[redacted]

[redacted]

Theory of Knowledge Essay
Biotechnology High School

"In expanding the field of knowledge we but increase the horizon of ignorance" (Henry Miller). Is this true?

As a child, I used to play "The Why Game." The rules are simple; ask someone a complicated question and after they give you their answer then ask, "why" to their answer. They will then answer that question, to which then you ask why to that answer. Depending on the patience and intelligence of the person will determine the amount of "whys" you will have to ask until they say "I don't know." This game parallels with the paradox proposed by Henry Miller when he said, "In expanding the field of knowledge we but increase the horizon of ignorance." The paradox is that for every question that we answer, there are hundreds of new questions asked. Essentially, by answering questions and obtaining knowledge, we are creating more unknowns and thus increasing ignorance.

A paradox is a statement that contradicts itself. For example when Aristotle said, "We make war that we may live in peace," (Philosophy Quotes and Quotations) he pointed out the contradiction that we kill so that we won't have to kill. To understand this specific paradox we must first understand how we expand the field of knowledge. Generally speaking, the areas of knowledge rely on two different types of reasoning to obtain knowledge, deductive and inductive reasoning. Deductive reasoning takes a general statement and applies it to a specific situation, as in an ethical argument where a general moral principle is assessed in an incident. Inductive reasoning works in the opposite pathway, citing specific examples to create a general conclusion. The scientific

method uses inductive reasoning when it calls for a multitude of trials to create a stronger conclusion.

However, while these methods to obtain knowledge can be sound, they are not invulnerable to error. They can be unreliable because of problems with our perception, such as hasty generalizations and confirmation bias, both which can originate from a faulty paradigm. Our paradigm adds to the paradox because our paradigm can limit what questions we ask and what observations we make. Consequently, our paradigm limits what knowledge we look for and what knowledge we obtain. So while making advancements in our understanding of the universe, we can be completely oblivious to an entire field of information. Also, if by chance our paradigm is incorrect, the knowledge that we are creating and teaching may not be true.

Ironically, the good thing about our paradigm is that it limits the amount of knowledge we can process. Around us at every moment there are thousands of things for us to process, endless volumes of information. There are viruses smaller than we can imagine, the universe is bigger than we can comprehend, and in between one and two there is an endless amount of numbers. This is knowledge's infinite nature. The greatest factor that drives the scientific community is that knowledge is infinite because it provides the notion that there is more to discover. So, to the natural sciences spreading ignorance only provides more opportunity to foster knowledge.

However, some answers are finite. One of the great scientific races in the twentieth century was to determine the structure of DNA. However, this race ended once Watson and Crick discovered it (Gilbert, 2006). Afterward, people no longer focused research on determining the structure of DNA, instead they look to unanswered areas of

science. In this sense, this avenue of study was closed and so this example of knowledge is finite, people no longer need to study it.

There is a consequence to this reasoning though, that links back to the faulty paradigm. We cannot constantly reprove what we have already proven because that is anti-productive. However, we cannot take what has been proven for fact without testing it. If we did, we would run the same risk as our ancestors. People used to use Ptolemy's Geo-centric model of the universe, and assumed its validity because it had perfect orbits, which in their religious based paradigm, is how God would create the universe (Heburn, 2007). Had Galileo not questioned it, we would still use this incorrect model. As Xi Zhi said, "Large skepticism leads to large understanding. Small skepticism leads to small understanding. No skepticism leads to no understanding" (Philosophy Quotes and Quotations). By inquiring about the validity of knowledge we help to limit the potential error and ignorace attached to it. So to agree with Karl Popper, "Our belief in any particular natural law cannot have a safer basis than our unsuccessful critical attempts to refute it" (Philosophy Quotes and Quotations). While some ideas have been rigorously proven, we should not take any knowledge from science to be completely finite.

While knowledge's infinite nature provides opportunity to discover more knowledge in the natural sciences, it creates difficulties for empirical knowledge in mathematics. Math has a formal system that is based on axioms, deductive reasoning, and theorems, and like science it needs to be rigorously proven. For example, Goldbach's conjecture states that every even number is the sum of two primes. Notice however that this is a conjecture and not a theorem. Since conjectures are tested to show support, and while it is true that Goldbach's conjecture has been proven to 100,000,000,

000, 000 with computers (Caldwell, 2008); there is no guarantee that at 100,000,000, 000,002 the conjecture will fail. Since we cannot calculate infinity, it remains impossible to have absolute certainty. It is like they are incomplete thoughts, well planned but not finished. And if they are incomplete, how can they be knowledge? Therefore because numbers are infinite, as we attempt to create new knowledge, an ever-growing field of ignorance inhibits us.

The question to ask then is, given this surmounting evidence that we will never be able to finally and definitely test every number to prove a mathematical concept, what should you do then? Just as someone may use mathematics to tackle an economics question, a man named Godel tackled this question. He made Godel's Incompleteness Theorem, which proves that it is impossible to prove that a formal mathematics system is free from contradiction. He worked in an abstract sense, which was that instead of proving the formal system true; he proved that it couldn't be done. Simplified, this means if it is proven that it is impossible to show that something is free from error, then why prove it (Myers, 2006)? Godel, by this abstract method, makes a very strong point. He demonstrated that as long as we are aware of our limitations, we could create functional knowledge around our blind spots. In this circumstance, by being aware of the field of ignorance we may be able to create knowledge that can actually reduce its size. In my opinion, both the claim and counter claim are valid ideas. It shows that we have to accept that while our paradigm may be faulty, it is functional enough and can be improved, to get us bye on a daily basis.

The paradox doesn't only exist in strongly quantitative areas of knowledge like the sciences and mathematics, it is also present in history. Historians study primary and

secondary sources and rely on this evidence as well as their own judgment to piece together a conclusion. For example, we can look at the historical reasons why WWII started. Traditionalists say that WWII in the Atlantic was started because of ideological reasons; essentially a war of democracy against fascism and it blames Hitler as the epicenter of the problem. However, Revisionist propose the Taylor Thesis that states that Germany was a disruptive state, and thus at fault for WWII, and that WWII was not an ideological war. Still some people are critical of this interpretation and offer another opinion saying that WWII was a continuation of WWI (Palmer, Joel, & Lloyd, 2007).

Now, all of these people reviewed the same facts, but have come up with contradicting theories. How is it possible to have knowledge if our knowledge is contradictory? Wouldn't one be able to say that if someone was knowledgeable of the Taylor Thesis, that they still would be ignorant of the causes of WWII? What appears to happen is that when one explanation is set in stone another seems to come along and replace it. With every instilment of a new acclaimed cause the original and true answer become more and more ambiguous. While the purpose of the review is to get a more accurate answer, the continual review of historical theory creates a surplus of ideas and essentially makes the original answer more ambiguous and thus creates ignorance.

In the natural sciences there are multiple debates about how the universe originated. While all these ideas have support, no one theory is accepted to be correct. In a sense, history itself is a theory, and so while there are different theories explaining the same event, none of these explanations are considered to be entirely correct. Since there is no right or wrong answer, ignorance is not produced. I agree with this counterclaim. As Voltaire said, "History is fables agreed upon," (Philosophy Quotes and Quotations)

and I think that collaborated together the historiographies are creating knowledge rather than ignorance because they all offer new knowledge that the previous did not consider.

The original paradox states that by answering questions and expanding upon our knowledge, we are actually producing more unknowns and ignorance. This paradox inherently exists because of our limited paradigm, the infinite nature of knowledge, and by our own creation. Still we can benefit from the paradox because it provides more room to discover in the sciences, and if not we can accept the paradox as is and still be able to function fine.

Word Count: 1,599

Works Cited

Caldwell , Chris. "Goldbach's conjecture." The Prime Glossary. 2008 Sept. http://primes.utm.edu/glossary/page.php?sort=goldbachconjecture. 16 Jan 2009 <http://primes.utm.edu/>.

Dale, Myers. "Godel's Incompleteness Theorem." Dale Myer Mathematics University of Hawaii. 2006. 16 January 2009 http://www.math.hawaii.edu/~dale/godel/godel.html

Gilbert, Scott. Developmental Biology. 8th ed. Sunderland, MA: Sinauer Associates, Inc, 2006.

Heburn, Carl. "A Brief History of Cosmological Ideas." Splung. 2007. 16 Jan 2009 <http://www.splung.com/content/sid/7/page/earlymodels>.

Palmer, R.R., Joel Colton, and Lloyd Kramer. A History of the Modern World. 10th ed. New York: McGraw Hill, 2007.

"Philosophy Quotes and Quotations." Famous Quotes and Authors. 2008. Famous Quotes and Authors. 16 Jan 2009 <http://www.famousquotesandauthors.com/topics/philosophy_quotes.html>.