

The Development of the Natural Sciences in the Context of the Reformation

Jiayi Chen^{1,a,*}

¹College of Social Science, University of Glasgow, Glasgow, UK, G12 8RS

a. jodyjychen@gmail.com

*corresponding author

Abstract: The Reformation, which is the symbol of humanist thought and early science, played an important role in the development of the Church. During the Reformation, the Church, which benefited from the development of natural science, also provided the basis and necessary conditions for the development of natural science. This paper examines the process of change in the natural sciences during this period on the basis of the Reformation of the 16th and 17th centuries, with the aim of demonstrating the particular features of the relationship between religion and science during this period. The Reformation transformed people's preconceptions of God and broke the blind faith in God that had been influenced by the traditional Latin Bible. After the 17th century, when it became increasingly clear that scientists were reducing their use of the supernatural to explain scientific developments, the natural sciences tried to avoid excessive association with theology.

Keywords: The Reformation, Catholicism, Natural Science, Humanist

1. Introduction

The Reformation has been the subject of much discussion in relation to changes in traditional theological concepts and views of nature, but the Reformation's contribution to the natural sciences is more likely to be studied in the context of changes in humanistic views. This paper examines the impact of the Reformation on the natural sciences, starting with the changes in humanistic views during the Reformation. The paper will further discuss the relationship between religion and science in this period based on the work of successive scholars, and will consider the development of the natural sciences in the light of the Enlightenment and humanistic thought in a dialectical manner. By comparing the findings and conclusions of previous scholars, the paper will examine the process of change in the natural sciences during the 16th and 17th centuries on the basis of the Reformation, with the aim of demonstrating the special features of the relationship between religion and science during this period: The leap forward in the natural sciences only during the Christian Reformation, and what the Reformation brought to the natural sciences. In the course of the study, the relationship between the progress of humanistic thought and the development of natural science will be further elucidated, and will likewise inform the progress of science and the further development of humanistic thought in contemporary society. For this field, this paper synthesizes and builds on previous research findings to help scholars identify gaps in previous research and fill in the gaps.

2. Background of the Reformation

The Reformation was a movement of reform initiated by the most numerous of the Christian religions (Catholicism) in the 16th and 17th centuries when different denominations were split up and initiated due to differences in beliefs among their followers. The Catholic Church was criticized as early as the 15th century, a period represented by John Wycliffe and Jan Hus, who was the founder of the original Czech Protestant Christian movement, the Hussites, in the 15th century [1]. Before the 15th century, Catholicism had penetrated all areas of Western European society in the Middle Ages, including politics, economics, ethics, law, scholarship, culture, education and the arts, and held the main power of the state, as well as limiting the Humanist thinking and the development of the natural sciences. The Renaissance of the 14th century provided the basis for the development of humanism, but it was still confined to the theological framework, and in 1517 Martin Luther's 95 Theses were published, representing the official beginning of the Reformation.

There were many reasons for the Reformation, but when it comes to its influence on humanist thought and its links with science, the main ones are the release of the Bible in the original languages, the invention of printing and the development of humanism. The invention of printing extended the reach of the Bible and made the original Greek Bible available to the people. On this basis, Martin Luther switched from reading the original Latin version of the Bible to reading the original Greek, where he discovered that the concept of "justification by faith" was not the same as the Latin translation of "justification by faith" that the Church had claimed in the past, and thus popularised the concept of "justification by faith" among believers. This also paved the way for the development of humanism. The development of humanist thought opened the way for popular questioning of the traditions of the Church, as thinkers and clergy debated whether a man had free will, thus freeing him from the traditional and rigid theological ideas and beliefs.

3. The Relationship between Science and Religion

In addressing the ideas discussed in this paper, the question of how to analyze the relationship between religion and science in the context of the Reformation process is inevitable. Before the fifteenth century, the natural sciences had already achieved certain developments and laid a considerable foundation [2]. In all the regions affected by religion, the Christian regions affected by the Reformation showed a relatively good development of the natural sciences during the Reformation process. The reason for this is that Christianity in the West did become the cradle of the development of natural science and provided the early conditions necessary for the development and validation of the theories in modern natural science from the 16th century onwards. That is to say, modern science did develop as a result of the development and reformation of Christianity, not in response to it.

While the traditional Christian definition of God was presented as omniscient, after the Reformation this definition was further elaborated in the light of the times to become 'rational', and this deepening of the definition gave explorers of the period the opportunity to explore science further, freeing themselves to some extent from the constraints of the original dogma. In social terms, the Reformation had a comprehensive and diverse impact on society, including science, education, culture and language [3]. In exploring the development of Christianity, the Reformers endeavored to implement a process of philosophical thinking with reason, structuring physical revelation and ways of thinking on the basis of nature.

What should also be mentioned in this context is the contribution of the Reformation to the formation of the market and the authority of the state. Language, the initial formation of the market and the development of imperial authority were the key foundations of the Reformation, and together these features enabled Christianity to move away from the stereotyped ways of thinking. In the

discovery of God's rationality, these factors also served to lay the foundations for the development of natural science after the 16th century.

4. An Overview of the Development of Science in the Reformation Period

The changes resulting from the development of science during and after the Reformation were mainly in the areas of worldview, human nature and values. In the case of the world view, the overall development has been from a negative to a positive one. The Reformation movement led people to move away from the medieval doctrines of seclusion and seclusion from the world and instead to the idea that people should know nature and explore its mysteries in the name of God [4]. Under the influence of the Reformation, the process of knowing nature was equated with knowing God, and the process of scientific inquiry, that is, the exploration of the natural world, was seen as a praise to God. The knowledge of nature was a material asset for mankind, capable of bringing both spiritual and material enjoyment, which could then be applied to society and contribute to it, again as a celebration of God's care for mankind. Although the process varied, the Reformation's change in the values of religion and society as a whole undoubtedly contributed to the further study and development of natural science, and the change from a negative to a positive attitude towards the understanding of society became one of the founding factors of modern science.

From the point of view of human nature, the emancipation of human nature brought about by the Reformation became one of the driving forces behind the development of the natural sciences [5]. According to Thomas Aquinas, the Church was above all rule, God had absolute dominion over man, and theology was above philosophy. This view effectively bound man to the rules and regulations of the Church and, influenced by this view, Catholicism also had a more serious negative impact on science in the Middle Ages and beyond. The Reformation brought about a marked change in this view, with the independence of man becoming more visible from the Renaissance onwards and the Reformation developing it further. This shift led to a greater appreciation of the role that man could play as an individual and the rights to which he was entitled, thus giving scientists an added incentive to explore science. In the Reformation, the idea of scientific inquiry as a way for individuals to discover their self-worth and salvation actually supported the idea that 'man can struggle with his sins and achieve repentance in his inquiry' and provide society with material goods that can benefit it in practical ways.

In terms of values, the main impact of the Reformation was not directly on the development of natural science itself, but rather on the 'glorification of God' and its further conglomeration into socially utilitarian values [6]. The concept of the 'praise of God', mentioned in David's statement, had already been mentioned in medieval Catholicism, but after the Reformation, it was given a new meaning and eventually crystallized into social utilitarianism. The development of Puritanism in the post-Reformation period can be further seen in the gradual shift from the glorification of God to social utilitarianism, the aim of which was still to glorify God's devotion to the earth and to call the faithful to it. This aim actually provided the basis for the emergence and development of modern science. As mentioned above, the post-Reformation Church and its main ideas saw the exploration of nature as a devotion to God, and the study of nature became an opportunity and a duty for believers to prove their piety. Scientists such as Newton and Boyle once said that the "secular activities and scientific achievements associated with science reveal the greatness of God" [7]. And Luther's idea of "justification by faith", reinforced the idea that God had shaped the world, strengthened the minds of believers and people, both for Catholicism itself and for a secular society. In this context, therefore, the idea of social utilitarianism laid the foundations for the development of natural science in both its subject and object dimensions.

5. The Backlash from the Reformation

The Reformation helped greatly to move the natural sciences out of traditional theology, but long-term scientific development still required a break with theology, which inevitably had some negative consequences [8]. There are insufficient arguments for the scientific research of this period to suggest that the development of science in this period should completely exclude God from the scope of the study. The natural sciences and philosophical developments of the period emphasized causal arguments for the development of things, but many of the advocates of the Reformation cited strong theological theories and perspectives to give a religious explanation for the logic of cause and effect [9]. The historian John Hedley Brooke once wrote, "..... Those seventeenth-century scholars who did most to introduce mechanical metaphors were those who believed they were doing so to enrich rather than weaken the concept of divine activity", and the tendency of theologians of the period to encourage people to explore the world did not mean that scholars tended to interpret discoveries in the natural sciences as truths or principles of nature itself [10]. Rather, in keeping with the scholars' propaganda that 'exploration of nature is equivalent to sincere faith in God', scholars and theologians tended to interpret scientific discoveries as things that depend on God's will or as certain laws created by God. The god-centered worldview remained the dominant idea of the period and was in stark opposition to the human-centered worldview that advanced philosophers or scientists had come to as a result of their explorations so that the occasional conflicts that erupted became a hindrance to the development of science. The Reformation period had a more loose denominational structure than the more orderly religious structures of the Middle Ages, and it was more difficult for the natural sciences to overcome theological constraints to achieve breakthroughs and developments.

The philosophical ideas that emerged during this period are also of interest. During the Reformation period, the mainstream of philosophical thought was still metaphysical, and the understanding of the origin of the world was still based on the reasoning and speculation of scientists and philosophers. From the mid-seventeenth century onwards, scientists avoided invoking too many theological concepts to explain phenomena in nature or scientific developments, thus gradually freeing the natural sciences from the framework of theological development. Theology and philosophy remain very different, and perhaps for a time theology was able to provide partial guidance to the development of the natural sciences, but it could not replace the role played by philosophy in the guidance process that was able to guide the development of the natural sciences in a scientific way.

6. Conclusion

This paper focuses on the ways in which the natural sciences were influenced and developed during the Reformation. Here this paper focuses only on the religious context in which modern science emerged and the impetus it gave to the impact and relationship with the natural sciences in the course of history. Even though religion was still repressive to the development of natural science during this period, the impetus provided by the Reformation to natural science cannot be ignored, especially as it provided the necessary human context for the subsequent development of natural science. This is indisputable, both from a cultural point of view and from the point of view of science itself. Future research can likewise present an in-depth and systematic examination of the contradictions between the philosophical, theological and scientific developments of this period.

Acknowledgements

Thanks to the author's friends, Christine and Zc, who gave the author warm moral support during the research and writing process, and whose encouragement was one of the major reasons why the author was able to complete her research and writing.

References

- [1] Décobert, C. (2006). *For the glory of god. how monotheism led to reformation, science, witch-hunts, and the end of slavery*: Princeton, princeton university press, 2003, 488 p. Archives De Sciences Sociales Des Religions, (136)
- [2] Reeves, J. (2017). *How not to link the reformation and science: Reflections on brad Gregory's the unintended reformation*. Religions (Basel, Switzerland), 8(5), 83.
- [3] Wootton, D. (2017). History: Science and the reformation. Nature (London), 550(7677), 454-455.
- [4] MORGAN, J. (2009). Religious conventions and science in the early restoration: Reformation and 'Israel' in thomas sprat's history of the royal society (1667). The British Journal for the History of Science, 42(3), 321-344.
- [5] Van Niekerk, F. (2020). Reformation and scientific revolution : Historical coincidence or continual renewal? In Die Skriflig : Tydskrif Van Die Gereformeerde Teologiese Vereniging, 54(2), 1-12
- [6] Saltelli, A., & Sarewitz, D. (2022). Reformation in the church of science. New Atlantis (Washington, D.C.), (68), 56-64.
- [7] Warren, J. (2010). Science and theology in the reformation: Studies in theological interpretation and astronomical observation in sixteenth-century germany - by charlotte methuen. Reviews in Religion and Theology, 17(1), 38-40.
- [8] Becker, S. O., Pfaff, S., & Rubin, J. (2016). Causes and consequences of the protestant reformation. Explorations in Economic History, 62, 1-25. <https://doi.org/10.1016/j.eeh.2016.07.007>
- [9] Casey, P. J. (2019). Ricoeur on truth in religious discourse: A reclamation. Horizons (Villanova), 46(1), 24-52. <https://doi.org/10.1017/hor.2019.7>
- [10] Brooke, J. H. (2022). REVISITING WILLIAM PALEY with bethany sollereder, "introduction to essays in honor of alister McGrath"; peter harrison, "what is natural theology? (and should we dispense with it?)"; john hedley brooke, "revisiting william paley"; helen de cruz, "A taste for the infinite: What philosophy of biology can tell us about religious belief"; michael ruse, "the dawkins challenge"; donovan O. schaefer, "the territories of thinking and feeling: Rethinking religion, science, and reason with alister McGrath. Zygon, 57(1), 141-160. <https://doi.org/10.1111/zygo.12768>