Bacon and Aristotle —— Analysis To Two Giants’ Philosophical Distinction

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Francis Bacon, one of the most prestigious philosophers, is regarded as the farther of the scientific method, which contributes a lot to his theory of natural and scientific philosophy. As for Aristotle, the brilliant star in the night sky of Ancient Greek, is well known for his thought-breaking theory and vision on philosophy. The time distance between two philosophers is already over 1900 years, but analyzing the thought distinctions between two is going to inspiring and significant. To better analyze the difference between the core of these two philosophers’ natural and scientific theory, it is also of great necessity to dig into the ways these theories were formed and deducted, for the formation of the theory shall be taken as the core of the scientific philosophy as well. In this paper, I will discuss about the difference between two philosophy as well as the distinctions between two great man’s deduction logic,

Bacon is well known for his theory of empiricism, but in contrast, Aristotle's natural philosophy relies heavily on deductive reasoning and qualitative observations. Aristotle's thesis, such as *Physics*, illustrate a comprehensive framework for understanding the natural world, grounded in the principle of the famous teleology. At the beginning of *Aristotle Physics* BookⅡchapter 1, from the statement “Some things are due to nature; for others there are other causes.” **1**, it is easy to see that Aristotle highly emphasize on the theory of teleology and try to explain the movement and the formation of this universe through using teleology together with the theory of “matter and form” which can be concluded as *notion of essential forms* **2**.

Central to Aristotle's methodology is the concept of the four causes: material, formal, efficient, and final**3**. According to Aristotle, these causes provide a comprehensive explanation for the existence and behavior of natural phenomena. He prioritizes teleology, asserting that all natural entities are trying to reach the ultimate goal. Just like what he said, “every natural body has a proper place, assigned to it as its natural end” **3**.

Furthermore, Aristotle's methodology involves categorizing and classifying natural objects based on their essential properties. Through thorough observations and logical analysis, Aristotle pursues the principles governing the natural world. His emphasis on classification and teleology reflects the belief in the existence of order and purpose in the universe. Presented in the official website of Stanford Encyclopedia of Philosophy, “Natural science is concerned with things that change, and Aristotle divides changes into two main types: there are accidental changes, which involve concrete particulars, or 'substances' (ousiai) in Aristotle’s terminology, gaining or losing a property.” **4** is a vivid demonstration.

As for Bacon, he prioritizes empirical observation and experimentation, supporting a bottom-up approach to scientific research. Just as the complimentary memorization documents say, “The words experiment and experience appear prominently in Bacon's philosophical discourse as an expression of the systematic critical empiricism that was an essential part of his conception of the practice of science”. In contrast, Aristotle emphasizes deductive reasoning and qualitative analysis, viewing nature through teleology. So essentially, the way these two giants look into the universe and try to reach conclusions is rather distinctive.

Bacon's empiricism represents a paradigm transformation towards a more experimental mode of scientific research, challenging the authority of tradition and religion. His emphasis on induction and systematic experiments laid the foundation for the scientific method, enabling unprecedented advancements in natural philosophy which was a great achievement at that time. For example, the famous tables designed for investigating in the form of heat, which explicitly illustrated his theorem of “*eliminative induction*”. In comparison to Aristotle’s typical syllogism, Bacon’s logic centering on experiment and experience seems to be more reliable, and the contemporary research proved so.

Because of his rigorous methodology of induction and deduction, Bacon was enabled with rather edge-cutting vision and far-reaching thoughts. For instance, Bacon believed that the opinion long prevalent, that art is something different from nature, and things artificial different from things natural, was mistaken.

The challenge that Bacon’s philosophy brought to the one of Aristotle was tremendous and direct. Bacon’s renowned work, *Novum Organum*, in comparison to Aristotle’s famous work, *Organon*, proposes a new system based on induction and observation. He outlined a methodical approach to collecting and analyzing data, which would lead to the discovery of the underlying forms or laws of nature **5**. The collision of two vigorous thoughts is still spreading vitality today, inspiring generations and generations

Though there are differences between of two philosophy, still, we have show great respect to these two thought giants who made their own contributions to the development of logic, methodology, philosophy and so on. Because of the limitation of era, some details of specific deduction or induction of their theory may seem to be invalid or inappropriate from the point of view nowadays, but their pioneering work will be recorded and researched for generations in the future by no matter specifications or mediocrities. Everyone can extract experience and inspirations from these spiritual, logical and philosophical treasures. With great respect, analyzing the differences between them brought countless ideas and inspirations to me.

In conclusion, the difference between Bacon and Aristotle natural science reflects contrary philosophical paradigms and methodologies. Bacon's empiricism revolutionized scientific inquiry and research, supporting systematic experimentation and empirical observation. In contrast, Aristotle's teleological framework emphasized deductive reasoning, qualitative analysis and complicated classification. While both approaches have contributed significantly to our understanding of the natural world, Bacon's theory on empiricism and experimentation, which was considered to more advanced than the one of Aristotle, marked a significant moment in the history of science, paving the way for modern scientific inquiry and research.

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**1** Aristotle, *Physics*, Translated by J.Lakrill and Lindsay Judson. Oxford: Clarendon Press 1970, p. 23.

**2** Stanford Encyclopedia of Philosophy, https://plato.stanford.edu/entries/form-matter/, “Form vs. Matter”

3 William F. McDonald, *The Concept of Cause*, Issues in Criminology, Vol. 3, No. 2, pp. 129-145

4 Stanford Encyclopedia of Philosophy, https://plato.stanford.edu/entries/form-matter/, “Form vs. Matter”

5 PhilScience Magazine, https://www.magazine.philscience.org/2022/09/11/, “Francis Bacon and the philosophy of the new scientific methodology”