

Comparison between Rene Descartes and Francis Bacon's Scientific Method

Course

Date

Similarities and Differences between Descartes and Francis Bacon's Scientific method

Introduction

Science and Philosophy are two disciplines that often share ideas to develop their arguments. The scientific method is a set of principles and procedures that helps scientists to gain knowledge and correct previous knowledge through investigations and observations. However, not all methods qualify to be scientific. For a method to be scientific, it must have the relevant evidence to test it, which has the support of reasoning. This shows the relationship between science and philosophy because reasoning is one of the corner stones of philosophy¹. In most cases, scientists always thrive to explain their theories using deductions and experiments. The ability to make these deductions depends on their reasoning capabilities and understanding of philosophical tools.

It has taken time for scientists and philosophers come up with the scientific method due to different standpoints on understanding scientific knowledge among the parties that are involved. Rene Descartes and Francis Bacon are among the philosophers with immense contributions in the development and history of the scientific method. The main contributions of Descartes to the development of the scientific method are in his book, *Discourse on the Method for Rightly Directing One's Reason and Searching for Truth in the Sciences*². His main proposition was the need for demonstrative science that capitalizes on making inferences and deductions for self-observable traits. This has been unlike the previous

¹ Gimbel, Steven. *Exploring the scientific method: cases and questions*. (Chicago: The University of Chicago Press, 2011), 135.

² Jim Jones, *Background to Thinking Clearly and Distinctly by Rene Descartes* (Chicago: West Chester University of Pennsylvania, 2002), 99.

methods of science that depended on experiments and observation. At this point, it is clear that Descartes applied epistemology in science. Epistemology is a branch of science that deals with the study of the nature and range of knowledge. His method of analysis depends on how one can use what he or she knows (knowledge) to make rational scientific observations and deductions. Descartes came up with various rules that would establish a new system of understanding science from the reasoning and knowledge point of view.

Francis Bacon has also had immense contributions in the fields of philosophy and science. People refer to Bacon as ‘the prophet of the scientific revolution’ because he began expressing interest in science at an early age. His main argument was that individuals had to question what their minds perceive to be satisfied with facts. Bacon believed that inductive reasoning was the only way of understanding nature and science. Unlike Descartes who concentrated on epistemology, Bacon mainly stressed on natural philosophy, science and their contributions towards technological advancements. Bacon appreciated the possibility of human bias and perception affecting the validity of scientific deductions. He argued that it was important to use experimentation as a way of identifying particular patterns. Analysis of the patterns would help in making generalized inductions. Therefore, his scientific method depended on inductive reasoning as opposed to Descartes’ method of deductive reasoning. It is clear that the two thinkers shared the similarity of using reasoning in science, but their methods of reasoning were different. They also questioned the ability of the mind in making rational decisions throughout the process of observation. Whereas, Rene Descartes and Francis Bacon’s methods advocate for the use of the mind in reasoning, they present different approaches towards reasoning.

Biographical information and historical context of Descartes and Bacon

Born at La Haye in France (1596), Rene Descartes gained his education at the Jesuit school of La Fleche where he acquired knowledge in mathematics, science and philosophy. He later graduated after studying law in 1616³. Descartes later joined the army as a way of broadening his experience and skills in different fields. He could study science when he had time while still in the army. It was while he was studying that he observed how science depended on past authorities rather than present observations. Therefore, he set out to do his own investigations and determine how reasoning can apply in science. He published the Discourse on Method which contained his observations and conclusions. Descartes passed away in 1650. Descartes came at a time when scientific revolution was at its peak. There was the importance of science in all structures to encourage technological advancement.

Francis Bacon, born in 1561, was an English philosopher, scientist and even an author. He studied at the Trinity College at the age of twelve and later studied law. He worked in the field of law before embarking on a political dimension of life. He believed that his political interests would help him advance his ideas on the advancement of science. He served as an attorney and a speaker in Parliament, which helped him gain popularity⁴. Bacon wrote on the structures upon which science was built and questioned the people's understanding of natural philosophy. Bacon's main interest was the validity and the ability of the mind in making

³ Vrooman, Jack Rochford. *René Descartes: a biography*. (Putnam, 1970), 13-167.

⁴ Zagorin, Perez. *Francis Bacon*. (Princeton, N.J.: Princeton Univ. Press, 1998), 23

inferences. He wrote books on how we should question the mind using inductive reasoning. He passed away in 1626⁵. Just like Descartes, Bacon's ideas helped in improving technology through science in the scientific revolution.

This essay will use the excerpt A Method of Thinking Clearly and Distinctly from the Discourse Method. Descartes published this book to record some arguments and contributions towards science and philosophy. The book contains the rules and principles that Descartes developed to help in the new understanding of science. The works of Descartes came at a time when the world was experiencing the scientific revolution. Science was the only way to achieve technological progress that was the ultimate goal of many countries. Therefore, Descartes' work was very influential in the process of technological advancement. Similarly, Bacon's Scientific Method came at a time when the world needed to understand science as a prerequisite for technological improvements. The book contains various propositions and arguments that Bacon raised in his quest of understanding science and natural philosophy. The works of Descartes and Bacon came at a time when it was important to understand science, which is important in technological advancements.

Comparison of the scientific method by Rene Descartes and Francis Bacon

There are observable differences and similarities in the approaches to the scientific method of Descartes and Francis Bacon. However, these differences show congruence in the final results because the two approaches arrive at almost similar conclusions. The differences

⁵ Solomon, Julie Robin. *Francis Bacon and the refiguring of early modern thought: essays to commemorate the advancement of learning (1605-2005)*. (Aldershot [u.a.]: Ashgate, 2005), 34 - 123.

are in terms of the methodologies the two philosophers used, but their motives and results are similar. Descartes and Bacon had different contributions and propositions to the scientific method though they shared some similarities in some instances. The Bacon's main interest was to use science to understand nature, which will help man in dominating nature. Bacon believed that experimentation and observation were the foundations of science. Man is capable of identifying various unbiased facts from observations in an experiment. Correlating the facts gives the best fact that is a combination of experimentation, observation and inductive thinking. However, Descartes proposed a system where reasoning, logic and mathematics were responsible for understanding nature.

According to Descartes, there are standard principles upon which deductive reasoning bases its premises. This differs from Bacon's ideas who believed that observations were important in inducing assumptions. This implies that Descartes method was from top to bottom while Bacon's method was the other way round. A critical analysis of the Discourse Method by Descartes reveals that he mainly used mathematics to support his arguments and experiments. On the other hand, Bacon's expertise in law helped him in supporting his arguments⁶. However, it is worth noting that this difference is in terms of the tools used to support the scientific method but not in the application of the scientific method. Furthermore, Bacon depended more on the results of experimentation while Descartes did not find any importance in experimentation. Descartes challenges the observation and experimental approaches to science and suggests the need to incorporate reasoning and thinking in science.

⁶ Gauch, Hugh G. *Scientific method in practice*. (Cambridge [u.a.]: Cambridge University Press, 2003), 78.

According to Bacon, using the mind to make scientific observations and conclusions brings about bias and imperfections. He suggests that the process and role of making these conclusions and observations should involve all senses to explain nature. On the contrary, Descartes maintains that logic, reasoning and rationality are the central points of explaining nature⁷. It is for this reason that Bacon applied identification of behavioral patterns to make generalizations. Descartes invested in the breakdown of observations and subjected them to further analysis and introspection to establish the truth (rule two in Descartes' set of rules and principles). Bacon does not challenge the quality of observations while Descartes stresses on the importance of challenging observations to find out the truth about something.

Both Descartes and Bacon believed in the ability of doubt and reasoning to find out the truth. Descartes maintains that one must challenge the mind by doubting observations with knowledge and facts. Similarly, Bacon held the view that individuals should always question the mind to avoid misconceptions and bias. This similarity shows the connection between science and philosophy. While Descartes uses the epistemology branch to support science, Bacon uses natural philosophy in science. Bacon challenged the validity and application of the methods that other philosophers to explain nature. For instance, he challenged Aristotle's logic and reasoning and exposed the flaws that the ancient thinkers did not consider in their propositions and arguments. Descartes also did not agree with Aristotle's view of nature and the universe.

⁷ Nordgren, Tim. "The Scientific Methods of Rene Descartes and Francis Bacon". *Things Revealed* 5 (2009), 17 – 94.

The other similarity shared by Descartes and Bacon is that the two maintained that science needed to be free from personal and societal perceptions as well as bias. Bacon identified “idols” that the old understanding of science and nature based its facts. One of the “idols” was the idol of the cave. Francis Bacon challenged this line of thinking because it gave way for personal points of view and thereby subject to bias. Bacon had an extra emphasis on Aristotle’s previous contributions in the field of science and nature⁸. Descartes held the view that the mind was prone to deceit and influence from other external forces. He stressed on the importance of rational judgement and thinking in an attempt to find out the truth about certain observations. Rational judgement helps in making viable conclusions that are devoid of any personal influence.

The combination of the ideas created a standardized method of approaching science and understanding nature. These standardized methods led to the present day scientific method, which is a combination of the ideas of the two. Another similarity that Bacon and Descartes share is that they both established flaws in the past versions of understanding science. They focused on how to counter the limitations by coming up with new suggestions that would avoid the flaws in the past accounts of science⁹.

Descartes did not find favor with the approach to science that depended on experiments and observations only, which influenced him establish a system that would incorporate the use of the mind in making rational judgments. Bacon challenged the

⁸ Jardine, Lisa. *Francis Bacon: discovery and the art of discourse*. (London: Cambridge University Press, 1974), 54.

⁹ Fowler, William Stewart. *The development of scientific method*. (Oxford: Pergamon, 1962), 65.

foundations upon which early thinkers and scientists used to explain nature. He argued that it was not on point to use experiments to obtain observations. He advocated for the need to use observations to come up with possibilities and then use the senses in establishing h relationship between different observations.

The main similarity between Descartes and Bacon's lines of thinking is that the two approaches to arrive at the same standardized method of understanding science and nature. The difference comes in because the two applied different types of reasoning to express their concerns. It is possible to summarize Bacon's arguments into three main steps. The first step involves identifying different possible observations from a particular situation or experiment. These observations are the set of all possibilities in a specific event or experiment. The second step is the application of inductive reasoning to identify the assumptions and strength of the observations. Inductive reasoning involves introspection of individual observations and using facts and knowledge to find out the truth behind individual observations. The final step is the identification of common trends and patterns in the introspected observations¹⁰. The common trends help in coming up with a common generalized conclusion that summarizes the truths in all the observations.

Alternatively, it is possible to summarize Rene Descartes contributions towards the development of the scientific method into four main rules and principles. The first rule and principle eliminates the possibility of prejudice and bias in the observations. He argues that is important to consider whether observations have the support of facts before making conclusions on the observation. The second principle involves division of the observations

¹⁰ Cavanagh, John Bernard. *The scientific method of Francis Bacon*. (Thesis (M.A.--Philosophy)--Catholic University of America, 1932), 256.

into smaller units to make it easy for analysis. The third principle is the application of deductive reasoning, which follows a specific pattern. One must start with the issues that are simple before reasoning in complex and difficult issues. The final step is a summary where the accuracy of the results of deductive thinking is measured through rationality measures¹¹. The final principle synthesizes all possible points of view into a complex conclusion.

Conclusion

The modern scientific method is the combination of the efforts and works of different thinkers and scientists. Rene Descartes and Francis Bacon are among the thinkers who have had immense contributions towards the development of the scientific method. The essay has compared the contributions of each by identifying the similarities and differences of their accounts. From the essay, it is clear that the main difference between Descartes' and Bacon's accounts is the method of reasoning that they use to defend their arguments. Descartes uses deductive reasoning while Bacon uses inductive reasoning. All differences converge to the same similarity that the two accounts strive to achieve a standardized way of understanding science and nature. Furthermore, the works of Descartes and Bacon came at a time where science was important to enhance technological progress in the wake of the scientific revolution. Therefore, it is worth concluding that Rene Descartes and Francis Bacon have had immense contributions in the development of the scientific method.

¹¹ Jim Jones, *Background to Thinking Clearly and Distinctly by Rene Descartes* (Chicago: West Chester University of Pennsylvania, 2002), 154

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