

Cutting corners, speeding, cheating, and heavy legal machinery in science: Why scientific integrity cannot be contained as a fringe problem

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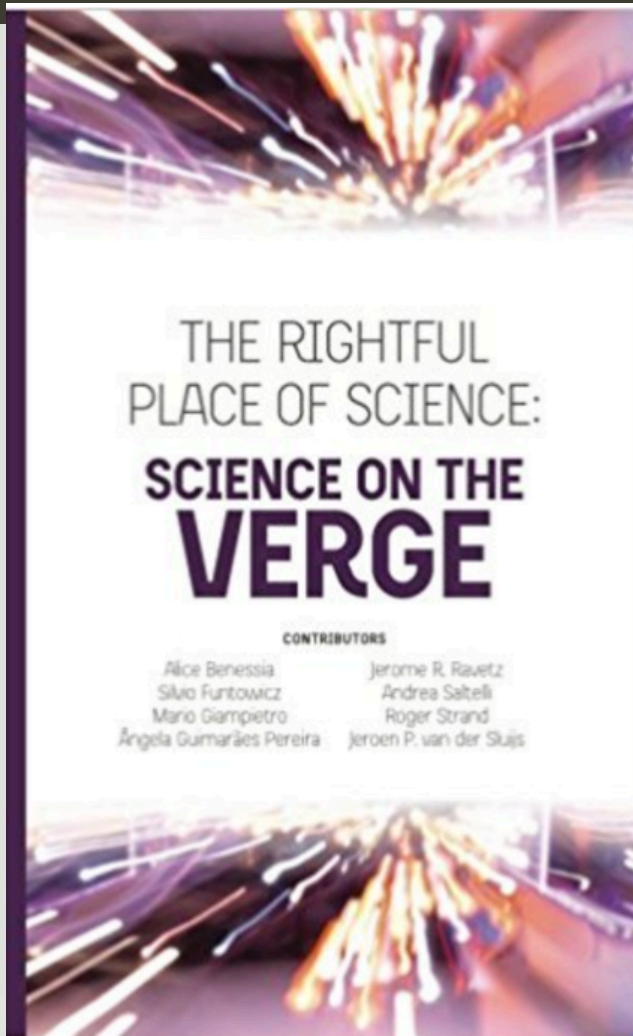
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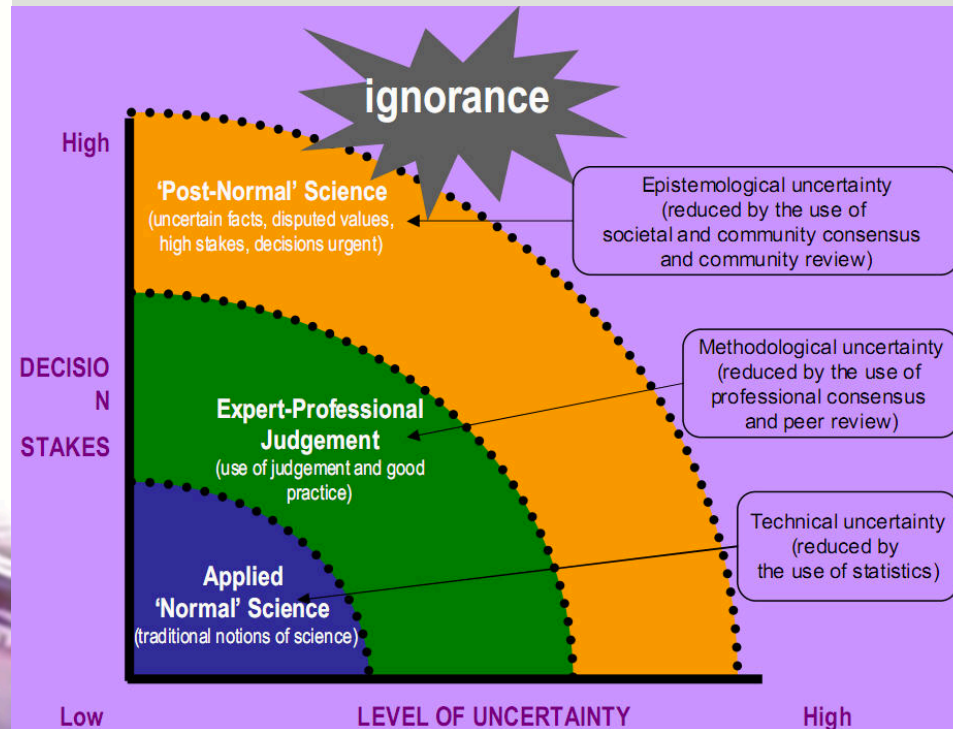


A "philosophical" contribution

■ Cf also:



Post-normal science;
Funtowicz & Ravetz 1992



Reflect:

- How many times have you been speeding recently?
- Now, what do you do when the GPS Navigation System tells you it is X minutes to goal, but you were detained in traffic and thus e.g. 3 minutes behind schedule?



The probable causes of scientific misconduct?

- Rotten apple theory
- Lack of training and knowledge
- **Systemic factors in knowledge production**



What I do NOT accept:

- That the main problem with scientific integrity rests with human psychology of the individual;
- That FFP & QRP exhausts the main bulk of problems of scientific integrity;
- That problems of scientific integrity are at the periphery of good science;
- That we can aim at "objective" measures of scientific integrity;

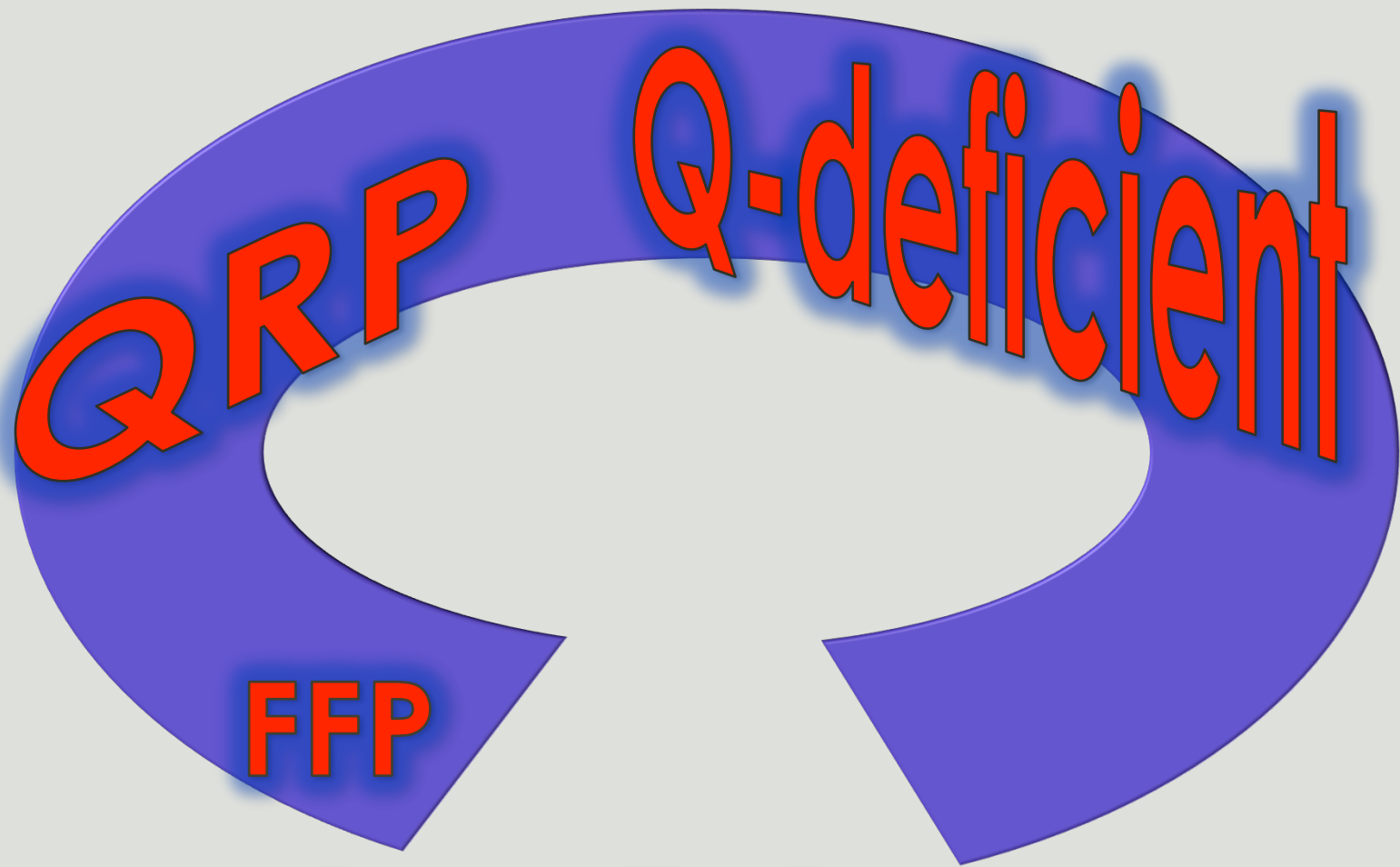
Rather I tend to argue:

- Scientific integrity has become a serious problem because our current science – **all of it** – is in a deep **crisis**!
- The crisis of **integrity** = the crisis of **quality** in science.
- Supposedly objective systems to monitor and navigate the quality of science are in effect **counter-productive**.
- The more "**scoring**" becomes a part of institutional culture and personal career patterns, the more we **undermine** quality.
- "**Big science**" structures (management and commoditization) cover up rather than reveal the roots of the problem.



Evidence of crisis:

- Retraction watch revealing increasing trends of retractions.
- Anecdotal evidence of extreme cases of fraud and betrayal in science. Closer to home: many less extreme but still severe cases.
- The reproducibility crisis (e.g. Begley & Ellis 2012)
- P-hacking and useless statistics (Ioannidis 2005; J.P.v.d. Sluijs 2016)
- Overselling of (composite) indicators and numbers (Giampetro & Saltelli 2014)
- Lack of predictability in important global areas (Saltelli & Funtowicz 2014)



Quality = fit-for-purpose

Systemic?

- The pace of publications
- The carving out of smaller specialisations
- Legal frameworks around research (commitment to planned results)
- Innovation pressure => patents & limited secrecy & increased competition
- Career pressures (h-index, high impact journals, soft money, etc)

The theory (or: the illusions of safety)

- In a system of total monitoring coupled to one-dimensional paths of progress, any delay in relation to estimated milestones will be balanced by acceleration.
- General psychology: the more safety measures we build into the system, the more wreckless behavior is encouraged.

Translation:

- One-dimensionality of research developments, coupled to measurable milestones and monitoring of progress leads to temptations of cutting corners and speeding.
- Individual accountability and responsibility is seen as taken away from the individual, and thus placed on the "system".
- Asymmetry: After the damage, the public tends to see the individual as solely responsible (human failure).

What to do?

What we need anyway:

- ▣ Transparency
- ▣ Open science
- ▣ Responsibility and accountability (RRI)
- ▣ Advisory bodies
- ▣ Better training
- ▣ Extended peer-reviews (NB \neq citizen science or co-production of knowledge)

What I would like to see:

- ▣ **Slow science**, i.e. longer and wider processes of knowledge quality assessment;
- ▣ Inclusion of study of scientific **failures** in study;
- ▣ **Pluralism** in methodology and knowledge validation;
- ▣ Explicit assessments of **uncertainty** and **values**.

Criticism:

- Citizen science (co-production of knowledge etc) over-estimates the analytic power of citizens;
- It also over-estimates their engagement in theoretical issues (stakeholder fatigue);
- It unnecessarily inflates many issues;
- With a new type of responsible scientist it is not needed.

My conclusions:

- Bureaucratic short-term measures seem limited in their effect.
- Transparency, openness, extended peer-reviews and pro-longed quality control mechanisms are necessary but not sufficient mechanisms to improve the integrity of science.
- Hopes for the workings of citizen science, co-production of knowledge, or even Do-it-yourself-science to correct current failings may be pipedreams of an intellectual elite!
- We need **to re-invent** the scientist, the universities, and the communications of research.
- Core-element of new paradigm for **slow science** must be the introduction of **plurality**, the scoping of **uncertainty**, the visibility of **values**, and the assesement of **failure**.

Thanks for your kind attention!



Just one more thing... is your
data faked?

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