



Sciences vs. Non- and Pseudo-Sciences: The Demarcation Problem

Thursdays 16-18h, KG I HS 1227

Syllabus as of 04 October 2022

We have a rough and ready idea what sciences are and that some methods to gain knowledge are “scientific” whereas others are “unscientific.” Conducting a social survey, doing experiments in behaviour economics or constructing computer models to predict how the climate changes is scientific, relying on hearsay, following gut intuitions or compiling knowledge from randomly selected search results on google is not. Moreover, we consider some fields of knowledge to be “pseudo-sciences.” Astrology is a prime example, although it was considered being a science for a long time.

How do we justify these intuitive judgements? What principles do we appeal to, and which elements of the sciences do we focus on? A central discussion in philosophy of science is devoted to precisely this “demarcation problem”: to finding criteria that distinguish between sciences, pseudo-sciences and non-scientific knowledge. Despite the fact that philosophers and scientists often agree on individual cases, giving an account of general criteria is not just surprisingly hard but the search for it was more or less abandoned in the 1980s. The demarcation problem was declared unsolvable or even a “pseudo-problem.” In the seminar, we will revisit this discussion and consider newer contributions, which were often prompted by political worries. After all, should philosophy of science not be able to show why e.g. creationism or astrology are not sciences?

Preparatory Reading

Hansson, Sven Ove (2017): Science and Pseudo-Science. In: Edward N. Zalta, *The Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/pseudo-science/>.

McIntyre, Lee (2019): *The Scientific Attitude: Defending Science from Denial, Fraud, and Pseudoscience*. Cambridge, MA/London: MIT Press.

Oreskes, Naomi (2021): *Why Trust Science?* Princeton/Oxford: Princeton University Press.

Pigliucci, Massimo and Maarten Boudry (eds.) (2013): *Philosophy of Pseudoscience*.

Reconsidering the Demarcation Problem. Chicago, Ill.: University of Chicago Press.

Rupnow, Dirk, Veronika Lipphardt, Jens Thiel and Christina Wessely (eds.) (2008):

Pseudowissenschaft. Konzeptionen von Nichtwissenschaftlichkeit in der Wissenschaftsgeschichte. Frankfurt a. M.: Suhrkamp.

Requirements

Graded Exam: The final assessment task is to write a term paper of 4,000–5,000 words, to be handed in before **15 March 2023** (as an electronic copy and in print). Please discuss the topic with me before you start writing.

Pass/Fail Exam: Each student must give a short presentation (10min max!) of the core text (or texts if there are more than one) in one session. This short presentation is intended to open up the discussion in class and should answer three questions:

- What is the main argument in the text? How can we express its main thesis?
- How does the argument work?
- Where do you see problems? Identify where you find an argument hard to understand or why you think an argument is inconclusive.

Please be aware that you should reconstruct the argument and not just recall the text. Since you will not have time to include every detail, you must decide what is important and

what is not. It is far better if we discover in the discussion that we do need some of the left-out passages than if you try to cramp everything into the presentation.

Attendance & Punctuality: The attendance of the lecture and the workgroup is mandatory for LAS students. The UCF standard policy applies (see ILIAS LAS Info Board --> Study Organisation --> Handbooks and Policies). Note that you are expected to arrive punctually for workgroups and the lecture. Presuming that your time is more valuable than everybody else's time is simply arrogant, if not rude.

All core texts will be made available via ILIAS.

Sessions

#	Date	Topic	Core Texts	Further Reading (optional)
1	20.10.2022	FÄLLT AUS		
2	27.10.2022	Intro- duction	Overview and Seminar Organisation	
3	03.11.2022	Intro- duction	<p>Ruse, Michael (1982): Creation Science Is Not Science. In: <i>Science, Technology, & Human Values</i> 7 (3), 72–78.</p> <p>Laudan, Larry (1982): Commentary: Science at the Bar—Causes for Concern. In: <i>Science, Technology, & Human Values</i> 7 (4), 16–19.</p> <p>Ruse, Michael (1982): Response to the Commentary: Pro Judice. In: <i>Science, Technology, & Human Values</i> 7 (4), 19–23.</p> <p>Laudan, Larry (1983): More on Creationism. In: <i>Science, Technology, & Human Values</i> 8 (1), 36–38.</p>	<p>Kitcher, Philip (1984): <i>Abusing Science. The Case against Creationism</i>. Cambridge, MA/London: MIT Press.</p> <p>Ruse, Michael (ed.) (1996): <i>But Is It Science? The Philosophical Question in the Creation/Evolution Controversy</i>. Prometheus Books.</p>
4	10.11.2022	Classics	Popper, Karl R. (2002 [1963]): Science: Conjectures and Refutations. In: <i>ibid., Conjectures and Refutations: The Growth of Scientific Knowledge</i> . London/New York: Routledge, 43–86.	Popper, Karl R. (1980 [1934]): <i>The Logic of Scientific Discovery</i> . 10 th ed. London: Hutchinson.
5	17.11.2022	Classics	Kuhn, Thomas S. (1970): Logic of Discovery or Psychology of Research? In: Imre Lakatos and Alan Musgrave (eds.), <i>Criticism and the Growth of Knowledge</i> . Cambridge: Cambridge University Press, 1–23.	Kuhn, Thomas S. (2012 [1962]): <i>The Structure of Scientific Revolutions</i> . 4 th ed. Chicago: University of Chicago Press.

#	Date	Topic	Core Texts	Further Reading (optional)
6	24.11.2022	Classics	<p>Thagard, Paul R. (1978): Why Astrology is a Pseudoscience. In: <i>PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association</i> 1978, 223–234.</p> <p>Laudan, Larry (1983): The Demise of the Demarcation Problem. In: Robert S. Cohen und Larry Laudan (eds.), <i>Physics, Philosophy and Psychoanalysis. Essays in Honor of Adolf Grünbaum</i>. Dordrecht: D. Reidel, 111–127.</p>	Principe, Lawrence M. (2011): Alchemy Restored. In: <i>Isis</i> 102 (2), 305-312.
7	01.12.2022	Contemporary Philosophy of Science	Pigliucci, Massimo (2013): The Demarcation Problem. A (Belated) Response to Laudan. In: Massimo Pigliucci and Maarten Boudry (eds.), <i>Philosophy of Pseudoscience. Reconsidering the Demarcation Problem</i> . Chicago, Ill.: University of Chicago Press, 9–28.	Boudry, Maarten (2021): Diagnosing Pseudoscience – by Getting Rid of the Demarcation Problem. In: <i>Journal for General Philosophy of Science</i> 53 (2), 83-101.
8	08.12.2022	Contemporary Philosophy of Science	Cleland, Carol E. and Sheralee Brindell (2013): Science and the Messy, Uncontrollable World of Nature. In: Massimo Pigliucci and Maarten Boudry (eds.), <i>Philosophy of Pseudoscience. Reconsidering the Demarcation Problem</i> . Chicago, Ill.: University of Chicago Press, 183–202.	Stengers, Isabelle (2000 [1993]): <i>The Invention of Modern Science</i> . Translated by Daniel W. Smith. Minneapolis/London: University of Minnesota Press.
9	15.12.2022	Perspectives from History and Sociology	<p>Frietsch, Ute (2015): The Boundaries of Science/Pseudoscience. <i>European History Online</i>. Leibniz-Institut für Europäische Geschichte, <http://www.ieg-ego.eu/frietschu-2015-en>.</p> <p>Gordin, M. D. (2017): The Problem with Pseudoscience. In: <i>EMBO reports</i> 18 (9), 1482-1485.</p>	Gordin, Michael D. (2021): <i>On the Fringe. Where Science Meets Pseudoscience</i> . New York: Oxford University Press.

#	Date	Topic	Core Texts	Further Reading (optional)
10	22.12.2022	Perspectives from History and Sociology	Merton, Robert K. (1942): A Note on Science and Democracy. In: <i>Journal of Legal and Political Sociology</i> 1 (1/2), 115–127. Gieryn, Thomas F. (1983): Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists. In: <i>American Sociological Review</i> 48 (6), 781-795.	Gieryn, Thomas F. (1995): Boundaries of Science. In: Sheila Jasanoff, Gerald E. Markle, James C. Petersen and Trevor Pinch (eds.), <i>Handbook of Science and Technology Studies</i> . Thousand Oaks/London/New Delhi: SAGE, 393–443.
11	12.01.2023	Perspectives from History and Sociology	Degele, Nina (2005): On the Margins of Everything: Doing, Performing, and Staging Science in Homeopathy. In: <i>Science, Technology, & Human Values</i> 30 (1), 111–136.	Wallis, Roy (ed.) (1979): <i>On the Margins of Science: The Social Construction of Rejected Knowledge</i> . Keele: University of Keele.
12	19.01.2023	Learning from Pseudoscience?	Hecht, David K. (2018): Pseudoscience and the Pursuit of Truth. In: Allison B. Kaufman and James C. Kaufman (eds.), <i>Pseudoscience. The Conspiracy Against Science</i> . Cambridge, MA/London: MIT Press, 3–20.	Howard, Jonathan and Dorit Rubinstein Reiss (2018): The Anti-Vaccine Movement: A Litany of Fallacy and Errors. In: Allison B. Kaufman and James C. Kaufman (eds.), <i>Pseudoscience. The Conspiracy Against Science</i> . Cambridge, MA/London: MIT Press, 195–219.
13	26.01.2023		Open Session: Topic will be decided during the seminar	
14	02.02.2023		Open Session: Topic will be decided during the seminar	
15	09.02.2023		Final Discussion	