Samuel Butler wrote, “Though analogy is often mislaeading, it is the least misleading thing we have”. In explaining complex scientific theories to non-scientists, scientists often make use of the analogy. Much of Behe’s arguments are put forth by analogies (mousetrap, Rube Goldberg, etc). Are Behe’s analogies useful and applicable or are they obscured to fit his own beliefs? What does this suggest about Intelligent Design and the legitimacy of its theories?

Behe’s Analogies: Helpful or Misleading?

Much of what we cannot physically see in science is based on analogy. Whether its thinking of gas particles as billiard balls colliding into each other or conceptualizing genes as individuals fighting for survival in evolution, analogies are useful to scientists hoping to enlighten non-scientists. However, analogies in the science realm do not give a complete understanding of the material, only a concrete visualization of an otherwise abstract concept. In promoting the idea of Intelligent Design, Michael Behe, in his book *Darwin’s Black Box* (1995), relies heavily on the analogy to illustrate his points. In doing so, Behe creates a slippery slope so that if his analogy fails, his whole argument fails. Ultimately, Behe’s analogies are flawed and distorted; moreover, Behe’s arguments are misleading to the average reader because they apply simple analogies to complex scientific concepts, in turn creating a skewed view of what is scientifically plausible.

At the heart of the Intelligent Design movement stands the concept of irreducible complexity. It states that certain biological systems could not have evolved gradually from evolution because they contain multiple, interacting parts that are all essential to their respective operations. Intelligent Design then goes on to say that since evolution cannot explain these systems, they must have been intelligently designed. Behe claims that the eye, the blood-clotting process, and the bacterial flagellum are all examples of irreducibly complex systems. In an attempt to provide the reader with a tangible analogy of such systems, Behe puts forth the mousetrap. The mousetrap, he claims, is a simple irreducibly complex system, so that if a person

removes any of the components (base, hammer, spring, catch, etc..), the function is void. The first glaring error is that the mousetrap is in fact reducibly complex, meaning that a person can remove one or multiple parts of the mousetrap in a way so that it still functions. Many scientists have already proven it. John McDonald, a biology Professor at the University of Delaware, has an entire website devoted to developing modified mousetraps that still function without one of Behe's crucial elements. Michael Young, scientist and author of "Grand Designs and Facile Analogies: Exposing Behe's Mousetrap and Dembski's Arrow" (2002), also claims to be able to construct a mousetrap that removes the latch but is still able to function. The mousetrap analogy reveals one of the logical flaws in the Intelligent Design argument: the fact that a person cannot imagine something does not necessarily indicate that it is impossible. Instead, it may mean that the person has a limited imagination or science has not progressed enough yet to explain the phenomena. Even if the mousetrap could not be reduced in complexity at this point in time, Behe's assumption that it is definitely impossible is easily susceptible to dismissal if new evidence were to arise. The same concept applies on the biological level. Another fallacy in the logic of the mousetrap analogy is that mousetraps are made with exact human specification to maximize efficiency and minimize error while evolution exhibits inexact specifications determined mostly by random mutations and environmental factors. A mousetrap cannot be compared to biological system in this way because a mousetrap could never evolve nor could it reproduce and pass on genes. Mousetraps do not change over time. Evolving organisms do.

Another analogy Behe presents is the Rube Goldberg machine. A Rube Goldberg machine is a satirical, cartoon device that uses and unnecessary amount of dependent steps to accomplish an otherwise simple function. Without one of the components, the Rube Goldberg machine fails. Behe attempts to use the Rube Goldberg machine to illustrate how the blood-

clotting cascade is also irreducibly complex. Behe's Rube Goldberg analogy fails for two reasons. First, like the mousetrap, a Rube Goldberg is a human designed contraption with exact specifications to carry out a single task while biological systems evolve with no specific blueprints or intentions. Behe would argue that these biological systems achieved this level of complexity because they are the result of intelligent design, and evolution could never reach that level of complexity. However, a basic understanding of these systems reveals blatant inefficiencies within them. For instance, the blood-clotting cascade is extremely inefficient with multiple pathways, and our vision would greatly improve if the optic nerves ran behind our retina instead of directly in front. These and other inefficiencies point more to a random, imperfect evolutionary pathway of development than intelligent design. Secondly, the Rube Goldberg machine is also counterintuitive to the concept of an intelligent designer. Rube Goldberg machines are comical because they go through an extreme number of unnecessary steps to accomplish simple tasks that could have been otherwise accomplished by much simpler means. By comparing the blood-clotting cascade to a Rube Goldberg machine, Behe unintentionally suggests that these biological systems are unintelligently designed. The systems do function, but much like the Rube Goldberg machines, they are unnecessarily complicated and inefficient. The Rube Goldberg analogy provides the reader with a better understanding of an irreducibly complex system than the mousetrap, but by doing so, Behe's intelligent designer seems rather unintelligent.

In addressing the question of how to detect design, Behe employs an analogy comparing Intelligent Design to an elephant in a room full of scientists looking for the culprit of a flattened body. The scientists neglect the elephant as a possibility and continue to search in vain. This distorted scene presents the reader with picture of science that is entirely wrong. It portrays

Intelligent Design as the only possible solution to the complexity of biological systems when in fact there are many legitimate theories regarding the evolution of complexity. Behe's analogy also misrepresents the goal of science: to find natural explanations for the world around us. Scientists should not resort to supernatural explanations when there is no concrete understanding of a field. These "God of the gaps" beliefs only impede the progress of science. Furthermore, history has proven that previously unexplained phenomena that are eventually unveiled are often the greatest triumphs in science. Einstein's theory of relativity and Watson and Crick's discovery of DNA are examples of major scientific discoveries that have led to explosions in scientific progress. If these scientists were content to just say, "God did it", where would science be today? The answer is unknowable, but to say that there is no other explanation for irreducibly complex systems than an intelligent designer is simply bad science. Behe reverses the tables on this assumption by stating that is ignorant to not consider the supernatural. History has shown us otherwise, and also given the relatively young field of molecular biology, it is irrational to state that the development of complex biological systems is only possible through intelligent design.

The disconnect between the advanced sciences and the general population is massive. Scientists, often poor communicators, struggle to effectively present science to the public in easily understood terms. Behe's argument and analogies illustrate this disconnect. To the average reader, the mousetrap, the Rube Goldberg machine, and the elephant all seem to be good illustrations of what is actually happening in the complex field of molecular biology, but a closer examination reveals both blatant scientific and logical flaws. Behe does raise good questions about the lack of evidence for the complex biological systems, yet he reaches conclusions that are unfounded. His skewed analogies propel him and his followers to grasp and hold tightly to the idea of Intelligent Design.