

Reading Guide: The “Demarcation Problem”

This course introduces you to the biggest questions asked by philosophers of science, and it introduces you to these questions via a study of some important episodes in the history of scientific thought. So, we want to attend to the history of science in this course. But before we do that, we must first ask a philosophical question: what counts as science?

Why do we have to ask this question before we get into our regular routine? Here is why: If we are to study the history of science, and if we are to investigate philosophical issues that pertain to science, then we need to have some sense of what science is and what theories, thinkers, historical episodes, etc. fall into the domain of science. That is why we spend our first week discussing the nature of science.

This is the issue to which all of our readings this week pertains. That is, all of our readings have to do with the philosophical attempt to demarcate science – and thus to distinguish science from non-science. This issue has come to be known as the “Demarcation Problem” in philosophy of science.

Recommended order of reading

1. Sections 1 and 4.0-4.2 of [SEP: "Science and Pseudo-Science"](#) (required, as an introduction to the philosophical question at issue and an introduction to Popper's thoughts. The first section of this article also gives some examples to show that this philosophical question is important to all of us!)
2. PS, pp. 459-462 (recommended, as a more in-depth introduction specifically to Popper's thoughts on the Demarcation problem and some criticisms of Popper)
3. PS, pp. 471-475 – parts I and II of Popper's *Conjectures & Refutations* (required; this is your primary reading assignment for the week. You should spend the most time and energy on this. See the reading guide questions below.)
4. Dewitt, ch. 7 (required; see reading guide questions below.)

Popper's *Conjectures & Refutations*.

Note: I mean for you to be able to work through these questions as you read the text through carefully. Thus, I have arranged the questions below so that they appear in approximately the same order as the passages that they correspond to in the text.

1. In the first couple of paragraphs of the reading, Popper states concisely what the philosophical problem is that he is most interested in investigating. What is Popper's statement of this problem?
2. What, according to Popper, is the most widely accepted answer to this problem at the time he is writing?
3. What does Popper think is wrong with this widely accepted answer? And what example(s) does he give showing this?

Contextual note: Popper has great admiration for Einstein's theory of relativity – and rightly so! In this article, he refers to Eddington's expedition, which resulted in a great experimental confirmation of Einstein's theory. Popper himself describes this historical episode in some detail in the right column of p. 473. Here's my own quick version of what Popper is referring to:

Einstein's theory predicts that the path of light will be noticeably influenced by the

light appear to us to be in different places depending on whether or not the sun (or some other sufficiently massive body) sits in between us and those stars. To confirm this prediction of Einstein's theory, Eddington took photographs of the stars visually surrounding the sun during a solar eclipse and compared their positions to those observed in a photograph of the same stars in the night sky. A noticeable shift in the positions of the stars was indeed noted, and this shift was as predicted by Einstein; thus, Einstein's theory was confirmed! I've included a graphic from the Illustrated London News (November 22, 1919) at the end of this reading guide (and on the course website) for a visual explanation of Eddington's evidence.

4. What do Marx's, Freud's, and Adler's theories have in common with primitive myths and astrology, according to Popper?
5. Does Popper ultimately think that it is a good thing or a bad thing for a theory to be able to explain everything? Explain why Popper thinks this.
6. Popper says that the impressive thing about Einstein's hypothesis, particularly in the context of Eddington's expedition, is the "risk" it took. What does Popper mean by this?
7. Popper summarizes 7 main conclusions that he arrived at "in the winter of 1919-20" on pages 473-474. Do your best to understand what he means by each of these, and then try to restate each conclusion in your own words. Are all of these conclusions different from one another?
8. Popper gives two clear statements of his solution to the Demarcation Problem in this selection. Find both statements, and compare them.
9. What are some typical ways in which defenders of theory avoid the implications of falsifying evidence? What do these moves inevitably do to the status of such theories, according to Popper?
10. What does Popper think of "Freud's epic of the Ego, the Super-ego, and the Id" and why exactly does he conclude this? What role does he think this theory (and others like it) may have (and historically have had)? And what would have to change about this theory in order for it to become more scientific?

Dewitt, ch. 7.

Dewitt's discussion of "falsifiability" differs in some interesting ways from the discussions of falsifiability and the demarcation of science that you have seen in the other readings. Read this chapter in the light of this other material. A key part of gaining a good understanding of this chapter will involve you thinking hard about how this material relates to that in the other readings. Here are a few specific questions to think about as you read from Dewitt this week:

1. How does Dewitt think of falsifiability? I.e., how does he describe / define it?
2. How does Dewitt's understanding of falsifiability differ from Popper's understanding of falsifiability? How are their understandings of this concept similar?
3. Is Dewitt addressing the same question(s) that Popper was addressing in his discussion of falsifiability?
4. Try your best to think of ways in which we can apply Dewitt's discussion of falsifiability to Popper's classic treatment of this topic. Do the differences and similarities between these two treatments tell us anything about what philosophers of science may have learned in the 50 or so years that came in between these two writings?

