

# On science and ethics

## Rotten Apples or Corrupted Quality?

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**Part 1: Some relevant background**  
**– Hopes, aspirations, and**  
**“innocent” beginnings?**

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# Historical highlight from the French Revolution:



- *a story from more than 200 years ago ->*
- Marie Jean Antoine de Condorcet

## Marie Jean Antoine de Condorcet 1795: “Sketch for a Historical Picture of the Progress of the Human Mind”

“Will increased welfare and improved health of man lead to largely increased populations? Will not necessarily there be a time when the number of people has outgrown the natural resources that nature can supply? Is it not reasonable to assume that when resources become scarce, then there will be fight for the resources, war between people?”

**[Technology Fix argument:]** Nobody could claim that such a time is imminent, Technological progress may bring the answers.

**[Ethics argument:]** People’s ethics and morality will progress alongside reason. Our moral duty is not to make sure that unborn life is born, but that those that are born are secured a life in reasonable welfare, dignity and happiness.”

# Condorcet believed in the power of rationality / science.

*The following is an obvious truth for him:*

- *The progress of science and technology cannot be conceived without at the same time assuming that human reason and ethics also will have made considerable progress!*
  - ***Moral progress matches the scientific progress!***

# Moral Progress?

## In line with scientific progress?

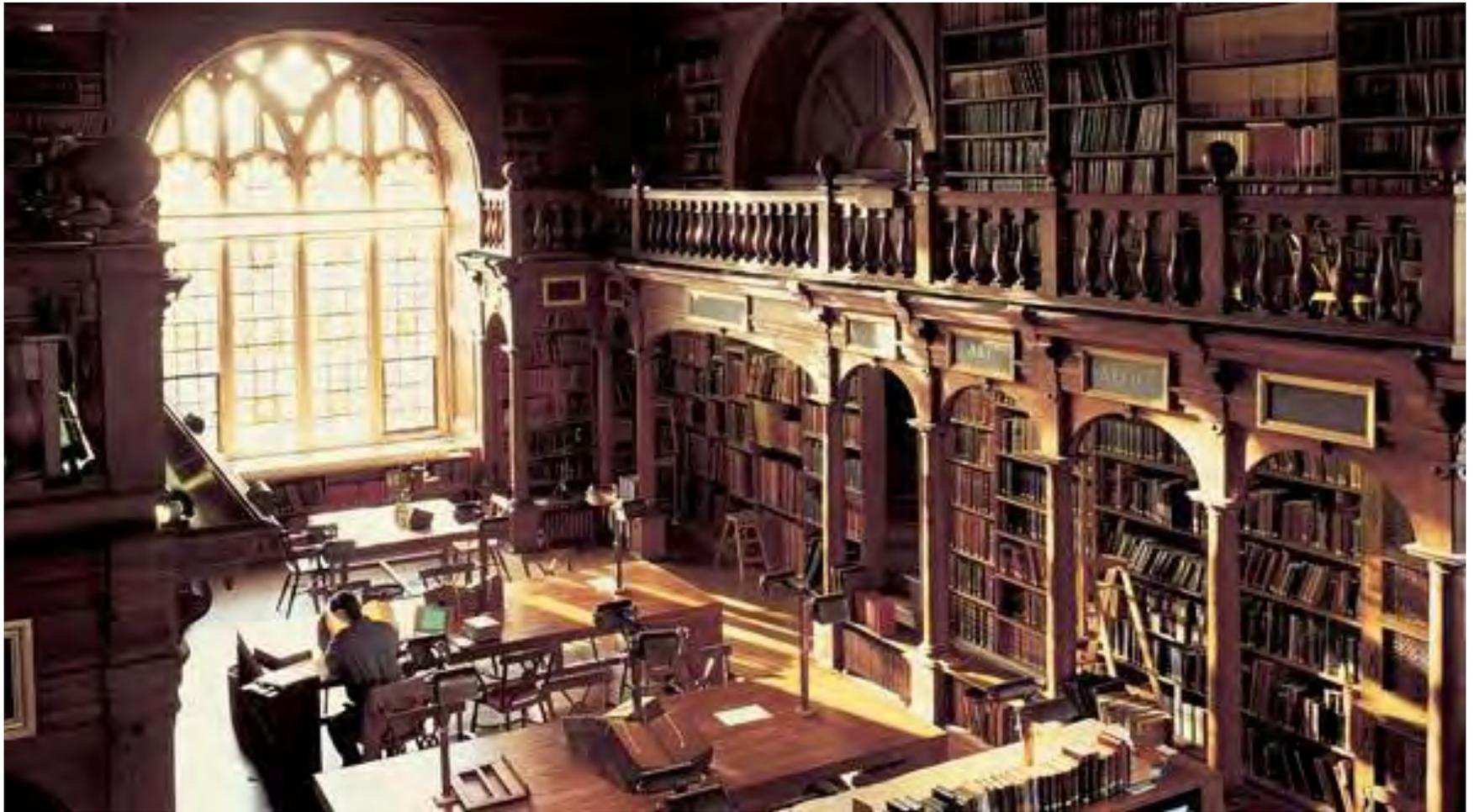
- What do you think?



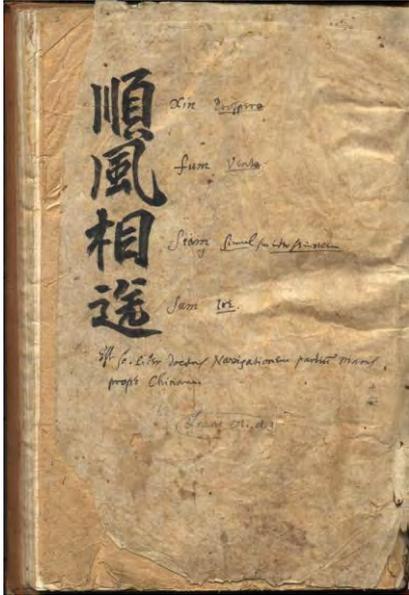
**Part 2: The story of a true scholar – or was he? Truth, fiction, or does it matter?**

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# Oxford University: The Bodleian Library

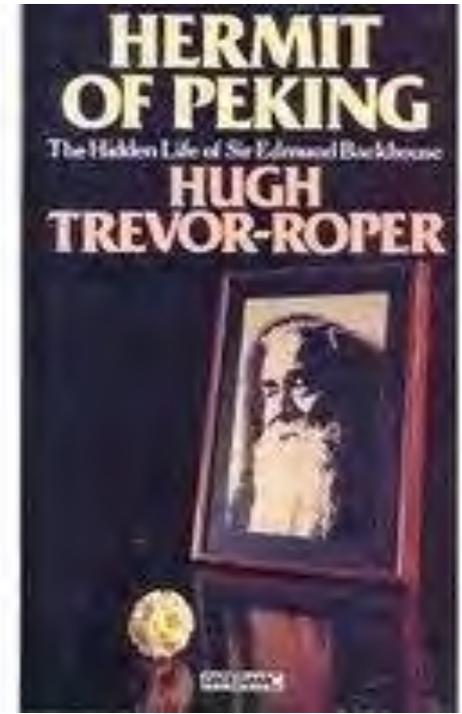
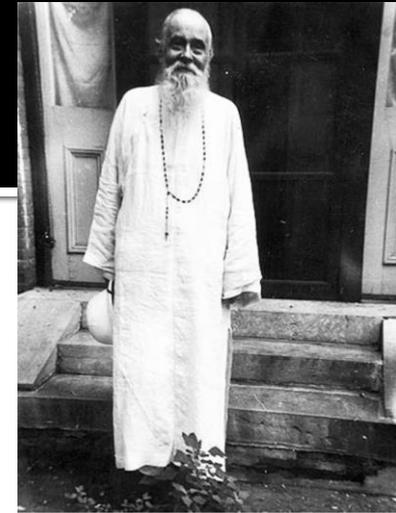


# Oxford University: The Bodleian Library



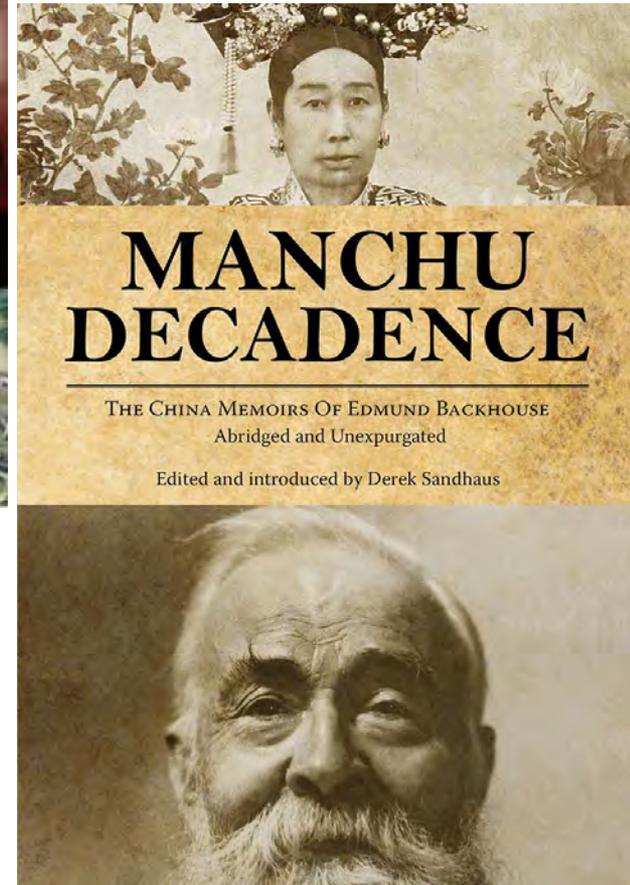
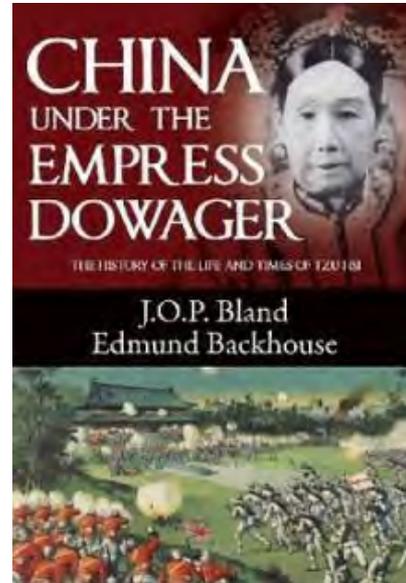
Inscribed on a marble roll of honor on the wall of the Bodleian Library at Oxford University in England are the words "**Edmundus Backhouse, baronettus.**" The inscription pays tribute to the eminent scholar Sir Edmund Back-house, whose gift of more than 27,000 rare Chinese books and scrolls made the Bodleian into Europe's finest repository of Chinese scholarly materials.

# Sir Edmund Backhouse



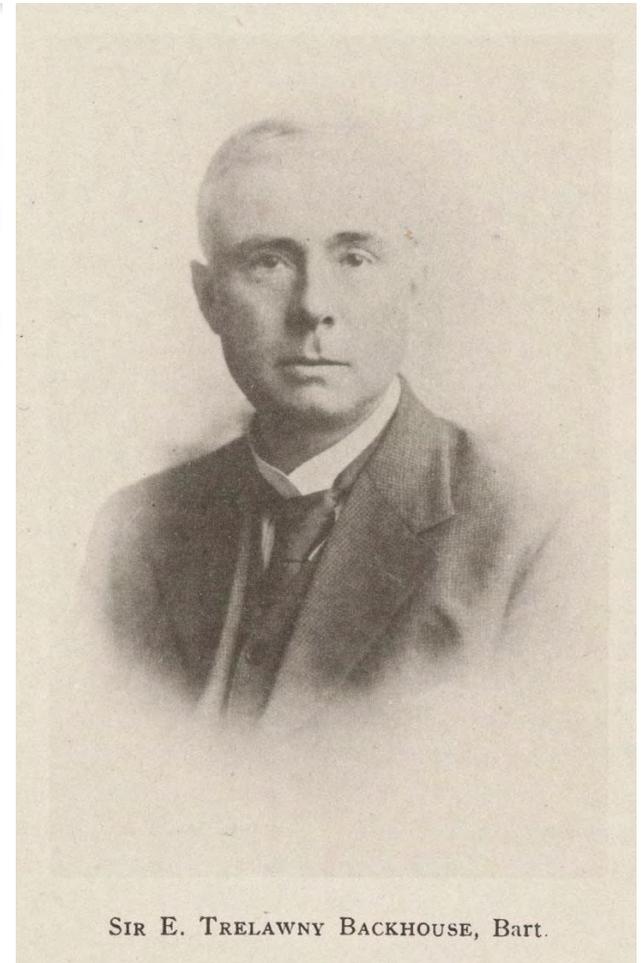
# Memoirs?

- Backhouse was known for 2 books, written in collaboration with J.O.P. Bland: **China under the Empress Dowager** (1910) & **Annals and Memoirs of the Court of Peking** (1914)
- Hugh Trevor-Roper felt he had to check the veracity of Backhouse Memoirs before handing them over to the library!  
*"The volumes were of no ordinary obscenity ...it was the story which they told!"*



# The life of someone nobody seemed to know! A hermit!

- Sir Edmund Trelawny Backhouse, 2nd Baronet (20 October 1873 – 8 January 1944);
- *"I was born of wealthy parents who had everything they wanted and were miserable...I heard not a kind word nor received a grudging dole of sympathy..."*
- A life in different stages and roles.
- Escaped from England in 1899, learned fluent Chinese.



# Many "careers"!

- A **gambler** and **swindler** in England:  
After 3 yrs at Oxford a total of £ 23,000 in debts.
- Bankrupt!
- (missing years 1895-98)



# The fraudulent scholar

- The **Scholar:**
- George Ernest Morrison – Time correspondent (& J.O.Percy Bland not able to speak Chinese.
- Backhouse became their translator (Mandarin, Mongolian, Manchu?)
- Ching-Shan's diary = genuine?
- The book = the first readable account of the whole reign. Financial moderate success.
- In 1991 definitive proof of its fraudulence.



# Other careers – based on lies:

- **Benefactor** to the Bodleian library
- The **secret agent** on behalf of British government at war; buying weapons
- The **entrepreneur** for US bank notes company.
- The **diary**
  - = he made Bodleian pay him for rare manuscripts and transport, many never arrived. & Forged manuscripts!
  - China was neutral, but had unused weapons, which could be bought by a “private” person, an agent: Backhouse, the only man to make the contacts. 30k – 150k rifles.- No shipments ever arrived.
  - Betrayal in printing contacts and other dealings.
  - The sexual phantasy? Or based on rumour? Truth is not possible.

# Truth or fiction – what makes a difference?

- The post-modern condition => truth as evasive.
- Science built on truth - but whose truth if history tells many stories?
- Copy or original –does it matter?
- Fraud in science? Defending old values?

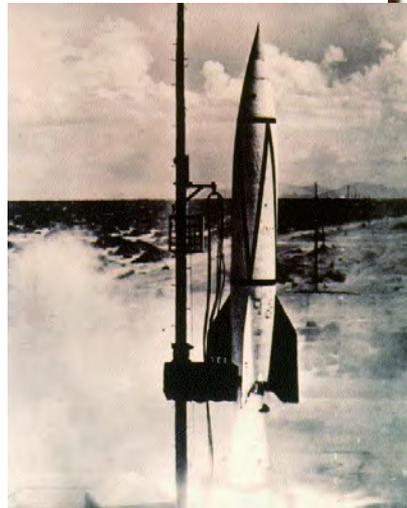


**Part 3: A scientific hero? What does greatness in science amount to?**

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# "Big Science" and funding of research:

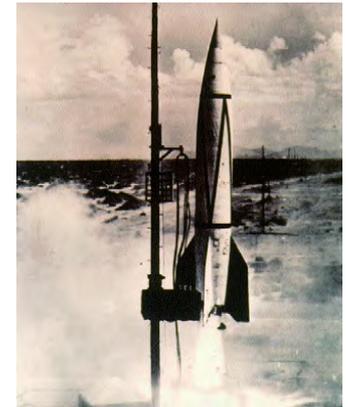
- *a trip to the Moon and how it started ->*
  - *Wernher von Braun: Heroe of science or corrupt betrayer of morality?*



# Holidays at the Baltic Sea



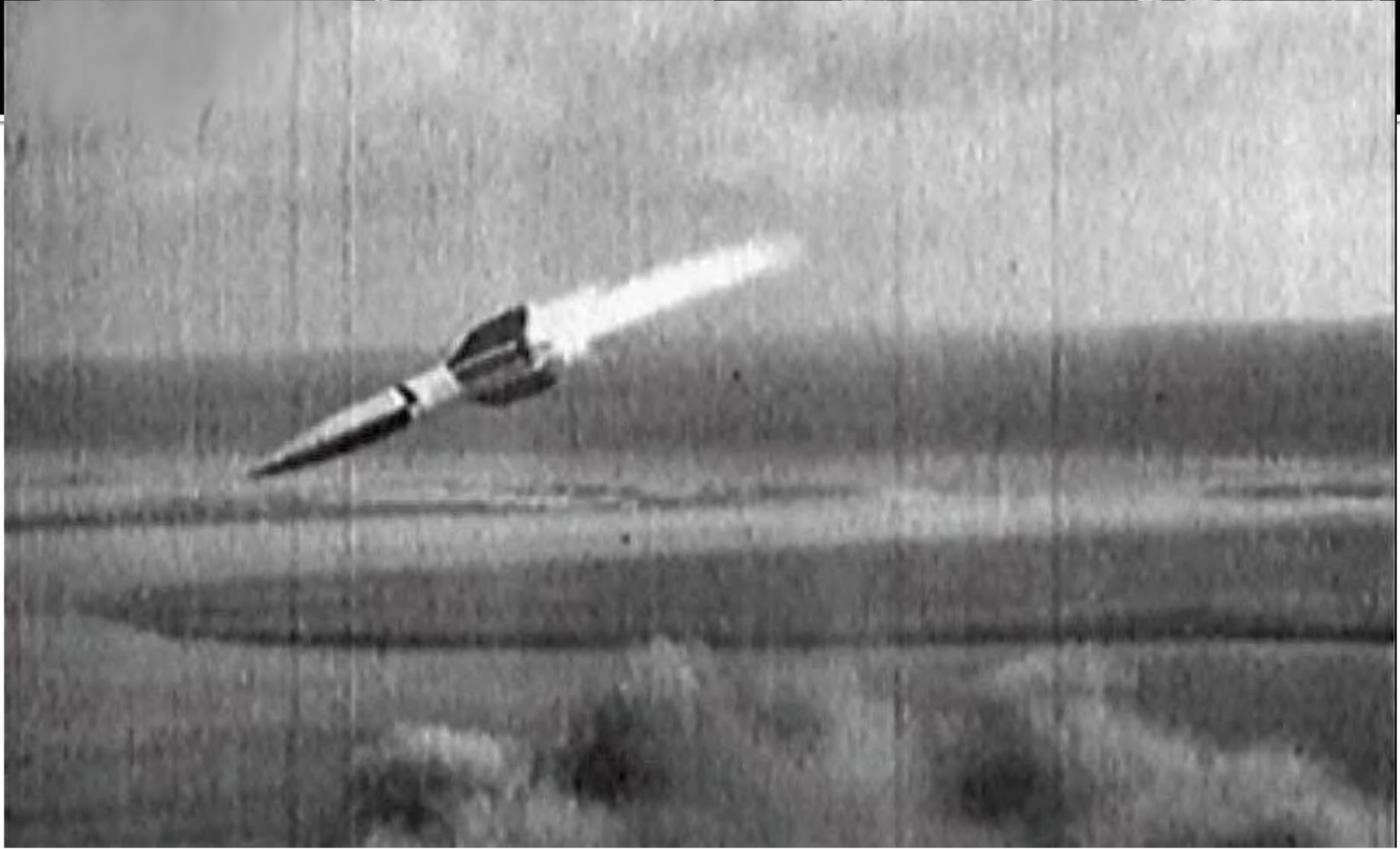
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# Wernher von Braun – model scientist?

- Born 1912
- Early interest in space exploration (book by Romanian physicist)
- Volunteered for the military (1932) in order to do research
- With Dornberger starting Peenemünde 1936;
- Privately a big snobb
- Success at the end of the 1930's; first good tests of rockets in (1943); V2 was developed
- No doubt aware of the use of concentration camp inmates to produce these weapons
- Reported to USA in 1945, they transferred him to USA
- Became leading figure in NASA
- Leading the Moon landing project
- Died in 1977











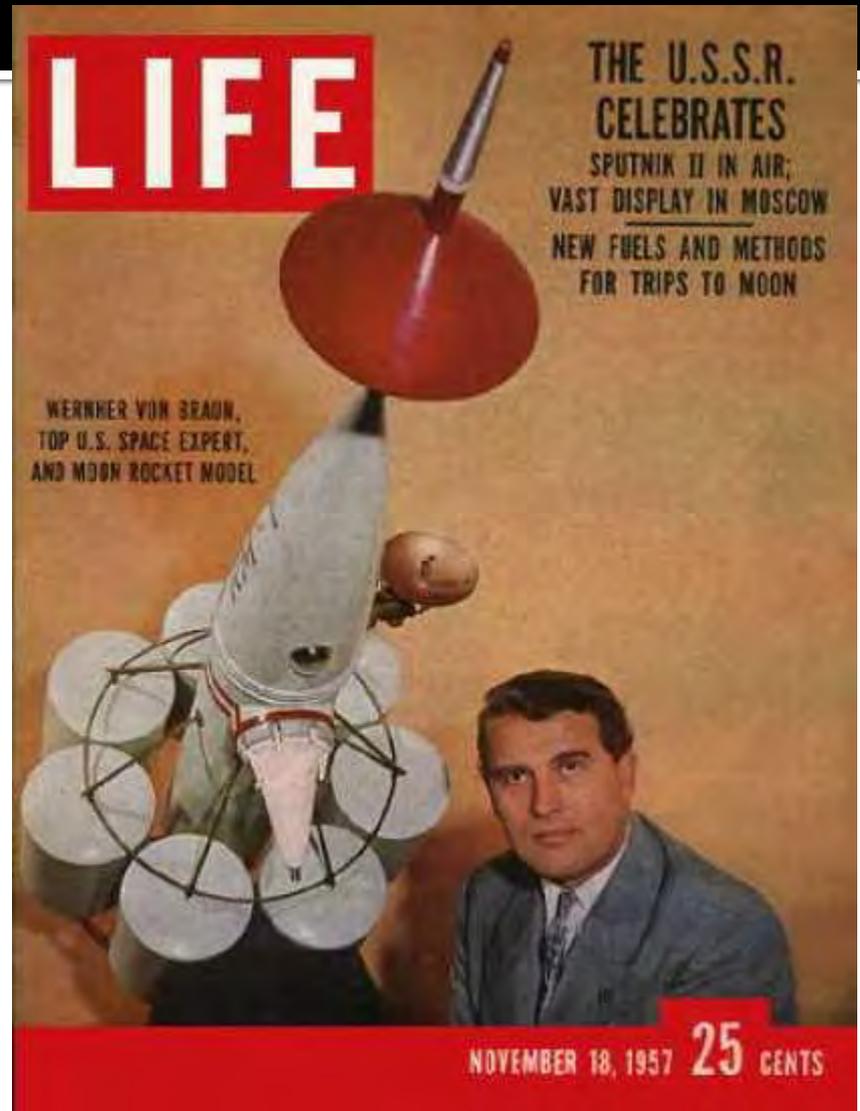
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**Werner von Braun Rocket Science Team Surrenders to the U.S. 324th Regiment - 44th Infantry Division, May 2, 1945**





***"I do not care if I work for Uncle Sam [USA] or if I work for Uncle Joe [Joseph Stalin], as long as the uncle is rich!"  
Wernher von Braun, NASA***



# Three reflections:

1. Yes, I have met the same type of researcher like Wernher von Braun, even in our days.

“you have to go where the money is” , “After all, we just provide the knowledge, it is others that use it” ,

2. No, I do not think that our society today can afford this type of scientist.

We expect social responsibility in exchange for academic freedom!.

3. If you agree with statements 1. og 2., then it “only” remains to answer the question what type of instruments one should use in order to increase the ethical responsibility of the workers at the workbench. -> Ethics in science, research ethics,...

1. Education?
2. Guidelines? ...
3. Ethical committees?
4. Broad public debate ...

# Part 4: An eye-opener - The case of the vanishing support for ethics

# Impressions from the World Conference on Science (UNESCO & ICSU)

155 countries, 1800 delegates, 60 NGOs, 90 Ministers

**Saturday, 26 June 1999**

**Opening Session:**

Opening statements by High Officials of Unesco, ICSU and Hungary

Keynote addresses on:

Science for the Twenty-first Century

Science in Response to Basic Human Needs

Science as an Investment

Science and Human Values



**WORLD  
CONFERENCE ON  
SCIENCE**



SCIENCE FOR THE TWENTY-FIRST CENTURY  
A New Commitment

# Ethics on the Agenda!

*Science and Engineering Ethics* (2000) 6, 131-142

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## **Ethics and the Responsibility of Science**

Background paper for the World Science Conference, Budapest June 26-July 1, 1999

**Prepared by the International Council for Science's Standing  
Committee on Responsibility and Ethics in Science\***

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**Keywords:** International Council for Science, ethics, responsibility in science

# Sir Joseph Rotblat !

From Wikipedia:

**Sir Joseph Rotblat** KCMG CBE FRS (November 4, 1908 – August 31, 2005) was a Polish physicist, a self-described "Pole with a British passport".[2] Rotblat worked on Tube Alloys and the Manhattan Project during World War II, but left the Los Alamos Laboratory after the war with Germany ended. His work on nuclear fallout was a major contribution toward the ratification of the 1963 Partial Nuclear Test Ban Treaty. A signatory of the 1955 Russell–Einstein Manifesto, he was secretary-general of the Pugwash Conferences on Science and World Affairs from their founding until 1973, and shared, with the Pugwash Conferences, the 1995 Nobel Peace Prize "for efforts to diminish the part played by nuclear arms in international affairs and, in the longer run, to eliminate such arms."



Nobel Peace Prize Awarded 1995



Hermann Joseph Muller was an American geneticist, educator, and Nobel laureate best known for his work on the physiological and genetic effects of radiation.



Hiddeki Yukawa was a Japanese theoretical physicist and the first Japanese Nobel laureate.



Max Born won the 1954 Nobel Prize in Physics.



Linus Pauling was an American scientist, engineer, peace activist, author and educator.



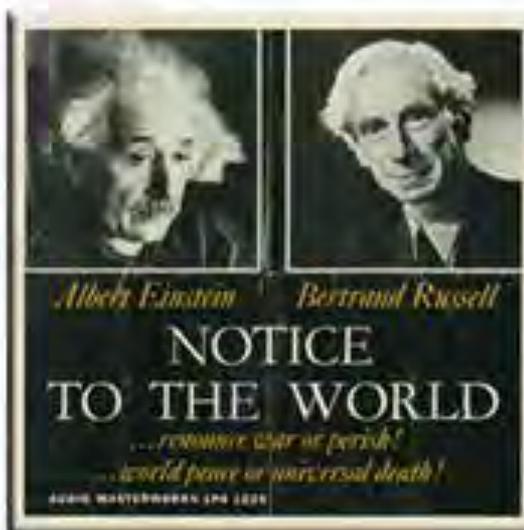
Leopold Infeld was a Polish physicist. He was a Rockefeller fellow at Cambridge University



Cecil Frank Powell was a British physicist, and Nobel Prize in Physics laureate (1950) working at Bristol University.



Frédéric Joliot-Curie was a French physicist and Nobel laureate.



Percy Williams Bridgman won the 1946 Nobel Prize in Physics for his work on the physics of high pressures



Joseph Rotblat was a Polish-born and British-naturalised physicist.

## The Russell - Einstein Manifesto, 9 July 1955 Signatories to the Manifesto

# The wake-up call!

**The time has come to  
formulate guidelines for  
the ethical conduct of  
scientist, perhaps in the  
form of a voluntary  
Hippocratic Oath.**

**Joseph Rotblat**  
Polish Physicist

# Accepted result:

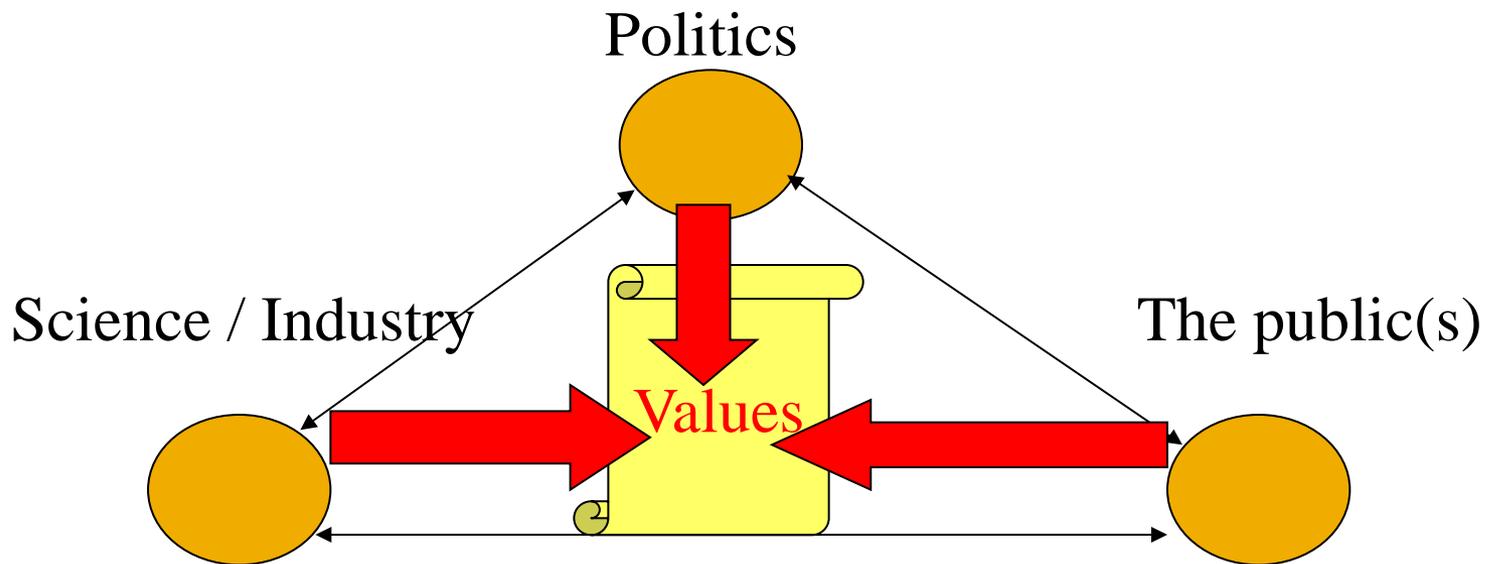
- Section 3.2 on Ethical Issues:
- "The ethics and responsibility of science should be an integral part of the education and training of all scientists. It is important to instil in students a positive attitude towards reflection, alertness and awareness of the ethical dilemmas they may encounter in their professional life. Young scientists should be appropriately encouraged to respect and adhere to the basic ethical principles and responsibilities of science. UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), in cooperation with ICSU's Standing Committee on Responsibility and Ethics of Sciences (SCRES), have a special responsibility to follow up on this issue."

# Part 5: Birds-eye view on (modern) science and ethics

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# ”Ethical issues” typically central:

- ”Ethics” = the common platform for dialogue on values and conflicting interests.
  - ”Values” = no privileged access; democratic



# "Ethics of science" ???

- Is sometimes perceived as a "No"-exercise: the limits / constraints of research.
- But can also be perceived as a "Yes"-exercise:
  - *Ethics = visions of the good life*
  - *Ethics of science = visions of the good knowledge*
- As such, ethics of science comprises responsibility to strive for pro-social values.
- Responsibility comprises co-responsibility; and is thus always total, it never comes in small "departments".

# Socially organised activity:

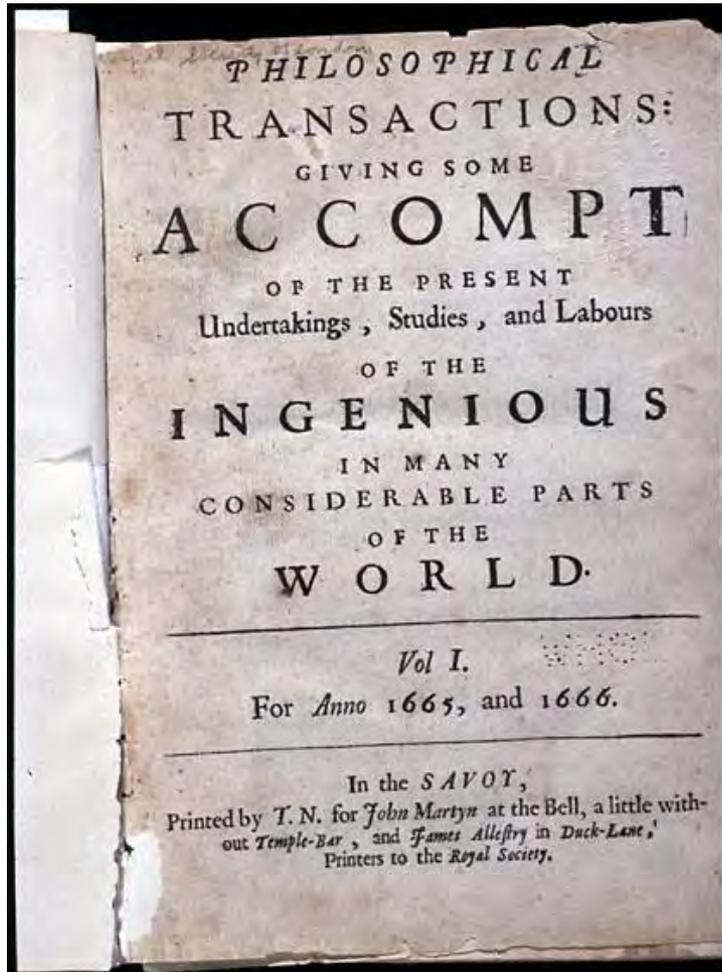


- Several scientific societies or academies were founded nearly at the same time in Italy, England and France.
- For the pursuit of natural philosophy and experiment
- Impressed by technological advances

# The need to justify the new organization:

- **” The business and design of the Royal Society (is) to improve the knowledge of natural things, and all useful Arts, Manufactures, Mechanick practices, Engynes, and Inventions by Experiments, - (not meddling with Divinity, Metaphysics, Moralls, Politicks, Grammar, Rhetorick, or Logick).”**
- Consequence: Church (owner of universities) can relax; King can relax, occupying an empty space.
- Believing it (or not?) – did it matter?

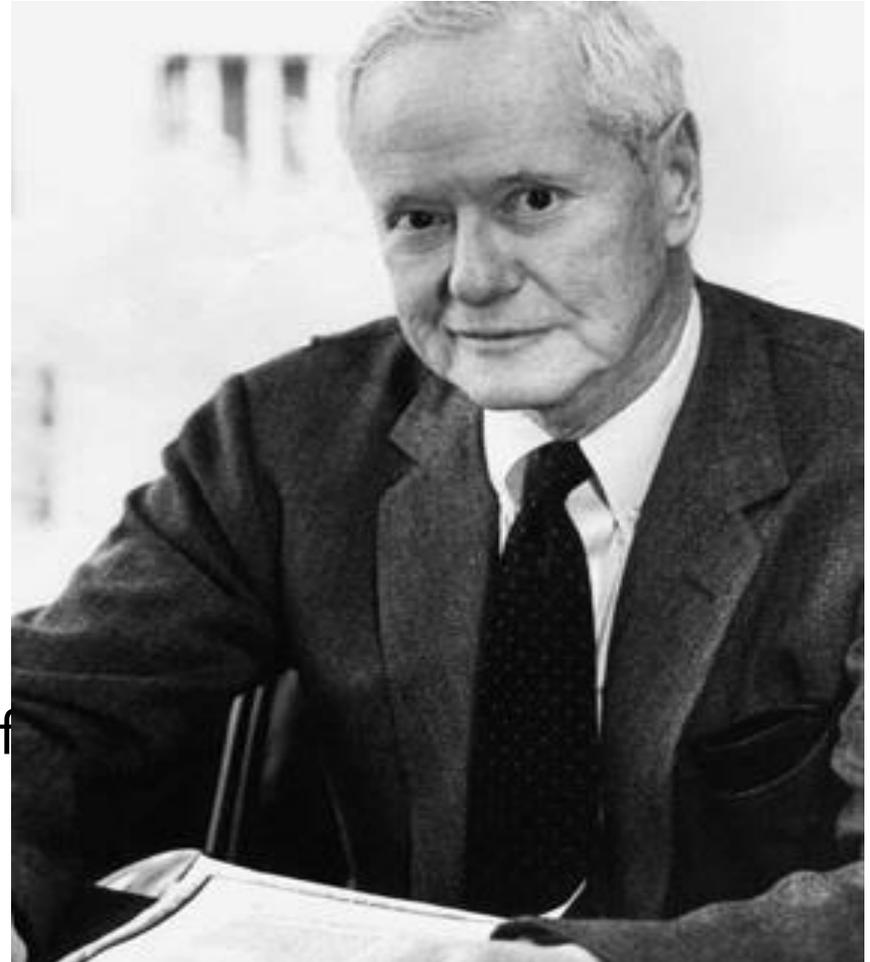
# Public knowledge:



- Universal science
- Test of knowledge claims through peers
- Birth of the scientific journal
- For the benefit of all
- No secrecy
- Insure priority of discovery
- Inspired by Arts and Crafts of the Renaissance (Da Vinci etc)

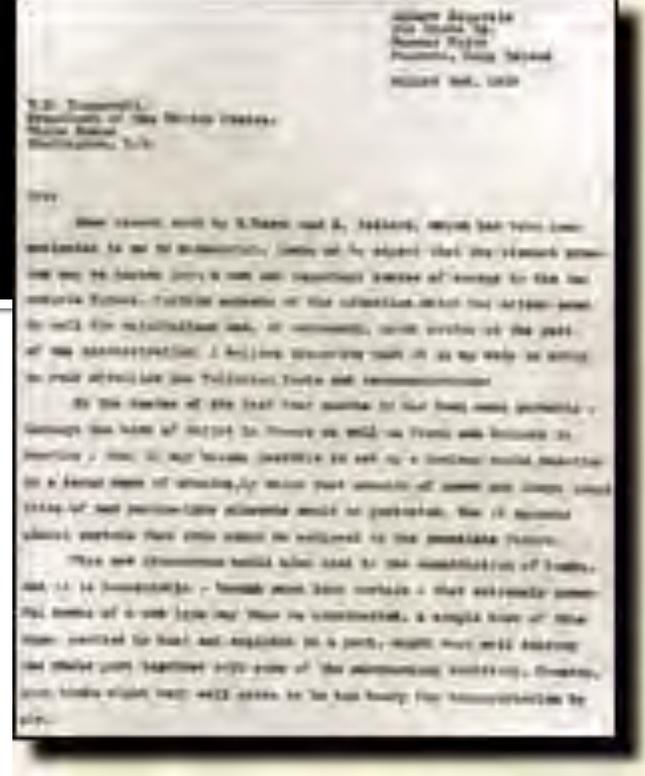
# Robert K. Merton (1919-2003) and the ethos of science

- Consists of 4 (5) "norms":
  - Communism
  - Universalism
  - Disinterestedness
  - Organized Scepticism
  - (Originality)
- Reward mechanisms in science:
  - Being credited in scientific literature
  - (symbolic capital)



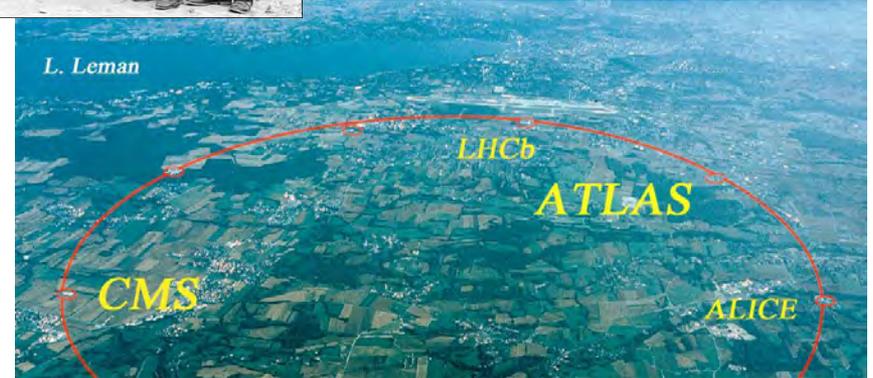
# Big Science:

- Starts with 2nd World War
- Manhattan Project
- Collective enterprise towards common goal
- Management system
- Goal from outside science



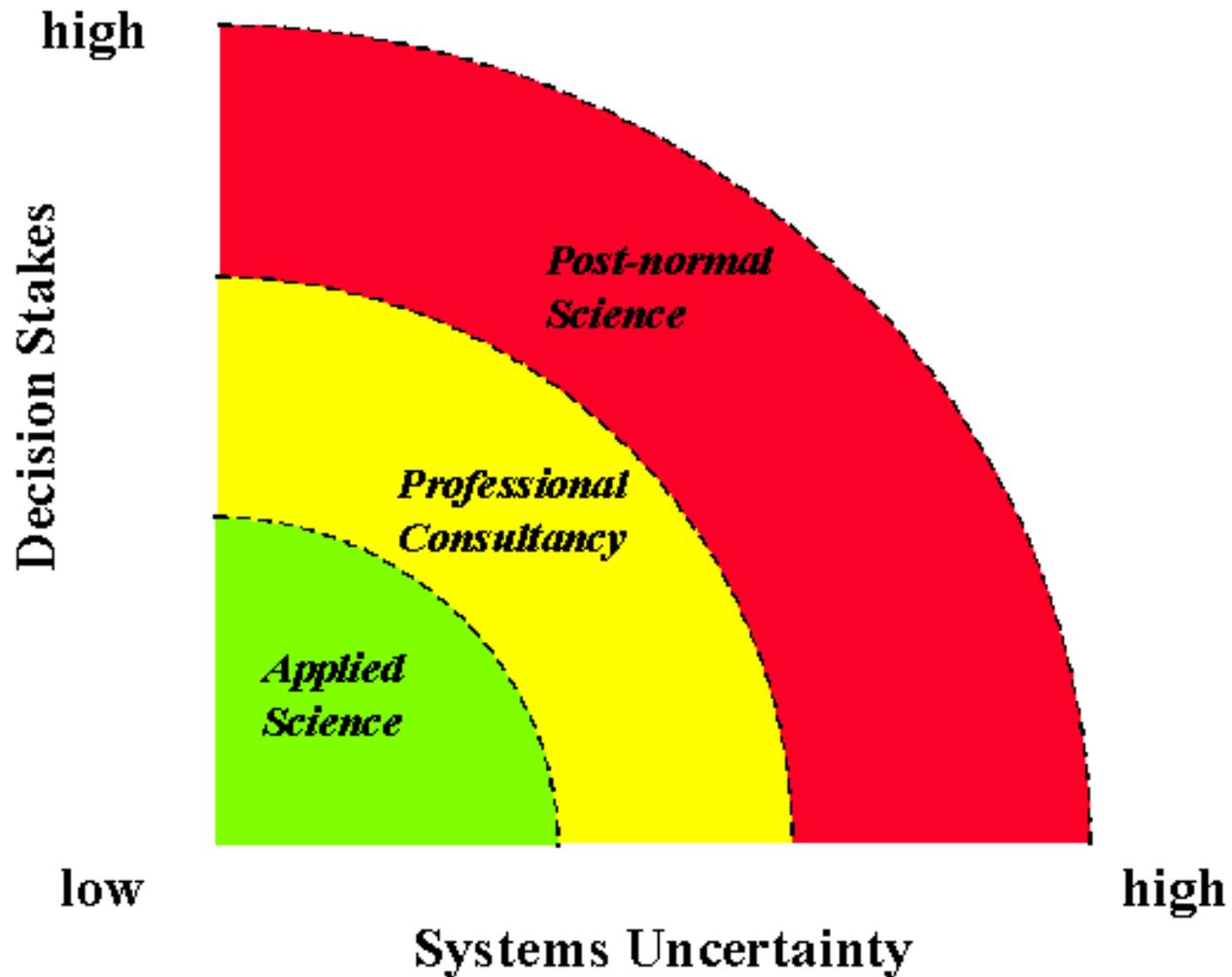
# More On: Big science:

- Manhattan project
- Hitler's rocket program at Peenemünde
- More followed: ...



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**Funtowicz and Ravetz, Science for the Post Normal age, *Futures*, 1993**

# Part 6: The case of the vanishing uncertainties – science for policy

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# A special challenge: the fallacy of the disappearing uncertainties:

- A case: building the Oslo airport
- A fact: the use of de-icing fluids (glycole etc) in wintertime
- A challenge: De-icing fluids contain e.g. glycol and other substances, which are easily degradabe under aerobic conditions, but large spills in runoff water may create anaerobic conditions, which again may lead to organic sulphur compounds, contaminating the ground water.



# The study:



- Based on thesis by my student Ole Espen Rakkestad, 1996:
- Studied the research leading up to the authorities' permission of discharges of the new Oslo airport, prior to its opening in 1998.
- Focus on scientific uncertainties

# Scientists at work:

- The airport was situated on top of Norway's largest aquifer, with a water-shed right between: 100 km<sup>2</sup>; airport 1/10
- Ten different studies were commissioned by builder, relating to possible water pollution, and the soils' remediation capacity.
- Various types of study: from laboratory simulations to field studies, actual measurements, technical solutions, and assessment of environmental impacts.



## Politicised issue from the beginning:

- Various NGOs and other interest groups used environmental pollution of the aquifer as one concern when pollution from the old airport made headlines.
- Parliament demanded, in its initial agreement to go ahead with the planned airport, that the airport be "100% environmentally safe".
- The aquifer had to remain a potential source of drinking water.
- Scientists participating in the study agreed not to be involved in the public disputes about the airport.

# Some basic initial uncertainties:

- Due to lack of knowledge and experience, the scientists had to build up their own expertise while conducting the studies. Few studies available. **Background of ignorance**
- The scientists were given a strict and **short time frame**: only a few months within one winter/spring season.
- The precise composition of the used substances remained unknown to the scientists, due to **industrial secrecy**.
- The system for cleaning up the spills from de-icing fluids had to be developed while construction was under way.
- Some pollution already present from earlier military uses.

# More specific uncertainties:

## ■ Imprecision in measurement:

- While basic science can correct some imprecisions, applied science is dependent on the limited number of measurements actually performed.
- Standard variation for soil studies was ca 60% of the mean.
- Some studies reported a statistical uncertainty of results of + - 5-10%, though a more realistic estimate might have provided even larger uncertainties.

## ■ Lack of transferability of results

- Studies from one site were used for another site, without evidence that results were actually transferable.
- Lack of temperature data from soil makes laboratory study uncertain
- Absence of ground frost during measurement affects data on transport of fluids
- Precipitation during study period was 2% of average for this month, thus affecting data on how deep the fluids reach.
  - Researchers assumed that normal precipitation will not change transport by more than 40 cm, but without obvious basis for this assessment.
- Studies used clean solutions, not actual products, thus joint effect of all substances could not be observed.
- Soil samples for laboratory studies used one sample from one location which was then purified for controlling results, thus strong idealization occurred.

## ■ Framing uncertainties in regard to causal influence from external factors:

- Local versus global
- Short term versus long term
- Micro versus macro descriptions.

# How were the uncertainties managed?

- The builder set own emission limits that were to reassure the authorities.
- Original reservations in reports by researchers due to some uncertainty in measurements, were hidden in summary reports, and disappeared altogether in application to authorities.
  - **4-step invisibility of uncertainty**

Component to be decomposed	Load	Capacity
	Kg/m <sup>2</sup> /year	Kg/m <sup>2</sup> /year
Acetate	2	13-33
Glycol	0,3-1,2	3-40

# Inadequate information for a given purpose = uncertainty

- Systemic uncertainties, the complex nature of the soil's remediation capacity and groundwater flow, could not be handled by safety levels related to uncertain data. Irreducible uncertainty.
- The practical context with existing guidelines for environmental safety would indicate that uncertainties were to be communicated qualitatively to decision makers.
- Scientists did not even object when all their initial reservations disappeared.

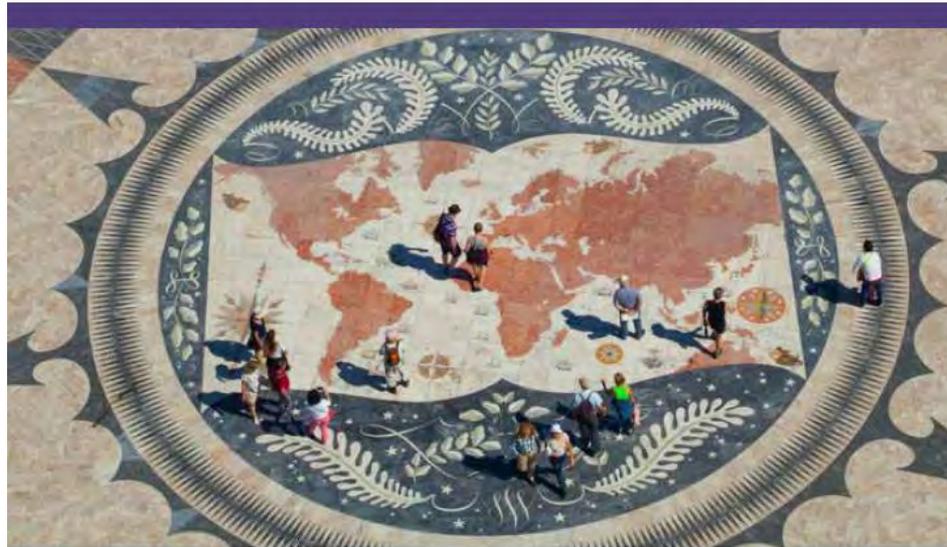
# What happened?

- 6 months after the opening of the airport the groundwater data indicated that significant residues of substances from de-icing fluids had reached the groundwater.
- All preset limits were exceeded.
- Public outcry: who is the culprit?
- Scientists blamed the politicians for setting unrealistic standards and fostering too high hopes; politicians blamed the airport, and the airport found "some" faults in the previous assessments.

# Part 7: Ethical guidelines

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## Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology



## INNHOOLD

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# **A) FORSKNING, SAMFUNN OG ETIKK**

## **1 Forskningens normer og verdier**

*Forskeren er forpliktet til å følge anerkjente forskningsetiske normer.*

Forskning er søken etter ny og bedre innsikt. Det er en systematisk og sosialt organisert virksomhet styrt av ulike normer og verdier. Vitenskapens viktigste forpliktelse er idealet om å søke sannhet. Samtidig er det slik at forskningen aldri har noen garanti for å nå dette målet. De fleste konklusjoner er foreløpige og begrensede. Vitenskapens normer har likevel en verdi i seg selv som retningsgivende og regulerende både for forskerens sannferdighet og forskersamfunnets sannhetssøken.

I humaniora og samfunnsvitenskap er ofte innlevelse og fortolkning en integrert del av forskningsprosessen. Forskjellige faglige tilnærminger og teoretiske ståsteder kan dessuten åpne for ulike, men likevel rimelige tolkninger av det samme materialet. Det er derfor viktig å reflektere over og redegjøre for hvordan egne verdier og holdninger kan påvirke valg av tema, datakilder og tolkninger. Redelighet i dokumentasjon, konsistens i argumentasjon, upartiskhet i vurderinger og åpenhet om usikkerhet er felles forskningsetiske forpliktelser, uavhengig av verdimeslig eller vitenskapsteoretisk posisjon.

# Ansvar

## 3 Forskningens ansvar

■ God forskning forutsetter frihet fra styring og kontroll, mens samfunnets tillit til forskning forutsetter ansvarlighet b.de fra den enkelte forskeren og fra forskningsinstitusjonene.

Forskningens ansvar er regulert av vitenskapelige, etiske og juridisk normer. Forskning har også et samfunnsansvar, enten det er instrumentelt som kunnskapsgrunnlag for samfunnsmessige beslutninger, kritisk som kilde til korrektiver og alternative handlingsvalg, eller deliberativt som leverandør av forskningsbasert kunnskap til det offentlige ordskiftet.

## ■ 25 Medforfatterskap

Forskeren skal følge god publiseringspraksis, respektere andres bidrag og f. lge anerkjente standarder for medforfatterskap og samarbeid.

Vitenskapelig publisering er avgjørende for å sikre at forskningen er åpen og etterprøvbar. Samtidig reiser publisering ulike forskningsetiske utfordringer og dilemmaer.

Forskingsamfunnet er preget av sterk konkurranse og stort publiseringspress, som ofte setter forskningsetiske normer under press. Normen om originalitet kan for eksempel lett komme i konflikt med normen om ydmykhet, og ulikhet i autoritet og maktforhold kan komme i konflikt med forskerens integritet og uavhengighet. Medforfatterskap er også knyttet til fordeling av ansvar mellom ulike bidragsytere.

I utgangspunktet kan fire kriterier definere rettmessig forfatterskap. Alle må være innfridd, slik det framgår av anbefalingene fra International Committee of Medical Journal Editors (ICMJE):

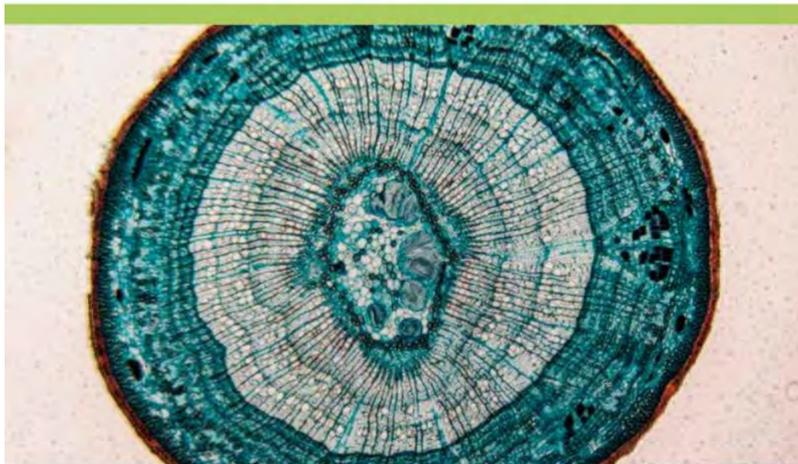
1. Forskeren skal ha bidratt vesentlig til idé og utforming eller datainnsamling eller analyse og fortolkning av data; og
2. forskeren skal ha bidratt til utarbeiding av manuskript eller kritisk revisjon av publikasjonens intellektuelle innhold; og
3. forskeren skal ha godkjent den endelige versjonen før publisering; og
4. forskeren skal kunne stå inne for og holdes ansvarlig for arbeidet i sin helhet (om enn ikke nødvendigvis alle tekniske detaljer) med mindre annet er spesifisert.

# Ethical guidelines for research in science and technology

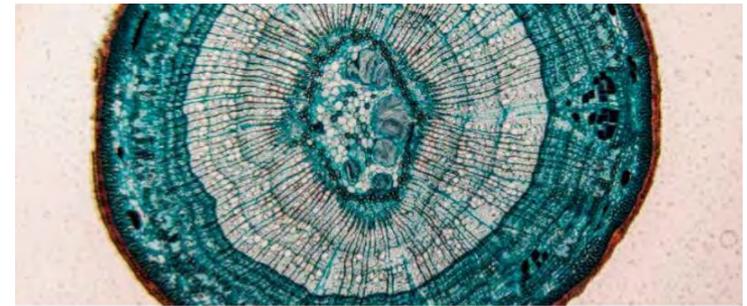
[www.etikkom.no](http://www.etikkom.no)



## Guidelines for Research Ethics in Science and Technology



## Forskningsetiske retningslinjer for naturvitenskap og teknologi



### ***Research ethics***

The concept of "research ethics" refers to a broad set of standards, values, and institutional arrangements that contribute to constituting and regulating research activities. These include the duty of honesty in research as well as responsibility to colleagues, other people, animals, the environment, and society in the widest sense.

### ***The obligations of research to society***

- 1 Research has an independent responsibility for the role it plays in social developments.
- 2 Research should be compatible with sustainable development.
- 3 Research has a responsibility to contribute to greater global justice.

### ***Scientific integrity, truthfulness, and accountability***

- 4 Researchers are responsible for conducting high-quality research characterised by scientific integrity, truthfulness, and accountability, and research institutions must create conditions that promote such practice.
- 5 Researchers must respect the contributions of other researchers and observe standards of authorship and cooperation.
- 6 When involved in reviewing the work of others (articles, theses, applications, positions, etc.), researchers have a responsibility to evaluate their own qualifications and impartiality.
- 7 Researchers must comply with national and international rules and regulations established to safeguard ethical and safety interests.

### ***Uncertainty, risk, and the precautionary principle***

- 8 Researchers must clarify the degree of uncertainty in their research and evaluate the risk associated with the research findings.
- 9 Researchers must strive to observe the precautionary principle.

### ***Protection of research subjects***

- 10 Researchers must respect the requirement of freely given, informed consent.
- 11 Researchers must protect the privacy of their research subjects.

### ***Protection of animals used in research***

- 12 Researchers must proceed with due care and respect animal welfare when preparing and conducting experiments involving animals. Researchers must justify the necessity of the experiment to the responsible supervisory authorities.
- 13 Researchers must arrange their research in such a way that the use of the research results is not in conflict with fundamental animal welfare requirements.

### ***The relationship between research and other knowledge-bearers and forms of knowledge***

- 14 Researchers must acknowledge the economic and cultural value of other forms of knowledge.
- 15 Where relevant, researchers should engage in dialogue with other knowledge-bearers.
- 16 Research should involve the affected parties where relevant.

### ***Commissioned research, openness, and conflicts of interest***

- 17 Research institutions and the researchers involved must ensure openness and scientific quality in commissioned research.
- 18 Research institutions and the individual researcher must ensure openness about possible conflicts of interest.

### ***Whistleblowing and ethical responsibility***

- 19 When, in the course of their work, researchers become aware of matters that they consider to be in conflict with ethical principles or their social responsibility, they must have the possibility and, depending on the circumstances, the duty, to act as whistleblower.
- 20 Research institutions must have independent mechanisms that can support employees in whistleblowing situations.

### ***Dissemination of research to the general public***

- 21 Research institutions should reward dissemination that popularises research as well as research-based participation in public debates.
- 22 Research institutions and researchers are both responsible for disseminating research findings.
- 23 Researchers should not misuse their titles to add weight to their views

### ***Proposed scientific oath***

The research ethics guidelines should be well known in research communities and should especially reach those who are newly recruited into the research community. The guidelines mean that the individual researcher makes a personal commitment. We therefore propose that research institutions should consider whether it might be reasonable to ask every individual to make a declaration of good research ethics practice, verbally or in writing, for example when they have completed their training as a researcher. The guidelines therefore include a proposal for such a declaration:

**I acknowledge that I am a part of an international community of researchers. I will practise my activities in line with the recognised standards for good research practice. I shall conduct my research in an honest and truthful way and show respect for humans, animals, and nature. I shall use my knowledge and skills to the best of my judgement for the good of humanity and for sustainable development. I shall not allow interests based on ideology, religion, ethnicity, prejudice, or material advantages to overshadow my ethical responsibility as a researcher.**

The National Committee for Research Ethics in Science and Technology (NENT)

# Part 8: a corrupted science?

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# Retraction Watch

## “FDA has repeatedly hidden evidence of scientific fraud,” says author of new study

with 2 comments

For decades, the U.S. FDA has uncovered misconduct in clinical trials but hidden it from the public, according to a new paper in [JAMA Internal Medicine](#).

The study, by New York University journalism professor [Charles Seife](#), looked at 78 publications resulting from trials where the FDA found serious misconduct, including “failure to protect the safety of patients” and data fakery. Only three of those publications mentioned the problems uncovered by the FDA. No retractions or errata were ever issued for any of them.

For example, in one of the three cases:

“...data from several patients were excluded from the efficacy analysis because “site monitoring raised questions in regard to certain data at 1 study site.”<sup>65(p431)</sup> The FDA documents<sup>64</sup> allege that none of the individuals enrolled at 1 study site had met the inclusion criteria and that the responsible researcher had fabricated chest radiographs of participants and committed other forms of misconduct.

(Reference 65 reported results of a trial Ivan [wrote about several years ago](#), in coverage that raised some unrelated questions.)



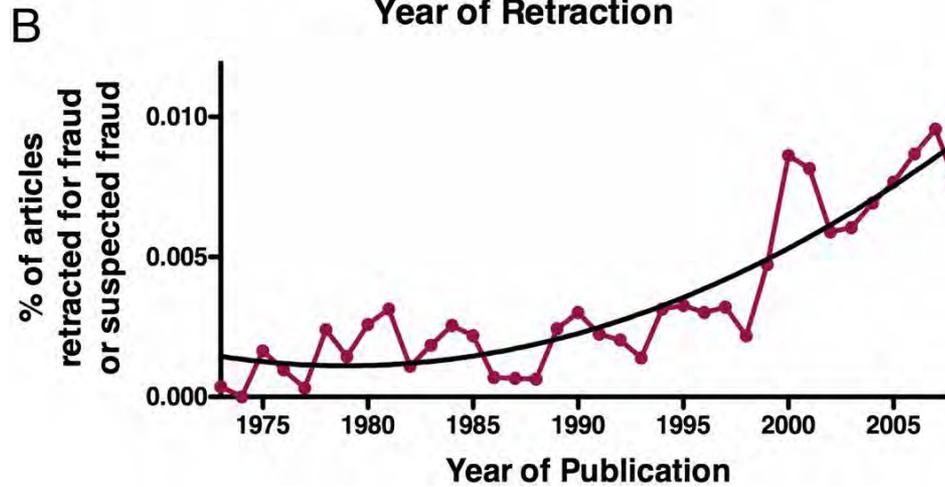
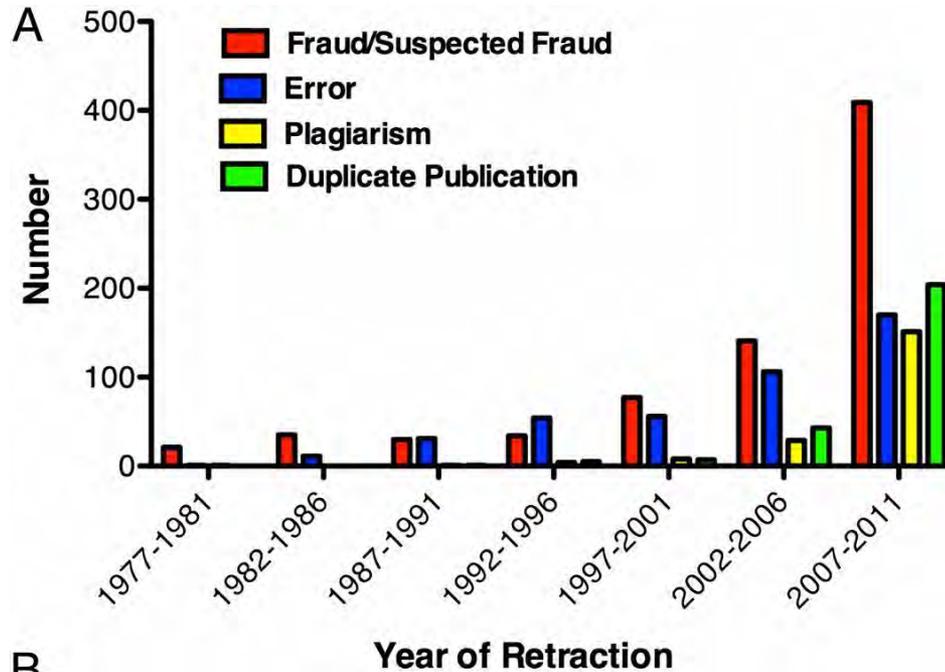
# Scientific integrity / integrity of science ?

- Scientific integrity  
=> Facts? Fads?  
Flops?
- Normativity and  
value judgements  
when talking about  
integrity of science.



Hypothesis...experiment...conclusion.  
Wow. This is so last century.

(A) Number of retracted articles for specific causes by year of retraction.



Fang F C et al. PNAS 2012;109:17028-17033

# Fabrication, Falsification, Plagiarism

- “Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.
  - (a) Fabrication is making up data or results and recording or reporting them.
  - (b) Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
  - (c) Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.
  - (d) Research misconduct does not include honest error or differences of opinion. “

(<http://ori.hhs.gov/definition-misconduct>; accessed 8 February 2014)

<p><u>Core “Research Misconduct”</u></p> <p><b>Fabrication of data</b></p> <p><b>Falsification of data</b></p> <p><b>Plagiarism</b></p> <p>FFP normally includes:</p> <ul style="list-style-type: none"> <li>Selectively excluding data from analysis</li> <li>Misinterpreting data to obtain desired results (including inappropriate use of statistical methods)</li> <li>Doctoring images in publications</li> <li>Producing false data or results under pressure from a sponsor</li> </ul>	<p><u>Research practice misconduct</u></p> <p>Using inappropriate (e.g., harmful or dangerous) research methods</p> <p>Poor research design</p> <p>Experimental, analytical, computational errors</p> <p>Violation of human subject protocols</p> <p>Abuse of laboratory animals</p>
<p><u>Data-related misconduct</u></p> <p>Not preserving primary data</p> <p>Bad data management, storage</p> <p>Withholding data from the scientific community</p> <p>NB: The above applies to physical research materials as well</p>	<p><u>Publication-related misconduct</u></p> <p>Claiming undeserved authorship</p> <p>Denying authorship to contributors</p> <p>Artificially proliferating publications (“salami-slicing”)</p> <p>Failure to correct the publication record</p>
<p><u>Personal misconduct</u></p> <p>Inappropriate personal behaviour, harassment</p> <p>Inadequate leadership, mentoring, counselling of students</p> <p>Insensitivity to social or cultural norms</p>	<p><u>Financial, and other misconduct</u></p> <p>Peer review abuse e.g., non-disclosure of conflict of interest, unfairly holding up a rival’s publication</p> <p>Misrepresenting credentials or publication record</p> <p>Misuse of research funds for unauthorised purchases or for personal gain</p> <p>Making an unsubstantiated or malicious misconduct allegation</p>

# Scientific fraud?

- Many discussions and cases
- Recently: The Diederik Stapel case, NL
  - "a more general failure of scientific criticism in the peer community and a research culture that was excessively oriented to uncritical confirmation of one's own ideas and to finding appealing but theoretically superficial ad hoc results". And: "not infrequently reviews [of social psychology journal articles] were strongly in favour of telling an interesting, elegant, concise and compelling story, possibly at the expense of the necessary scientific diligence." (The Levent Commission)
  - FFP = fabrication, falsification, plagiarism
  - QRP = questionable research practices



# In Norway:

- Jon Sudbø
- Led to the adoption of the Research Ethics Act: 2006:  
  
“Scientific misconduct is defined as falsification, fabrication, plagiarism and other serious breaches of good scientific practice that have been committed willfully or through gross negligence when planning, carrying out or reporting on research.”  
(Norwegian Act of 30 June 2006 No. 56 on ethics and integrity in research, section 5)



# Misconduct as court cases?

- Several cases experienced with legal threats against findings of misconduct;
- Stricter standards for students than for scientists?
- Example: 11.000 persons too many, those who did not give informed consent, they gave informed disconsent, but were still the subject of a scientific study!
- “Written informed consent was gathered from all participants. For the nonparticipants, only registry data were used; in principle, this is public information and is made available for research purposes through application to the (*proper authority*).”

## The causes of scientific misconduct?

- Rotten apple theory
- Lack of training and knowledge
- Systemic factors in knowledge production



# Pure science, pure truth?

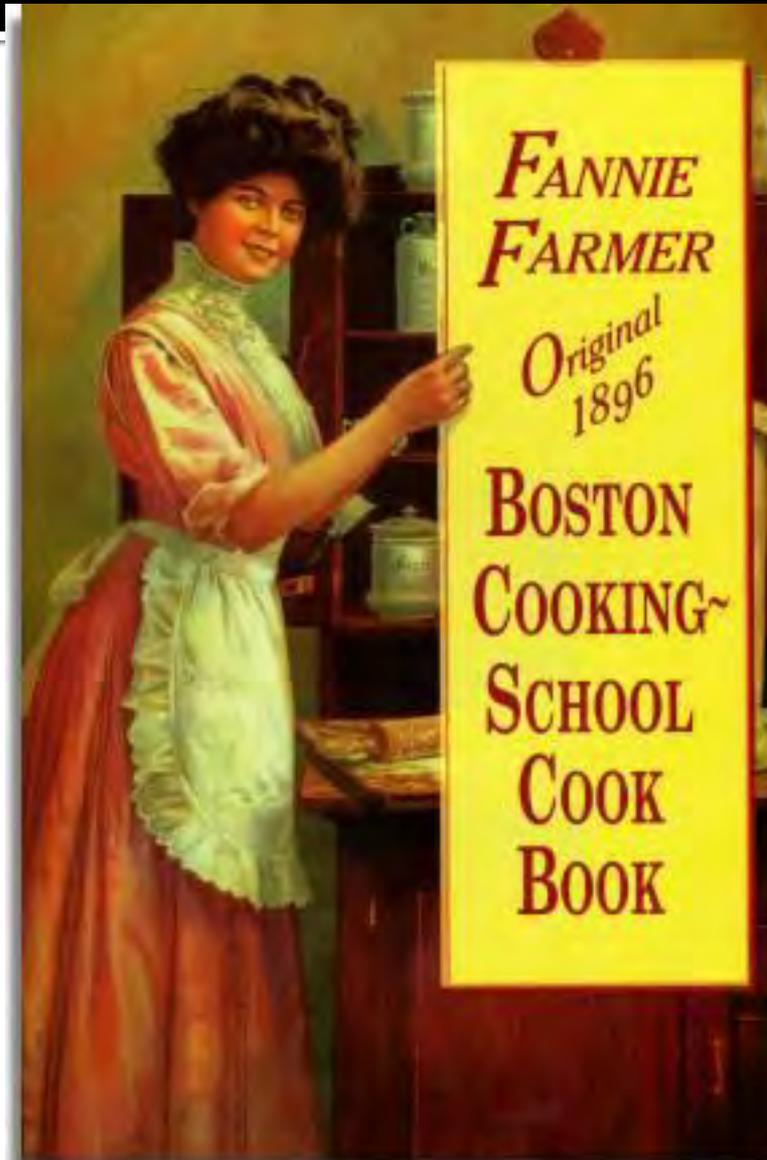
- Fallibility
- Half-life of "facts"
- Permanent disunity
- Facts and values intertwined
- Publication bias
  
- Who pays the piper? Funding sources and their influence on content.

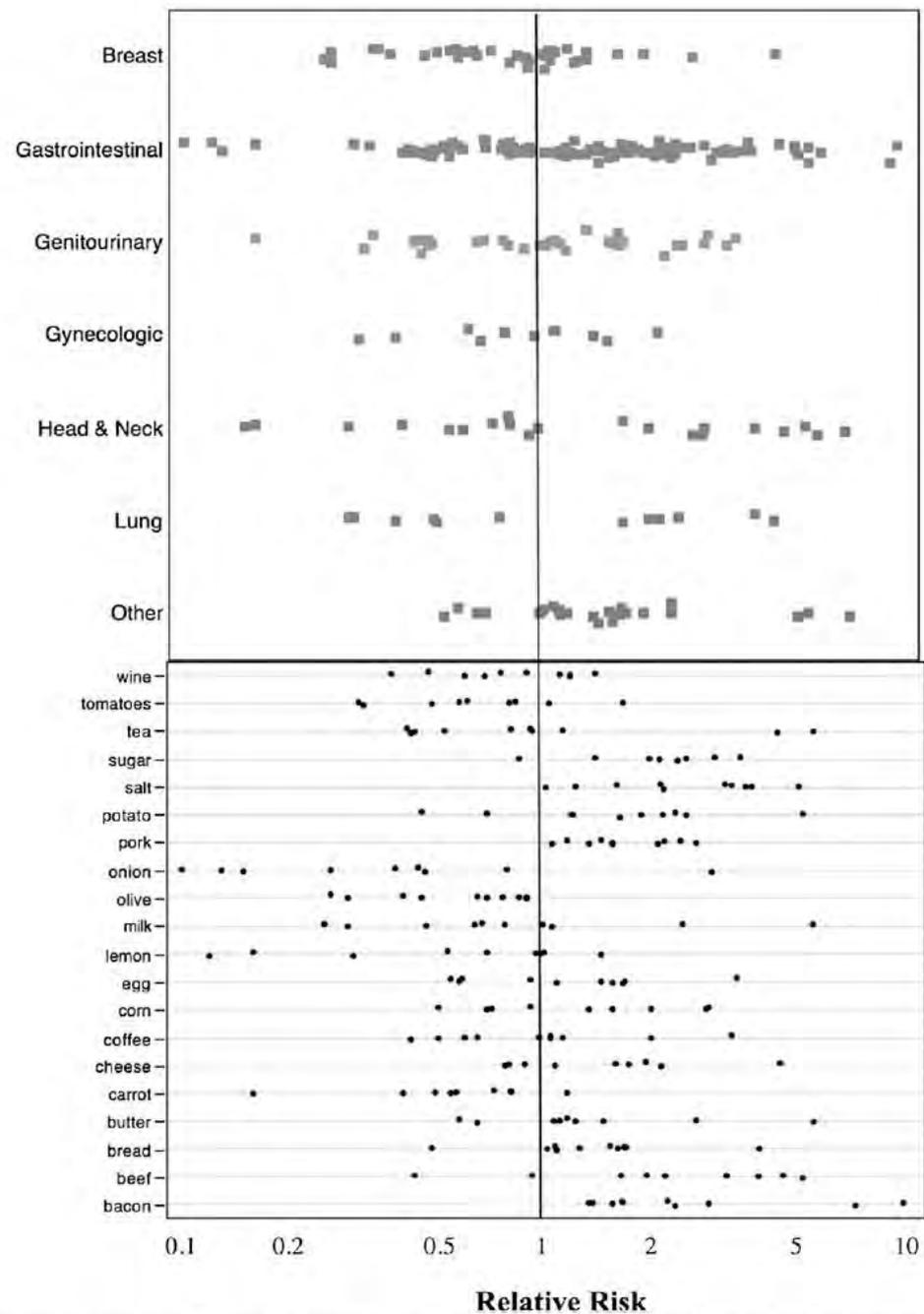


"You are completely free to carry out whatever research you want, so long as you come to these conclusions."

# Most published results are wrong?

- John Ionnanidis
- PLoS Med  
2005;2(8): e124
  
- Example: The Boston Cook Book!

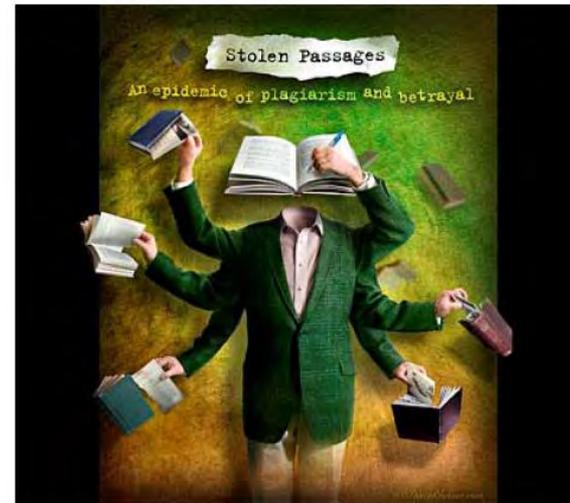




**FIGURE 1.** Effect estimates reported in the literature by malignancy type (top) or ingredient (bottom). Only ingredients with  $\geq 10$  studies are shown. Three outliers are not shown (effect estimates  $> 10$ ).

# The solution?

- Transparent and clear procedures;
- Open institutions
- Ethics teaching- some!
  
- Talk about it!
- Slow Science!



# Thanks for your kind attention!



Just one more thing... is your  
data faked?

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