**SCI 1003 – Assignment due on September 26 (2022)**

This assignment involves the Stephen Jay Gould essay *Evolution as Fact and Theory*. Note that the purpose of the article is for us to understand the difference between the terms ‘fact’ and ‘theory’ as used in science.

Two of the several definitions of ‘theory’ from <https://www.merriam-webster.com/dictionary/theory> are given below:

1) ‘an unproven assumption: conjecture’

2) ‘a plausible or scientifically acceptable general principle or body of principles offered to explain phenomena <the wave theory of light>’

This essay defines scientific theories as ‘structures of ideas that explain and interpret facts’.

1. **When someone states that ‘\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is just a theory’, are they using ‘theory’ in the non-scientific sense (definition 1, above), or the scientific sense (definition 2, above).**

I think this mainly depends on context, but mainly I think people use this when a scientific theory does not align with their own world views but I think many people can use this in legitimate ways about a theory or theories.

1. **The sentence in the 5th paragraph “And facts and theories are different things, not rungs in a hierarchy of increasing certainty”. Does the phrase ‘not rungs in a hierarchy of increasing certainty’ mean that scientific theories are less true/less likely to be true than are facts, or is Gould stating that scientific theories are treated/assumed as being as true as are facts? Explain.**

Gould believes that theories should be treated as “facts”, in which he does not conflate to being absolute certain, but he also does say that not every theory is as factual as another. For example, Einstein’s theory of Relatively built off of and replaces Newton’s model.

1. **Regarding paragraph #6 (“Moreover, “fact” does not mean “absolute certainty”) – are scientific facts and scientific theories absolutely true, as in incapable of being questioned and possibly being wrong?**

No Scientific theories can be wrong, and sometimes are but the point of Science is to keep question these theories and hopefully find a theory that is better than the last.

**b) Can we absolutely prove a scientific theory the same way that we can prove a logical or a mathematical proof? Explain.**

No, because math problems flow deductively from a stated premise and end at a given point. Science must deal with the empirical world.

1. **In paragraph (“Evolutionists have been clear...”), Gould uses the phrase ‘mechanism of evolution’. Is Gould referring to evolution as a fact or evolution as a theory in this phrase?**

The mechanism is the theory in this case, or more specifically the Theory of Natural Selection.

1. **In paragraph 9 (“Scientists regard debates…”), how does Gould describe how science is done? (Hint: What comes after “Science is- and how else can I say it? – most fun when”)**

He describes Science as being, most fun, when interesting ideas are examined and then used along with old evidence to rewrite a theory about a topic in a new way.

**6A) Gould uses the term ‘dogma’ in paragraphs 10 and 12. Look up the definition of ‘dogma’ (and give your source).**

a principle or set of principles laid down by an authority as incontrovertibly true. – Oxford Dictionary

**b) Is science dogmatic? Explain.**

I believe the act of Science itself is not dogmatic as Science seeks to question theories new and old until the most solid rises to the top. I do believe some Scientists are dogmatic however as they are human like everyone else.

**7) In paragraph 13 (“Our confidence…”) Gould mentions examples of evolution being observed. Are these observations of evolution occurring show that evolution is a fact or evolution is a theory? Explai**n.

In this case he is referencing to the Fact of evolution as we can physically run trials and such to see the changes evolution imposes. He gives examples of viewing as well as how we can study evolution without direct viewing of evolution in effect. He is not talking about the mechanism evolution uses to function.

**8) In paragraph 16 (“Evolution lies exposed”), summarize the argument that Gould is making in the first part of the paragraph (before he goes off on the tangent about Australian animals) and explain the logic in his argument.**

He explains through the imperfections in all animals, mainly structures of the body, you can see a pattern acquired more than likely through a common ancestor. He uses Australian Marsupials as an example as most large native mammals of Australia are Marsupials because of that premise.

**9) In paragraph 22 (“Continuing the distortion”), the term ‘major mutations’ is used – does mutations relate to the fact of evolution, the theory of evolution or to both the fact and the theory of evolution? Explain.**

A little of both as mutations can appear just randomly through the fact of evolution or it can appear throughout multiple generations acting through the mechanism of evolution.

**10) In paragraph 23 (“I am both angry at and amused by”), do you agree with Gould that scientists are often dogmatic and elitist? If so, give an example of when scientists have behaved dogmatically and elitist.**

I agree with Gould in this case that scientists can be dogmatic and elitist through the example he gave. While I don’t think every scientist is this way, I believe some are tempted by the fiscal opportunities rather than the pursuit of truth.

**11) In paragraph 24 (“I am sad”), Gould rhetorically asks, “Shall we deprive millions of this knowledge and once again teach biology as a set of dull and unconnected facts, without the thread that weaves diverse material into a supple unity?” What is this ‘thread’ that ‘weaves’ the diverse biological facts into a unified whole?**

In this case Gould is talking about Evolution and its processes and vehicles.

**12) In paragraph 26 (the last paragraph) do you agree or disagree with Gould’s claim that we will be truly lost if we ever begin to suppress our search to understand nature? Why do you agree or disagree?**

I agree with his notion that to stop pursuing the Truth in an attempt to seem together on a topic, socially or culturally, would be against the notion of Science to begin with. To steal a quote, “In order to think you must risk being offensive” or even wrong to begin with and I think that is where Science shines. With Science you can be wrong as long as you are legitimate in your search for the truth.

**13) Read the article *Lizards Undergo Rapid Evolution After Introduction To A New Home*. Is this an example of the fact of evolution/evolution as a fact, or the theory of evolution/evolution as a theory? Explain.**

Fact of evolution, as the lizards showed different changes and characteristics over a short time. These changes were physical and behavior showing that these reptiles have at least adapted to their new environment and then have changed in nature to better fit their environment. They are not trying to explain the vehicle that caused the change to begin with

**Read the essay by Charles Wynn, *Does Theory Ever Become Fact?* and answer the following:**

**14) Contract Wynn’s ‘Law of Next Door Neighbor’s Early Morning Behavior’ with his ‘Neighbor is a Jogger’ theory. Are there conceptual differences between laws and theories?**

Laws are observations that can be predicted consistently, for example an object will always fall when you toss it up in the air.

Theories seek to explain why the facts occur. Newton was the first to theorize about gravity but was then replaced by Einstein’s theory of Relativity, while the theories may have changed the fact did not.

**15) According to Wynn, can a theory ever become a fact? Why or why not?**

No, because a theory must cover every instance of a phenomenon. The theory must remain open ended just in case a new phenomenon violates the theory. It must be universal.