Philosophy of Science // Fall 2016

Handout 21

Scientific realism: Kitcher

Remark 1. Kuhn's discussion is a necessary background to the present one.

The framework of the debate. We can distinguish different claim of realism and anti-realism. For example:

Realism about entities Entities (states, processes) really exist.
Anti-realism about entities Entities are our own costructs ('phenomena').
Realism about theories Theories aim at truth and approach truth.
Anti-realism (instrumentalism) about theories Theories are useful tools, taken literally or not.

Thus we have the following ingredients of realism:

Ontology Entities exist.
Causation (Unobservable) entities have causal powers affecting phenomena.
Epistemology We have a warranted belief in scientific theories.

So, it is natural to ask just what people mean by 'reality' or 'real'. 'Real' may be thought to be an ambiguous word. 'Real hero' may mean something totally different from 'real entity'.

Truth as correspondence. Kitcher discusses realism primarily in the sense of realism about theories. However, implications are drawn immediately for the realism about entities. Thus one way to characterize realism is to say that our true statements correspond to reality. A statement is true when it represents the world as it is. Similarly for beliefs, which can be taken to have linguistic form.

This view does not have to come with metaphysical baggage. On the contrary, in everyday situation we use some version of the correspondence theory to explain practical successes and failures. If I believe I can fly, I will soon find myself splashed on the ground. But I am able to walk in part because I believe I can walk.

By the same token, we are naturally attracted to the correspondence theory can explain the transition from one theory to another. Lavoisier's (mature) view of oxygen was superior to Priestley's view of phlogiston, since it resulted in better dealing with environment—that is, in delivering prediction and improving the capacity of 'puzzle-solving'.

Kuhn denies the existence, indeed the intelligibility, of theory-independent nature. But then we require an alternative explanation why one theory was more successful in puzzle-solving than the other. Notice that an anti-realist explanation cannot simply appeal to increased generality, or greater formal sophistication: the gap between the two paradigms is conceptual, so that one cannot be a special case of the other.

Abduction. Abductive inference, like deductive, consist on premisses and a conclusion. But the conclusion is not drawn by following a logical rule. Instead, the conclusion is supposed to explain better the evidence formulated among the premisses.

Example 2. Consider the following inference:

1. If the economy slows down, the inflation rate falls. (If P, then Q).
2. The inflation rate falls. (Q)
3. Probably, the economy slows down. (Probably, P)

Thus we can construct abductive arguments for realism. Consider Abduction I:

1. If scientific theories are approximately true, they will typically be empirically successful.
2. If the central terms in scientific theories genuinely refer, those theories will generally be empirically successful.
3. Scientific theories are empirically successful.
4. (Probably) Theories are approximately true and their terms genuinely refer.

But are the theories that genuinely refer are successful? Examples from history of science show that this is not the case. For many years theories that we currently believe to be referential have not been successful. Presumably ancient atomistic theories are approximately true. But for many centuries they failed to produce adequate explanations. In fact they were rejected in part because of that very failure. Objection: they were not approximately true. Reply: well, they were more so than their competitors. And these examples can be multiplied.

Pessimistic induction. Another abductive inference is the so-called 'pessimistic induction'. Consider Abduction II:

1. If the earlier theories in a "mature" science are approximately true and if the central terms of those theories genuinely refer, then later more successful theories in the same science will preserve the earlier theories as limiting cases.
2. Scientists seek to preserve earlier theories as limiting cases and generally succeed.
3. (Probably) Earlier theories in a "mature" science are approximately true and genuinely referential.

Here we appeal again to history of science to show that many theories than were thought to explain are (now) considered not at all approximately true. Examples can be easily found in Kuhn's monograph. Some of the more famous ones: phlogiston theory, the theory of electromagnetic aether.

YSB