Overview

Thomas Kuhn takes issue with Sir Karl Popper’s attempt to demarcate science from pseudoscience by using falsifiability as his criterion. On the one hand, he indicates that falsification is unsatisfactory, since it not only does not capture the way science has been done throughout history, but it also fails to separate astrology from real science.

Kuhn does believe that falsifiability does have a role to play in separating science from pseudoscience, but he believes that it is only a part of the story. After all, falsification is only relevant when talking about the revolutions in science that lead to the overthrow of fundamental theories. Most of the time, this approach is not what scientists are doing.

Instead Kuhn talks about a puzzle-solving process that is more typical of scientists’ activities. In their ordinary research, scientists try to connect their own problems to an accepted body of knowledge. Rather than put that accepted body of knowledge to the test, scientists accept it as an established framework and strive to use it to solve particular puzzles. It is only when there are repeated failures to solve these small puzzles that scientists begin looking at the possibility of finding new foundations.

Thus, while Popper and Kuhn often come to the same conclusion with regard to whether a particular field is scientific, Kuhn believes he has much stronger reasons for making that determination.

Reading Questions

The following questions are meant to guide and assist you in reading Kuhn’s article. They will draw your attention to key passages and challenge you to think about what Kuhn is really trying to say. Although no page numbers are given, the questions come roughly in the order that you will find their answers in the text.

1. In the opening paragraph, Kuhn identifies three problems with Popper’s statement with regard to how science operates. What are the three problems?
2. Kuhn identifies two main types of scientific statements that scientists put to the test: ordinary research statements and extraordinary research statements. Explain the difference.
3. Can you come up with examples of your own of each type of statement?
4. Which type of statement does Kuhn believe that Popper has in mind with his demarcation criterion?
5. Why does Kuhn believe that Popper commits a basic mischaracterization with regard to science?
6. Why is science likely never to be understood if research is viewed exclusively through the revolutions it occasionally produces?
7. What is the critical discourse that Kuhn and Popper trace back to Thales, Plato, and early Greek philosophers? How is it different from science?
8. Once critical discourse is no longer central to a particular field, what role does it still have to play?
9. When do scientists behave as philosophers?
10. What special circumstances in the puzzle-solving endeavor can lead to a crisis in the profession of science?

Key Terms

There are no new key terms in this article. An understanding of the basic terms from Popper’s article would be helpful.
11. What are the two sides of the demarcation coin, according to Kuhn?
12. Why does Kuhn believe Popper's criterion of falsifiability fails to bar astrology from being characterized as science?
13. How did astrologers explain away their failed predictions? How was this similar to the most common ways of explaining away the failures of mainstream science?
14. How were the practice of astrology and the practice of medicine (pre-1800s) similar? Why was neither scientific?
15. How is astronomy different from pre-1800s medicine and from astrology?
16. What does Kuhn mean when he says “tests are not requisite to the revolutions through which science advances”?
17. Exactly how does puzzle solving fit into the revolutionary process in science?

**Challenge Questions**

1. How are Popper’s and Kuhn’s ideas of the demarcation between science and pseudoscience similar? How are they different?
2. Which of the two philosophers do you think has done a better job of separating science from pseudoscience? Why?
3. Can you think of any endeavors that you believe are scientific but that Kuhn’s criteria would reject?
4. Can you think of any endeavors that you believe are not scientific but that Kuhn’s criteria would accept?