Science Communication

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Agenda Today

- A bit of history
- 3 spheres of science communication
- From public understanding of science to engagement upstream: communicating science for debate
- Key influencing factors
- Quality assurance of science communications

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History [curiosities]

> Science [as we know it] appeared in the beginning of the 17th century and was accompanied from *day 1* by science popularisation and science fiction.

▶ One of the first science popularisation books was Galileo's "Dialogue", published in Italian in February 1632.

▶ Athanasius Kircher (the most famous scientist of his time, the prototype of the media scientist) used then-recent optical scientific discoveries to design spectacular public shows in Rome around 1640 and created one of the first science museums.

▶ Science fiction novels as "Les Etats et Empires de la Lune et du Soleil" of Savinien Cyrano de Bergerac, a physicist, published 1648.

▶ Part of the mission of the Royal Society of London, founded in 1660, was public demonstrations of new science, as part of its validation process.

▶ ...

History [curiosities]

► The historical crisis of science-society relationships, such as the one which occurred in the Romantic era (illustrated by the Goethe-Newton debate about colour), has set the stage for attitudes up to the present day (the status of "Nature" in our society as described by the German Natürphilosophie at the beginning of the 19th century, which influenced deeply the north of Europe).

→ National history or tradition has greatly influenced the actions taken to promote RTD culture and PUS…

Science communication
to non-scientists

Policy making

Science to decide

Popularisation

Science to raise awareness

Societal debate

Science to debate

> Communication purpose
> Principles are ≠ but some may be shared

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Science communication [purpose]

"The purpose of a science communication may be to empower its recipients, to enhance existing democratic processes or help develop new ones where they do not exist, or to prevent the alienation of sections of society; but it may also be to serve the interests of the science community and their paymasters."

*In Science in Public: communication, culture and credibility by Miller & Gregory. 2000.*

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Public Understanding of Science

► response of *scientists* to growing levels of public detachment and mistrust was to embark on a mission to inform [already in the 1970's US NSF launched polls to gauge public understanding of sci & tec; Eurobarometer occasionally…]

► a pedagogical approach which tries to increase the scientific knowledge of citizens (by a variety of means: education, media, museums, festivals, etc…)

► it relied on a **'deficit model'** of the public as ignorant and science as unchanging and universally comprehensible…

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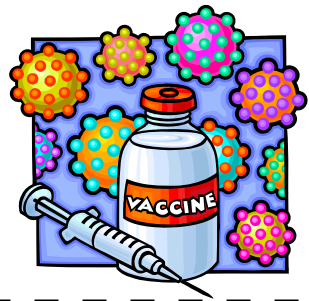
The UK's BSE "scandal" of the mid-1980s to mid-1990s is often cited as pivotal to the change of direction noted in the relations between science and citizens.

A key moment was the publication of the 2000 House of Lords Report *Science and Society*, followed a year later by the European Commission's *Science and Society Action Plan*.

From deficit to dialogue

► partly as a result of PUS's failings, relations between science & society aggravated throughout the 1990's

► A new language of "science & society" towards dialogue and engagement started emerging…

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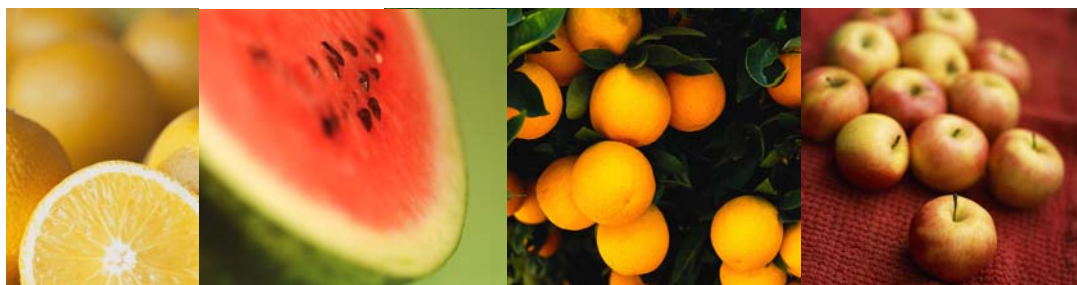
The *GM Nation?*

Public debate in the UK – unique experiment in public engagement [2003]

- 9 foundation workshops with member of the public
- 6 national and regional conferences; small county level meetings; local meetings
- Focus groups [*narrow but deep* meetings]
- Material: CD-ROM, brochures incl. questionnaire
- Website where people could post comments and accompany progress of debate… [http://www.gmnation.org.uk/]

Total: 675 public debate meetings!

>> lack of transparency [how would results be used?]

>> influence [of views expressed]

>> early involvement [events not held early enough to influence public policy]

In Horlick Jones et al. 2004

Moving engagement upstream

► science community has embraced dialogue and engagement [recognising that many controversies had made it non-negotiable clause of their "license to operate"]

► a new term has entered the lexicon of public engagement: there has been a surge of interest in moving engagement **"upstream"** [e.g. Royal Society's nanotechnology report in 2004: *constructive and proactive debate about the future of nanotechnologies to be undertaken now*...]

► focuses on establishing a two-way dialogue between citizens and other actors on S&T challenges facing society

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Places of engagement (1)

▶ Two thirds of E.U. Member State Governments now either have or are developing mechanisms of involving the general public in issues concerning scientific and technological developments (A, DK, FL, F, G, GR, IE, NL, S, UK.)

▶ Denmark currently has the most extensive toolkit of participatory instruments, organised through the Danish Board of Technology. Denmark was also the EU country that pioneered Scientific Ethical Committees to approve research procedures such as medical trials.

▶ Many countries are now trying to use one of the techniques pioneered in DK, consensus conferences of technology assessment (A, F, G, NL and UK).

▶ Austria has held a referendum on GMOs

Places of engagement (2)

▶ There are also activities such as scenario workshops, policy forums and citizens juries.

▶ Science shops are another way of empowering citizens, providing them with independent scientific and technological advice as required for local issues, in particular.

▶ Some web-pages of leading scientific organisations offer opportunities to the general public to get involved in discussion about future directions of science. CNRS; Royal Society…

Science communication (1)

to non-scientists

- Who is doing the science communication in public debate?

- How is science communication done in public debate?

Science communication (2)

to non-scientists

Who is qualified to inform society about science and technology?

Researchers	**52%**
Journalists	**32%**
Researchers in private companies	**28%**
...	
Environmental Associations	21%
Consumers Associations	16%
...	
Government	6%
Policy makers	5%
Religious leaders	2%

Source: Eurobarometer 2005

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► UK, August 2006: when scientists were asked to define in their own terms what engaging with the non-specialist public meant to them, they said:

>> **To explain and promote PUS [34%]**

>> Highlighting implications, relevance and value of science [15%]

>> giving a public lecture [13%]

>> listening to and understanding the public [13%]

Source: Survey of factors affecting science communication by scientists and engineers – Royal society. 2006

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Science communication (4)

to non-scientists

► the most important reason to engage the non-specialist public is to ensure the public is better informed about sci & tec [35%]

► the least important reason was to contribute to ethical discussions about science [5%]

► Barriers to science communication:

>> need to spend more time on research[64%]

>> time taken away from research [29%]

>> scientists who engage with the public are less well regarded by other scientists [20%]

► Several researchers highlighted that public engagement activity was seen by peers as bad for their career; "done by those who are not good enough" for academic career… etc.

► Science communication: altruistic activity and does not bring significant funding to universities…

Source: Survey of factors affecting science communication by scientists and engineers – Royal society. 2006

Science communication (4)
to non-scientists

▶ 73% of scientists that responded to the survey had no training on communication

Source: Survey of factors affecting science communication by scientists and engineers – Royal society. 2006

▶ "Scientists should be given training in communication skills, taking into account the need for public dialogue, debate and inclusion in decision making."

SourceReport from the Expert Group "benchmarking the Promotion of RTD culture and PUS, July 2002.

Who should communicate the science in public engagement activities?

>> scientists?
>> media professionals?
>> dedicated professionals?

Sci-Com 4 public engagement (1)

principles

"Communication is a process of negotiation: it is one of a <mark>mutual getting-to-know</mark>. It is a process of generating new, <mark>mutually acceptable</mark> knowledge, attitudes and practices…"

In Science in Public: communication, culture and credibility by Miller & Gregory. 2000.

Sci-Com 4 public engagement (2)

► **Respect your audience**

  ► audience possesses knowledge

  ► audience is not taking a course to graduate: not a lecture

  ► avoid wording such as "too complicated to discuss here" – that is arrogance!

  ► no paternalistic attitude – that is arrogance!

► **Establish basis for trust**

  ► trust is established based on negotiation of shared ground and not through statements of authority or of facts

  ► quality of the science provided

  ► acknowledgement of *knowledges* other than science

  ► appreciation of limits of science

  ► communication of sources, methods, controversies, uncertainties

  ► congruent, clear and secure message

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► Acknowledging "the social" in science

"Bring out the social implications of work, voicing optimism and enthusiasm where appropriate and concerns and reservations when they exist"

► Extended framing

► beyond the myth that it is up to experts to frame what is relevant science for a debate on science and technology [B. Wynne]: "assumption that the task of defining what the salient issues are within processes of public engagement automatically falls to experts, leaving citizens with 'no capability nor proper role in autonomously creating and negotiating (…) more diverse public meanings"

► beyond the myth of downstream risks or impacts [B. Wynne]: "false assumption that public concerns are only about instrumental consequences, and not also crucially about what human purposes are driving science and innovation in the first place"
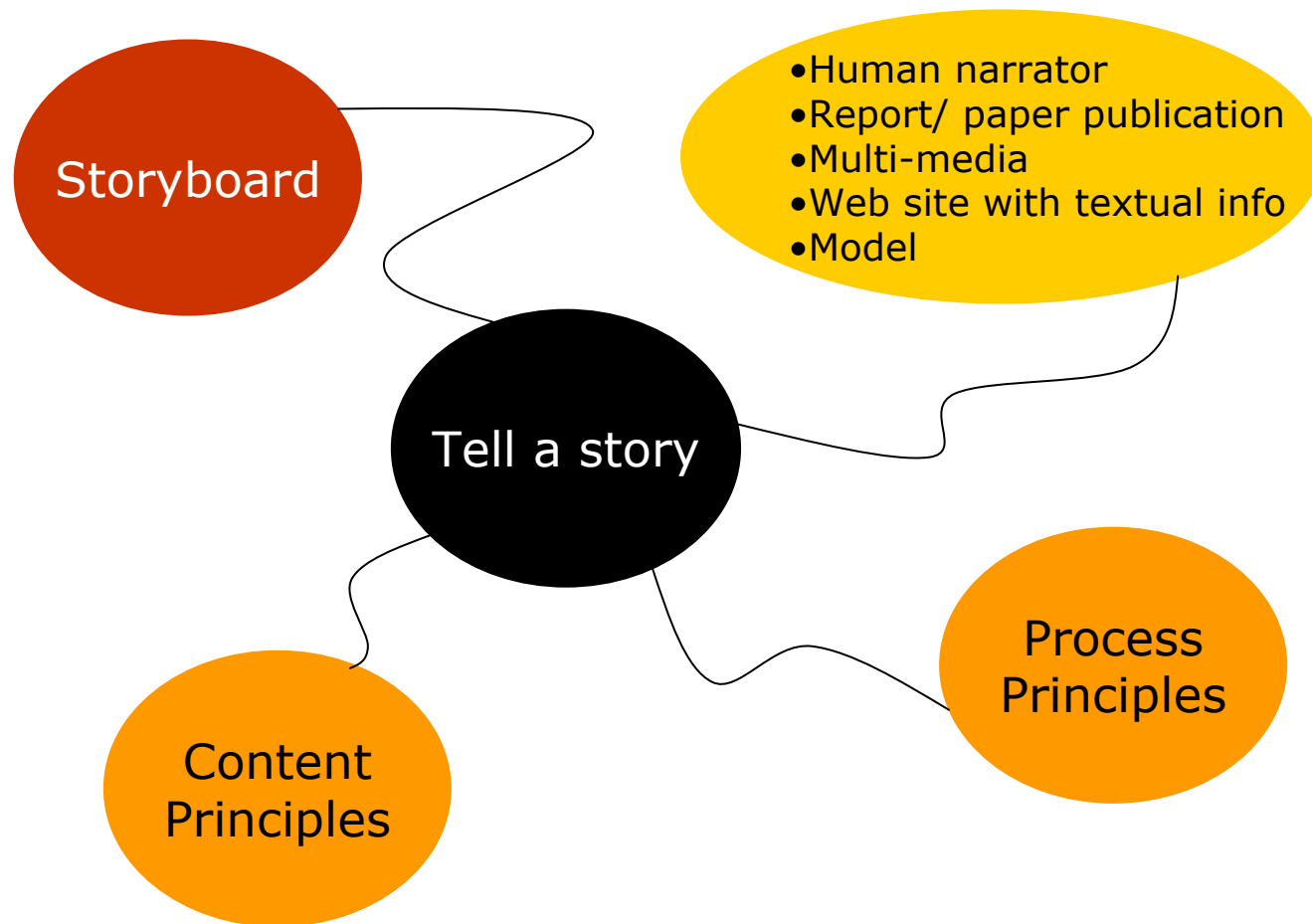
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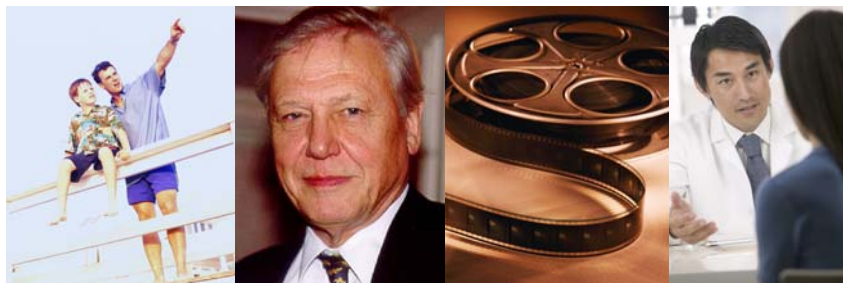
Every day we do it…

→ "translation" of scientific stories into "understandable" stories…

- doctors to their patients
- parents to their children
- the press, movies, TV shows
- Environmental Impact Assessment's non-technical summary to be available to the publics: as requested by legislation…

Sci-Com 4 public engagement (1)

practice

Storyboard

- Human narrator
- Report/ paper publication
- Multi-media
- Web site with textual info
- Model

Tell a story

Content Principles

Process Principles

interfaces for effective communication

contexts of engagement of civil society in science relevant policy

There is not a comprehensible "protocol" to communicate science **in public debate contexts**; yet there are some scattered indications on issues to be considered:

► legislation specifically requires EIA non-technical summary for public consultation → techno-jargons

► *GM Nation?* debate in the UK → concern about legitimacy of sources

► assessing uncertainty checklist in environmental assessment at RIVM, NL → how to communicate uncertainty?

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Context in which engagement takes place

- Scene
- Audiences

Sci-Com 4 public engagement (5)

►Objectives of involvement

►Stage at which involvement takes place [crisis … co-production…]

►Type of involvement

►Setting of involvement

►Who will be listening to outcomes? [institutional "ears"]

- Are you doing consultation?
- Are you doing extended peer review/ extended policy making; partnerships?

- Research
- Policy

>> Contents

>> Styles

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▶Who are the audiences?

▶Mix of audience?

>> Contents

>> Styles

>> Language

Sci-Com 4 public engagement (7)

issues to look at

Knowledge content

- Representation
- Language
- Mediation tools

- socially robust knowledge = relevant for the audiences

- progressive disclosure of information

- pedigree of information provided

Sci-Com 4 public engagement (8)

- How will the story be (re)presented?
  - Complexity of issues
  - Nature of information (including associated uncertainties)
  - Method of engagement
  - Availability of audiences
- Metaphors; provision of tangible elements (examples); illustrations

>> mediation props
>> formats

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languages

► Disciplinary specific jargon to be avoided or explained
► "Vernacular language" where possible, if it simplifies communication

>> Style of communication

>> Format of communication

► Medium through which the "story" is conveyed
  - ► report
  - ► policy brief
  - ► multi-media materials, homepages or applications
  - ► videos, audio-visual material
  - ► theatre
  - ► games

► Deployment of scientific tools [scenarios, models, multi-criteria evaluation, etc…]

>> Style of communication

>> Format of communication

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**contents
scope**

► What do people want to know?
► What is relevant information in the specific engagement process?
► Extended framing >> "extended facts"

A journalistic perspective:
• The 5 **W**: Who, Why, What, Where, When
• Elements of a story that sells: thesis, motivations, method, assumptions, results

Sources: A. Lewis, Univ. Royal Halloway, UK
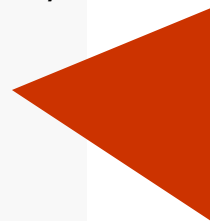*G. Carrada, A survival guide for science communication, EC*

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Sci-Com 4 public engagement (12)

contents
pedigree

- Data, Models

- Methods/ Methodologies, Procedures

- Research outputs

- Researchers' reasoning, motivations, assumptions

- Controversies

- Uncertainty

- …

PEDIGREE

v
v

▶ Contents **documentation** [sources of information, assumptions, etc.]
▶ **Quality assurance** elements [legitimacy, reliability (control & confidence), etc.]
▶ **Black boxes unfolding** [models, methods, etc.]

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Science Communication

▶ Towards a "protocol" of key issues to account for when planning the science input in a public debate on science-relevant policy:

>>Quality<<

fitness for purpose –
reliability –
legitimacy –
transparency –
intelligibility –

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► Discuss the agenda with audiences

► Allocate time for questions and later opportunities to answer if you cannot answer promptly

► Don't try to be "neutral" – you are not: what you choose to tell in your story is determined by your framing and agenda!

► The quality of the communication is to be checked against audiences' expectations, not just your agenda

► Don't take any issue for granted

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