MNSES9100 Autumn 2017 – Introduction

PROF. DEBORAH OUGHTON

CENTER FOR ENVIRONMENTAL RADIOACTIVITY, NORWEGIAN UNIVERSITY OF LIFE SCIENCES, AND

UNIVERSITY OF OSLO'S ETHICS PROGRAMME

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Three Areas

Philosophy of Science

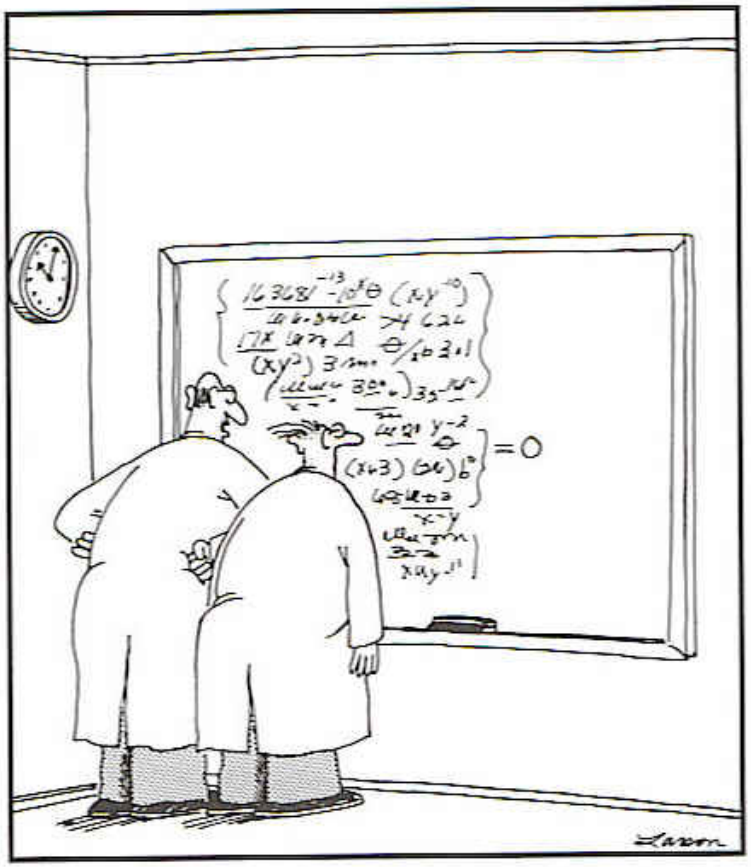
- What is science?

Research Ethics

- How should scientists behave

Science and Society

- Education, dissemination, funding, risk, patents, …



"No doubt about it, Ellington—we've mathematically expressed the purpose of the universe. God, how I love the thrill of scientific discovery!"

Lecture Overview

Monday 23rd

- Introduction; Philosophy of Science; Popper
- Introduction to Research Ethics; Scientific Integrity and Misconduct

Tuesday 24th

- Science and Education – *Svein Sjøberg*
- Research Ethics – ethical theory – *Andreas Carlsson*

Wednesday 25th

- Science, pseudo-science and ideology
- The Modern University
- Science, Uncertainty and Risk

Thursday 26th

- Essay Assignments
- Ethical challenges in Information Technology – *Charles Ess*
- Environmental Ethics *Andreas Carlsson*

Friday 27th

- Publication and Authorship, Ethical guidelines
- The Library 101 and a few things you should know about open access publication *Karoline Moe, UiO Library'*

Attendance and exam

80% for lectures (register)

Essay seminar not strictly obligatory (but getting approval for an outline is!)

Exam: 6-8 page essay (pass/fail)

Essay Seminars - Optional

Five half-day sessions to choose from between 30th October and 10th November

List to be circulated tomorrow

Each student attends one morning or afternoon session

Opportunity to get feedback on essay ideas

More on essays later

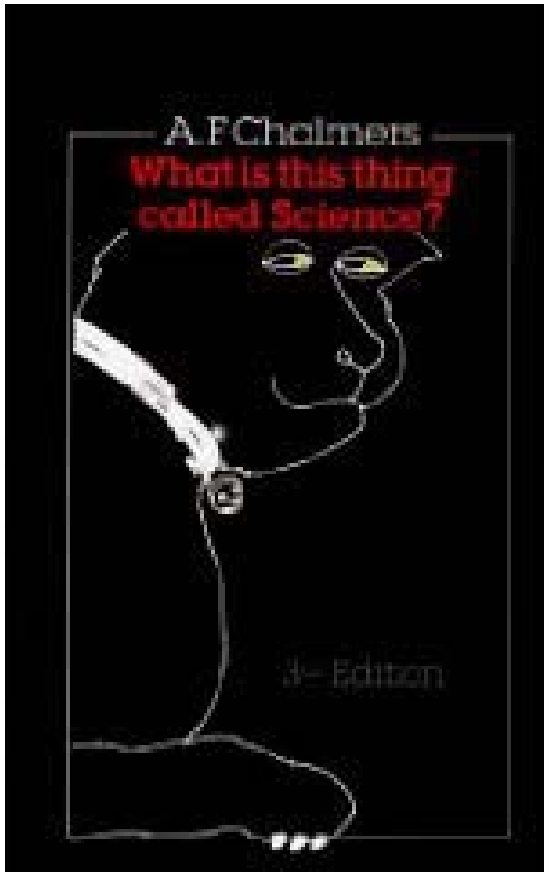
Course Literature

Book: Chalmers: *What is this thing called science?*

Articles: Links and pdf files

pdf files will be available on the website until 31st June

Additional:
plato.stanford.edu/contents. html



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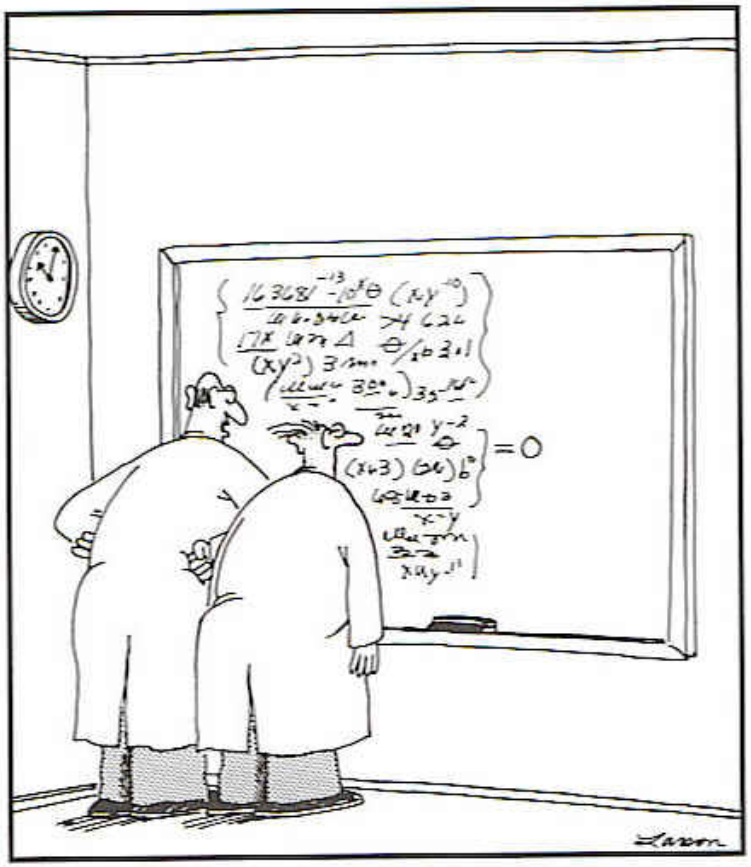


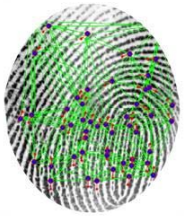
"No doubt about it, Ellington—we've mathematically expressed the purpose of the universe. God, how I love the thrill of scientific discovery!"

Research Ethics: Three areas of responsibility

Scientific community: research norms, misconduct, publication

Research subjects: humans, animals

Society: the public, environment, risk, dissemination


Fingerprint Analysis Software


Dolly, library.thinkquest.org

Diederik Stapel, November 2011

Modern Academia

Competition

Misconduct

Plagiarism

Exploitation (especially of students)

… including in Norway

May 2nd 2014

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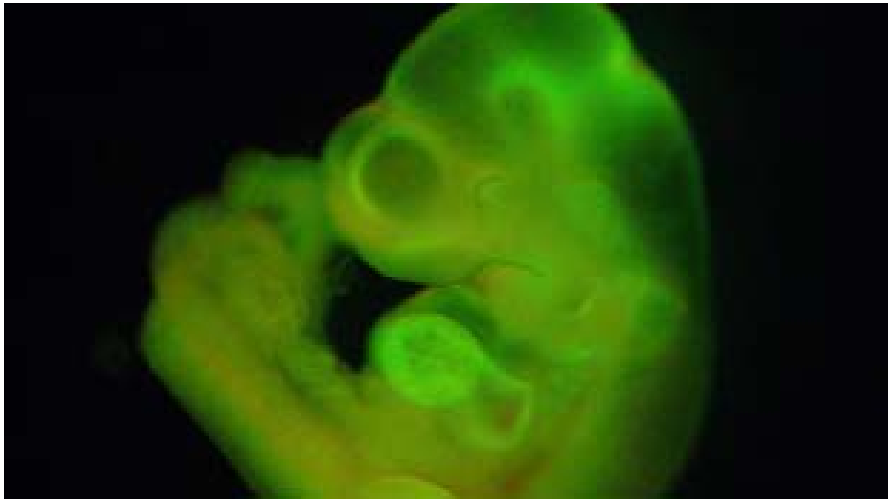
Misconduct concerns

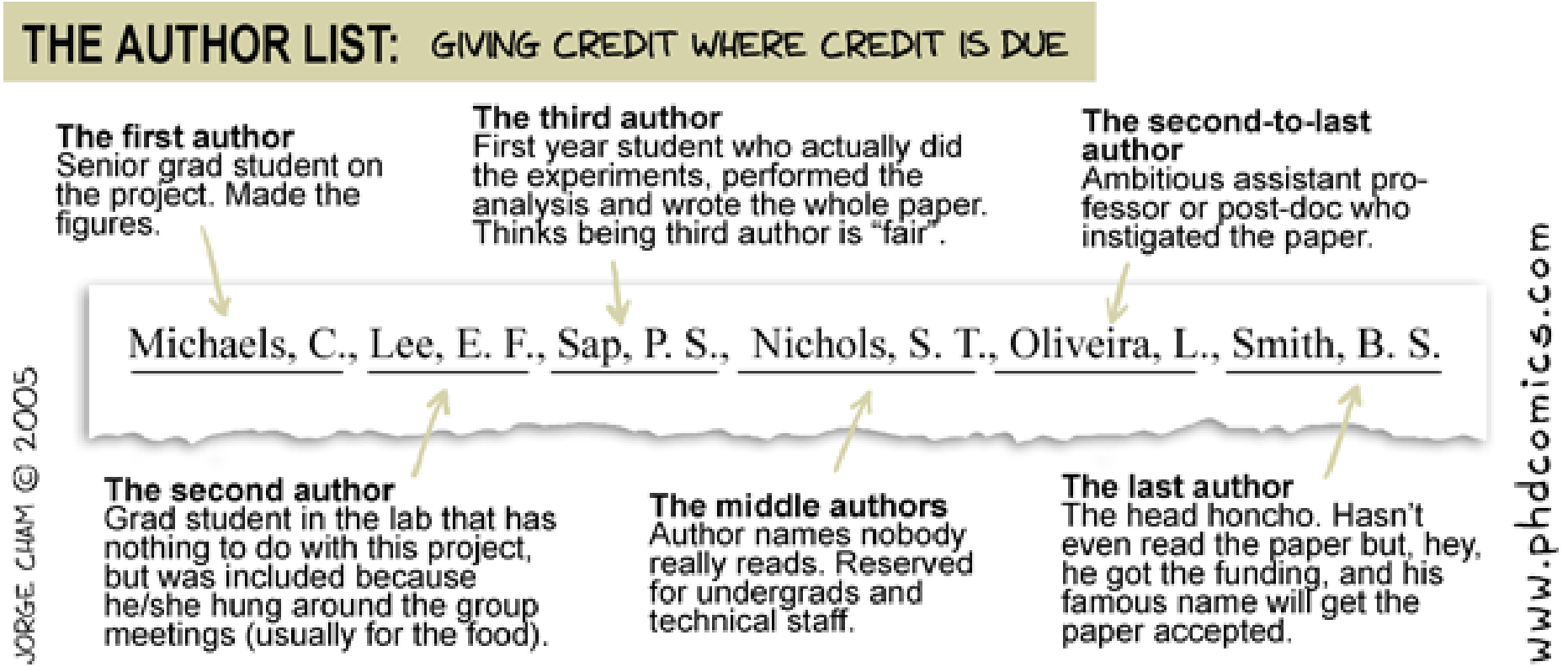
STAP (Stimulus-triggered acquisition of pluripotency) – Nature, Japan



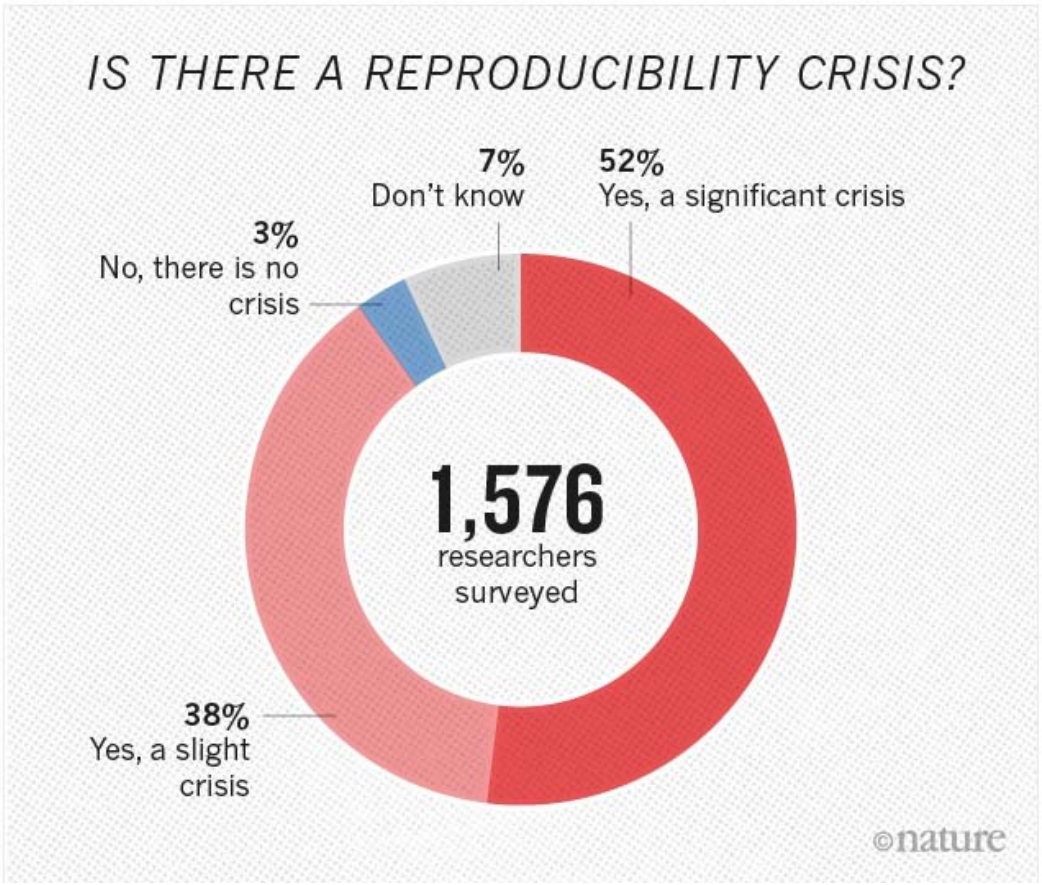
Photo, Haruko Obokata

Publication and Authorship

Guidelines for publication and review – The International Committee of Medical Journal Editors (ICMJE) – "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (the Vancouver Recommendations) www.icmje.org



Retractions and Reproducibility of studies



Science, Ethics and Society

Myriad Genetics
US Supreme Court Case

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Science Ethics and Society : Communication

Italian Earthquake Court Case

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nature International weekly journal of science

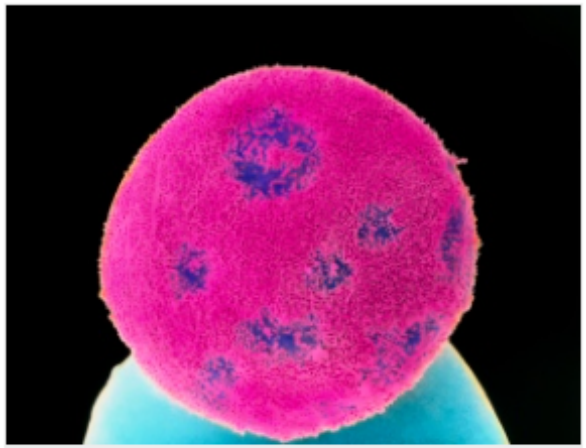
NATURE | NEWS

Scientists sound alarm over DNA editing of human embryos

Experts call for halt in research to work out safety and ethics issues.

David Cyranoski

12 March 2015



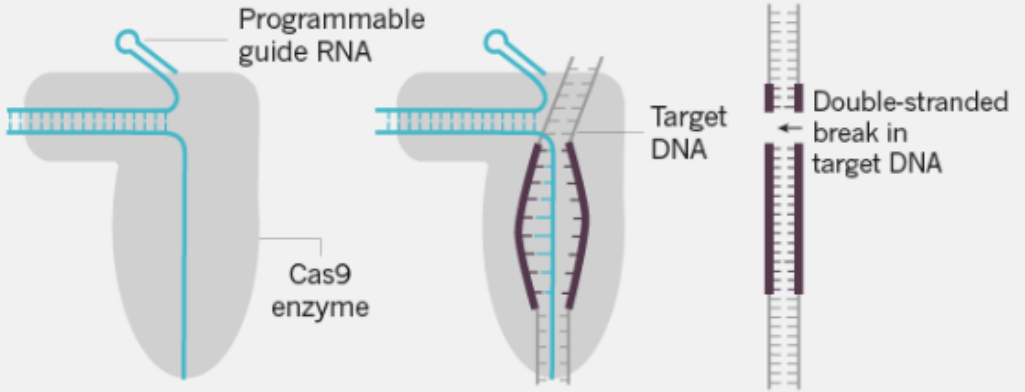
Yorgos Nikas/Science Photo Library

CRISPR ISSUE NATURE 30TH NOVEMBER 2015

Mythical beasts

Based on bacteria

How CRISPR–Cas9 works



Information Technology

Issues of privacy and data storage

Transparency, open source and access

"Does your car have any idea why my car pulled it over?"

Mattputz.com

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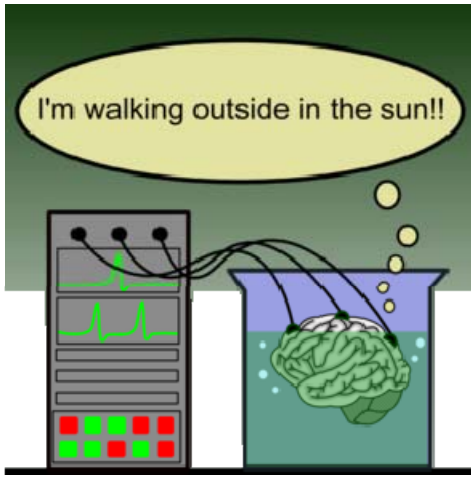
Philosophy of Science

Methodology: Study of the scientific method
Epistemology: Study of knowledge
Ontology: Metaphysics/ «What is»



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What do Philosophers of Science do?

Ask:

- What defines scientific method?
- Why is scientific knowledge different from other forms of knowledge?
- What is the difference between a scientific theory and a non-scientific theory?
- Can science help us believe in the truth of an external world?

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Why bother with philosophy?

”It might be thought that either philosophers or sociologists would have been able to illuminate the nature of science and why it has been so successful… not only have they failed to do so but some have instead provided what they regard as good reasons for doubting whether science really does provide an understanding of the way in which the world works…while providing no real threat to science they have become an increasingly vocal group, with an unfortunate influence on the study of science and its history…

”Fortunately for science these philosophical claims have no relevance to science and can be ignored…defining the nature of science is of only marginal interest, for it has no impact on their day to day activities”

Lewis Wolpert: *The Unnatural Nature of Science* (Faber and Faber: London. 1992

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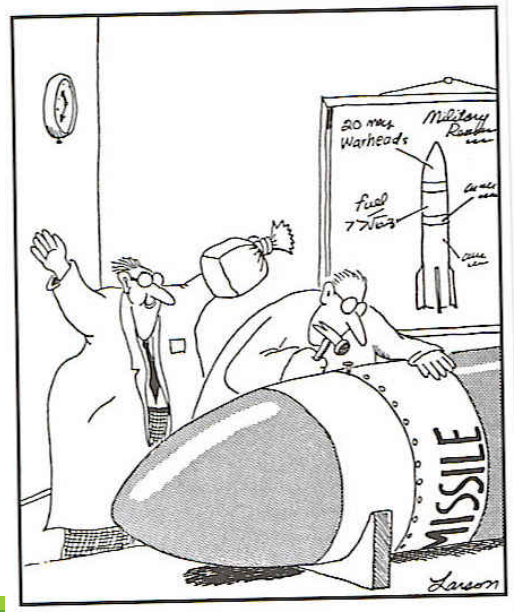
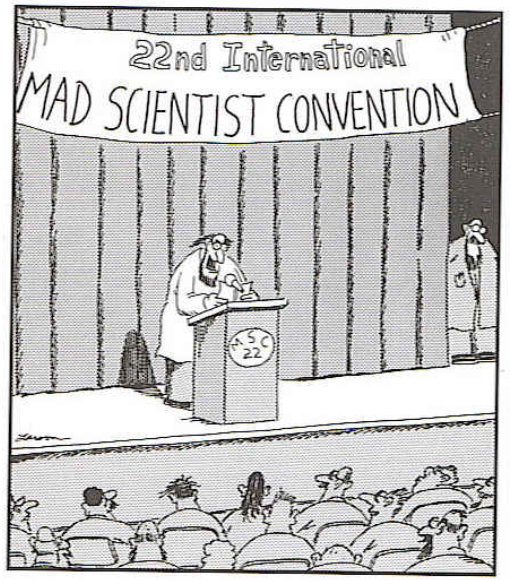
Reasons to learn about philosophy of science

Intellectual: educational, scholarly, informed opinion

Practical/Social: society's perception of science and scientists is influenced by what they think science is.





"So please welcome our keynote speaker, Professor Melvin Fenwick—the man who, back in 1952, first coined the now common phrase: 'Fools! I'll destroy them all!' "

Figure 1 The bizarre climax of the sensational Scopes trial occurred on the afternoon of 20 July 1925 when Clarence Darrow (right) questioned William Jennings Bryan (left) about the literal truth of the Bible. The Scopes trial remains the most famous event in the evolution-creationism controversy. Photograph courtesy of Bryan College.

Lysenko and Khrushchev

SATURDAY

Mostly Sunny
High 54, Low 30

THE DENVER POST

Voice of the Rocky Mountain Empire

ON THE WEB
The Denver Post Online

March 11, 2000

79% back creationism in schools

Figure 2 This front-page headline on the 11 March 2000 issue of The Denver Post announced Americans' continuing and overwhelming desire to have creationism taught in public schools.

Decades after monkey trial, debate hasn't evolved much

Theory's detractors say 'popular revolt' under way

By TODD ACKERMAN
Houston Chronicle

Even before he became a Christian, Jeff Farmer was an opponent of evolution.

His interest in such matters was twofold: As a wildlife artist, Farmer studied animal anatomy, and as a lifelong dinosaur buff, he read voraciously about prehistory. The more research he did, says Farmer, the less concrete evidence he found for evolution.

"I grew up, like most people, assuming evolution was 'true,'" says Farmer, a 1987 University of Houston graduate who wrote an opinion column for the Chronicle earlier this month calling evolution a "grand illusion."

"But ultimately, textbooks on evolution couldn't answer my most fundamental question: Why can't we clearly and convincingly see it in the fossil record?"

Three-quarters of a century after the Scopes monkey trial, Americans' resistance to evolution remains about the same. Since the Kansas Board of Education in August de-emphasized teaching that man descended from a common ancestor, newspapers around the country have been inundated with supporters' letters to the editor, presidential candidates have taken notice, and polls show as many people reject evolution as accept it.

It's gotten to the point that leading evolution opponents are crowing that a "popular revolt" is under way.

"The state of affairs is vexing to scientists, who believe that evolution is as well documented as Earth's revolution around the sun. To deny evolution often means believing that Earth is less than 10,000 years old, that mankind dating is false, that life on Earth exists purely much as it did at the beginning of time. No wonder,

See EVOLUTION on Page 16A.

Figure 3 Decades after the Scopes trial, the evolution-creationism debate rages on in the United States. This article appeared on the front page of the Houston Chronicle on 18 September 1999.

nature news

Published online 17 September 2008 | Nature | doi:10.1038/news.2008.1116

News

Creationism stir fries Reiss

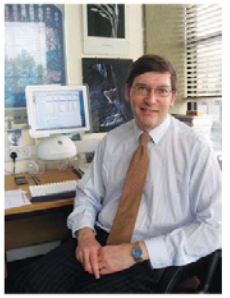
Royal Society's director of education stands down.

Daniel Cressey

The director of education at the one of the world's premier scientific bodies has been forced from his job in a row over approaches to creationism in the classroom.

Michael Reiss, a professor at London's Institute of Education and an ordained minister in the Church of England, yesterday stepped down from his post as director of education at Britain's Royal Society. The move, which appears to have been forced, follows a letter to the president of the Society, Martin Rees, from three Nobel-prize winning fellows "greatly concerned" by remarks Reiss was reported to have made at the British Association for the Advancement of Science's annual "Festival of Science" on 11 September.

Reiss's remarks on the need to engage in dialogue with the creationist views some children express in science classes resurrected claims that, as a priest, Reiss should not have been appointed in the first place. "When he was appointed there were concerns that he would push a religious agenda," says Richard Roberts, chief scientific officer of New England BioLabs in Massachusetts, a fellow of the society who in 1993 won the Nobel Prize in Physiology or Medicine. The fact that "Professor Reiss is a clergyman ... in itself is very worrisome," said the letter that Roberts sent on behalf of himself, Harold Kroto, of Florida State University in Tallahassee, and John Sulston, of the University of Manchester, UK.



Professor Michael Reiss
Institute of Education

October 11, 2007

Al Gore's inconvenient judgment

Lewis Smith, Environment Reporter

The nine inconveniences

Al Gore's award-winning climate change documentary was littered with nine inconvenient untruths, a judge ruled yesterday.

An Inconvenient Truth won plaudits from the environmental lobby and an Oscar from the film industry but was found wanting when it was scrutinised in the High Court in London.

Mr Justice Burton identified nine significant errors within the former presidential candidate's documentary as he assessed whether it should be shown to school children. He agreed that Mr Gore's film was "broadly accurate" in its presentation of the causes and likely effects of climate change but said that some of the claims were wrong and had arisen in "the context of alarmism and exaggeration".

The Times

"Født sånn eller blitt sånn"

Dagbladet.no

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A Brief History of the Philosophy of Science

Aristotle and Plato – no distinction between science and philosophy

Greeks to the Age of Enlightenment – mysticism, religion, ideology

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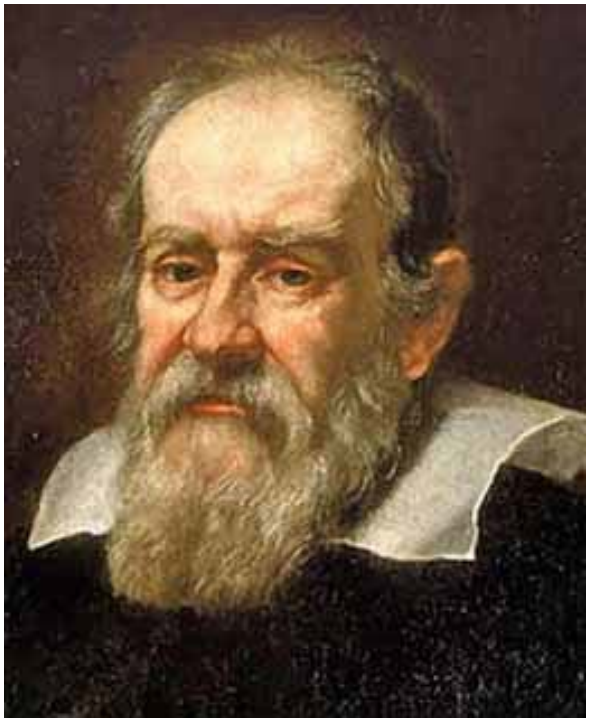
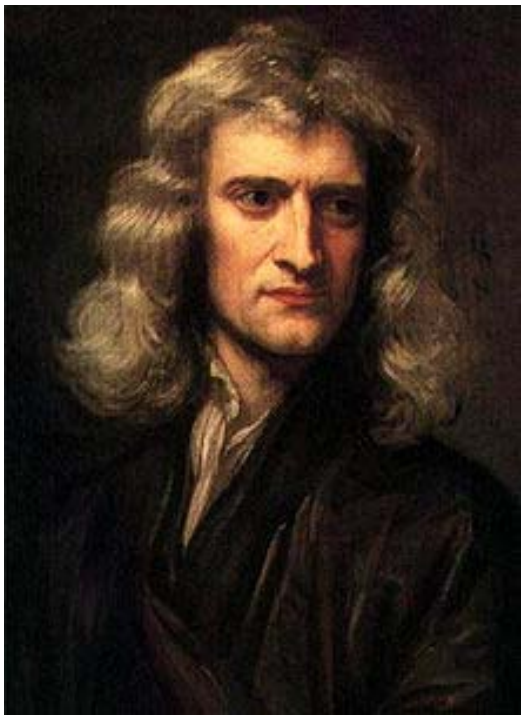
16-17th Century to the Age of Enlightenment



Galileo



Newton

Harvey

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A Brief History of the Philosophy of Science

16-17th Century

- Francis Bacon: Experimentation, inductivism,"*Science is knowledge; knowledge is power*".

- Rene Descartes: human reasoning; "*I think therefore I am*"

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History (cont.)

Vienna Circle (early 20th century)

- Logical positivism, verificationism
- Rudolph Carnap, Otto Neugarth, Moritz Schlick

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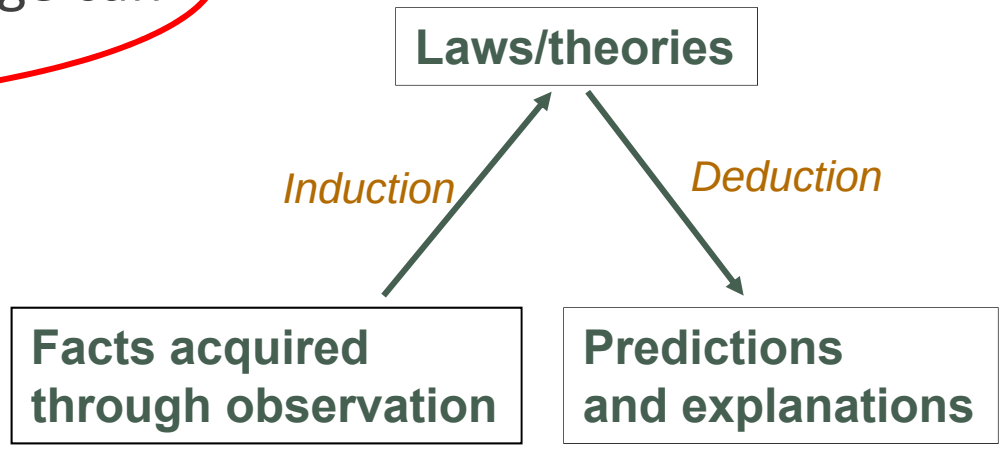
Inductivism

Theories justified by induction – the ONLY basis for scientific knowledge: LOGICAL POSITIVISM

Scientific knowledge is derived from observation statements by induction

Observation supplied a secure basis upon which scientific knowledge can be based

Science starts with observation



Logical Positivism

Vienna Circle: Planned to create an oasis of reason in a sea of irrationality. Saw philosophy as the ”hand-maiden of science”, working to clarify issues for natural science.

Bertrand Russell: attempted to formalise the foundations of mathematics from a set of logical axioms (*Principa Mathematica, 1910*)

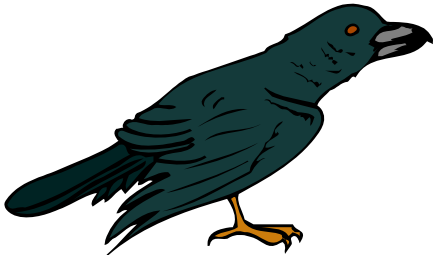
Ludwig Wittgenstein: redefinition of truth from one of correspondence to objective fact to one of agreement between persons

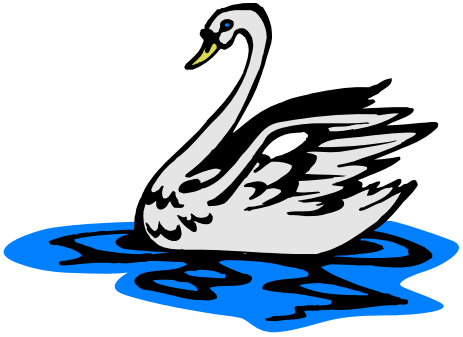
Problems with Inductivism

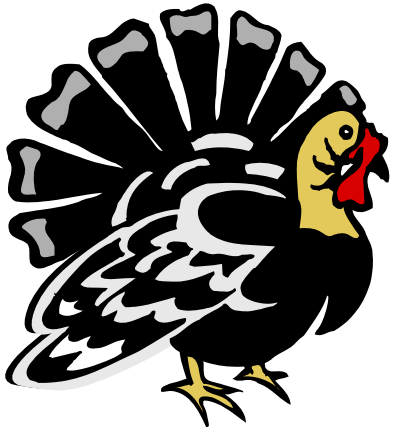
Inductive arguments are not logical

Observation cannot be separated from theory

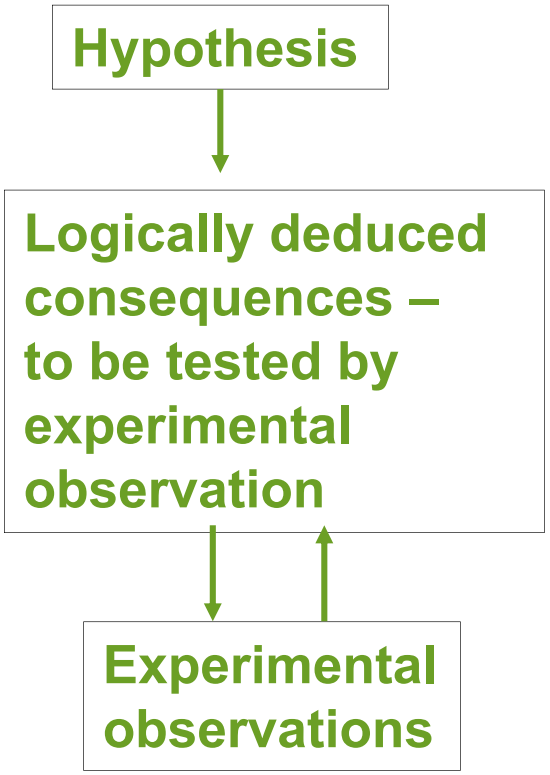
Science doesn't start with observation

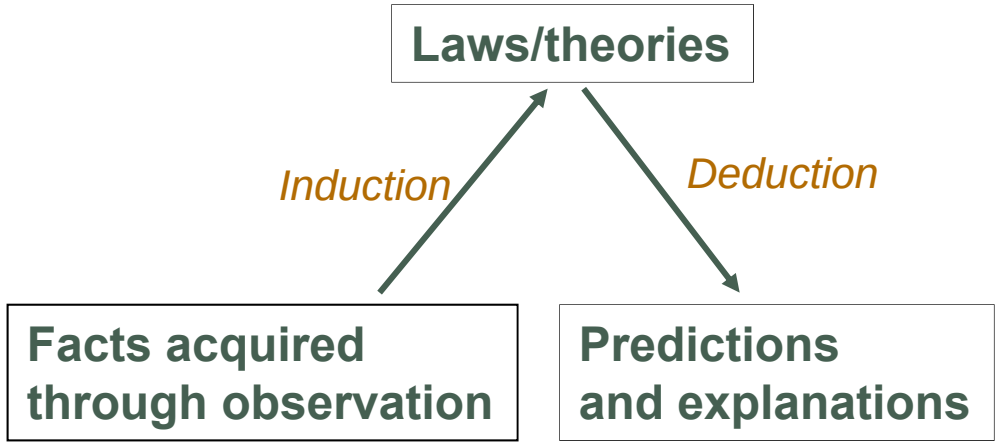






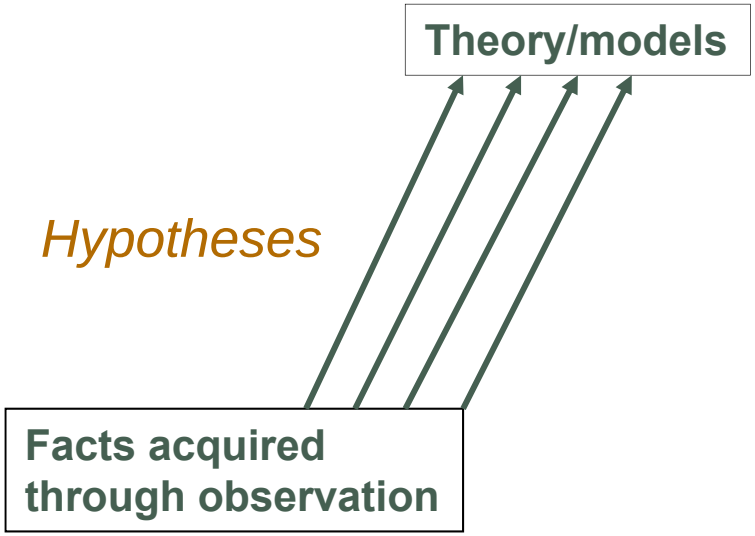
Hypothetico-deductive method





Abduction

Abduction – the selection of the best hypothesis to explain observations – and the reasoning to do this.



William of Ockham

History (cont.)

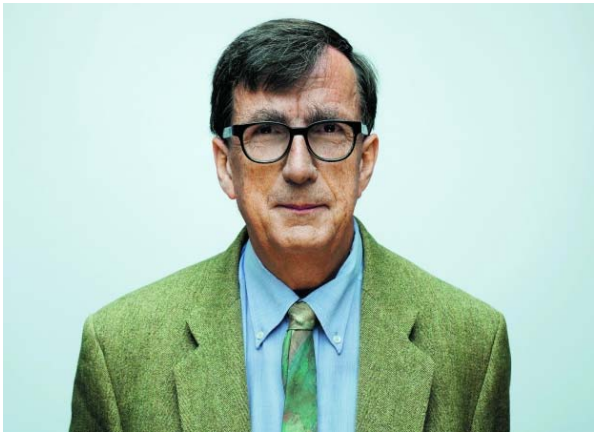
Karl Popper (1943): *The Logic of Scientific Discovery*

Thomas Kuhn (1970): *The Structure of Scientific Revolutions*

Paul Feyerabend (1975): *Against Method: Outline of an Anarchistic Theory of Knowledge*

1970s-21st century: increased focus on social and political institutions (Ian Hacking, Bruno Latour, Philip Kitchner, Shelia Jasanoff)

Thomas Kuhn,



Bruno Latour, Morgenbladet (Marcel Braun)

Scientific Norms: CUDOS

Robert
Merton

July 4, 1910 – February 23, 2003

Scientific Norms (Robert Merton)

- C **Communalism**: knowledge produced by science should be available to all; that scientific results are the common property of the entire scientific community
- U **Universalism**: claims to truth are evaluated in terms of universal or impersonal criteria, and not on the basis of race, class, gender, religion, or nationality; all scientists can contribute to science regardless of race, nationality, culture, or gender
- D **Disinterestedness:** Objectivity; Non-biased, free from ideology
- O **Originality**: Research should be novel and add something to our knowledge and understanding.
- S **Scepticism**: Results should be vigorously tested

Ziman, Is Science losing its objectivity? *Nature*