SHOULD SCIENCE BECOME MORE DEMOCRATIC?

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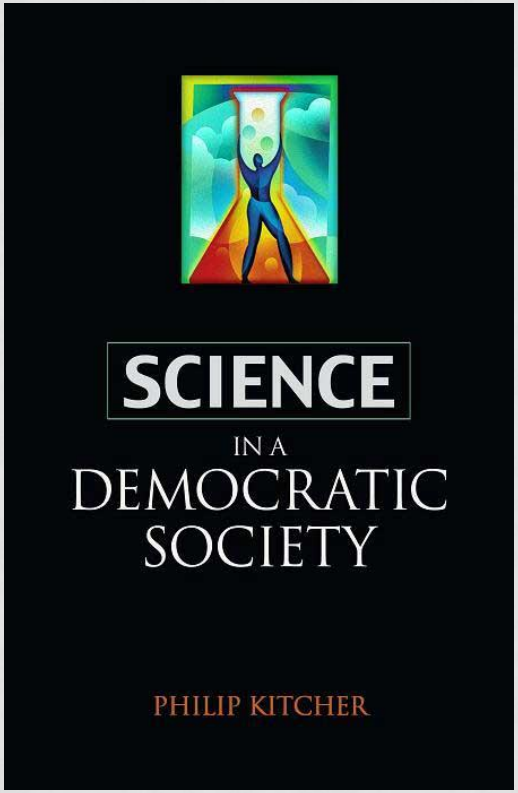
"We urgently need a theory of the place of Science in a democratic society – or, if you like, of the ways in which a system of public knowledge should be shaped to promote democratic ideals … the central question for the general philosophy of science (if not for epistemology) today – is to present a theory of this sort."

But why? If science is in the business of uncovering (or approximating) truth, isn't this requirement irrelevant?



THE STANDARD IMAGE

- systematic, free and dispassionate inquiry into the nature of a value-free and theory-free reality: science is concerned with how the world is, not how we should act on this knowledge
- unidirectional progression from science (incorporating the best available knowledge) to society (as recipient and user of this knowledge)
- the *social legitimacy* of science is assumed to derive directly from its *epistemic reliability*

SOME PROBLEMS

- Epistemic activity is socially embedded and value-laden
  - Assumptions and values underlying research
    - Instrumental approach to environment (factor of production)
    - Environmental degradation as market failure
    - Substitutability of natural and produced capital
  - Need to acknowledge bias, special interests, power relations (ex: the influence of big industry)

- Dealing with complexity and uncertainty: no easy way out
  - Is uncertainty always reducible to risk? The precautionary principle.

THE TECHNOCRATIC APPROACH

- Research as puzzle-solving following expert-defined criteria and procedures ('engineering approach')
- Values and normative commitments are defined outside the scientific process (e.g. by policy-makers, funding bodies)
- Limited transparency, public participation and public accountability

THE 'DEMOCRATIC' APPROACH

- *Epistemic egalitarianism or majoritarianism*:
  - appealing to mass participation, *taking public beliefs and preferences as given* ('survey-based knowledge')

- *'Epistemic Darwinism'*: science to address societal needs and interests as expressed by the most influential interest groups (political, economic)
  - Risk of dominance by well-organized minorities or power players

KNOWLEDGE QUALITY

- Therefore: reductionist understanding of knowledge quality; these options emphasize one criterion (ex. legitimacy) at the expense of others (ex. reliability).
- Epistemic vs. non-epistemic responsibilities of scientists
- If science is acknowledged as having an intrinsic moral responsibility, then knowledge quality has to better integrate requirements of relevance and legitimacy, apart from its usual focus on reliability.

Trade-off vs. **mutual reinforcement**

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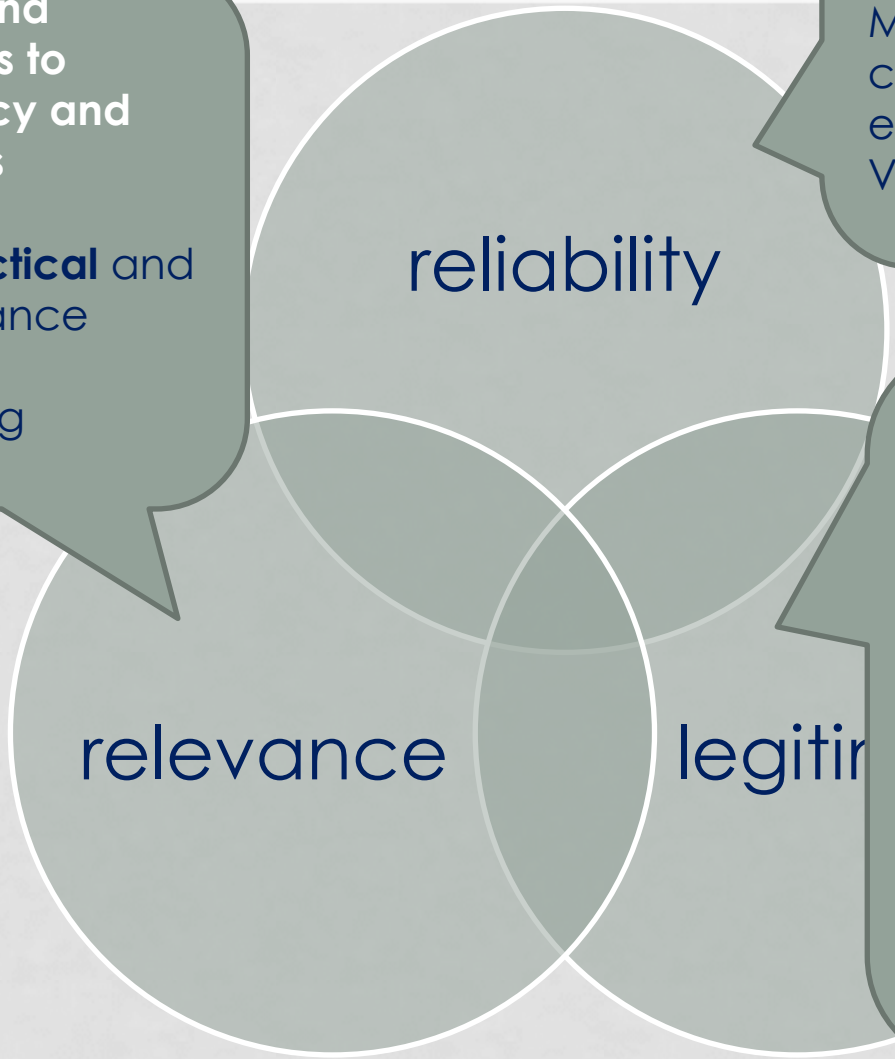

the credibility, validity and adequacy of the epistemic processes and resulting knowledge

Methodology: data collection, replicability of experiments etc.
Validation of results

the salience and responsiveness to scientific, policy and societal needs

Scientific, **practical** and **societal** relevance

Agenda-setting
Use of results

the perceived fairness and balance of the epistemic processes

Focus on the process: procedures, participation, accountability, transparency.

Who is involved
What type of involvement
Whose needs are addressed

REFLEXIVITY

- Bidirectional influence between subject and object
- Collaborative process of acknowledgement, critical deliberation and mutual learning on values, assumptions, norms and practices
- Reductionist understanding of:
  - Reliability: positivist assumptions
  - Relevance: reduced to scientific relevance
  - Legitimacy: used to legitimate a pre-existing research agenda or epistemic egalitarianism

Lack of reflexivity

DIMENSIONS OF REFLEXIVITY

- **Critical reflexivity: questioning assumptions, values and social context**
  - Deliberation on assumptions and values
  - Questioning the social, institutional and political context of research

- **Practice-based reflexivity: facilitating social experimentation and innovation**
  - Explicit normative orientation ('participatory action research')
  - Extended participation: emphasis shifts from the expert community to a broader 'community of practice'
  - participatory processes addressing both epistemic and legitimacy aspects

Values as given vs. values as result of deliberative inquiry.

HOW TO VALUE WITH MONEY

Total economic value (TEV) = direct-use value + indirect-use value + non-use and intrinsic value

Ecosystem services: nature as a source of services to humans; quantitative valuation needed to maximize utility from services (in the long run).

For the **entire biosphere**, the value (mostly non-market) was estimated to be in the range of US$16–54 trillion per year, with an average of **US$33 trillion per year** (in 1997, total global GDP was $27 trillion) (Costanza 1997)

Table 4.2 *Preference valuations for endangered species and prized habitats*

Species		Preference valuations (US 1990 $ pa per person)
Norway:	brown bear, wolf and wolverine	15.0
USA:	bald eagle	12.4
	emerald shiner	4.5
	grizzly bear	18.5
	bighom sheep	8.6
	whooping crane	1.2
	blue whale	9.3
	bottlenose dolphin	7.0
	California sea otter	8.1
	Northern elephant seal	8.1
	humpback whales[1]	40–48 (without information)
		49–64 (with information)
Habitat		
USA:	Grand Canyon (visibility)	27.0
	Colorado wilderness	9.3–21.2
Australia:	Nadgee Nature Reserve NSW	28.1
	Kakadu Conservation	40.0 (minor damage)
	Zone, NT[2]	93.0 (major damage)
UK:	nature reserves[3]	40.0 (`experts' only)
Norway:	conservation of rivers	59.0–107.0

PROBLEMS WITH CONTINGENT VALUATION

- is incapable of supporting multi-objective approaches and incommensurable values, because TEV has to result in a single aggregated value
- Usually covers only what is currently demanded / more visible, represents current knowledge and preferences (ex: children prioritize virtual exotic biodiversity over local biodiversity, PLoS One 2011)
- takes the prices estimated for ecosystem services to be the value of the ecosystem (from proxy / metaphor to real value)

PROBLEMS WITH CONTINGENT VALUATION

- Is anthropocentric, tends to disregard biocentric, ecocentric or holistic arguments
- Is implicitly utilitarian (disregards reasons based on a deontological or virtue ethics approach)

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What is the institutional, economic and political context of valuation?

Where does the funding come from?

Are there safeguards against interference from political, economic or other special interests?

What are the standard assumptions of research? Are they explicitly acknowledged? Are they questioned?

Who sets research priorities? Who frames the problem?

Economists? Ecologists? Politicians? Special interest groups?

Are complementary or alternative valuation methods used?

Is pluralism encouraged?

Whose problems and interests are taken into account?

CONCLUSIONS

- The epistemic value of science cannot be disconnected from questions of relevance, legitimacy and problem-solving efficacy.
- Reasoned moral and value commitments as an *internal* matter of science > space for options beyond the conventional choice between *technocracy* and *epistemic egalitarianism*.
- Reflexive processes > identifying ways of integrating requirements of reliability, relevance and legitimacy as mutually-reinforcing aspects.

CONCLUSIONS

- Should science become more democratic?
  - 'Vulgar' vs. 'enlightened' democracy
  - Intrinsic social & ecological responsibility
  - Reliability, relevance and legitimacy as mutually-reinforcing requirements

Thank you!

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