

Towards a Taxonomy of Ways in Which Current Science Lacks Integrity

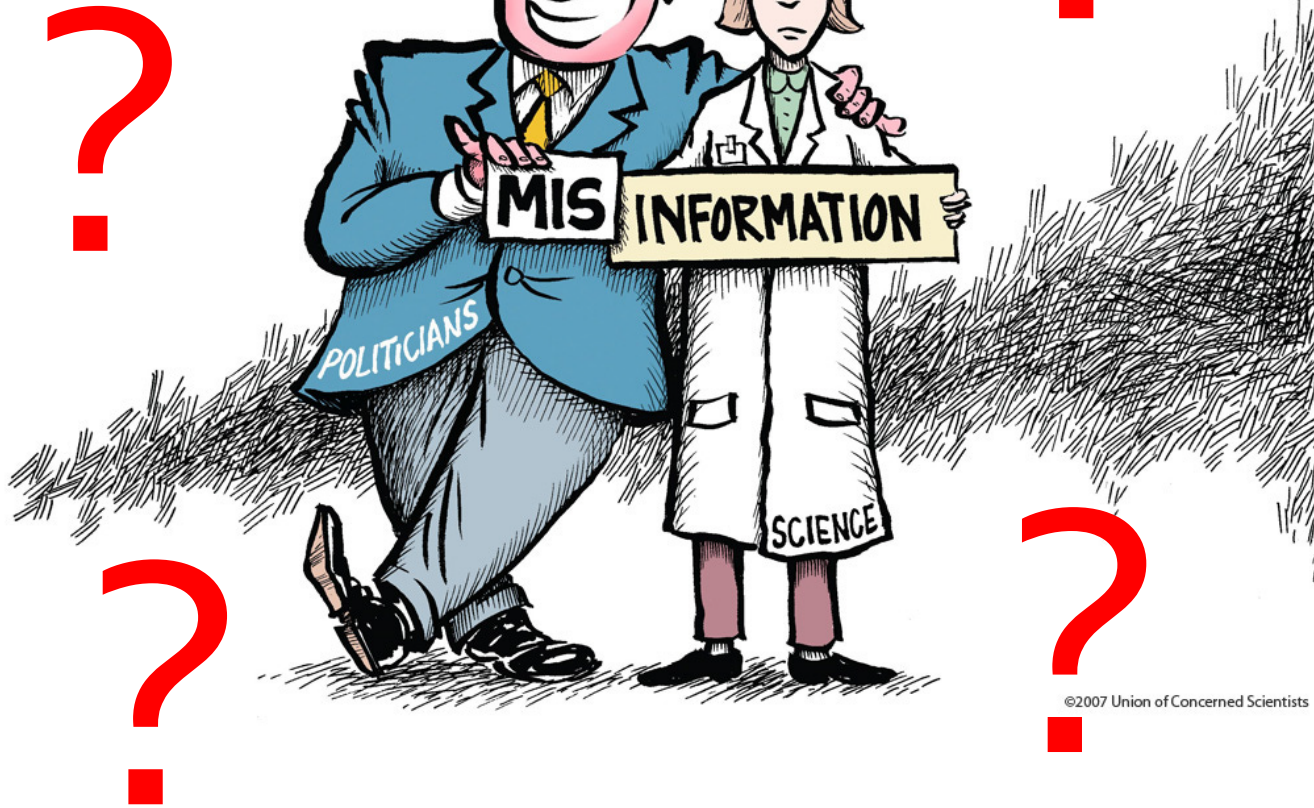
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DAY 2: Conference "The Integrity of Science" - Edinburgh (UK), 26 – 27 May 2023

PANEL: Scientific questions, findings and public policies: Denial, corruption, harassment and intimidation and links to public and corporate policies



SPRING 2007



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CONFERENCE “THE INTEGRITY OF SCIENCE”

“essentially contested
concepts” (Gallie, 1956)

Structure of presentation

[Where can we allocate responsibility for lack of scientific integrity?]

1 – Deliberate lack of integrity

2 – ‘Non-Deliberate’ lack of integrity

3 – Forms of Scientific Ignorance

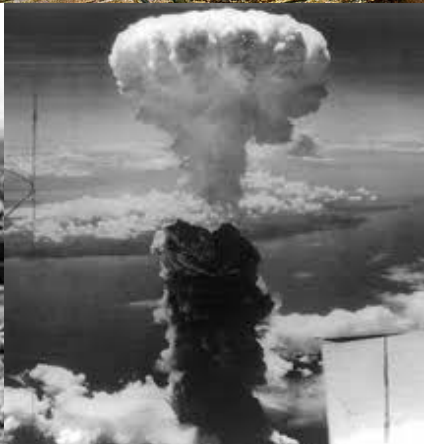
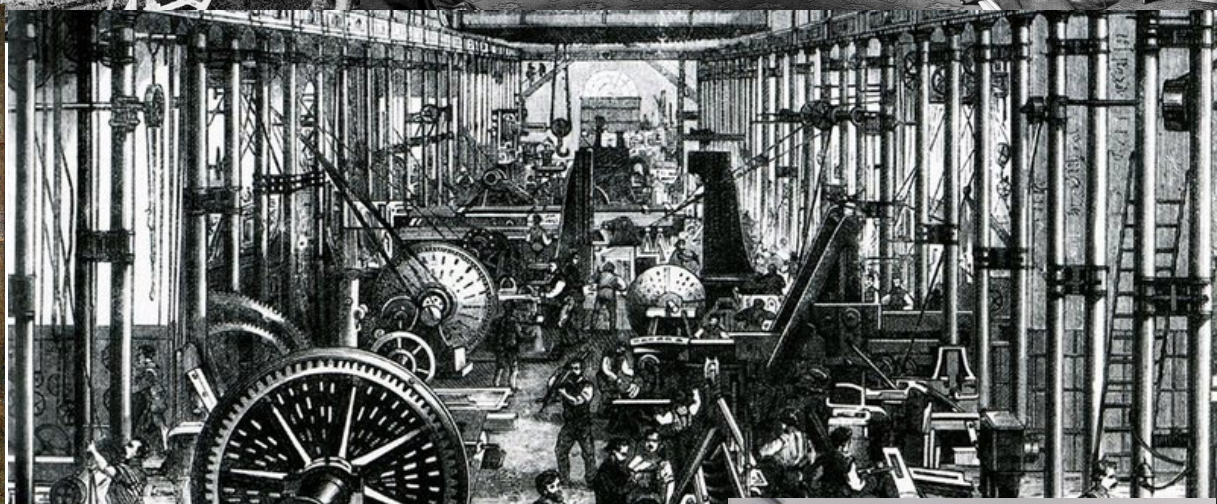
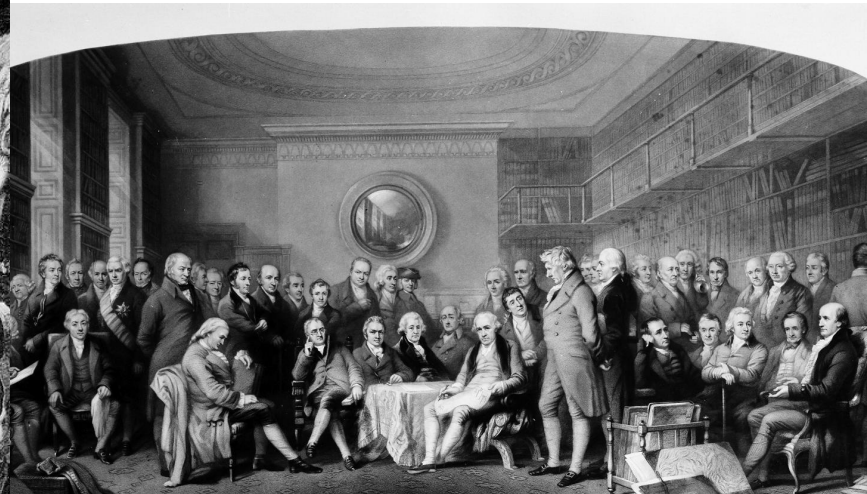
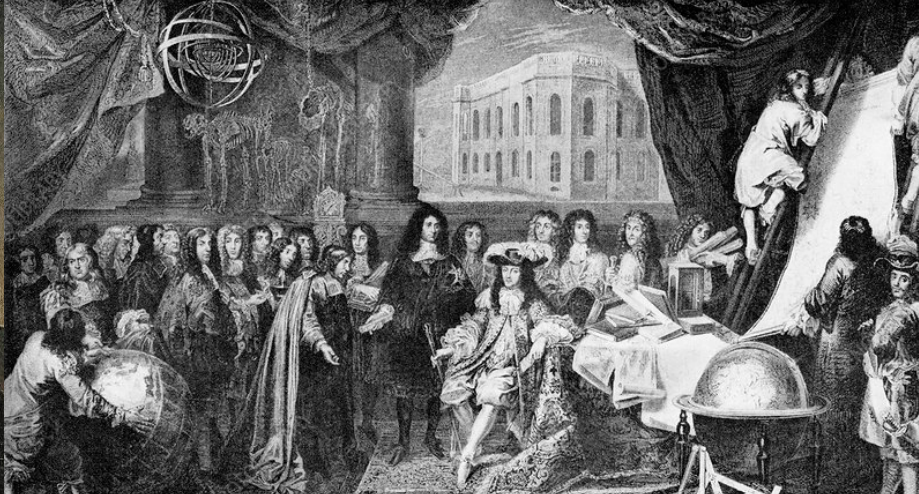




the quality of being....
the state of being.....

“Integrity” & “Science”

Some difficulties



A taxonomy of non-integrity

Ideals or Pretences?

communalism (that knowledge is owned by all)

universalism (the personal beliefs of a scientist or its cultural background do not matter)

disinterestedness (no value-based bias)

organized scepticism (the communities of peers ensures the quality and robustness of the claims).

Merton – CUDOS (1942)

Deliberate lack of integrity

- » A pandemic of retractions
- » Ghosts in the Machine
- » Manufacturing doubt

“Why don’t we know what we don’t know?”

Proctor in 2008 (p.18)



WE ARE STUDENTS
NOT CUSTOMERS



A pandemic of retractions

Competition and precarious job conditions lead to pressures to meet accelerated standards

- » plagiarism, data fabrication, and image manipulation
- » editors aim to keep the “prestige” of their journals
- » scientists aggressively seeking to eliminate competition

Retractions can be weaponized against scientific positions that challenge industry interests

- » Quist & Chapela, 2001 and Seralini et al., 2012
- » Corporate interests control editorial boards and peer review processes



Ghosts in the Machine

Consensus fabrication

- » Control over National Academies
- » Financial conflicts of interests
- » False idea that consensus is about quantity and not about quality-quantity peer-reviewed processes.
- » Become dominant in literature and influence education

Ghost authorships

- » Corporate interests control editorial boards and peer review processes
- » Falsifies scientists real publishing capacity
- » Hides precarious workers
- » Renders visible experts unnecessary, except as a means of conferring authority. (Sismondo, 2009)



Manufacturing doubt

Constructed ambiguity

- » Keep the debate alive
- » Make claims refuted by previous literature
- » Spread misinformation
- » Controlled the media
- » Give rise to businesses that manage doubt
- » Controlled regulatory process

Macro Strategies A-E and meso strategies 1–19 (grey cells indicate where we did not identify attempts to influence science, not evidence of lack of industry activity)	Industry sectors							
	Alcohol	Chemicals and manufacturing	Extractive	Food and drink	Fossil fuels	Gambling	Pharma and medical tech	Tobacco
A. Influence the conduct and publication of science to skew evidence bases in industry's favour	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
1. Fund and undertake “safe” research	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
2. Covertly undertake or prevent potentially “risky” industry research		✓□			✓□		✓□	✓□
3. Control design and analysis of industry-funded science to ensure favourable results	✓□	✓□	✓□	✓□	✓□		✓□	✓□
4. Shape and undermine external research			✓□	✓□		✓□		✓□
5. Ensure favourable research is heavily represented in the evidence base	✓□	✓□	✓□	✓□	✓□		✓□	✓□
6. Control reporting and suppress publication of unfavourable science	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
B. Influence the interpretation of science to undermine unfavourable science and create a distorted picture of the evidence base	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
7. Develop and promote industry-friendly criteria and concepts for critiquing science		✓□			✓□			✓□
8. Obtain and reanalyse raw data from unfavourable science		✓□		✓□	✓□		✓□	✓□
9. Attack and misrepresent science	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
10. Monitor and attack scientists and organisations	✓□	✓□		✓□	✓□	✓□	✓□	✓□
C. Influence the reach of science to create an ‘echo chamber’ for industry’s scientific messaging	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
11. Use legal means to protect industry evidence from being discovered or accessed		✓□	✓□				✓□	✓□
12. Contract messengers to create scientific “echo chambers”	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
13. Fund, produce and disseminate materials which package science in industry-favourable ways	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
14. Use education, events, and meetings to disseminate industry-favourable scientific messages to key stakeholders	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
15. Maximise press coverage of industry-favourable scientific messages	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
D. Create industry-friendly policymaking environments which shape the use of science in policy decision-making in industry’s favour		✓□		✓□	✓□		✓□	✓□
16. Implement and utilise industry-friendly standards of evidence in regulatory decision-making		✓□		✓□	✓□			✓□
17. Secure and utilise policymaking reforms which increase reliance on and provide a conduit for industry-favourable evidence		✓□			✓□		✓□	✓□
E. Manufacture trust in industry and its scientific messaging	✓□	✓□	✓□	✓□	✓□	✓□	✓□	✓□
18. Manufacture a picture of industry credibility	✓□	✓□		✓□	✓□	✓□	✓□	✓□
19. Conceal industry’s involvement in science, scientific messaging and influence on policy reforms that affect the use of science	✓□	✓□	✓□	✓□	✓□		✓□	✓□
Total macro (out of 5) & meso (out of 19) strategies	4 (12)	5 (18)	4 (12)	5 (15)	5 (17)	4 (10)	5 (16)	5 (19)

Legg, T., Hatchard, J., & Gilmore, A. B. (2021). The science for profit model—how and why corporations influence science and the use of science in policy and practice. PLoS One, 16(6), e0253272.

Scientific Non-integrity by accident?

- » Ignorance²: ignorance of ignorance
- » Political Economy of Promise
- » Shackles of funding – EU mission-oriented

Q - How is scientific ignorance about scientific ignorance, a question of scientific integrity?



The Case of CFCs & Stratospheric Ozone

- » CFCs developed in 1930s, permitted after regulatory Qs, 1940-1970 (a family of chemicals...)
- » Lovelock (1979) "No conceivable harm can come from environmental releases of CFCs"
- » 1985 *Nature*, Joe Farman and team publish finding of the ozone hole, and CFCs cause
- » Noone before that knew to ask the question of effects of CFC permeation from Earth surface to stratosphere 12-20 km altitude, uv light and temp conditions destroy ozone.
- » RA didn't ask, before defining CFCs as safe – They weren't only ignorant of the damaging effects; they were ignorant of the *question*
- » This is not an exceptional case

SCIENTIFIC IGNORANCE - DENIAL AND DELETION

“[AEBC]: Do you think people are *reasonable* to have concerns about possible ‘unknown unknowns’ where GM plants are concerned?

[ACRE Chair]: *Which* unknowns?

[AEBC]: That’s precisely the point. They aren’t possible to specify in advance. Possibly they could be surprises arising from unforeseen synergistic effects, or from unanticipated social interventions. All people have to go on is analogous experience with other technologies....

[ACRE]: I’m afraid it’s impossible for me to respond unless you can give me a clear indication of the unknowns you are speaking about.

[AEBC]: In that case don’t you think you should add health warnings to the advice you’re giving ministers, indicating that there may be ‘unknown unknowns’ which you can’t address?

[ACRE]: No, as scientists, we have to be specific. We can’t proceed on the basis of imaginings from some fevered brow....”

Final Remarks

- As public authority, science has a public responsibility to know, and to communicate, its own state of ignorance, and contingency, as well as its knowledge.
- Where can we allocate responsibility for lack of integrity? The usual tendency is individual; yet institutions, and political pressures, are often causal
- Should scientific integrity be understood as requiring continuous self-reflexivity? Challenging!!
- When political leaders require scientists to provide overly certain 'advice', can scientists speak truth to power?
- Since science alone cannot determine its own integrity, what changes could help remedy science's integrity-deficits and promote its robustness?

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Thank You

