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Science and religion of Isaac Newton

 Classical mechanics depend so heavily on the three laws of motion set by Isaac Newton that it is commonly referred to as Newtonian mechanics. Aside from his immense contribution to physics, Newton also played a pivotal role to mathematics and optics. Though the fame and respect Newton receives for these ideas are well deserved, his major contributions to sciences mask his religious influences. People rarely are aware of his underlying motives for his search for truth, hindering them from understanding an important reason behind his brilliance and success as a scientist. The public's ignorance of Newton's theological philosophy stems from not only the glorification of the scientific discoveries but also its reluctance to relate science and religion as well as its disapproval of the mixture of two during his lifetime. These causes of unawareness, over time, have led to little concern for Newton's personal, philosophical, and theological life, which lead people to adopt false ideas of Newton that oppose his beliefs. Also, since Newton was not very public about religion and most of his published texts include only few or even no religious references or connections, counterarguments that theology did not heavily influence his work may be made. However, personal journals and correspondences as well as scientific papers reveal not only that theology plays a significant part in his discoveries but also that his science supports the existence of deity. Through analysis of documents, biographies, and reviews of Newton's *The Principia Mathematica*, this paper will first attempts to examine why and how Newton's identity has been skewed and misrepresented throughout history, and then determine whether theology presents a crucial part of his identity or it has been rightfully neglected.

 Isaac Newton remains in history as a figure that contributed significantly to physics and mathematics. When people think of Isaac Newton, the image of the falling apple or the three laws of motion come to mind. Partial credit can be given to the media and textbooks for their misrepresentation of Newton. For Newton's birthday, Google celebrated by dedicating a rendition of "Google" in which apples are falling. An article from the *National Geographic: Daily* News explains "why Google apples are falling" (Ravilious) by describing Newton and why he is important. It does so in the popular way, briefly summarizing his early childhood life and education and highlighting Newton's scientific accomplishments. Though the substance of the article is true, it provides a simplified, surface view of Newton, which prevents it from explaining his motives for studies, such as theological ones, and further detail on how his earlier life contributed to his religious views. Much like Google, outsiders (i.e. non-Newtonian scholars or people with interest in history of science) have remembered Newton by his scientific contributions with little concern for his personal, philosophical, and theological life and influences.

 A further investigation of the portrayal of Newton in the eighteenth century can explain why and how this skewed impression of Newton has developed over time. The compilation of biographies by Rupert Hall in *Isaac Newton: Eighteenth Century Perspectives* provides insight into how Newton's life soon after his death has been flourished. It was understood during this time period that biographies "should not be a true picture but should be written to do good" (Hall 8). Thus, there is a bias towards glorifying and idealizing Newton, misrepresenting Newton's true character. For example, most depict him as one who "lived in a very handsome generous manner […] always hospitable" (30), contrary to the current understanding that he was extremely disagreeable at times. The bias also leads to the refrain from Newton's controversial religious views in order to avoid condemnation. In all five of the biographies included, the author thoroughly details the scientific accomplishments and papers Newton has published. They also mention the religion of Newton, but fail to connect it to his science. Bernard le Bovier de Fontenelle notes in his Eloge that "among the books constantly in his hands…was the Bible" (73) but neglects the possible influence religion has had on Newton's scientific thinking. Thomas Birch repeats the same line and inattention in his article (93). This negligence has been echoed in the biographies of the eighteenth century and continued to modern times. Rupert Hall points out how the misconception has followed in time, noting that Charles Hutton's article on Newton is not reproduced because it "contains nothing new, while repeating all the conventional mistakes" (174). The contents of media representation of Newton have not changed even today, such as how Google made tribute to Newton with falling apples. The spread of these biographies that include little information on Newton's religion and emphasize his scientific life in the eighteenth century can be considered one of the major factors of why a heavily one-sided view of Newton as a scientist is prevalent today.

 Aside from misrepresentation of Newton due to others, it is possible that Newton decided to conceal his religious influences, leading to the current view. Considering the social circumstances of his time period, it is not difficult to imagine why Newton would have chosen to hide his theology. When Newton's work gained popularity, the Royal Society warned against, in the words of Francis Bacon, "unwisely mingl[ing] or confound[ing] these learnings [science and theology] together" (Bacon 11). As a result, a theological argument for a scientific fact was never presented as a public case in the Royal Society (Manuel 30). Likewise, Newton took much heed in presenting his theological ideologies. Drafts of his work show that the initial mention of God in text was eventually removed. The following is an excerpt from the Cohen-Whitman translation followed by the deletion:

It is certainly difficult to find out the true motions of individual bodies and actually to differentiate them from apparent motions, because the parts of that immovable space in which the bodies truly move make no impression on the senses. ~~For only God, who [gives motion to]individual bodies without moving and without being perceived, [can truly distinguish true motion from apparent].~~ (Cohen 532-533).

The draft version indicates that, though religion did play a role in his sciences, Newton's theology was rarely published due to his self-censorship. His anti-Trinitarian views not only were considered "illegal in Newton's day and for many years afterward" (Ferngren, Edward, Amundsen 620) but also endangered him to punishment such as "denied professorships […] for heterodox religious opinions" (Manuel 31). Therefore, it seems logical that he removed any theology from his texts in order to avoid criticism of his mathematics and physics and any possible scrutiny.

 The conflict between religion and science prevails today. Issues such as those by Galileo Galilei and Charles Darwin have been magnified and emphasized in the modern culture that the true relation between science and religion, that the two are not always at conflict has been distorted. Due to these bias, the public is prone to adopting the idea that science and religion are mutually exclusive. Draper and White present this idea as the "conflict thesis". In the western culture, the notion of the Draper-White thesis of mutual hostility between science and religion has been "routinely employed in popular-science writing, by the media, and in a few older histories of science" (Ferngren 4), as exemplified by the works of Galileo and Darwin. Recently, historians of science have started to attack the conflict thesis finding faults and weaknesses in the argument. New studies and closer examinations have revealed "the conflict thesis as, at best, an oversimplification and, at worst, a deception" (10). However, the deeply instilled idea has been hard to displace. The disagreement also has been partially due to generalizing "science as based on 'facts' and theology derived from 'faith'" (5), creating an false distinction between naturalistic and religious views. Due to these misconceptions, people hesitate to relate science and religion. Since the two may not seem to relate naturally, that Newton, a great figure of science, had a deeply theological philosophy and influence may be not only neglected but also reproached and hard to believe.

 Regardless of why or how Newton's religion has been neglected, the current image of Newton is not false; he was a scientist. He did discover much of mechanics, invent infinitesimal calculus, and build the first reflecting telescope. However, one must remember that the popular impression does not encompass the entirety of Newton and his ideologies. Though Newton included only one direct reference to God in the *Principia*, theological influences are apparent after analysis of his correspondences and personal journals.

 Richard Bently once inquired Newton about whether he could use the *Principia* to "bolster his apologetics" (Snobelen 382). To this, Newton responded that the use towards that purpose would delight him since he initially "had an eye upon such Principles as might work with considering men for the belief of a Deity" (Newton 3:233). We do not know whether Newton had God in mind when he wrote the *Principia*. However, taking Newton's words, we can conclude that the *Principia* intended to serve theological purposes. Later in the correspondence, he specifically notes that the system of the Sun and Planets he proposed "requires a Cause" (3:235), opposing a common belief that Newton's physics not only created a 'clockwork universe' but also made God superfluous (Snobelen 278). That he believed that the sun and planets in the solar system "pointed to a Designer", where the motions was "the effect of choice rather than of chance" (Newton 3:236) is recurrently mentioned in the Bently-Newton correspondences.

 Further readings of his personal journals also indicate the presence of religion in his sciences. At times, he contemplates the role of God in the world, considering whether "God may have created a certain incorporeal nature which seeks to repel bodies and make them less packed together" (Newton, CUL, ff. 652-653). He considers and draws ideas from the role a large power might have on nature. Also, some relations between his theological and scientific ideologies can be made, most notably the resemblance of his concept of absolute space and time with God's omnipresence (Grandy 28). Newton believes that only space and God to be immovable, where as other beings and objects move relative to it. He uses the very same words "*ab infinito in infinitum*" to describe God's omnipresence in the *General Scholium* and absolute space in *Scholium on the Definitions* (Snobelen 404). From the relations, it is difficult to avoid the conclusion that his idea of space stemmed from his understanding of God. Theology contributed largely to his scientific discoveries. Though the first editions of Newton's scientific papers\* may not explicitly refer to his religious influences, his personal journals and correspondences clearly indicate a relation between his theological beliefs and scientific discoveries.

 Though one can understand Newton's mathematics and physics with lacking knowledge of his theological influence, it is crucial to avoid reaching false conclusions and obtaining inaccurate ideas. To those who seek to comprehend how or why Newton was able to make the many discoveries, the ignorance to religion and misconceptions due to it would prevent them from correctly determining the motive. People would fail to realize the possibility that strong reasons such as religious ones are necessary to propel one to make large discoveries. In reality, Newton viewed himself as a "priest of nature", which meant that the study of nature, for him, was "intrinsically related to piety and could itself be a form of worship and devotion" (Ferngren, et al. 621). He believed that through physics, he could understand nature because it "lines us up with the way God sees the world" (Grandy 28). The true motive and inspiration behind Newton's discoveries strays far from the current representation that his idea of gravitation was stimulated by a falling apple or simply and solely his love for science. Rather, his strong piety propelled him to discover and uncover the secrets of nature in hopes of understanding God and his attributes. In order to fully understand Newton as a thinker, one cannot ignore his religious influences. Also, understanding Newton in this light would loosen up the prevalent narrow view of sciences and religion, allowing people to consider the harmonies of science and religion. By truly knowing Newton's identity, we avoid misrepresenting him, accepting false facts (i.e. that Newton's work made religion unnecessary), and opening a path for people to relate and embrace science and religion as those which work in harmony, not in hostility. Therefore, though Newton is, from a modern perspective, a scientist, historians and others should consider remembering and labeling Newton as what he truly was: a natural philosopher and devout believer.

\*With each edition, Newton revised and inserted more of his religious beliefs (i.e. More than half of the *General Scholium*, an appendix to the *Principia*, is devoted to theological themes (Snobelen 385)).

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