What is Hume's problem of induction? Explain what the problem is using an example of science. On the basis of your examination, how serious is Hume's problem of induction?

The 'Problem' of Induction

Ewan Davidson Monahan

In this essay, I will outline Hume's problem of induction and explain it using scientific examples. I will then use these examples to analyse the problem of induction and arrive at the conclusion that it is not as much of a 'problem' as it is widely considered to be.

Hume's problem of induction relates to the idea that one cannot create scientific theory using deduction and must instead use induction. *Induction* is where one creates a general statement following a finite number of experiments or investigations. The alternative to induction is *deduction*, where the statement comes from a set of accepted premises which determine their conclusion to be true. The 'problem' arises when Hume argues that the limited sample of trials does not allow us to make general statements.

While most recent scientific discovery has stemmed from induction, consider this example: we carry out an investigation into the effect on the state of water when raising or lowering pressure, starting at 1 atm, while keeping temperature constant at 0℃. The experiment is carried out and at the end we arrive at a result: as pressure is increased, ice turns to water and as it is decreased, water turns to ice (Baird & Cann, 2012). Any credible theory must be repeated many times to remove outliers. Repetition shows the same result. Through induction, one could conclude that increasing pressure on ice sufficiently will cause it to turn to water. Hume and others who cite the problem of induction would take issue with this statement. They would point out that while we carried out our experiment repeatedly, recording what has already happened, this does not allow us to say anything about what *will* happen.

This is widely considered to be a problem, and philosophers often see a need to solve or bypass it. My first argument against this is that science can never be made deductive. The reason for this is that the premises for which deductions are based upon are themselves inductive usually. Take as a simple example, two premises and their conclusion: 1) Atoms are indivisible units that make up every element; 2) Every substance consists of elements; 3) Every substance consists of atoms. This deductive argument is easy to understand and has a logical flow, but how do we know that atoms are indivisible units? How do we know that every substance consists of elements? To limit ourselves to only deduction is impossible if we hope to make any sort of progress in science.

My second argument is that Hume does not have much to say with regards to varying the specificity of our claims. Take the pressure/state experiment and imagine that it were to be disproven one day. While Hume would argue that this demonstrates why induction is a problem, I would say that this happened as a result of our conclusion lacking specificity. The real issue is that our theory did not include our temperature and pressure conditions that were set in the experiment. The truth is, these changes of state will only be observed at

specific temperature and pressure. I argue that this sort of vagueness or inaccuracy in statements is the root cause of highly corroborated theory, that is, backed up by repeated experiments, being suddenly shown to be false.

My final argument is that highly corroborated theories, even if they may never be proven, are extremely useful from an instrumentalist standpoint where *instrumentalism* refers to the use of theory not to explain but to help to create better predictions (Godfrey-Smith, 2003, p.15). It is undeniable that inductive theories across physics and engineering especially have allowed us to build bigger and better and to advance humanity far beyond what would be possible without inductive theories. It is important to realise that whether we consider induction to be valid or not, the theories that arise are essential and have given us everything from vaccines to better hygienic practice.

Now that we have analysed Hume's problem of induction, we can conclude that while it may be true that scientific theory cannot be created without the use of induction, this does not necessarily cause us a problem like Hume claims it does. By trying to solve this non-issue, we are subjecting ourselves to a stagnant reservoir of knowledge. As long as science does not claim to be absolutely certain about the truth of the world, the self-improvement of science over time is enough for us to progress and we can consider this problem trivial.

Bibliography:

Baird, C., & Cann, M. (2012). *Environmental chemistry*. W.H. Freeman and Company.
Godfrey-Smith, P. (2003). *Theory and reality: An introduction to the philosophy of science* (D. Hull, 1ed).
Hume, D. (1748). *An enquiry concerning human understanding*.

Word Count: 745