018.

Jaron Lanier, 2018 Ten Arguments for Deleting Your Social Media Accounts Right Now

<https://www.theguardian.com/society/2018/aug/23/russian-trolls-spread-vaccine-misinformation-on-twitter>

Instead of a strategy of
confusion → confusion
without strategy

Contradictions in the imaginary of science

Contradictions between:

The public image of science and its
roles (example: illuministic versus
colonial/imperialistic science)

Real and acknowledged uncertainty in
science's pronouncements (technological
hubris, techno-optimism, ecomodernism; the practice of
implausible quantifications)



Jerome R.
Ravetz

Ravetz, J. R. Postnormal Science and the maturing of the structural contradictions of modern European science. *Futures* 43, 142–148 (2011).

Contradictions between:

Technological progress and
technological risk (gene manipulation on
humans, autonomous lethal weapons,
algorithms...)

The quality arrangements of little
science and big or mega science



Jerome R.
Ravetz

Ravetz, J. R. Postnormal Science and the maturing of the structural contradictions of modern European science. *Futures* 43, 142–148 (2011).

Contradictions between:

Democratic aspirations and elitist practices



Jerome R.
Ravetz

Ravetz, J. R. Postnormal Science and the maturing of the structural contradictions of modern European science. *Futures* 43, 142–148 (2011).

Science destabilizing democracy instead of science as a self-regulated republic upholding the democratic model

Technoscience and power: from gene manipulation on humans to autonomous lethal weapons

Proletarianization of the research labour force:

“One can even imagine a bifurcation within science, between the socially elite grantholders, ... and the non-elite researchers, hoping in vain for social mobility or even for job security”



Jerome R.
Ravetz

J. R. Ravetz, “Post-Normal Science Symposium: Address by Jerome Ravetz Reflections on ‘informed critical resistance, reform and the making of futures,’” University of Oxford, Institute for Science, Innovation and Society, 2018. [Online]. Available: <https://www.insis.ox.ac.uk/article/post-normal-science-symposium-address-jerome-ravetz>.

Science reproduces the sins of the society, rather than being their cure

Recap:

A divisive crisis

A different crisis

An announced crisis

Where science plays a leading role

Science's responsibilities:

Climate

The division between science's image and science's role is acute in the present discussion about how to deal with climatic change

From concern to alarm, from alarm to panic

Main narratives: science as victim of big oil; if our lifestyles have not changed yet it is because of the so-called deniers – dark money and climate as a battleground for conservatives in the US

Perhaps we could change our consumption pattern ourselves irrespective of what deniers and president Trump choose to do.

World Health Organization: seven million people die every year because of atmospheric pollution (outdoor and indoor)

➔ Seven million reasons to reduce the consumption of fossil fuels without awaiting the climate Armageddon

Yet there is no public figure which is not onboard

Paul Krugman and the **depravity** of climate deniers; V. Shiva, N. Klein, N. Chomsky calling for citizens to organise for climate 'emergency'; climate strikes; US democrats for a Green New Deal



Greta Thunberg

Green New Deal – Joseph Stiglitz: “It is better to leave a legacy of financial debts, which our children can somehow manage, than to hand down a possibly unmanageable environmental disaster”



Joseph Stiglitz

= future generations to the gig economy?

Joseph E. Stiglitz, “From Yellow Vests to the Green New Deal,” Project Syndicate, Jan-2019.

The only institution
suggesting that jobs come
before climate is the catholic
church



Pope Francis

Pope Francis, “Laudato si’,” 2015,
http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html.

We can do it

Economy can be made circular, decarbonized,
climate can be geo-engineered

Mathematical models can predict damage in \$ up to
the year 2050 or 2100

Model generated numbers in the public narrative: to
limit temperature increase to 2 °C with a 50%
certainty a greenhouse-gas concentration of 450
ppm CO₂-equivalent should not be exceeded

The same elites which failed to predict Brexit and the election of Trump were taken by surprise by the yellow jackets



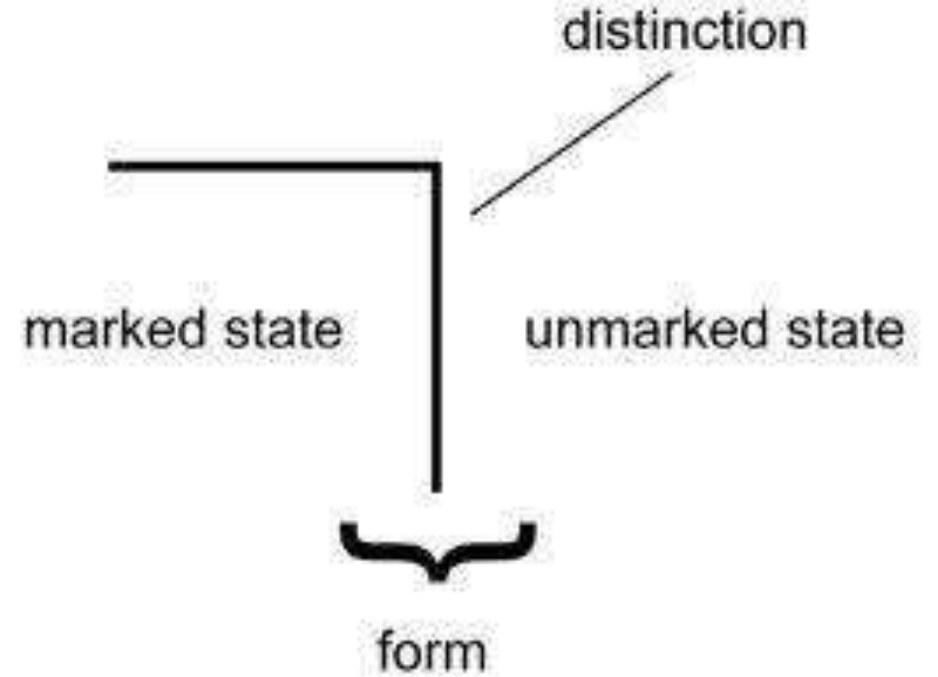
To use a form of taxation which hits the poor more than the rich to fix the environment appears to protesters as the ultimate effrontery of the elites.

The climatic day of reckoning
as a Baconian idol
(Idol of Theatre)

It assuages our anxieties
about the present by
projecting the threat into a
convenient not-so-close-to-
affect-me future

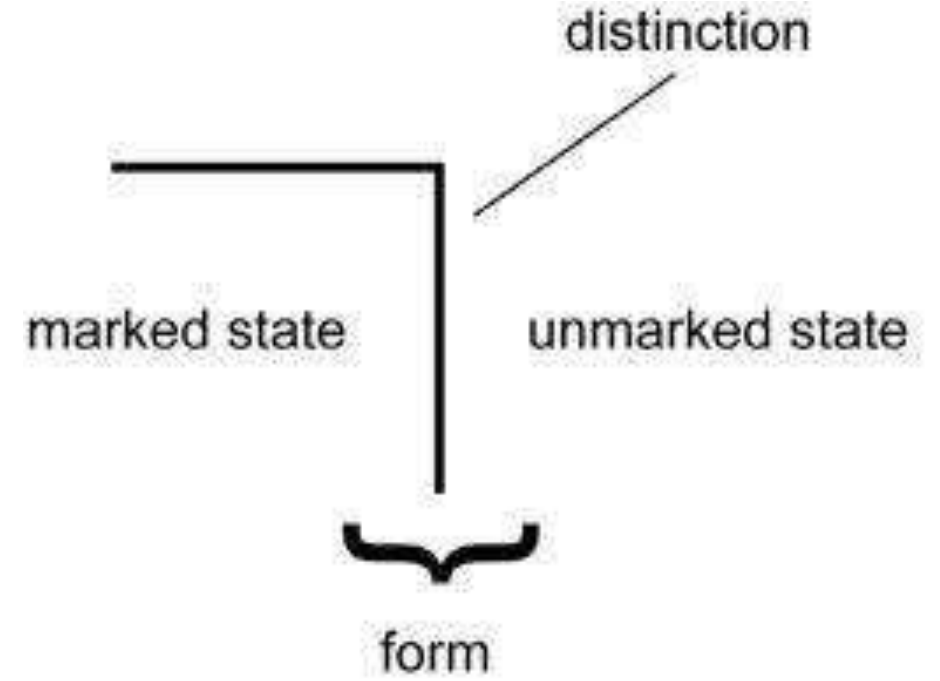


Instead of fostering ecological sensitivity, it boxes ecological problem into a single planetary container, where an **odourless and colourless gas** slowly increases the temperature of the planet



All observations
require a distinction
(N. Luhmann)

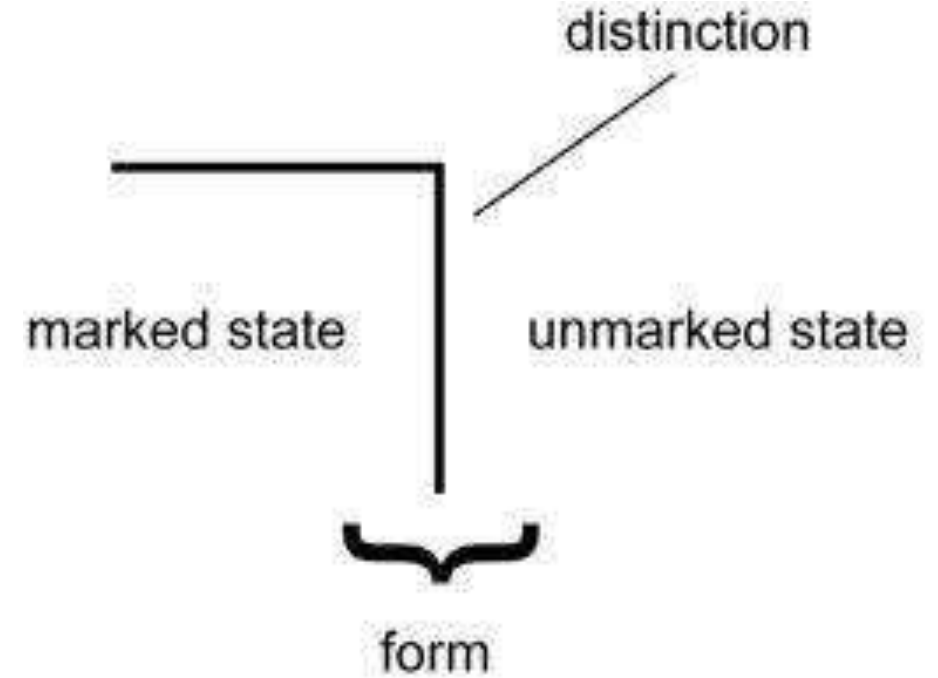
This vision risks subtracting energies from the fight against the messier aspects of our impact on the planet



All observation requires a distinction (N. Luhmann)

Since we need to fight all forms of fossil fuel we cannot fight the dirtiest, from tar sands to shale gas fracking

Since we take up a fight with fossil fuels corporations we cannot fight the agrochemical ones



All observation requires a distinction (N. Luhmann)

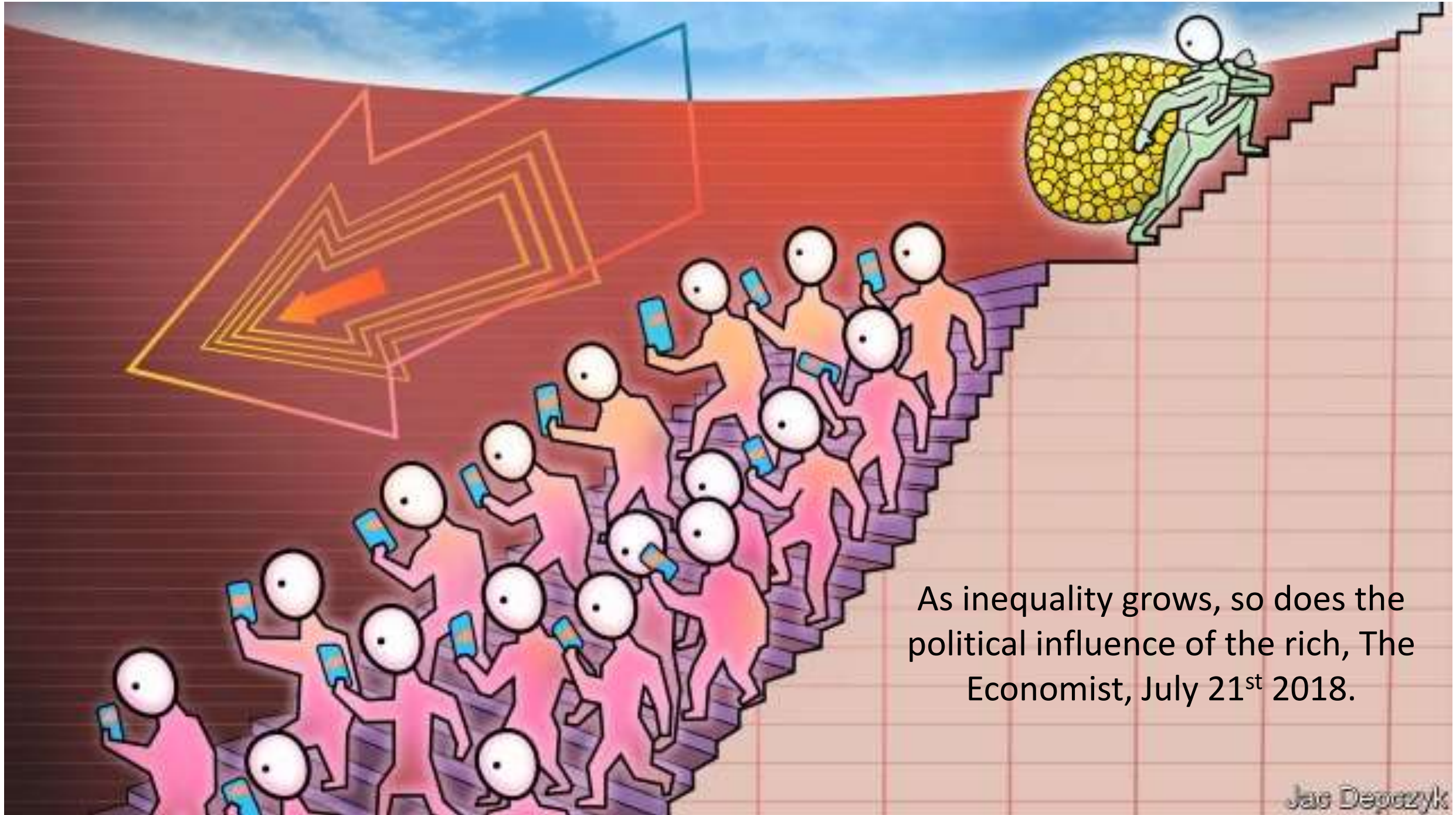
Science alienating from science a majority?

Science as the preserve of the elites?

A techno-spirit scenario; affluent super-technological and possibly trans-human/immortal minority, and a useless and distracted majority left glued to its mobile phones and tablets

Y. N. Harari, Homo deus : a brief history of tomorrow. Harvill Secker , 2016.

J. R. Lent, The patterning instinct : a cultural history of humanity's search for meaning. Prometheus Books, 2017.



As inequality grows, so does the
political influence of the rich, The
Economist, July 21st 2018.

Recap:

Science stakes all its epistemic authority on climate; other issues could be more urgent: collapse of fisheries to insectageddon, persistent organic pollutants, endocrine disruptors, and so on, to stay with the environmental threats

Rather than ending religious wars, science is starting some of its own – including internal ones (hoax on post-colonial and gender studies)

... but this is a minority
report

Nobel and Holberg Prize to advocates/practitioners of cost benefit analyses; new enlightenment frenzy...



William Nordhaus



Cass Sunstein



Steven Pinker

<https://www.sciencemag.org/news/2018/10/roles-ideas-and-climate-growth-earn-duo-economics-nobel-prize>

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

Steven Pinker, 2018, Enlightenment Now, Penguin.

Though increasingly the occasional vacuity of the serviceable quantification is exposed



Andrew Stirling



John Kay

...

<https://steps-centre.org/blog/how-politics-closes-down-uncertainty/>

<https://www.prospectmagazine.co.uk/magazine/the-price-of-everything-what-people-get-wrong-about-cost-benefit-analysis>

“A bewildering clamour of methods across wide areas of science, technology, the

[...]economy and society – complexities are routinely sidelined and expediently favourable numbers manufactured to suit the arguments of incumbent interests”



“‘tools’ like ‘externality assessment’, ‘impact analysis’ or ‘quantitative valuation’ help convince others which energy policy or health and safety standards or conservation strategy might be considered to be objectively ‘safest’, ‘safe enough’, ‘tolerable’ or even ‘best’”



“Each technique routinely delivers its answers with formidable levels of precision. Yet the resulting impression of accuracy is deeply misplaced”



[...] rhetoric clamour around ‘expected utility’, ‘decision theory’, ‘life cycle assessment’, ‘ecosystem services’ ‘sound scientific decisions’ and ‘evidence-based policy’

Recap:

Serviceable numbers still dominate the market

Reformation or
resistance?

“By ‘Reformation’ [of science] I mean simply an upheaval of belief that is of **religious depth**, but that does not involve destroying the common **faith**, but to purge and reform it...”



Paul Goodman

Paul Goodman, 1970, New Reformation, Notes of a Neolithic Conservative, PM press (2010 Edition).

“we are not going to give up the mass faith in scientific technology that is the religion of modern times; and yet we cannot continue with it, as it has been perverted.”



Paul Goodman

Paul Goodman, 1970, *New Reformation, Notes of a Neolithic Conservative*, PM press (2010 Edition).

A post-normal agenda for resistance:

- (1) Recast our public conversation about science – e.g. science isn't a victim
- (2) Seek inspiration in the radical 1970s-era movements that sought to change the world by changing first science itself – turn the deficit model on itself; privilege work with the NGO's and the scientific proletariat rather than with powerful institutions and lobbyists

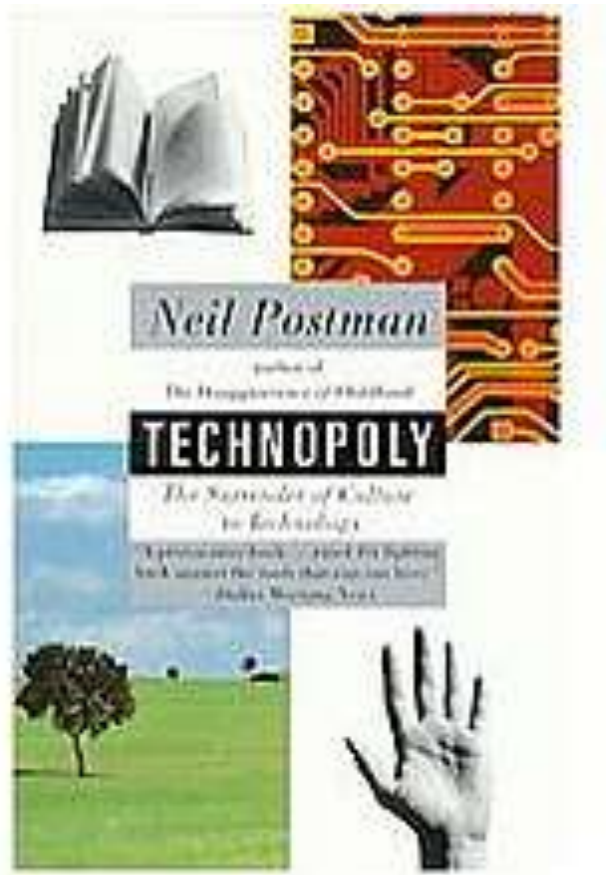
A post-normal agenda for resistance:

(3) Fight knowledge asymmetries; offer expertise to the weaker stakeholders; help them to shape the questions asked of science

(4) Fight methodological corruption, e.g. deconstructing shoddy quantifications, with tools such as NUSAP, sensitivity auditing ...

Saltelli, A., Guimarães Pereira, Â., Van der Sluijs, J.P. and Funtowicz, S., 2013, 'What do I make of your latinorum? Sensitivity auditing of mathematical modelling', Int. J. Foresight and Innovation Policy, (9), 2/3/4, 213–234.

... a resistance fighter who “maintains an epistemological and psychic distance from any technology, so that it always appears somewhat strange, never inevitable, never neutral”



Neil Postman



The End



@andreasaltelli