# Regulation of Emerging Technologies at the Interface of Evidence, Values and Culture

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# (1) Anecdote

# (2) Vantage Point

# (3) Thesis

**Thesis**

- Risk assessment and the use of the PP play now a major role in environmental regulation
- This is important for the emerg tech context because the call for moratoria, the opposition tends to come from environmental acitivists circles
- RA and PP are a perfect example of the meeting place of facts and values, science and policy
- No matter how hard one tries, values and judgment will not be squeezed out of the decision-system
- We think we know the upside of rationality, transparency, efficiency, secularization of discourse and the reproducibility of procedures
- I argue that we should also discuss and understand the downsides

# (4) The Emerging Tech Context

- Pacing
- Diffusion
- Ethics

# Many Regulatory Tools

- Self-regulation
- Risk assessment
- Precautionary principle
- Labels
- Moratoria

# Note: Worthwhile analogy to climate change policy

- Prohibition (precaution) .... Mitigation
- Non-regulation, soft regulation .... Adaptation

>> new tools

**Saner M.**, "The role of adaptation in the governance of emerging technologies", Innovative Governance Models for Emerging Technologies, Gary E. Marchant, Kenneth W. Abbott and Braden Allenby, Northhampton, MA, Edward Elgar Publishing, 2013, 92-107.

# Forces for Regionalization

- Economic, legal and political systems
- Religious freedom is a human right
- Cultural sensitivities
  - Food, animal welfare, environmental values
  - Children, education, women in society, jobs

# Forces for De-regionalization

- Innovation is increasingly international
- Regulation is increasingly international
- Global trade (incl. global companies)
- Secularism
- World regulation may be required

# (5) The Precautionary Principle

Beef hormones
Asbestos
GMOs
Bisphenol-A (BPA)

# France Moves To Ban GMO Corn Cultivation, Harvesting

**Amid debate over the safety and long-term effects of genetically-modified organisms, France takes a major step toward banning genetically-modified corn within its borders.**

***By Frederick Reese*** Follow ***@FrederickReese*** | *April 21, 2014*


Green members of the european parliament, with France's Jose Bove, top center, show posters reading "For a GMO-free Europe" during the

# The Rio Declaration 1992: Principle 15 – the Precautionary Approach

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities.

Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

# Wingspread 1998 Statement on Precautionary Principle

Where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

# Canada: Oceans Act 1996

The national strategy will be based on the principles of [...] the precautionary **approach**, that is, erring on the side of caution.

# Canada: CEPA 1999

In the administration of this Act, the Government of Canada [...] applies the precautionary **principle** that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation, and promotes and reinforces enforceable pollution prevention approaches;

# Canada: PCPA 2002

The Minister may cancel or amend the registration of a pest control product [...] taking into account the precautionary **principle**

[same formulation as CEPA 1999]

# Privy Council Office 2003

*A Framework for the Application of Precaution*

*in Science-based Decision Making About Risk*

# Emerging Technologies are "Vulnerable" to the PP

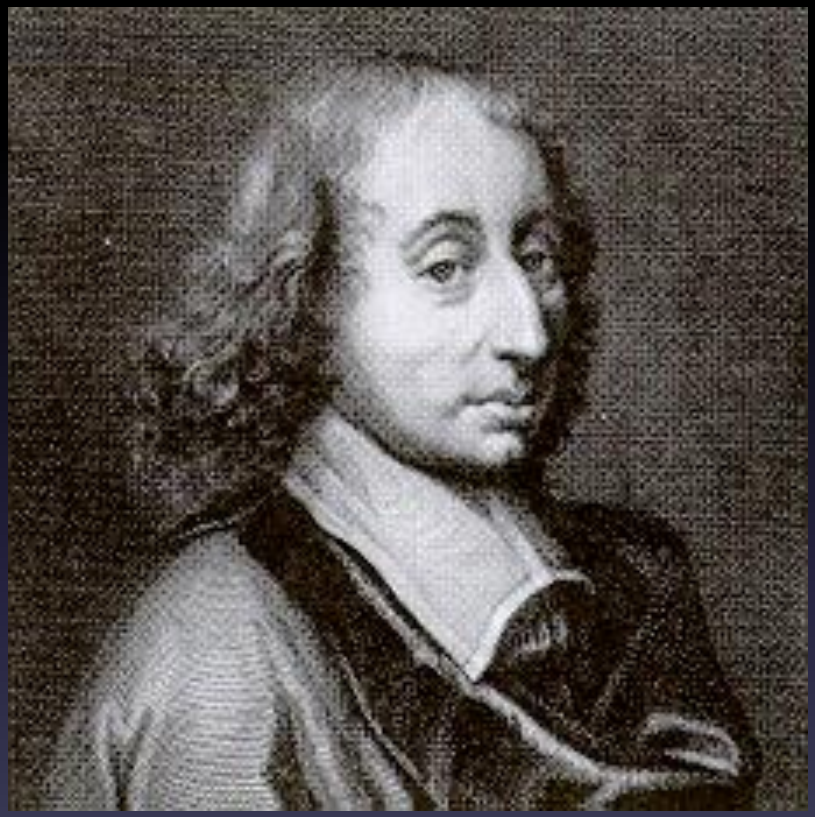
- Diffusion and potential persistence > irreversibility
- Huge Potential ("innovation cure-all")
- Huge Risks also ("dual-use")
- … while they are also ideally suited for regulatory harmonization ("alignment")

# Marchant *et al*. (2004)

"The precautionary principle may well be the most innovative, pervasive and significant new concept in environmental policy over the past quarter century. It may also be the most reckless, arbitrary and ill-advised."

Marchant, Gary E, Mossman, Kenneth L.
*Arbitrary & Capricious: The Precautionary Principle in the European Union Courts*, AEI Press, 2004.

# But: Logical Foundations Do Not Diverge



Blaise Pascal (17th Century)

Saner M. (2002). An Ethical Analysis of the Precautionary Principle. *International Journal of Biotechnology* 4: 81-95.

# Pascal's Wager

| **Does the Christian God exist?** | Possible outcome: The Christian God is | Possible outcome: The Christian God is not |
|---|---|---|
| Yes: Worship the Christian God | **Infinite benefit**<br><br>("infinity of happy lives") | <u>Finite</u> cost<br><br>(unnecessary worship) |
| No: Don't worship the Christian God | Infinite cost<br><br>(eternal damnation) | **<u>Finite</u> benefit**<br><br>(no unnecessary worship) |

Represents BOTH, risk assessment and the logic of the PP

# PP 1992

| **How should we respond to a serious, irreversible threat?** | Possible outcome: The Threat is True | Possible outcome: The Threat is NOT True |
|---|---|---|
| Act to Prevent the Threat | Quasi-infinite benefit | Finite cost |
| Don't Act to Prevent the Threat | Quasi-infinite cost | Finite benefit |

Represents BOTH, risk assessment and the logic of the PP

# Enter the Jealous God Baal …

Manson, Neil (1999) The Precautionary Principle, the Catastrophe Argument and Pascal's Wager, *Ends and Means* 4(1): 12-16.

| **Should We Worship the Christian God?** | Possible outcome: The Christian God is | Possible outcome: The Jealous God Baal is |
|---|---|---|
| Yes: Worship the Christian God | **Infinite benefit**<br><br>("infinity of happy lives") | Infinite cost<br><br>(Baal is not pleased) |
| No: Don't worship the Christian God | Infinite cost<br><br>(eternal damnation) | **Infinite benefit**<br><br>(Baal is pleased) |

Problem of Symmetry

# Similarly, Genetic Engineering …

| **Should we pursue genetic engineering?** | Possible outcome: Genetic engineering is required for our survival | Alternative possible outcome: Genetic engineering leads to the end of humanity |
|---|---|---|
| Yes: Go for it | **Quasi-infinite benefit** | Quasi-infinite cost |
| No: Prohibit it | Quasi-infinite cost | **Quasi-infinite benefit** |

Problem of Symmetry

# Jean Buridan (13th Century)

# Buridan's Ass

| **Which bale of hay?** | Predicted outcome: Reach hay (amount x, tastiness y, using effort z.) | Predicted outcome: Reach hay (amount x, tastiness y, using effort z.) |
|---|---|---|
| Choose one option | **High benefit** | High benefit |
| Choose the other option | High benefit | **High benefit** |

Problem of Symmetry – Rationality dictates flipping a coin!

# Wiener *et al*. (2011) *The Reality of Precaution*

| Americans | Europeans |
|---|---|
| Individualistic | Collectivist |
| Techno-optimists | Anti (American) technologies |
| Forward looking | Retrospective |
| Risk taking | Risk averse |
| Anti-regulatory | Eager to use precaution |

But these stereotypes are really just alleged!

# Wiener *et al*. (2011)
# *The Reality of Precaution*

Stereotypes untrue based on broad review of GMOs, beef hormones, tobacco, chemicals, biodiversity, nuclear, medical errors, weapons of mass destruction, ....

Wiener Jonathan B., Rogers M.D., Hammitt J.K., & Sand P.H. (eds.)
*The Reality of Precaution: Comparing Risk Regulation in the United States and Europe*, Earthscan, NY, 2011

# So, considering …

(a) the logical foundations converge

(b) The practical implementations converge

… why is the PP so important in regulation?

# Hypothesis #1

The real value of the PP is to create "elbow room" within a highly structured environment

# Note: In the world of risk assessment, semantic confusion is the norm

- Risk *analysis* may be a sub-component of risk *management*
- Risk *management* may be a sub-component of risk *analysis*
- Risk *assessment* may be a sub-component of risk *management*
- Risk *analysis* may be synonymous to risk *assessment*

Elbow room is one explanation,

the other is the (futile) attempt at clarity

# Secularisation Dilemmas

- Scientists: if the labour is truly reproducible – then where is the need for judgment?
- Policy side: be both, science-based and caring

… and the status of experts, the elite is declining

… "elbow room" helps

# Normal Solution: Push Further

- Rationalism (scientism)
- Discourse ethics, transparency
- Codifications
- Transparency
- Measurement (NPM)
- Secularisation (control value component)

# Hypothesis #2

The cost of such secularization is

spin and sophistry

[very significant and partially avoidable]

# Proposal

In tech debates, greater tolerance for the need to express values and a focus on:

- Particulars

  ( "synthetic biology" is neither safe nor unsafe)

- Urgencies

# Subtle Secularization will Accommodate Evidence, Values and Culture

The Master [Confucius] said, the virtue embodied in the Doctrine of the Mean is of the highest order. But it has long been rare among people …

# Bingo?

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