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Course Number

Date of Submission

The Scientific Method

It has been thought that the universe is made up of light and matter, elements that have been subject to scientific investigation of the behavior of elements within physics, responsible for why things happen the way they do. Science is composed of systematic rules and procedures that form the basis for these investigations to provide a description and explanation of reality by observing, inferring, generalizing, and analyzing (Andersen &Brian N.p). For a long time, little progress had been achieved in explaining the phenomena composing our world, with philosophers' views, like those of Aristotle, held without question. The scientific Renaissance began in part with the industrial revolution, in which its defining masterpiece, the steam engine, provided the foundation for requiring precise measurement and construction, thus improving techniques beyond what had already been developed. Scientific discovery gained momentum, buoyed by the introduction of the modern scientific method.

As time progressed, discoveries, innovations, and inventions became the order of the day, and scientists would agree on particular fundamental elements, that would make up the dynamic and improving contemporary scientific method. First, science is regarded as cyclic, both in theory and experiment. Explanations for experimental results obtained under particular ideal conditions, are developed through scientific theory, which can further be utilized in predicting results on new experimental approaches in varying conditions. If explanations are neither valid nor provide good approximations, theorists are challenged to dig deeper and provide more rational and applicable discussions. A second principle is that adopted theories must provide predictions and explanations for particular phenomena, to ensure that experimental measurements can be checked against a theory. Therefore, the theory must be testable and explanatory when explaining various occurrences using some basic principles.

A third principle is that experiments must be reproducible, regardless of who created it, their location, or timing. Thus, any person possessing the relevant equipment and skills should have the ability to obtain the same results from the particular experiment and the same explanation provided. As such, the scientific method implies that national, ethnic, racial, religious, or other boundaries are transcended. Moreover, because experiments are neither private nor confidential affairs, science can thus be defined as a public enterprise undertaking. An example of the experimental, theoretical and cyclic nature of science is the traditional view through the ages extending to the twentieth century, with the idea that chemical reactions were simply rearrangements of the elements without particular elemental identity change. However, in the twentieth century, it was discovered that extreme conditions of high temperature and pressure within a star or nuclear bombs could transform elements into one another. While not completely invalidating the original theory, this observation provided for exceptions to the long-held original theory.

Highlighted in this paper is the idealized scientific method that should not be mistaken with procedures for undertaking science. The important message behind the principles is that scientists are human, containing individual character flaws and weaknesses, and the discrediting of others' experiments when they do not match or agree is commonplace (Baumgardner N.p). Achieving a successful conceptualization of science deals more with creativity, intuition, and luck, and restrictions brought about by the method do not hinder self-expression or individuality. As such, the scientific method is dynamic, rather than static.

Works Cited

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Baumgardner, John. "Exploring The Limitations Of The Scientific Method | The Institute For Creation Research." *Icr.org*. N.p., 2008. Web. 9 Mar. 2017.