THE SCIENCE OF ASSESSMENT AND THE ASSESSMENT OF SCIENCE

NEW FRONTIERS IN FOOD SAFETY EVALUATION

SHEILA JASANOFF

HARVARD UNIVERSITY

EFSA SCIENTIFIC CONFERENCE

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ANCIENT PROHIBITIONS

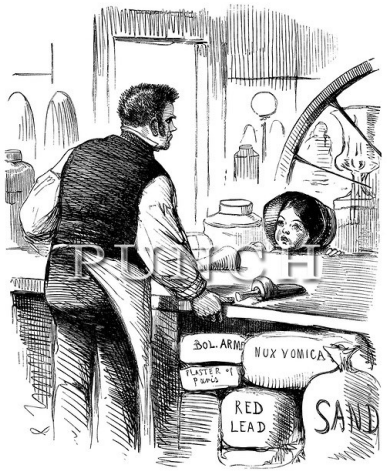
Leviticus 7:18

If any of the flesh of the sacrifice of his peace offering is eaten on the third day, he who offers it shall not be accepted, neither shall it be credited to him. It is tainted, and he who eats of it shall bear his iniquity

Leviticus 19:7

If it is eaten at all on the third day, it is tainted; it will not be accepted,

- English Standard Version

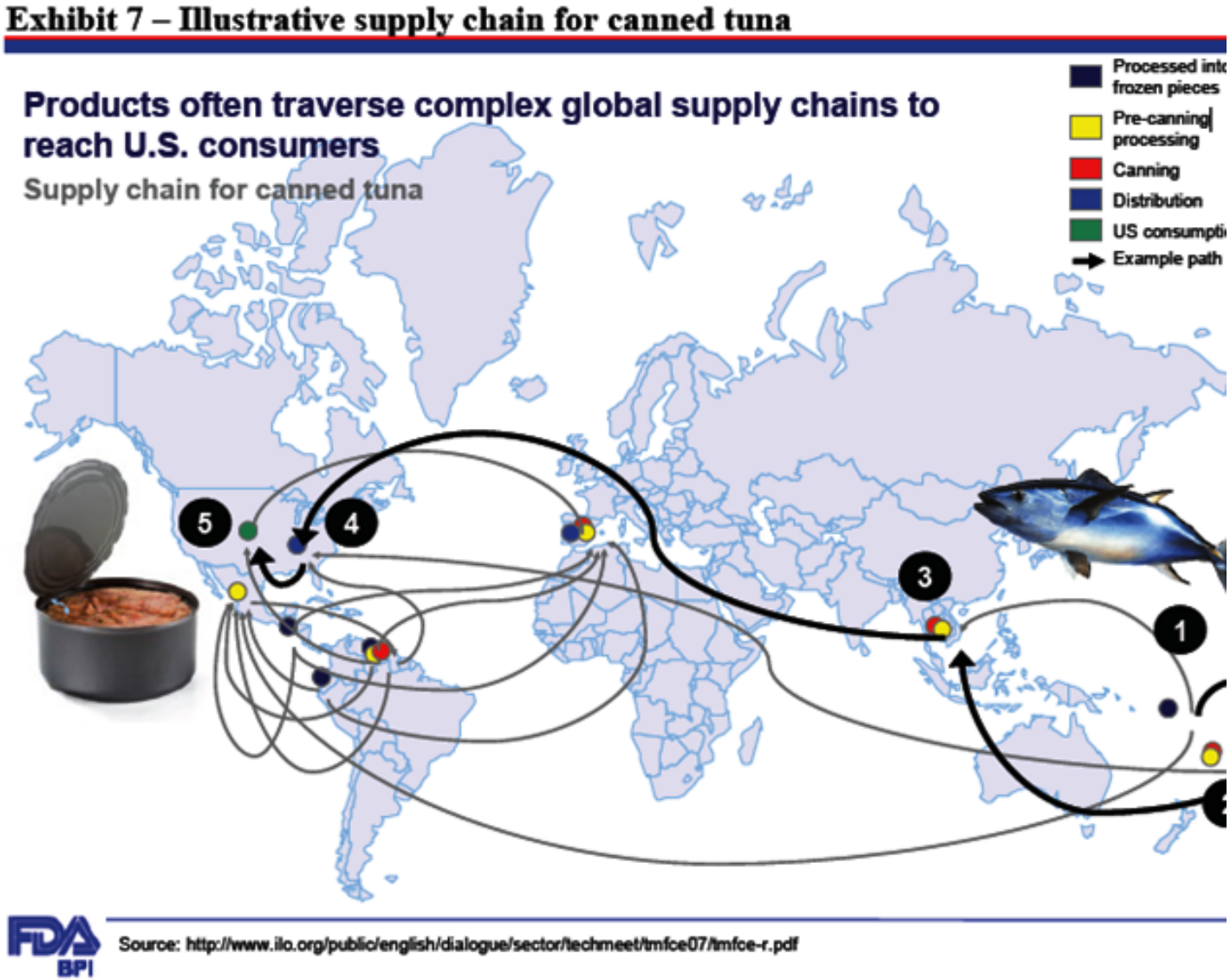


THE USE OF ADULTERATION.

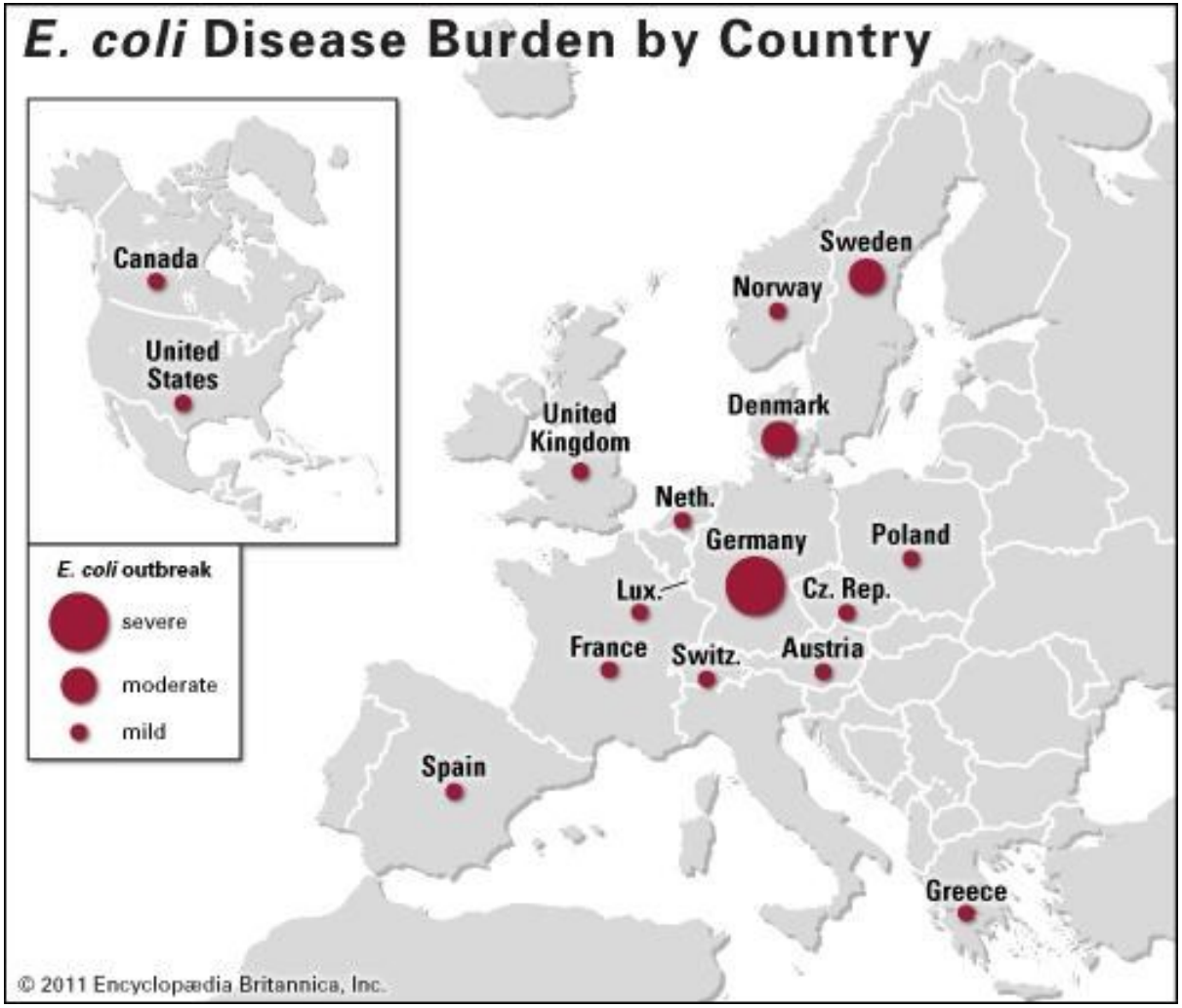
Little Girl. "IF YOU PLEASE, SIR, MOTHER SAYS, WILL YOU LET HER HAVE A QUARTER OF A POUND OF YOUR BEST TEA TO KILL THE RATS WITH, AND A OUNCE OF CHOCOLATE AS WOULD GET RID OF THE BLACK BEADLES"

Pat Oliphant cartoon. Dist. by Universal Press Syndicate. All rights reserved.

GLOBALIZATION (FDA 2011)



OUTBREAK (GERMANY 2011)



FOUR GUIDING PRINCIPLES

1. Framing matters.
2. “Assessment science” is impure science.
3. Consensus is cultural.
4. Trust is distributed.

FRAMING MATTERS

POWERFUL IMAGINARIES

AFRICA BEGGING (SOURCE: ***DER SPIEGEL NR. 51/46, 14. DECEMBER 1992, P. 160***)

CONSTRUCTING "AFRICA'S" GM NEEDS

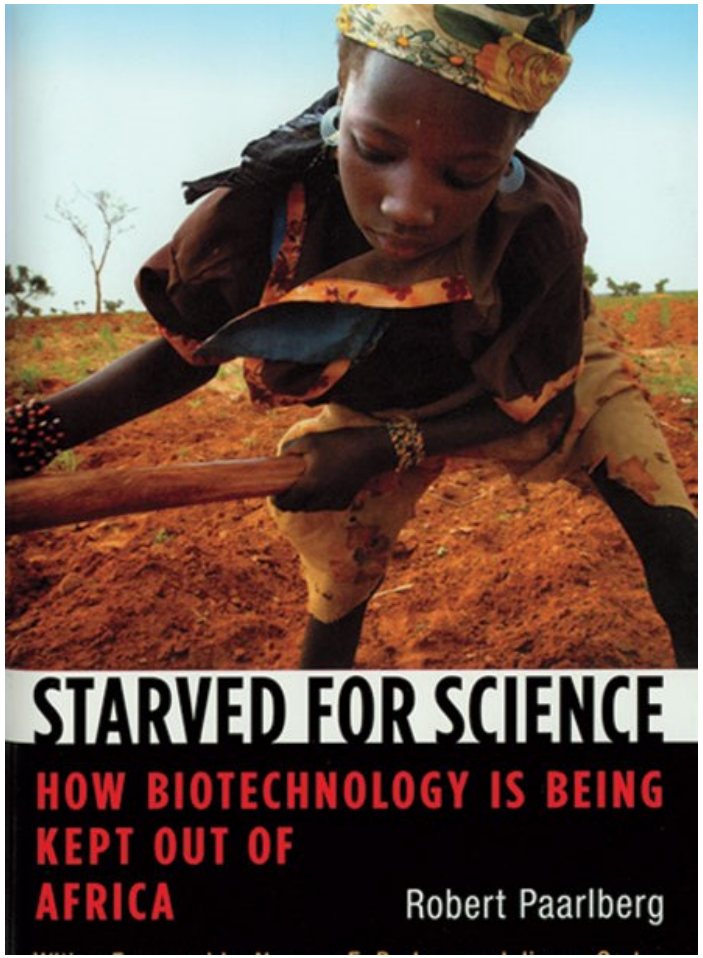
Source: Conway and Toennissen, *Science 299 (2003).*

- "We will refer to 'Mrs. Namurunda', who represents a composite of situations existing in Africa. Mrs. Namurunda, like many African farmers, is a single mother struggling to support a family."
- "The two youngest children suffer from undernourishment and persistent illnesses."

THE PLAGUES OF MRS. NAMURUNDA

Her cassava crop was devastated by cassava mealybugs (Phenacoccus manihoti) **and a new supervirulent strain of mosaic virus.** ***Her banana seedlings were infected with weevils*****, nematodes, and the fungal disease black Sigatoka when she bought them from neighbors.** ***Her beans suffered from fungal diseases that shrivel pods*** **and lower nitrogen fixation. And** ***more often than not, she faced a drought during the growing season*****, which reduced the yield of everything.**

THE EMPIRE OF SCIENCE



YET DISSENT PERSISTS

- **Repeated recent claims of a consensus affirming the safety of GMOs are misleading and "may place human and environmental health at undue risk and create an atmosphere of complacency," states Dr. Angelika Hilbeck, chairperson of the European Network of Scientists for Social and Environmental Responsibility (ENSSER). She is one of over 90 signatories to a statement, released today, of scientists and academics concerned that deliberate and coordinated attempts are being made to preclude further research and discussion of the safety of GMOs.**
  - Independent Science News, October 21, 2013

"ASSESSMENT SCIENCE" IS IMPURE SCIENCE

Pure science

- Curiosity driven (not ends-driven)
- Disinterested
- Discipline based
- Scrutinized by peers in discipline
- Receptive environment

(Risk) Assessment science

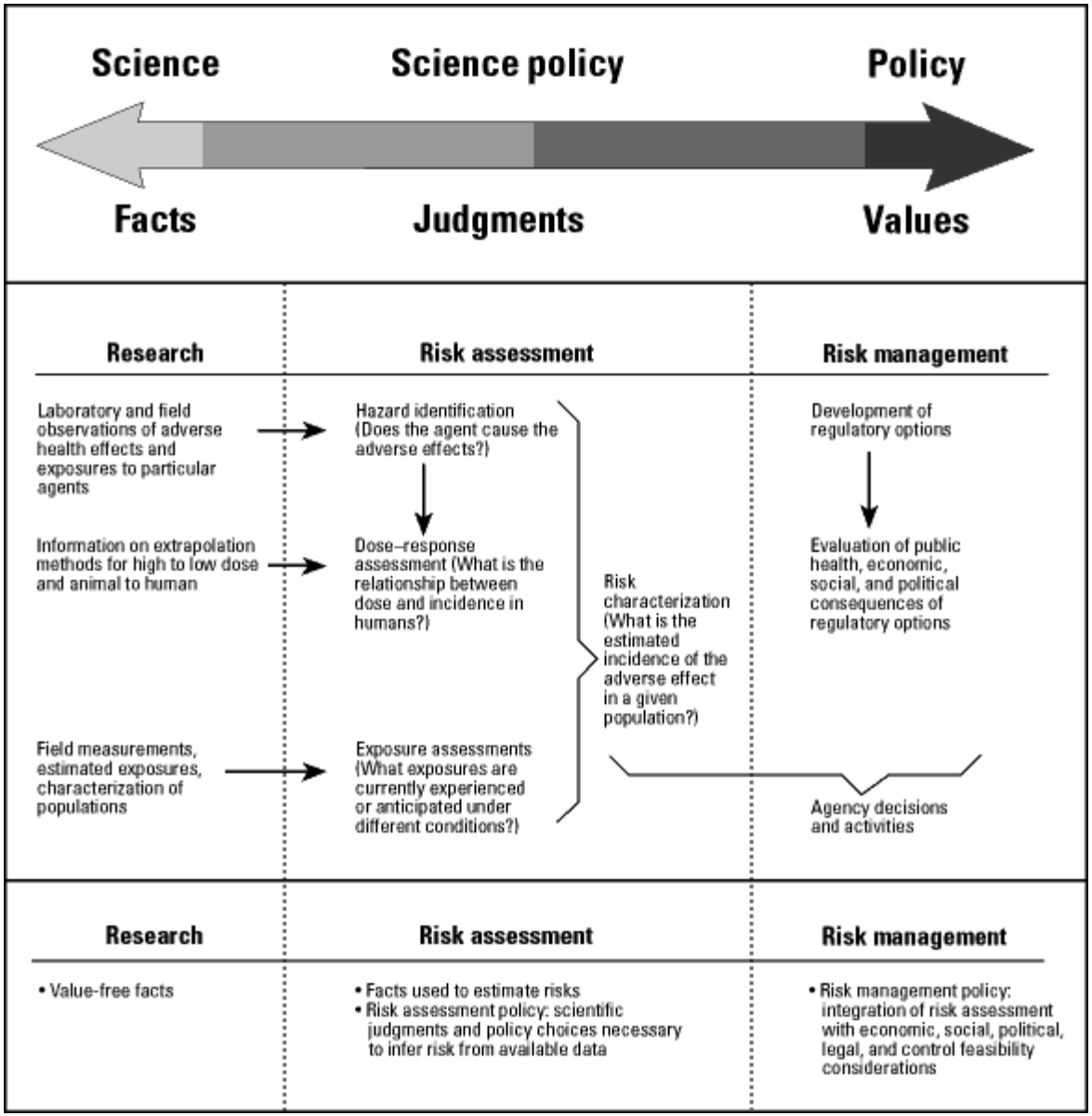
- Purpose driven
- Sponsored
- Cross-disciplinary and cross-institutional
- Publicly scrutinized
- Rejecting environment

REGULATORY SCIENCE: A KNOWLEDGE-POLICY HYBRID

Table 4.1. Regulatory science and research science.

	Regulatory science	Research science
Goals	"Truths" relevant to policy	"Truths" of originality and significance
Institutions	Government Industry	Universities
Products	Studies and data analyses, often unpublished	Published papers
Incentives	Compliance with legal requirements	Professional recognition and advancement
Time-frame	Statutory timetables Political pressure	Open-ended
Options	Acceptance of evidence Rejection of evidence	Acceptance of evidence Rejection of evidence Waiting for more data
Accountability		
Institutions	Congress Courts Media	Professional peers
Procedures	Audits and site visits Regulatory peer review Judicial review Legislative oversight	Peer review, formal and informal
Standards	Absence of fraud or misrepresentation Conformity to approved protocols and agency guidelines Legal tests of sufficiency (e.g., substantial evidence, preponderance of the evidence)	Absence of fraud or misrepresentation Conformity to methods accepted by peer scientists Statistical significance

LINEAR MODEL (PERSISTENT)



Is the linear model indispensable?
What would take its place?
Not merely hypothetical.
US National Research Council 1996

ANALYTIC-DELIBERATIVE MODEL (UNDERVALUED)

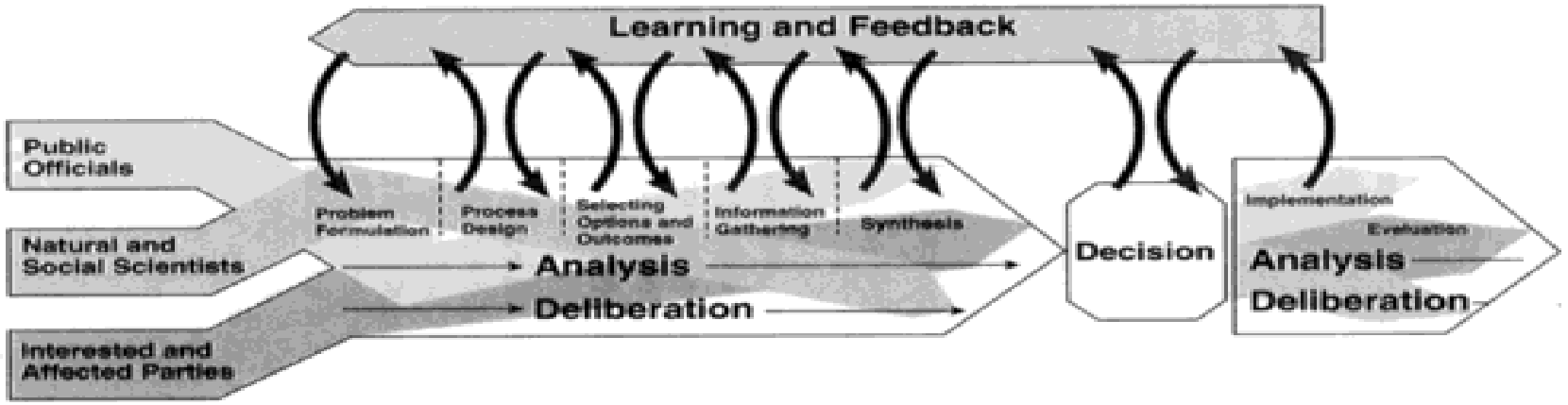


FIGURE 1-2. A schematic representation of the risk decision process.

US National Research Council, *Understanding Risk* (1996)

CONSENSUS IS CULTURAL

Same data lead to different policy foci, priorities, and outcomes

- E.g., Asbestos, Bisphenol A, GM crops

Hazard categories seen as salient in one nation are considered irrelevant or even "bad policy" in others

- E.g., Carcinogen

Basis for policy differs, resulting in different standards

- E.g., DDT, lead (toxicity or persistence?)

SOURCES OF DIFFERENCE

Nations differ significantly in strategies for

- Producing public knowledge (claims)
- Establishing the reliability of expert judgment
- Resolving policy-relevant knowledge disputes
- Involving lay publics in assessment science
- Choosing technological trajectories

National differences are not random but institutionalized

- Practices for relying on private sector science and assessment
- Administrative law and rules of participation
- Role of courts
- Technological preferences in agriculture, industrial production, packaging, labeling

CIVIC EPISTEMOLOGIES: CULTURAL WAYS OF KNOWING

	US	***Britain***	***Germany***
Ways of public knowledge-making	Pluralist, interest-based	Embodied , service-based	Corporatist, institution-based
Public Accountability	Assumptions of distrust Legal	Assumptions of trust Relational	Assumptions of trust Role-based
Demonstration (practices)	Socio-technical experiments	Empirical science	Expert rationality
Objectivity (styles)	Numerical; reasoned	Negotiated	Negotiated; reasoned
Expertise (preferred modes)	Formal methods	Experience	Training, skills, experience

INTO THE MOUTHS OF CHILDREN: MOMENT OF TRUTH?

SEEING THINGS DIFFERENTLY... (G. SCARFE)

TRUST IS DISTRIBUTED

Information sources have multiplied

Consumers are knowledgeable (and knowledge-able)

Relations have changed

- Neoliberalism and rise of markets
- Transnational networks
- Social movements
- Post-material values (sustainability)

Speed is a factor

Accountability processes have lagged (cf. 2011 e-coli case)

CRISIS IN MOTION

Stages of the outbreak

Late April – Mid-June
The 2011 *E. coli* outbreak was the deadliest and the second largest on record—the largest was the Japan *E. coli* outbreak of 1996, in which more than 12,600 people became infected—and was responsible for a total of 4,321 cases and 50 deaths, most of which occurred in Germany.

Sweden, the Netherlands, and the United Kingdom, occurred in persons who had visited the country just prior to their illness.

NETWORKS OF TRUST

RIGHT TO KNOW

The Bush Administration's War On Science

Our government is waging a war against science, endangering millions of lives in the U.S. and beyond.

Nobel Prize Winners Cite the Bush War on Science in Supporting Obama

Prof Failed To Disclose Connection to Company in Paper

connection

A Harvard Kennedy … widely disseminated policy paper last year in support of genetically modified … of the seed giant Monsanto, without disclosing his connection, e-mails show.

Harvard P…

Ousted Brookings economist lashes back at Warren

Brookings Economist Resig… Pressure from Sen. Elizabeth Warren

JUDGMENT IN ASSESSMENT SCIENCE

Always a factor in assessment science

Sound judgment ←→ Sound science

Integrity of science → Accountability of assessments

National bodies are experiment stations for process

International bodies can learn from experience

EXAMPLE: FORMAL RULES VS. "MUDDLING THROUGH"

What are the assumptions?

- Regularity vs. surprise, uncertainty

Who wins and who loses?

- Outsiders vs. insiders

How good is the knowledge produced in each system?

- Generalizable but possibly irrelevant vs. relevant but possibly non-generalizable

How knowledgeable are citizens?

- Informed stakeholder vs. in situ citizen learner

How does it matter?

- Depends on nature of problem

LEGITIMATION

It's in the process.

Transparency is not enough.

- Who gets to see?
- What do they see?

Involvement is key to trust.

Requires "opening up" and enlarging scope of knowledge.

A partnership model: the co-productionist world.

Thank you!