

# Aspects of Enlightenment in Work “The New Organon” of Francis Bacon

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Received on 27 December 2022. Revised on 10 March 2023. Accepted on 5 April 2023.

**Abstract:** Francis Bacon is one of the typical representatives of Western European materialism as well as among the most important and influential philosophers who made substantial contributions towards natural philosophy and the field of scientific methodology in the early modern era. Known as an earlier philosopher whose work influenced the Age of Enlightenment (Sootin, 1955), he had enlightenment thoughts. Being attracted by these interesting ones, this paper analyzes his work “The New Organon”, focusing on three prominent aspects of enlightenment, including views on errors in human mind, progressive viewpoints on human sense and reason, and standpoints of doubt in science and scientific discovery. Bacon’s ideas of doubt in science and scientific discovery were especially enlightening to the majority of people in his day, who had adopted previous philosophies with an attitude of no doubt. This aspect has held an enlightening meaning in all times because doubt in science and scientific discovery are two indispensable qualities of a true scientist.

**Keywords:** Francis Bacon, The New Organon, Enlightenment.

**Subject classification:** Philosophy.

## 1. Introduction

Francis Bacon (1561-1626), an English materialist philosopher, was one of the typical representatives of Western European philosophy in the 17<sup>th</sup> and 18<sup>th</sup> centuries. Marx and Engels (1995) referred to him as “the father of English materialism and modern experimental science”. His valuable philosophical works include “The New Organon” (Latin: *Novum Organum*) (1620), *Of the Dignity and Advancement of Learning* (Latin: *De Dignitate et Augmentis Scientiarum*) (1623), and *New Atlantis* (Latin: *Nova Atlantis*) (1624), some others. Although he had died before the Enlightenment movement emerged, his works concerning science had significant influence on many prominent Enlightenment philosophers (History, 2017).

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The work “The New Organon” of Francis Bacon contains many progressive ideas that were found in the Enlightenment. They continue to hold great significance in various scientific fields in social life nowadays. This can be seen clearly when these ideas have been applied in economic field (Lê Thị Huyền, 2012), diagnosis and treatment of mental illnesses (Corneanu & Vermeir, 2012), educational field (Batista, 2013), cultural field (Cortes-Ramirez, 2014), sci-tech policy development (Đỗ Thị Thùy Trang, 2022), and social development (Lê Thị Huyền, 2011 & 2016; Đỗ Thị Thùy Trang, 2022), among others.

Scholars have conducted various research publications on philosophical issues in the work “The New Organon” of Francis Bacon. In general, the main issues include idol (Latin: *idolum*), induction, and experimental method. With regard to the idol, many authors have studied the application of the theory of idols in argumentation (Walton, 1999), diagnosis and treatment of diseases (Corneanu & Vermeir, 2012), education (Batista, 2013), and culture (Cortes-Ramirez, 2014), among others. In relation to the induction, some authors such as Horton (1973), Coffey (2004), Trần Văn Phòng (2011), Lê Thị Huyền (2016), and Cassan and Lyon (2021) have expressed their agreement with Bacon’s induction, while other authors such as Kuiken, Wild, and Schopftocher (1992), and Belkind (2021) have disagreed. Moreover, some authors, such as Pastorino (2011) and Jalobeanu (2016), have studied Bacon’s experimental method in relation to “disciplining experience” or “weighing experience”, while Schwartz (2012) studied its influence, and Rusu and Jalobeanu (2020) attempted to explore its new points. However, few papers have written about the enlightenment aspects in Bacon’s philosophy and these aspects seem remain a “wild land to be explored”. Meanwhile, he has been recognized as the first philosopher who sowed the seed of the 18<sup>th</sup> century Enlightenment (Gottlieb, 2016).

Building upon this foundation, the article aims to identify the existence of the aspects within the work “The New Organon” of Francis Bacon. In order to achieve this goal, the author employs some theoretical research methods, including analysis, synthesis, classification, and systematization of theory. Specifically, the article utilizes the method of analysis and classification to scrutinize the contents concerning the enlightenment aspects in the work. It then employs the method of synthesis and systematization to compile and present research findings.

## **2. Aspects of enlightenment**

The work “The New Organon” is the second part of the six-part “The Great Instauration” (Latin: *Instauratio Magna*) project by philosopher Francis Bacon. This work comprises two books with aphorisms concerning the interpretation of nature and the kingdom of man (Latin: *Aphorismi de Interpretatione Naturae et Regno Hominis*). The content of the first book revolves around criticism of contemporary natural philosophy,

while the content of the second book focuses on the author's presentation of his own philosophy and method.

The term "Enlightenment" comes from the name of an intellectual and philosophical movement that occurred in Europe in the 17<sup>th</sup> and 18<sup>th</sup> centuries. In this movement, enlightening views were those about humanity (toleration, fraternity, etc.), reason (knowledge gained by the means of reason and the evidence of the senses, etc.), freedom, human happiness, and human progress (Outram, 2006; Zafirovski, 2010).

### *2.1. Enlightenment aspect shown by pointing out errors in human mind*

The aspect of enlightenment in "The New Organon" of Francis Bacon is demonstrated by the author's identification of the errors in the human mind that need to be eliminated for people to gain easy access to scientific knowledge. In this work, it can be seen at some expressions, such as "the understanding being thereby purified and purged of fancies" (Bacon, 1939: 12), "this doctrine then of the expurgation of the intellect to qualify it for dealing with truth" (Bacon, 1939: 18), "purging of the mind" (Bacon, 1939: 48), "the understanding thoroughly freed and cleansed" (Bacon, 1939: 48), "wash... wits" (Bacon, 1939: 55), "well-purged mind" (Bacon, 1939: 68), "purged and swept and leveled the floor of the mind" (Bacon, 1939: 76), and "understanding is emancipated and come as it were of age" (Bacon, 1939: 123).

Bacon calls these mistakes "idols" in "the New Organon" or "idola" in "Novum Organum". He believes there are four classes of idols: *the idols of the tribe (idola tribus)* - the mistakes that humans make by mixing their own nature with the nature of things, leading to a distorted reflection of the object (Bacon, 1939: 34); *the idols of the cave (idola specus)* - the errors that people make when they persist to be in their own "cave" due to innate, educational, or prejudicial reasons (Bacon, 1939: 35); *the idols of the market-place (idola fori)* - the mistakes people make by using words loosely and according to their opinions without truly understanding their definitions and explanations (Bacon, 1939: 35); and *the idols of the theater (idola theatri)* - the idols "which have immigrated into men's minds from the various dogmas of philosophies, and also from wrong laws of demonstration" (Bacon, 1939: 35). These idols can "beset men's minds that truth can hardly find entrance" (Bacon, 1939: 34) or "have most effect in disturbing the dearness of the understanding" (Bacon, 1939:39). Therefore, in the work "The New Organon", Bacon expressed his ideas of the idols as follows: "keeping off and clearing away of idols" (Bacon, 1939: 34), "keeping off and dislodging the idols" (Bacon, 1939: 40), expel the idols (Bacon, 1939: 41), "the human understanding may the more willingly submit to its purgation and dismiss its idols" (Bacon, 1939: 42), "the several classes of idols, and their equipage: all of which must be renounced and put away with a fixed and solemn determination" (Bacon, 1939: 48), "the extirpation of idols from the understanding more easy and gentle" (Bacon, 1939: 49).

Moreover, the aspect of enlightenment in "The New Organon" is also shown by pointing out mistakes in contemporary cognitive methods and how to fix them by

the Baconian method. On the one hand, Bacon points out the short-sightedness of empiricists' cognitive method when they only focus on collecting and using specific data without generalizing to theory - "The men of experiment are like the ant; they only collect and use" (Bacon, 1939: 67). On the other hand, he highlights the error in the cognitive method of rationalists when they are only interested in creating theories without regard for specific experiences - "the reasoners resemble spiders, who make cobwebs out of their own substance" (Bacon, 1939: 67). Based on the criticism of these two methods, Bacon has suggested fixing them by the induction by elimination that he established and called the true induction. The image of bee is used as a metaphor for those who use his induction inherit the positives of both methods to generalize and theorize from concrete experience "like a bee" - "the bee takes a middle course, it gathers its material from the flowers of the garden and of the field, but transforms and digests it by a power of its own" (Bacon, 1939: 67).

Obviously, the theory of idols and the Baconian method mentioned above have the great significance of enlightenment for the epistemology of Western European philosophy in the early modern era. With regard to the doctrine of idols, which is "one of the most famous aspects of Bacon's thought" (Weeks, 2019: 1), "it is drawn, not from classical Greek philosophical sources such as Plato and Aristotle, but from a different kind of approach to the study of the mind" (Gaukroger, 2001: 121). As the empiricist who is usually mentioned first when referring to the early modern Western European philosophy, Francis Bacon deserves to be recognized as an enlightened figure by his followers when he highlights the errors in the human mind. This is due to the fact that empiricists are prone to making mistakes because of their reliance on experience, which is related to senses and "for certain it is that the senses deceive" (Bacon, 1939: 17) - "the sense both fails us and deceives us" (Bacon, 1939: 48).

The connection between Bacon's philosophy and the French Enlightenment established through their shared views on the idols in the human mind (Cortes-Ramirez, 2014: 29). Bacon's theory of idols is said to have positively transformed the early modern philosophy (Gaukroger, 2001) as well as being believed to have a profound influence on the early modern philosophy and science (Jalobeanu, 2013). Furthermore, the enlightenment brought about by this theory remains relevant today, with recent studies demonstrating significant benefits when it is applied to important fields nowadays such as argumentation (Walton, 1999), education (Batista, 2013), mental health (Corneanu & Vermeir, 2012), culture (Cortes-Ramirez, 2014), and others.

Additionally, Bacon's theory of idols points out the idols of the theater, which directly caused many progressive philosophers, such as Mikolaj Kopernik and Galileo di Vincenzo Bonaiuti de' Galilei, to be considered heretics. This theory also contains another important enlightenment factor which is his notions of objectivity - "Bacon's vision for the reform of natural philosophy introduced the demand for what would later be called objectivity... This paradigm of scientific objectivity became a cornerstone of scientific practice over the next several centuries and only began to be questioned at the end of the twentieth century" (Coffey, 2004: 264).

In relation to the Baconian method, Francis Bacon was still the philosopher considered most important for induction method in the early 19<sup>th</sup> century (Ducheyne & McCaskey, 2014). He is credited with re-inventing Aristotle's earlier method of induction (Cassan & Lyon, 2021: 260). Nevertheless, Bacon's approach is considered to be more qualitatively advanced than previous methods (Trần Văn Phòng, 2011). Its enlightenment significance is demonstrated by its use by renowned scientists after Bacon such as physicist Thomas Browne and philosopher John Stuart Mill, as well as its recognition as "the seeds for modern 'scientific' concepts such as induction, empiricism, experimentation, method, objectivity, ..." (Coffey, 2004: 262).

## *2.2. Enlightenment aspect expressed through offering progressive views on human sense and reason*

Experience is related to sense; however, Francis Bacon was not a conservative empiricist who emphasized sense and disregarded reason, but had progressive views on sense and reason when believing that "the sense by itself is a thing infirm and erring" (Bacon, 1939: 38) and "the human understanding is no dry light" (Bacon, 1939: 37). According to Bacon, "far better things, and more of them, ... are to be expected from man's reason" (Bacon, 1939: 72). Therefore, when referring to Bacon's theory, Marx - one of the two founders of dialectical materialism and historical materialism - commented that the feeling that Bacon mentioned in his theory is reliable and is the source of all human knowledge (Marx & Engels, 1995).

Regarding sense, Bacon pointed out that "the greatest hindrance and aberration of the human understanding proceeds from the dullness, incompetency, and deceptions of the senses" (Bacon, 1939: 38). Concerning reason, he believed that it was essential to adopt a positive attitude towards reason. Specifically, one must renounce and put away the idols and their equipage with a fixed and solemn determination to free and cleanse the understanding thoroughly (Bacon, 1939: 48). People must also maintain objective attitudes towards reason. It is not about exalting reason - "while we falsely admire and extol the powers of the human mind we neglect to seek for its true helps" (Bacon, 1939: 29) - or slighting the understanding (Bacon, 1939: 83), or even about "what the Greeks call Acatalepsia, - a denial of the capacity of the mind to comprehend truth" (Bacon, 1939: 83). In Bacon's view, the understanding, which is called reason, must not "be supplied with wings, but rather hung with weights, to keep it from leaping and flying" (Bacon, 1939: 71). Therefore, it is necessary to provide understanding (reason) with truth and govern it (Bacon, 1939: 83). Specifically, people need to "apply the understanding, thus made fair and even, to a fresh examination of particulars" (Bacon, 1939: 68). They must not have negative attitudes towards reason, such as subduing or weakening it (Bacon, 1939: 47). According to Bacon, people subdue the reason when they are "ready in deciding ... render sciences dogmatic and magisterial" (Bacon, 1939: 47), and those who weaken the reason deny that people can know anything, and so "introduce a wandering kind of inquiry that leads to nothing" (Bacon, 1939: 47). Furthermore, receiving

true understanding (true reason) requires guarding against the understanding that leaves to itself and its own spontaneous movements because it is incompetent and unfit to form axioms (Bacon, 1939: 95). As far as Bacon, who is known as “the father of experimental philosophy” (Lewes, 1910: 52), was concerned, the true understanding must be tested through experiments (Bacon, 1939: 48). He referred to these experiments as “experiments of light” (Bacon, 1939: 10, 49, 79) and considered them necessary for regulating the senses. To some extent, it could be said that he enlightened contemporary experimenters by introducing his concept “experiments of light”, which is distinguished from “experiments of fruit” - “all industry in experimenting has begun with proposing to itself certain definite works to be accomplished, and has pursued them with premature and unseasonable eagerness; it has sought, I say, experiments of Fruit” (Bacon, 1939: 10).

Additionally, the enlightening significance in Bacon’s ideas of scientific experimentation is also expressed as follows: he started at the point of traditional “recipe format” to discover new avenues for experimental research (Rusu & Jalobeanu, 2020), his experimental philosophy basically shapes scientific methodology as well as deeply pervades all philosophical learning (Schwartz, 2012: 65), his methodology of experimentation helps to distinguish true experimental philosophers from mere empirics as well as literate experiences (disciplining experiences) from unguided, vague, and uneducated experiences (Jalobeanu, 2016).

### *2.3. Enlightenment aspect expressed through views on doubt in science and scientific discovery*

#### *2.3.1. Doubt in science*

In addition to pointing out the idols of the theater (*idola theatri*), “which have immigrated into men’s minds from the various dogmas of philosophies, and also from wrong laws of demonstration” (Bacon, 1939: 35), the work “The New Organon” also expressed philosophical views on the doubt in science. These views can be seen as meant to enlighten people, particularly for the majority of contemporary philosophers and scientists who accepted earlier philosophies without questioning them (Bacon, 1939: 53-54).

Specifically, based on criticism of the attitude “following and going along together” towards the matters intellectual pointed out in the earlier philosophies (Bacon, 1939: 53) - as well as “understanding accustomed to the present system” (Bacon, 1939: 79), Bacon’s philosophy identifies two factors that hinder or even extinguish the doubt in science: agreement and custom. Regarding the first, Bacon believed that “for the worst of all auguries is from consent in matters intellectual (divinity excepted, and politics where there is right of vote)” (Bacon, 1939: 54). He explained that “for true consent is that which consists in the coincidence of free judgments, after due examination. But far the greater

number of those who have assented to the philosophy of Aristotle have addicted themselves thereto from prejudice and upon the authority of others” (Bacon, 1939: 53). Besides, agreement or consent often leads us to believe that if the majority of people assume a certain issue is right (or wrong), then it must be so, unquestionably.

Regarding custom, Bacon stated that it could hold the human mind in captivity (Bacon, 1939: 111). Indeed, when we become familiar with something, we often take it for granted (or assume it to be false) without questioning it.

### 2.3.2. Scientific discovery

It is undeniable that scientific discovery is closely associated with the enlightenment. Bacon’s ideas of the scientific discovery are clearly expressed in “The New Organon”. Specifically, Bacon believed that philosophy and the sciences must disclose truth (Bacon, 1939: 25). He identified several factors that can hinder the discovery of new things, such as low self-confidence, consent and custom. Regarding low self-confidence, he pointed out that “it first distrusts and then despises itself: first will not believe that any such thing can be found out” (Bacon, 1939: 74). According to him, “for in conjecturing what may be men set before them the example of what has been, and divine of the new with an imagination preoccupied and colored by the old; which way of forming opinions is very fallacious” (Bacon, 1939: 73). With regard to consent and custom, as mentioned above, the doubt in science tends to be ignored; therefore, the scientific discovery does not occur. Additionally, as far as Bacon was concerned, the scientific discovery, in most cases, must follow a certain order and not by chance or by desultory impulses, but rather by man’s reason with suitable methods, regardless of any favorable conditions (Bacon, 1939: 72).

It is evident that scientific doubt and discovery are closely related to each other and to enlightenment; the scientific doubt therein serves as the condition, premise, and motivation for the scientific discovery to achieve the goals of the enlightenment. Before Francis Bacon, there were other philosophers who had some scientific doubts and discoveries, such as Mikolaj Kopernik, Galileo di Vincenzo Bonaiuti de’ Galilei, and Johannes Kepler, who developed the heliocentric model. However, they were considered heretical. Francis Bacon, on the other hand, boldly supported them by expressing his enlightening views on scientific doubt and discovery. He desired to transform contemporary society into a scientific society, as he referred to in his “New Atlantis”.

Bacon’s perspective on scientific doubt and discovery is meaningful in enlightening people. It contributed to the distinction between idealistic and religious world view and the scientific one, creating a turning point for Western European philosophy - natural science was separated from philosophy and continued to develop. Nowadays, it is an undeniable fact that scientific doubt and discovery are considered essential qualities of a true scientist.

### 3. Discussion

The work “The New Organon” of Francis Bacon contains the enlightenment aspects and therein lies three prominent ones: (1) perspectives on errors in human mind, (2) progressive views on human sense and reason, and (3) standpoints of scientific doubt and discovery. Regarding the first, Bacon’s theory of idols has great significance not only in his time and during the Enlightenment period that followed, but also today, when it is applied to important fields such as argumentation (Walton, 1999), the healing of the mind (Corneanu & Vermeir, 2012), education (Batista, 2013), and culture (Cortes-Ramirez, 2014), among others. Pointing out the idols is “of great use, for the doctrine of idols is to the interpretation of nature what the doctrine of the refutation of sophisms is to common logic” (Bacon, 1939: 34). Of Bacon’s epistemology, besides the theory of idols, his method of induction is another important contribution to contemporary philosophy. Bacon’s induction is considered the reinvention of the Aristotle’s one:

*“It is true that the concept of induction, far from being a Baconian invention, belongs to a traditional logical lexicon. But Bacon understands the notion of induction very differently than Aristotle does in the Posterior Analytics and this difference is highly significant. In a way, he reinvents the concept of induction, because his reworking of the Aristotelian approach to induction amounts to attributing induction a new place and a new part within the system of knowledge” (Cassan & Lyon, 2021: 260).*

In terms of the second aspect of enlightenment, although Bacon is considered the first empiricist of the early modern Western European empiricism (Hagger, 2009), the philosophical school that considers sense the sole source of knowledge, he was not a pure empiricist (Zagorin, 2001: 379) when offering philosophical views on reason based on criticism of the errors of sense and the misconceptions of the empiricists who was in his time or came before him. Especially, enlightening significance of his experimental method earned him the title of “the father of experimental philosophy” (Lewes, 1910: 52). Marx also considered him the father of modern experimental science (Marx & Engels, 1995).

With respect to the third aspect of enlightenment, Bacon’s ideas of doubt in science and scientific discovery were specially enlightening to the majority of people in his day, who had adopted previous philosophies with an attitude of no doubt. This aspect has held an enlightening meaning in all times because doubt in science and scientific discovery are two indispensable qualities of a true scientist.

The three aspects of enlightenment mentioned are closely related to the Bacon’s famous statement “Knowledge itself is power” (Latin: “Ipsa scientia potestas est”). They show his extraordinary efforts in glorifying the image of rational man and building a scientific methodology to help people interpret nature and overrule it. Bacon’s philosophy has the meaning of enlightening by pointing out “scientific knowledge” proven through “experiments of light” as a powerful tool for people to explore natural science and conquer



the natural world. Nevertheless, to receive the scientific knowledge easily, people must keep off and clear away the errors in their mind, which Bacon called the idols (or phantoms) and false notions, because of their troubles as follow:

*“The idols and false notions which are now in possession of the human understanding, and have taken deep root therein, not only so beset men’s minds that truth can hardly find entrance, but even after entrance obtained, they will again in the very instauration of the sciences meet and trouble us, unless men being forewarned of the danger fortify themselves as far as may be against their assaults” (Bacon, 1939: 34).*

Bacon once likened a man of scientific knowledge to a man carrying a burning torch (Bacon, 1939: 1857-1870); this shows his desire to enlighten people by lighting a “torch of knowledge” to dispel the “dark shadows” (idols or idola) that obscure the human mind and prevent people from accessing scientific knowledge.

For knowledge to be powerful, as far as Bacon was concerned, it must be correct and rational since “the sense both fails us and deceives us” (Bacon, 1939: 48). Francis Bacon’s philosophy expresses the aspect of enlightenment by advancing progressive views on sense and reason while demonstrating how to verify the correctness of knowledge through scientific experiments, which he called “experiments of light” (Bacon, 1939: 10, 49, 79). Furthermore, scientific knowledge, which provides people with power to explore and control the nature, can be derived from the doubt in science and scientific discovery. The philosophical views on scientific doubt and discovery demonstrate the enlightening aspect of Bacon’s philosophy in the contemporary social context, where philosophical and scientific ideas are often received with an attitude of obedience and submission (Bacon, 1939: 53).

Additionally, “The Great Instauration”, which is Bacon’s project for the purpose of reforming knowledge as well as raising and exalting human intellect, it can be said that the instauration of science itself is an enlightening work that Bacon aimed to achieve. Bacon sought to enlighten contemporary philosophy and sciences with “the tools he created”, such as the doctrine of idols, the exclusionary induction method (“In the process of Exclusion are laid the foundations of true Induction” (Bacon, 1939: 113)), and the scientific experiments - the “experiments of light” (Bacon, 1939: 10, 49, 79), along with the philosophical views on doubt in science and scientific discovery. The functions of these “instruments of enlightenment” show their significance not only in Bacon’s time but also in the present day.

#### **4. Conclusion**

By analyzing the philosophical thought of Francis Bacon in “The New Organon”, it is evident that his philosophy encompasses the aspect of enlightenment. In-depth research has identified three significant ones, including (1) viewpoints on the errors in the human mind, (2) views on progressive viewpoints on human sense and reason, and (3) standpoints of scientific doubt and discovery.

Bacon's enlightening views were later found in the Enlightenment period's philosophy, demonstrating his significant contributions to laying the foundation for enlightening thought within the long-time span of the Enlightenment from the 17<sup>th</sup> century to the 18<sup>th</sup> one (Gottlieb, 2016). Furthermore, these aspects are still relevant today, making it worthy to research for the purpose of serving people's life. To some extent, it may say that Francis Bacon is worthy to be considered a great early enlightener; since him, the early modern Western European philosophy has moved away from the naive dialectic spirit of ancient Greek philosophy and has gone with the natural sciences' achievements.

Three enlightenment aspects mentioned above are closely related to three most influential and important contributions of Francis Bacon to contemporary epistemology: the theory of idols, the induction by elimination, and his experimental method. The evidence of these contributions to real life is vast, and his followers have continued to develop his enlightening thought in their work. It can be seen that these enlightenment aspects may be the valuable legacies that Bacon left for the community of philosophers and scientists to achieve their scientific goals with the purpose of developing science and serving for people's life.

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