

# Making radioecological knowledge

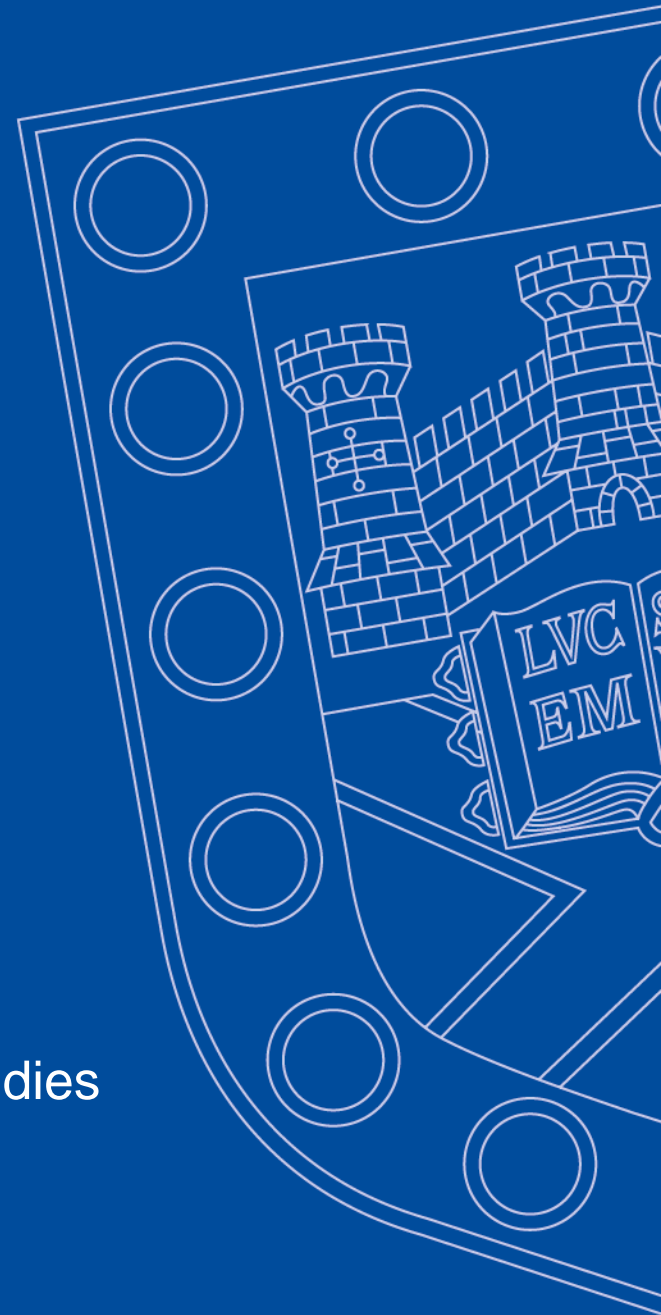
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# A different case ....



- Synthetic biology has been described as “extreme genetic engineering” => **EARLY ENGAGEMENT**
- “Overall, there was a sense that the science was both exciting and scary” (SBD 2010: 7)
- “Five central questions emerged” for the scientific researchers out of the dialogue (ibid)

Full report available:-

<http://www.bbsrc.ac.uk/documents/1006-synthetic-biology-dialogue-pdf/>

# A different case ...

“When reflecting overall on regulations, the following observations were made by participants:

- Mistakes are inevitable
- You can't control all of the risks
- There are unknown risks at this stage
- Release into the environment is an issue
- Proceed with caution” (SBD 2010: 8)



# So what?

- Results of synthetic biology work echo findings from analysis of some other scientific topics & controversies
  - Publics can ask sophisticated questions regardless of 'levels of comprehension' of the science
  - The concerns of publics are often about process, practice & (everyday) governance of science
- => interesting challenge to STS research on 'radiation'...

# Opening up some 'invisible' practices

- >30years research on social study of science; science as a culture and a practice
- Qualitative research allows attention to “the daily production and reproduction of what is to be shared” (Traweek 1988:9)
- The *ethnographic gaze* ... following the actors (wherever they go; fields, labs, conferences ...) observe, talk, texts
- Generate understandings of processes of scientific knowledge production, using a range of social theories ..



# Theories of scientific collectives

Scientists *work together*, they are part of a ‘social collective’

In sociology of science, scientific communities have been understood as:

- a normative unit (Merton)
- thought collectives / thought styles (Fleck)
- a paradigmatic (consensual) unit (Kuhn)
- a transactional unit (Bourdieu, Latour & Woolgar)
- communities of promise/hope (Brown, Martin)

... communities share (to some degree) a language, theories, technologies, methods ...



# Radioecology: an ethnographic sketch of scientific community life



# Welcome to the Radioecology Exchange

## Protecting Humans and the Environment from Radiation

Decision makers and the public need accessible, understandable information about the many different issues concerning radioactivity in the environment. Scientists need to provide independent guidance based upon well founded research.

Radioecology is the study of the behaviour and effects of radioactive elements in the environment and measures the exposure of humans and other organisms to radiation. ... as experts retire, expertise is being lost and radioecology is becoming fragmented across Europe





(workshop 3) “Models fit for purpose”:

Questions we would like to address in the workshop are:

- What is the purpose of the models?
- Why do we need radioecology models?
- How should an ideal radiological model look like?
- How is the interactions between the modellers and the experimentalist?
- What is the model/data requirements?

**=> Radioecology community itself is continuously posing questions about the process of knowledge making ...**



# Fields and Labs

Differences are found between findings generated in the field and findings generated in laboratory studies

[=> significant, as findings lead to benchmarks, policies on exposures etc]

When designing **field work** - “always need to consider specificity of locale” e.g. soil; topography; water regime; climate; plant communities; animal communities; natural history ... [& in the lab?]



# the 'visibility' of data in the community

- data sets ... too infrequently published!
- 'Open data' requirements "took me 3.5 months to do it!"
- data not allowed as an output for promotion; no rewards for publishing data sets ("just good practice")
- "its an attitude that has to change in data publishing"
- "Journal editors the only people who can enforce it" [data set publishing]
- "we [all] know it's a requirement, but how rigorously is it policed?"

# The use [& abuse] of statistics

“a significant relation does not mean a causal relation”

“a significant relation may not *mean* a lot”

⇒ the numbers do not ‘speak for themselves’

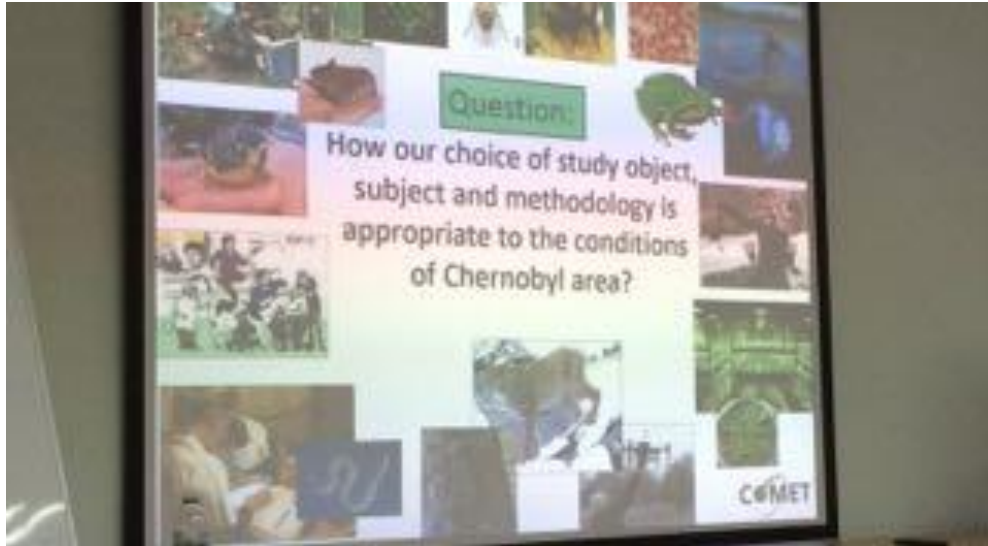
“see annually, a log variation within a site, so if only have 3 or 4 sites ... is that enough [to see effects]? ... we need to account for ‘natural variability’ ...”

=> debate on the *adequacy* of control sites

# Community integrity

- “being honest about what your numbers *are* on a graph”
- “being honest about what you've actually done”
- “encourage people to publish results where there was no effect” ... “but wouldn't get published in Nature”  
⇒ **‘good scientific practice’ versus organizational requirements**
- “who reviews?” [about 6 papers have been reviewed by people in the room] “yet there have been 100s of papers published on ‘effects’.”

# “no parrot studies allowed”



“is your study system native of common?” (to CEZ)

“discussion of limitations is usually missing”



# Summary

- Publics are concerned with the process and practice of science as much as ‘topics’ or specific ‘technologies’
- Social scientific fields (STS, anthropology ..) have both methodologies and theories to analyse scientific process and practice
- Analysis of everyday knowledge production ‘opens up’ scientific work to public scrutiny
- If you desire trust from wider society, suggest need to focus *more* on process and practice of science and *not only* on provision of information, forms of communication etc.

