Thought probes for September 29th

Chapter 4: Popper: Conjecture and Refutation.

1. Godfrey-Smith provides a nice discussion on pages 58-9 of Popper's view on induction. Do you think that this account would be endorsed by contemporary scientists? Try to imagine how the debate over climate change would proceed if scientists were thorough-going Popperians.

2. Popper's model of scientific inference is sometimes called the hypothetico-deductive method. First, a scientist puts forward a hypothesis. Second, a prediction is derived from that hypothesis. Note that the derivation of a prediction involves the use of deductive logic. Hence, there is a strict logical connection between a hypothesis and the associated prediction (if the hypothesis is true, then the prediction cannot be false). This is why, on his view, a scientist is required to reject a hypothesis if the prediction turns out false.

   You might ask, where do these hypotheses come from? Popper claimed that there are no rational principles governing hypothesis formation. Instead, he described hypothesis formation as a creative process akin to making artwork. Just as one cannot criticize an artist for making a mistake in the creative process, so too is it impossible to criticize a scientist for putting forward particular hypothesis.

   How defensible is this account of hypothesis formation? Do you think that there are some cases when a scientist ought to test one hypothesis instead of another? What might such a situation look like?

3. The demarcation principle was an attempt to distinguish real science from pseudo-science. It claims that only genuine scientific hypotheses can be falsified by an observation. However, As many philosophers have noted, hypothesis testing is holistic. How does this feature of hypothesis testing undermine his distinction between science and pseudoscience? That is, how does the holistic nature of hypothesis testing make scientific hypotheses immune to falsification?

4. It is interesting that most students of science are taught to follow the hypothetico-deductive method. This is perhaps surprising given that the method has been shown not to provide a rational basis for hypothesis formation, and perhaps worse, that it has been shown not to provide a method for determining when a hypothesis should be rejected. Why do you think that science students are taught to follow this method?