**Assignment due on October 3 (2022)**

**Reading:** *Science as Falsification* by Karl Popper

**Questions:**

1. **A scientist performing a series of experiments obtains the theoretically predicted results. Has she ‘proven’ the theory? Explain.**

No, since the experiments should be used to genuinely present a serious but unsuccessful attempt to falsify the theory.

1. **Popper writes ‘every “good” scientific theory is a prohibition; it forbids certain things to happen. The more a theory forbids, the better it is’.**
2. **What have we been calling things that ‘are forbidden to happen’ in nature?**

Physical Impossibilites

1. **Briefly explain how the above quote is related to the Sagan essay *Can We Know the Universe?***

Sagan said something similar in his essay about everything not being known and not everything being possible. Sagan also believed this made Science more fun as everything doesn’t always go to plan and things can be hard to think about.

1. **Briefly explain/describe Popper’s Falsifiability concept. In your explanation/description, discuss the following – if a claim is falsifiable, does that mean that the claim is false? If falsifiable is not the same as false, how do falsifiable and false differ from each other?**

Popper differentiates good and bad theory as a sense of good theories are falsifiable and bad theories are just ‘proven’. What he means by falsifiable is that a theory is tested in a way where the theory is refuted and not proven. This does not mean the theory is false i.e., incorrect.

1. **How does Popper distinguish a ‘real’ scientific claim (theory) from a pseudoscientific one?**

Popper believes the man characteristic of Pseudoscientific theories is the incessant stream of confirmations, of observations which “verified” the theories in question.

1. **Briefly discuss why Marx’s, Freud’s and Adler’s theories were not scientific, but Einstein’s was. Was it because of their disciplines (political theory, psychology and physics, respectively) or was it due to some other reason?**

The reason Einstein’s theory was scientific and the others were not was because Einstein made a prediction that was falsifiable, which meant there were places where the theory could be tested for a refutation while for the other theories there was not a way the theory could be falsified.

6**) In Note 3, Popper writes that ‘ “Clinical observations”, like all other observations, are *interpretations in the light of theories*; and for this reason alone they are apt to seem to support those theories in the light of which they were interpreted’.**

1. **Can we make interpretations without having a theory?**

We can make interpretations without theory we make them all the time but in a Scientific sense many interpretations are build around theories so usually interpretations require some theory as a base.

1. **If you are not already familiar with Circular Reasoning, do some research to learn and understand the concept. Is interpreting observations in the light of a theory circular reasoning? Why or why not?**

If you are using the observation to justify the observation in the first place. You can use observations to test a theory but once observations are used to justify a theory and vice versa than the reasoning becomes circular.

7) **Are religious claims falsifiable? Why or why not?**

No as religious claims are not meant to be tested; they are meant to be believed at face value.

8**) Some people use the claim that any weather event that happens (or doesn’t happen) happens or doesn’t happen due to Climate Change. If it is unusually hot, unusually cold, unusually wet, unusually dry, if it snows or doesn’t snow, if tornados or hurricanes form or don’t form, each of these is due to climate change. In this vein, is Climate Change a valid scientific theory? Why or why not?**

While It is a theory in sense it is a bad theory as there are no limitations to the theory. The more a theory forbids, the better it is according to Popper.

9) **Disciplines such as Meteorology and Economics often use complex computer models; these models involve various inputs (data) and assumptions about what will happen when there is a specified set of inputs. Global Warming/Climate Change claims often involve a complex computer model known as the General Circulation Model (GCM). Consider the claim that GCM ‘isn’t required to accurately predict the future, it only has to accurately describe the past’. According to Popper, would a model that isn’t required to accurately describe the future scientific? Why or why not?**

Maybe, since the models already has assumptions built into its core and because of those assumptions the model might not be testing the theory for a refutation and instead just be trying to give more data to ‘prove’ the theory. If these assumptions aren’t being used in a manner to just prove the theory its possible the Model could pass Popper’s tests.

10) **A ‘tame’ problem is one in which the proposed solution can objectively be tested, and if the solution fails the test, the solution is rejected and another solution is tried. Adequately feeding 8 billion humans is an example of a tame problem.**

A ‘wicked’ problem is one in which the proposed solution cannot objectively be tested, as the determination as to whether or not the solution passed the test is subjective, not objective. The problem of reducing crime is an example of a wicked problem.

Can science (scientists) and technology (engineers) solve all of society’s problems? Why or why not?

No, Science can only solve tame problems while more wicked problems must be solved in a more political or religious sphere as Scientists can only collect data and give possible solutions not solve it outright.