

PHILOSOPHICAL PERSPECTIVES ON SCIENCE:
KUHN AND INCOMMENSURABILITY

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INTRODUCTION

In *The Structure of Scientific Revolution* Kuhn describes his belief that science alternates between normal and so-called revolutionary periods of science, and that the paradigms that determine the scientific enterprise in two consecutive periods of normal science are incommensurable.

The purpose of this essay is to explain what this means and to show why this led Kuhn to believe that 'getting closer to the truth' is not a valid description of scientific progress.

INCOMMENSURABILITY

In order to understand Kuhn's remarks on the incommensurability of scientific paradigms, one has to understand his views of how science changes in the course of history. It is then possible to comment on his views on comparing paradigms.

Scientific Progress

Kuhn does not see the changes made in science as a linear progression. In his opinion, scientists do not evaluate and question the theories they use all the time, waiting for a counterexample that would lead to falsification and the need to create a new theory, which does not get falsified by this particular example.

He believes that periods of normal and revolutionary science appear in an alternating fashion. The periods of normal science consist only of puzzle solving, not of trying to overthrow the current system of rules (Kuhn, 52). To Kuhn, however, this puzzle solving is very positive and leads to actual progress in science. When doing normal science, researchers apply theories to anomalies that are known to exist and try to force them into the system of rules. Kuhn calls this system a paradigm. Even though it consists of rules, it is not a concrete method, but may instead involve illicit and not fully understood parts, and people following the paradigm do not have to be able to articulate it. It is a very broad concept encompassing not only theories but also methods, instruments, standards, assumptions, and even instincts. As a consequence, there is no direct access to the world, since observations can only be made using a paradigm as well.

When scientists fail to apply the current paradigm to more and more anomalies, this might eventually lead to a crisis. It is not only those counterexamples, though, that contribute to the crisis; external factors, like social changes, may also play a role (Kuhn, 82). When the stress exerted by a crisis on the scientific community becomes too large, different versions of the paradigm are proliferated, and this “loosens the rules of normal puzzle-solving in ways that ultimately permit a new paradigm to emerge” (Kuhn, 80).

This process is what Kuhn considers to be revolutionary science. After a new paradigm has been generally agreed upon, a new period of normal science commences.

Comparing Paradigms

As stated before, the very broad notion of a paradigm that Kuhn introduced prohibits direct access to the world: All observations can only be made using one's paradigm, and for different paradigms, the same observation may have different meanings.

When science undergoes a revolutionary change and a new period of normal science begins, this is also marked with the acceptance of a new paradigm. It, however, changes and constrains what people think and how they perceive the world. Assumptions that had been valid and rational under the previous paradigm might suddenly appear ridiculous, and theories used before seem unscientific.

Kuhn, however, argues that those discarded theories are as scientific as the ones currently in use. They have been derived using a similar process, just under a different paradigm. The inability of people following one paradigm to understand a second paradigm does not make it less scientific in any way. If this were true, then previous theories would merely be myths, and the idea that those myths can be created in a scientific fashion seems to be a paradox.

The fact that there is no direct way to access the world, together with the scientist's commitment to adhere to processes that are part of their paradigm, makes it impossible to accept the other paradigm and its theories. There is no common standard of

comparison that can be used to judge both without favoring one. This is what Kuhn means by saying two paradigms are incommensurable.

NATURE OF SCIENTIFIC PROGRESS

The paradigm concept and the idea of alternating phases of normal and revolutionary science that Kuhn propagates do not agree with the more conventional idea of linear progress. He disagrees with it in several points.

Contrary to philosophers that believe in such a linear progress, Kuhn does not think it is possible to actually pinpoint the date of a discovery, even though textbooks often do just this. He argues that textbooks serve a pedagogic purpose and thus have to be persuasive by showing the actual history of a discovery in an abridged fashion that makes it appear logical and intuitive.

The increase in stress due to the crisis and the eventual change to revolutionary science, however, is a gradual process not only limited to a single researcher or group. It is, in fact, dependent on many external factors that make it impossible to specify the date of discovery exactly (Kuhn, 55).

Kuhn also objects to the general notion that advances in science bring it closer to the truth. Such an absolute statement cannot be justified since all observations that can be made to make the current paradigm look better than the previous one have to be made using the current paradigm; therefore, they are biased. The incommensurability of two paradigms prohibits any kind of comparison (Kuhn, 148).

CONCLUSION

According to Kuhn's philosophy, scientific research requires a paradigm. This paradigm, however, limits the ways a person can think, making it impossible to compare two paradigms, or to make absolute statements about the world (Kuhn, 60). Because of this, he says, it is also invalid to say science is getting closer to the truth.

I find the basics of this approach very interesting and logically appealing. From observations about the way different persons discuss issues and the way sexism, for example, seems to bias scientific discoveries and the acceptance thereof to a certain degree, I am convinced that external factors influence one's view of the world. It therefore makes sense to talk of a paradigm.

On the other hand, I find the notion that paradigms are incommensurable, absolutely without common comparative standard, a little too extreme. The general approach describes the happenings in the history of science quite accurately as time progresses, but to say that there is absolutely no possibility for somebody in one paradigm, particularly one that follows immediately, to at least partially understand the rationale behind a second paradigm is exaggerated. I agree with Kuhn that a person's mind can truly follow only one paradigm at a time, and changes are difficult, but with reason, hindsight, and maybe a little empathy, it should be possible to at least understand the principles behind the other paradigm.

BIBLIOGRAPHY

Kuhn, Thomas S. *The Structure of Scientific Revolutions*. 3d edition. Chicago and London: The University of Chicago Press, 1996.