Probability, the Philosophy of Science, and the Philosophy of Religion

Course Number: SES/Pl 169

Institution: California Institute of Technology

Professor: Alan Hájek

Course description

Both religion and science make claims that cannot be conclusively proven. For example, various religions claim that God exists, while various scientists claim that electrons exist, yet these claims do not follow deductively from all the available evidence, and so they apparently cannot be known with certainty. Nonetheless, it appears that even in the face of uncertainty, opinions can be more rational and less rational. Probability theory is our leading theory of uncertainty, and a number of authors have used it to illuminate various religious questions, while other authors have used it to illuminate various scientific questions. This course will critically examine several arguments in the philosophy of religion, both classic and contemporary, that turn on considerations of probabilities; it will also critically examine several arguments in the philosophy of science that use probabilistic considerations to rationally reconstruct key episodes in the history of science. We will thus see that there are both analogous and disanalogous patterns of reasoning in the philosophy of religion and the philosophy of science literature. By studying them in parallel, our goal in this course is to understand both better.

Assessment: Three papers, each of approximately 1500 words, due roughly in weeks 5, 8, and at the end of term, each worth 30% of the final grade. You are free to invent your own paper topics, but you should consult with me on them before embarking on the papers. Attendance and participation will contribute 10%.

Topics and readings

Each week there will be both required and optional readings. I will expect all of you to have done at least the required reading before each class, since it will form the basis of our discussion. I will expect you also to do the optional reading relevant to your papers.

1. Introduction; early probabilistic reasoning in the service of theism

Blaise Pascal, "The Wager", from *Pensées.*

J.L. Mackie, *The Miracle of Theism*, Clarendon Press, Oxford, 1982, 11(a) ("Pascal's Wager"). Optional.

W. Paley, excerpt from *Natural Theology*, 1802.

Elliott Sober, "The Design Argument", forthcoming in the *Blackwell Guide to Philosophy of Religion.*

2. Early probabilistic reasoning in the service of atheism

David Hume, *An Enquiry Concerning Human Understanding*, ed. Eric Steinberg, Hackett Publishing Company, X ("Of Miracles").

John Earman, *Hume's Abject Failure: the Argument Against Miracles*, Oxford, 2000 (excerpts). Optional.

Mackie, Ch. 1 ("Miracles and Testimony"). Optional.

3. Modern-day Bayesianism

Colin Howson and Peter Urbach, *Scientific Reasoning: The Bayesian Approach*, Open Court Publishing Company, Second Edition, 1993, Ch. 7.

4. Recent uses and misuses of probability in theistic arguments

William A. Dembski, *The Design Inference: Eliminating Chance Through Small Probabilities,* Cambridge University Press, 1998, Ch. 2 and 4-6.

Branden Fitelson, Elliott Sober and Christopher Stephens, "How Not to Detect Design --- A Review of William A. Dembski's 'The Design Inference'", *Philosophy of Science* 66 (3) 472-488

Paul Davies, *The Mind of God: The Scientific Basis for a Rational World,* Orion Productions, 1992, Ch. 7 ("Why is the World the Way It Is?") and Ch. 8 ("Designer Universe").

Ernan McMullin, "Indifference Principle and Anthropic Principle in Cosmology*," Studies in History and Philosophy of Science*, 24, no. 3, 1993, pp. 359-389.

John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle*, 1986, Oxford University Press, Ch. 5 ("The Weak Anthropic Principle in Physics and Astrophysics"). Optional.

Mark Colyvan, Jay L. Garfield and Graham Priest, "Problems with the Argument from Fine-Tuning".

5. Bayesian philosophy of science I: case studies from the history of science

Dorling, Jon, "Bayesian Personalism, the Methodology of Scientific Research Programs and Duhem's Problem", *Studies in the History and Philosophy of Science* 10, 177-187, 1979.

Neil Thomason, "The Power of ARCHED Hypotheses: Feyerabend's Galileo as a Closet Rationalist", *British Journal for the Philosophy of Science*, 45, 1994, pp. 255-264.

Allan Franklin, *"The Rise and Fall of the Fifth Force"*, New York: American Institute of Physics, 1993, Ch. 3 ("Discussion").

6. Bayesian philosophy of science II: should we believe in the unobservable entities postulated by science?

Allan Franklin, *Experiment, Right or Wrong,* Cambridge University Press, 1990, Ch. 6 ("Experimental Results").

John Earman, *Bayes or Bust?,* Ch. 6, 7 ("Underdetermination and Antirealism"). Optional.

7. Discussion: Analogies and disanalogies between religious and scientific reasoning