

## Fourth Writing Assignment

Assigned in class 1 of week #12, due one day after class 2 of week #14 (in the recitation section).

1. Consider the following passage from Karl Popper's *Conjectures and Refutations*:  
"...Take one typical instance--Einstein's prediction, just then confirmed by the findings of Eddington's expedition. Einstein's gravitational theory had led to the result that light must be attracted by heavy bodies (such as the sun), precisely as material bodies were attracted. As a consequence it could be calculated that light from a distant fixed star whose apparent position was close to the sun would reach the earth from such a direction that the star would seem to be slightly shifted away from the sun; or in other words, that stars close to the sun would look as if they had moved a little away from the sun, and from one another. This is a thing which cannot normally be observed since such stars are rendered invisible in daytime by the sun's overwhelming brightness; but during an eclipse it is possible to take photographs of them. If the same constellation is photographed at night one can measure the distances on the two photographs, and check the predicted effect. Now the impressive thing about this case is the risk involved in a prediction of this kind. If observation shows that the predicted effect is definitely absent, then the theory is simply refuted. The theory is incompatible with certain possible results of observation--in fact with results which everybody before Einstein would have expected... These considerations led me in the winter of 1919-20 to conclusions which I may now reformulate as follows....

(4) A theory which is not refutable by any conceivable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.

(5) Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks.

One can sum up all this by saying that the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability."

Explain Popper's main points in this quotation. How would Putnam and Kuhn react to this picture of science? What is your own view? Is Popper right? Are the criticisms Putnam or Kuhn would make correct? Or is Popper wrong for other reasons?

2. Consider some views that have been attributed over the years to Kuhn.

- (a) There is no theory-neutral basis for preferring new theories to old.
- (b) New and old theories are not directly comparable since key terms lack a common meaning.
- (c) New and old theories are not directly comparable since their advocates "see things differently."
- (d) New and old theories are not directly comparable since their advocates "live in different worlds."
- (e) New theories don't not give "a better representation of what nature is really like."
- (f) New theories are not better than old ones in any way.

Which of these do you think Kuhn would agree with? Which would he reject, and why? Of the views listed, pick one that you think is true, and explain why you think this. Then pick one that you think is false or misleading, and explain why it is false. Is it reasonable, in your opinion, for people (us, as it might be) to believe what scientists tell them (us)?