An Ethical Dimension to Sustainable Restoration and Long-Term-Management of Contaminated Areas*

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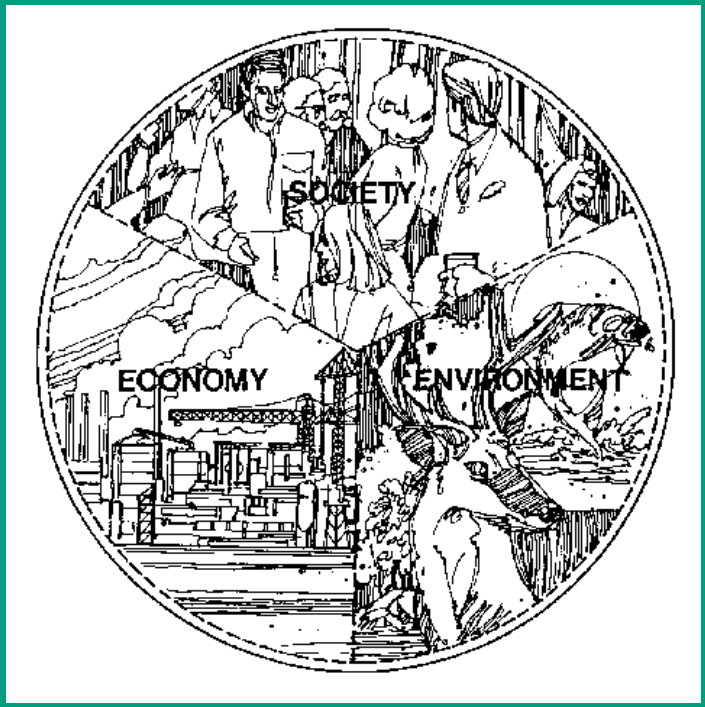
Asian Ethics Workshop, Fukushima, June, 2015



CERAD
CENTRE FOR ENVIRONMENTAL RADIOACTIVITY

*Oughton, D.H., Bay, I., Forsberg, E-M, Kaiser, M., Howard, B. (2004, *Journal of Environmental Radioactivity,* **74**: 171-183

My background

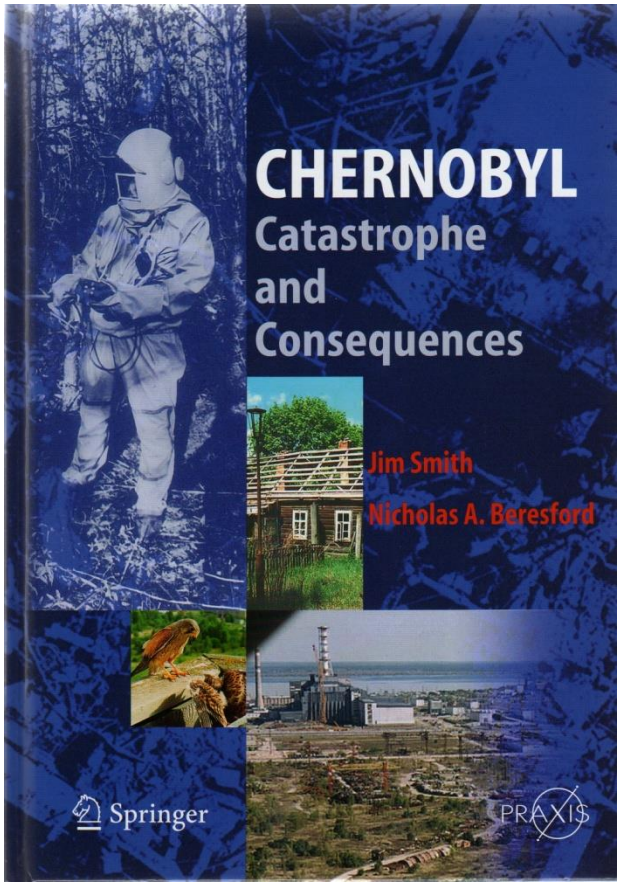
- Educated in nuclear chemistry at University Manchester
- 1989: PhD on the environmental impacts of Sellafield, and then Chernobyl in UK/Cumbria.
- 1990 Post doc in Norway
- 1992 Scholarship from Norwegian Research Council to study ethical aspects of radiation protection
- Present:
  - Research Director, Centre for Environmental Radioactivity (CERAD - Norwegian Centre of Excellence)
  - Prof II University of Oslo (Ethics Programme) teaching research ethics to PhD students in natural sciences
  - Member of UNESCO Committee on Ethics in Science and Technology (COMEST)

Dr Philip Day, University of Manchester

Obituary John Phillip Day J Rad Prot, 2010

Overview

- Societal and ethical challenges in remediation – STRATEGY, and EURANOS projects
- Ethical tools
- Some implications for risk perception and remediation strategies



Oughton and Bay, 2005

STRATEGY (www.strategy-ec.org) and EURANOS (www.euranos.fzk.de)

Challenges in Remediation Evaluation

- The complexity of the issues (many countermeasures have both positive and negative social and ethical consequences);
- The various “trade-offs” that may be required when making choices;
- Lack of agreement within society on what is practical or acceptable, let alone on how to “put a price on” such non-monetary side-effects; and
- The lack of established procedures, and experience, in systematically incorporating these dimensions in decision-making.

STRATEGY, EURANOS and NERIS EU Projects

- STRATEGY project (Sustainable Restoration and Long-Term Management of Contaminated Rural, Urban and Industrial Ecosystems). 1999-2003.
- Multi-disciplinary project assessing radiation accident management strategies (Howard et al., 2002).
- Succeded by EURANOS and NERIS projects
- **Outputs**: countermeasure templates, handbooks; stakeholder consultation, decision-tools, value matrix

See www.strategy-eu.org.uk and www.neris-eu.com

Name of countermeasure	
Objective	
Other Benefits	
Countermeasure description	
Target	
Targeted radionuclides	
Scale of application	
Contamination pathway	
Exposure pathway	
Time of application	
Constraints:	**In this section, various types of restrictions on countermeasure application are stated.**
• **Legal constraints**	
• **Social constraints**	
• **Environmental constraints**	
• **Communication constraints**	
Effectiveness:	**In this section, the effectiveness of the method in eliminating the targeted contamination is estimated together with factors that may influence this value.**
• **Countermeasure effectiveness**	
• **Factors influencing effectiveness of procedure (Technical)**	
• **Factors influencing effectiveness of procedure (social)**	
Feasibility:	**This section describes what is required to carry out the countermeasure.**
• **Required specific equipment**	
• **Required ancillary equipment**	
• **Required utilities and infrastructure**	
• **Required consumables**	
• **Required skills**	
• **Required safety precautions**	
• **Other limitations**	

STRATEGY

101 templates of accident management strategies, (including «social countermeasures»)

Andersson et al, 2002 (urban)
Nisbet et al. 2003 (agricultl.)
Kis et al., 2002 (averted dose)
Hunt and Wynne, 2002 (social impact)
Alverez & Gil, 2003 (economic evaluation)
Thørring & Liland, 2003 (cost-effectiveness)
Oughton, Bay, Forsberg, 2003 (socio-ethical aspects)

Remediation Strategy Evaluation: Social and Ethical Issues

- Disruption of everyday life and importance of "self-help"
- Free informed consent of workers (to risks of radiation exposure and/or chemical exposure) and consent of private owners for access to property
- Distribution of dose, costs and benefits
- Change in public perception or use of an amenity (e.g. access to graveyards or places of childhood memories)
- Concerns about discrimination and stigma
- Uncertainty
- Environmental risk from ecosystem changes, groundwater contamination, waste generation and treatment
- Animal welfare issues
- Liability and/or compensation for unforeseen health or property effects

Oughton et al., An Ethical Dimension… JER, 2004

“Social countermeasures”

Actions where the primary aim or focus is not dose reduction

For example:

- Dietary advice
- Provision of counting/monitoring equipment
- Compensation scheme
- Change in food intervention levels
- Information/Advice bureau
- Education programme in schools
- Medical check up
- Stakeholder and public consultation methods

(Oughton et al., 2007, 2009)

Ethical Values and Tools

Value and Ethical Matrixes

- Ethical Matrix: A tool developed for assessment of technology and policy, based on adaption of Beauchamp and Childress Biomedical Principles (Mepham, 1996).
- Similar adaptations of Beachamps and Childress's principles had occurred in Public Health ethics (e.g, Seedhouse, 2004), where a stronger focus had been placed on community and ethics of care than the doctor – patient relationships in medical ethics

Affected Party	Beneficence/ non-malificence	Autonomy	Justice
Society			
Industry			
Animals			
Etc…..			

Biomedical Ethics

RELIGION
SOCIETY
MORALITY
CULTURE
POLITICS
SCIENCE

Value-basis

Conceptualised as:

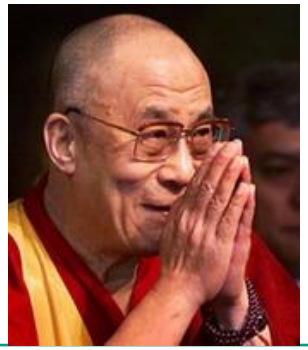
UTILITARIANISM	DEONTOLOGY	VITRUE ETHICS

Ethical Theories

Broadly compatible with the principles of:

Autonomy	Beneficence	Non-Maleficence	Justice

Biomedical Principles



Biomedical Ethical Principles

- **Respect for autonomy** (a norm of respecting the free-will and decision-making capacities of self-governing persons)
- **Nonmaleficence** (a norm of avoiding the causation of harm)
- **Beneficence** (a group of norms for providing benefits)
- **Justice** (a group of norms for distributing benefits, risks and costs fairly)

Beauchamps and Childress, 1979

Value and Ethical Matrixes

- Value Matrix:
- In STRATEGY, the values were modified into the principles of *well-being*, *dignity* and *justice*.
- Well-being refers to what is good for a person, for example health, economic welfare, security, etc.
- Dignity refers to the right to be treated with respect.
- Justice is the principle of treating everyone fairly, ensuring a equitable distribution of burdens and benefits.

Affected Party	Well-being	Dignity	Justice
Community			
Future generations			
Etc…..			

Oughton et al., JER, 2004

Excerpt from a Template Matrix for Management Evaluation

Stakeholder	Example	Well-being	Dignity/ integrity	Justice/ equity
Owners/ employers	Farmer House dweller Hotel owner Business proprietor	Doses to humans Loss/gain in income Damage to property	Self-help Consent Property rights	Possibility for conflict between different industries or projects
Users/ community	Tourists Public amenity user Local community	Access Aesthetics Empathy Community values Tourism	Respect for public heritage and footpaths Community sense	Potential inequity between age/sex/ cultural minorities
Animals **Environment**	Farm animals Other biota	Animal welfare	Endangered species Habitat loss	Future generations Sustainability

Value and Ethical Matrixes

- Primarily a tool for gathering and mapping stakeholder concerns
- Useful as an aid to stakeholder dialogue and in identifying relevant stakeholders
- In radiation protection, tested as part of general emergency preparedness and specific countermeasure evauation and selection/prioritorisation

Crout et al., Radioprotection, 2004

Affected Party	Well-being	Dignity	Justice
Community			
Future generations			
Etc…..			

Stakeholder evaluation of management strategies

Contaminated Milk Disposal	**Acceptable**
• Discharge to Sea	UK
• Land Spread	Finland/ Belgium
• Containment	France

Nisbet et al., 2003

Relevance to Risk Perception and Remediation Strategies

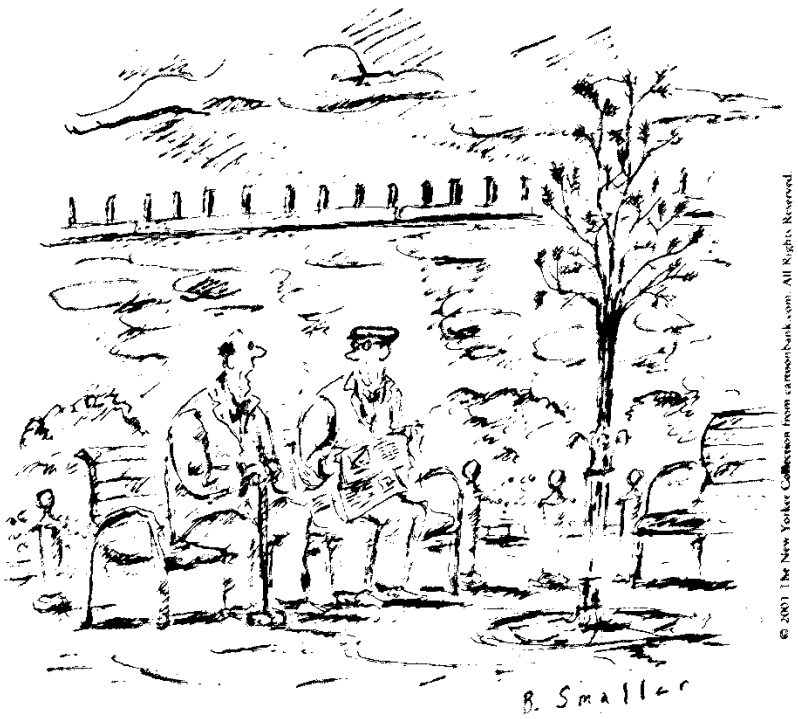
Psychosocial Consequences

- "*The social and psychological consequences of Chernobyl far outweigh any direct heath effects from radiation exposure*" (IAEA, 1991, + +)
- "*The most important health effect is on mental and social well-being, related to the enormous impact of the earthquake, tsunami and nuclear accident, and the fear and stigma related to the perceived risk of exposure to ionizing radiation*" (UNSCEAR, 2013)

Public perception of risk

- ”Expert I” – the public is ignorant, misunderstands risks, is irrational in attitude towards risks (smoke and drive but rejects much smaller risks associated with GM foods, biotechnology, nuclear power)

- ”Expert II” – the public’s perception of risk is complex (psychological, societal, ethical, …)



“My goal is to die before there’s a technology breakthrough that forces me to live to a hundred and thirty.”

Public perception: ”Risk” is not synonymous with ”probability of harm”

Rank according to ”probability of death”	**Rank according to ”risk”**
Smoking	Genetically modified organisms
Driving	Nuclear power
Alcohol	Alcohol

Survey of Oslo commuters, asked to rank the same list of hazards (Oughton, 1996)

Societal and Ethical Consequences of Nuclear Accidents

Misconception:
1) Aversion to radiation risk is (mostly/only) due to misunderstanding about the probabilities of harm
2) Educating people about risks will make those risks more acceptable

Reality:
- Probability of harm is only one dimension of risk acceptability
- Many factors influencing risk perception have strong ethical relevance

Autonomy, Dignity, Control

- Control over situation
- Consent to risks
- Choice
- Participation in decision-making

Practical implications: self-help, transparency about policy, stakeholder engagement, personal dosimeters, local-monitoring, …

Lavrans Skuterud, NRPA

Ethically and psychologically important

Justice, Fairness and Equity

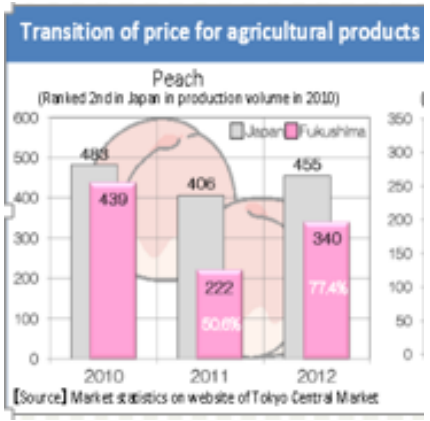
- Distribution of risks and benefits
- Risks for children
- Differences between medical (personal benefit) and environmental exposures

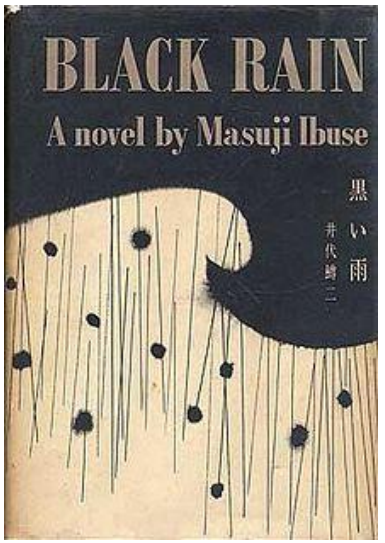
Photo: EPA

- Practical Implications: Waste disposal, time and spatial variation in risk; compensation, cross boarder issues

Well-being and Community Values

- Societal consequences of accidents and risk management
- “Doing more good than harm”
- Fears of discrimination and stigma
- Importance of community and social well-being (e.g. employment, relationships, infrastructure)





Practical Implications: Remediation and risk management needs to address more than dose reduction; infrastructure, “new-normality”

Other Factors Influencing Radiation Risk Perception

- Natural vs unnatural sources
- Internal vs external exposure
- Identifiable vs statistical deaths

Harder to ground in ethical relevance

Conclusion

- Remediation needs a holistic multidisciplinary approach, including consideration of social and ethical factors
- Management strategies can have benefits besides dose reduction
- Public and stakeholder participation is essential in risk management – but the types of stakeholders and the processes will depend on the case in question
- Ethical evaluation can aid in structuring decisions and making choices more transparent

Thank You!

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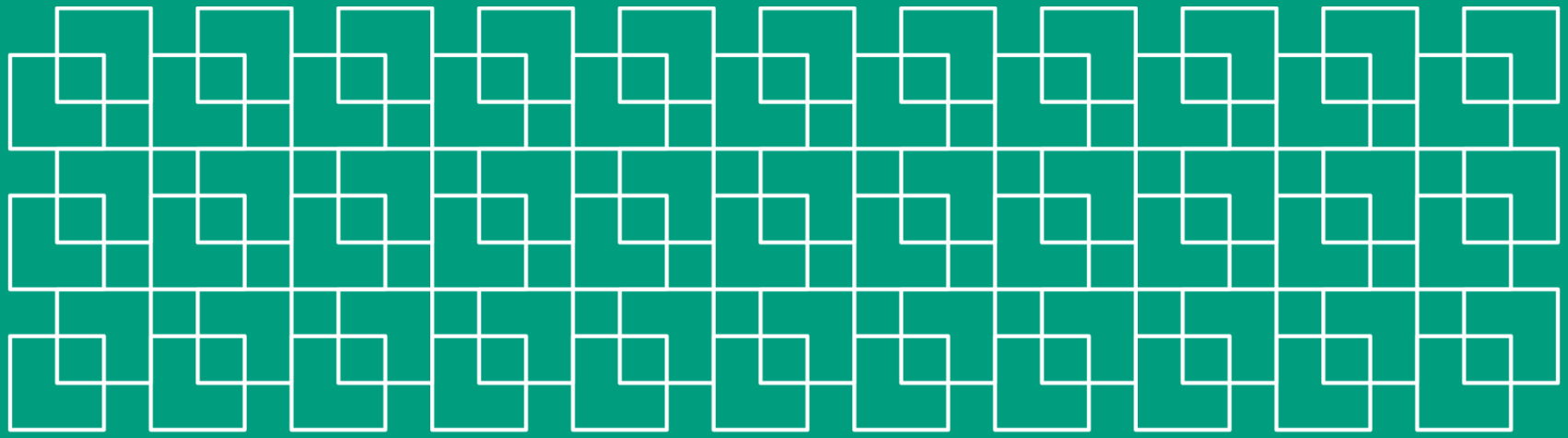

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