Philsoc Student Essay Prize – Trinity 2014

3rd Prize: Chris Lyons

What is the problem of induction? Is it important to be able to offer an answer to this problem?

The problem of induction arises from its implied premise that there is regularity in nature. This essay will argue that while we have no reason to accept the premise, and that this precludes us from having certain knowledge of the world, we can nevertheless still acquire knowledge which is useful for our survival and well-being.

Induction is a form of inference, which (unlike deduction, which is truth preserving and, when sound, can deliver certainty) leads to a conclusion whose truth is only *likely*. This follows from its premise that there is regularity in nature, such that a sample can be representative of the whole and that the future will resemble the past. The premise, however, can only itself be inductively inferred from observations of the world and the flow of time. There is, therefore, no justification of induction, independent of an inductive process, and so no certainty to be had in our empirical knowledge.

This problem, first described by Hume, applies to all the knowledge we have of the world that is derived from the senses. It is therefore of considerable relevance to the philosophy of science, but also to the practical assumptions we make in our daily lives. Russell illustrated it with the example of the turkeys, who, being regularly fed morning after morning, came to inductively infer this to be a general pattern that they could expect to enjoy into the future, only to be disabused of this when, come Christmas Eve, instead of getting breakfast they had their heads cut off. Similarly, no matter how many white swans had been observed over the centuries, it was no guarantee that the next one wouldn't be black, as was found to be the case when black swans were discovered in Australia in the late eighteenth century. And no matter how consistently stock prices might rise or the economy grow, that is no guarantee against there being a crash just round the corner.

Several variations to induction have been suggested to try to avoid Hume's objection. *Probabilism* holds that whilst certainty in the truth of a proposition cannot be achieved, we can have degrees of belief, which can be expressed as the dispositions we might hold to bet at different odds on its truth. This has been given a precise mathematical form in Bayesianism, which tracks how the probability of our confidence should change as new evidence is found. The weakness of this approach is that it fails to address Hume's central claim that we have no reason to believe in the uniformity of nature.

Abductive reasoning doesn't seem to infer a general rule from particular instances, but seeks the best explanation for a single particular instance. Its logical form is *a* can be abduced from *b*, when *a* is sufficient (or nearly sufficient), but not necessary for *b*. The problem with it is that there are usually a number of explanations for the instance in question and the best is usually regarded as being that which is simplest. But there is no reason why the simplest should be the best other than past experience, discovered by induction. Abductive inference then depends upon an underlying inductive process, to which it ultimately reduces.

P F Strawson suggested that there is no need to have a particular reason that the future will resemble the past, and that having observed regularity in the past is itself just what it means to have reason to believe that a similar instance will be observed in the future (Stroud, 2011). This is an *externalist* account of knowledge, but seems inadequate as it fails to distinguish between the past regularity being a law-like generalization or a merely 'accidental' correlation.

Because of the relevance of this uncertainty for science, Popper sought to show that the scientific method wasn't in fact inductive. He argued that scientists don't arrive at their theories by inductive inference, but by declaring bold new conjectures which they then try to falsify or refute. Those that remain unfalsified are considered to be provisionally true. Popper's theory relies upon the asymmetry between the logic of confirmation and that of refutation. Whilst no number of confirmatory instances can *inductively* establish a general rule with certainty, a single falsifying one can *deductively* disprove it. The problems with Popper's theory are that exceptions to a generality can often be re-classified to preserve the generality (black swans, for instance, could have been considered a new type of bird), but, more importantly, scientists are usually unwilling to abandon a well established theory on the basis of less-than-overwhelming evidence. It is nearly always possible to reinterpret a single piece of falsifying evidence as being insufficient to refute a well established theory.

But whilst Hume's objection holds, and we can't ever be certain that the particular will represent the general, or that the future will resemble the past, we nevertheless have to live in the world and make decisions on the basis of the best knowledge we can acquire. Reichenbach argues that it is induction that provides this *best knowledge* and that it is pragmatically, even if not epistemologically, rational to use it. Whilst we have no reason to believe in the regularity of nature, nature nonetheless appears not to be wholly chaotic, but to have at least limited regularities - and if there are limited regularities then, induction will work to a limited extent. If, on the other hand, there were only total randomness, then no kind of inference at all would be possible.

In conclusion, we have no non-inductively inferred reason to believe in the regularity of nature, and induction is therefore incapable of leading to empirical beliefs of which we can be certain. But, given that we must act in the absence of certainty, and given that nature does appear to have limited regularities, it is pragmatically rational to rely upon induction. Not to do so, would be to abandon any attempt at all at understanding the world.

985 words

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