The philosophy of experiment

Lecture summary

Although experimentation has been a central feature of modern science since the seventeenth century, it was only recently, during the 1980s, that experimental practice attracted the attention of philosophers of science. In this lecture I will present some of the salient philosophical issues concerning experiment and its relation to theory that emerged in that period. To place contemporary philosophical debates on experiment in historical perspective, I'll start with a brief sketch of the birth of systematic experimentation in the seventeenth century. I'll then touch on a few notable pre-twentieth century philosophical perspectives on experimentation: those of Francis Bacon, John Stuart Mill, and Pierre Duhem. Next, I'll discuss the place of experiment in twentieth century philosophy of science, its neglect for most of the century and its recent revival as a topic of philosophical reflection. In the remaining part of the lecture I'll focus on two main features of the new experiment-oriented philosophy of science. The first concerns a shift of the focus of analysis from the final product of experimentation, experimental reports and observational results, to experimental practice itself. The aim of recent philosophical work on experiment is to understand the process of discovering, or creating, new experimental facts and thereby to develop an epistemology of experiment, a theory of experimentally obtained knowledge. The second feature is related to the function of experimentation. Several commentators have stressed that the function in question is not limited to the testing of scientific theories. Its scope is much wider, extending from the measurement of physical constants to aiding the construction of scientific theories and the systematic exploration of phenomena. Experiments are often made for the purposes of exploring a new domain, without having any systematic high-level theory to guide their design and implementation.

Recommended readings:

Arabatzis, T. "Experiment." In S. Psillos and M. Curd (eds.), *The Routledge Companion to the Philosophy of Science* (Routledge, 2008), pp. 159-170.

Hacking, I., *Representing and Intervening* (Cambridge University Press, 1983), pp. 149-185, 210-232.