

THE SIGNIFICANCE OF NATURAL PHILOSOPHY AND THE EPISTEMOLOGICAL HERITAGE OF FRANCIS BACON IN THE FORMATION OF THE PHILOSOPHY OF THE NEW TIME

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Bacon proposed the idea of studying nature as such. Scholasticism and ancient philosophy, especially Plato and Aristotle, derived the subject of knowledge from ideas, forms, that is, from subjective perceptions. Bacon rejects them and puts nature at the center of research. Conflicts in these theoretical-philosophical views are revealed in the topic.

Similarly, Bacon believes that a person can know and even change nature by conducting experiments. His methods of scientific knowledge - observation, experiment, induction - were absolutely new for the philosophy of that time.

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ABSTRACT

In this article, Bacon put forward the idea of studying nature as such. Scholasticism and ancient philosophy, especially Plato and Aristotle, derived the object of knowledge from ideas, forms, that is, from subjective perceptions. Bacon rejects them and puts nature at the center of research. The topic reveals conflicts in these theoretical and philosophical views.

Bacon sought to create a common scientific methodology, important for all branches of science, in his words, "the globe of the world." He is not limited to the study of nature or natural philosophy, his attention is also focused on the study of issues related to such sciences as socio-political, jurisprudence and ethics. From this point of view, Bacon's methodology has the features of a "universal philosophy".

of the world." It is not limited to the study of nature or natural philosophy, its focus is also on the study of issues related to the sciences such as socio-political, jurisprudence and ethics. From this point of view, Bacon's methodology has the characteristics of "universal philosophy".

In Bacon's scientific-philosophical heritage, the issues of philosophy and its relationship with other sciences occupy an important place. Therefore, before turning to Bacon's natural philosophy, it is necessary to take a brief look at his views on the science of philosophy.

It is known that, according to Aristotle, philosophy is "higher wisdom". Therefore, it stands above all disciplines, does not include other disciplines or exists "for



itself". The subject of philosophy is something motionless, immutable, formless, and independent; while the subject matter of other sciences is non-independent things or things that change. Philosophy does not deal with the appearance and types of things, nor with their "characteristics that express suchness" [1].

Deification of philosophy, the view left by Plato and Aristotle that only special people, wise men perceive it, was the main conclusion and method of medieval scholasticism. Against this scholasticism, Bacon started the philosophy of the New Age.

Bacon divided philosophy (the first philosophy) into three parts - divine philosophy, human philosophy and natural philosophy [2]. Divine philosophy is wisdom. At this point, Bacon relies on Aristotle. Therefore, he was the "first teacher" and did not completely reject the opinion of the scholastics. Indeed, Bacon does not deny that the world was created by a divine power, God. God does not affect people directly, but either through us or through nature. Therefore, philosophy cannot remain in the divine part, that is, it achieves its goal through the second (philosophy of man) and third (philosophy of nature) parts. The second philosophy includes theoretical philosophy and practical philosophy. Theoretical philosophy consists of physics and metaphysics.

In this place, the classifications of sciences proposed by our great zamindars Ar Razi, Farabi, Ibn Sina and Beruni come to mind. For example, Ibn Sina divides science into theoretical and practical fields. Farabi considers the closeness of practical sciences (5) and theoretical sciences (3 and

4) in the "five" classification and Beruni's classification and the basis of Farabi's, Ibn Sina's, Beruni's classifications to be influenced by Plato and Aristotle [3]. But our great compatriots began to free science and philosophy from scholasticism, and Beruni began to distinguish it from theology, saying that science "came into being because of the need of man" [4]. That is why A. V. Sagadeev, studying Ibn Sina's classification, rightly notes that "Arab-Muslim scholars of the Middle Ages connected abstract observation with practice, not only moral and political life, but also with production and everyday life in general"[5]. Especially, if we remember that the works and scientific-natural researches of Ar-Razi and Ibn Sina "were known to all of Europe" [6] in the XII-XIII centuries, we can express the opinion that Bacon's classification is influenced by the views of our great compatriots.

In addition, our great ancestors tried to base their classification on a scientific and theoretical basis, and Bacon's classification shows subjectivism.

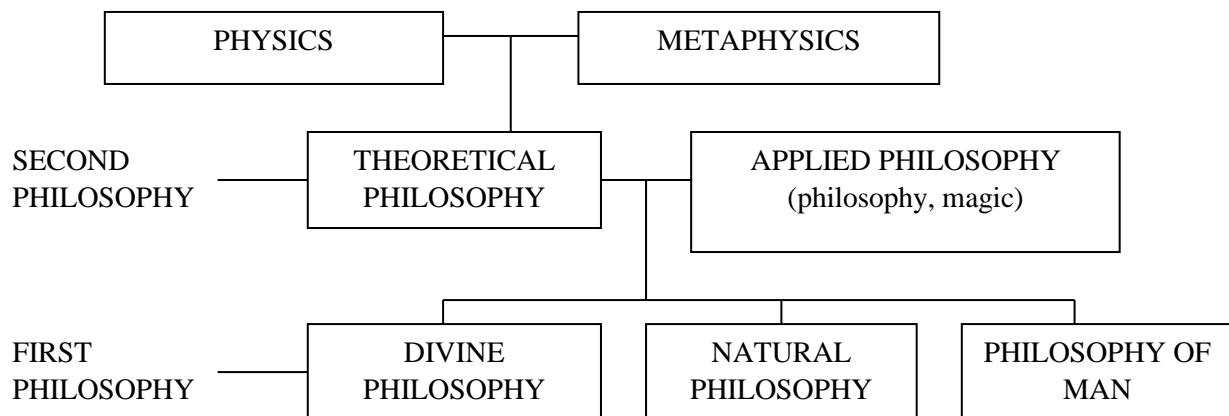
Why is philosophy divided into the first and second philosophies? Why are human philosophy and natural philosophy included in the first philosophy, and they are considered separately from metaphysics or applied philosophy in the second philosophy? Is there a dialectical relationship between these stages, and if so, what are they? Unfortunately, Bacon does not ask such questions. In this way, he causes to reject, although not openly, the general methodological feature of philosophy, even to doubt that it is a science. For example, K. Popper, an English philosopher, one of the major representatives of the school of critical rationalism, believes that there is no



philosophical science, there are philosophical problems, and he takes these problems from existing sciences. As sciences, there are logic, mathematics, and exact sciences [7] We believe that Bacon's influence is here, because K. Popper often refers to Bacon's scientific-philosophical and epistemological heritage. But Bacon himself never openly denied that philosophy is a science.

Based on the above classification, Bacon's scientific and philosophical views can be

expressed through the following diagram. (It should be noted that A.L. Subbotin, who studied F. Bacon's philosophy, notes that it is in a "scientific direction"[8]. That is, he expresses the opinion that Bacon was only interested in natural philosophy. In our opinion, such an opinion existed in the former USSR was the effect of siding with the prevailing Marxian-Leninist philosophy, thus tending to turn Bacon's philosophy towards materialism).



It can be seen that F. Bacon placed science (physics and metaphysics) higher than theological philosophy and scholasticism and focused his attention on it, mainly on natural philosophy and natural science. However, he did not absolutize natural philosophy, but he did not forget that metaphysics, like physics, has its importance in scientific research. Therefore, Bacon recognizes the divinity of philosophy, the right

of other sciences, including the "first philosophy", to live independently, to develop and conduct research, not as a field seeking to establish its dominance as a "science of sciences" [9]. First, philosophy is of fundamental importance, and it is wrong to completely deny that philosophy is primarily a science of wisdom. That is

why Bacon recognized metaphysics in his second philosophy. In his scientific-theoretical research, he focused on physics or natural sciences. This dialectical connection cannot be forgotten when studying Bacon's work and scientific-philosophical heritage.

Although Bacon's views on the creation of the world, the universe, are essentially close to the mythology of antiquity, he tries to fully explore the transcendence and theoretical views on this matter. He analyzes the ideas of Thales, Anaximenes, Heraclitus, Democritus, Anaxagoras, Plato and Aristotle. He accepts Aristotle's concept of four causes, *bois*, and based on it creates his idea of "natural cause - *bois*", "source of causal form". Natural causes, according to Bacon, are essentially from



nature. All existing things are essentially of nature. Matter and form are the essence of nature, when they come together, in harmony, they can be the expression of Existence[10]. Bacon's view of form in harmony contradicts the Aristotelian concept that all things originate from form and are expressions of form and therefore are permanent, so that matter has no quality, it is hidden, invisible.

Bacon ironically writes that people like Plato and Aristotle see matter as a prostitute and form as its agents [11].

Bacon's natural philosophy was built on the materialistic views of ancient Greek philosophers. He relies on the ideas of Thales that the universe was created from water, Heraclitus from fire, and Anaximenes from air. Thales saw water as the basis of existence. Brooker, Tennemann, and Diels suggest that Thales introduced the scientific method of the origin of the universe into philosophy. It is precisely because he proposed that existence can be known through the natural-scientific method that Thales "stimulated the stupid Hellenic thinking" [12]. Bacon himself shows that the substance of existence and things is color, in this place he refers to the different opinions of the ancient Greek philosophers about the material foundations [13]. However, the thoughts of ancient Greek philosophers were unscientific hypotheses, sometimes random hypotheses, which Bacon interpreted at the level of scientific and philosophical methods. In this way, he introduced a scientific, grounded, methodological approach to the natural philosophical views of the ancient Greek materialists.

It is known that according to ancient mythology, God created the world. Bacon

opposes Anaxagoras' homeomery to this mythological concept. According to homeomery, "the universe was created from the chaotic combination of the seeds of things." Therefore, the primary material base alone was sufficient for the creation of the universe[14].

Ancient Greek philosophers admit that the origin of the world was based on the chaos of "indivisible mass". In their eyes, chaos is not an absolute void, an absolute "nothing", it consists of "masses" located in disorder. If God created the universe, he created it by arranging this chaotic "mass" in a certain order. In this way, the idea that God created the universe from "nothing" in mythotheology is rejected and it is corrected by the chaotic "mass". Therefore, according to Bacon's natural philosophy, "the existing must arise from the existing", that is, the existing exists from the existing [15]. This existent, i.e., primordial, matter cannot remain immutable, moreover, it is real, it exists. In another place, the philosopher emphasizes the natural existence of matter and writes: "primordial matter is the cause of all causes, and it itself is not the result of other causes." It is absolutely impossible for this primary matter, its own powers and actions, to have necessary causes for itself (we always exclude God in this case), because nothing existed before them, "there are no causes to produce its causes, there was no other beginning than nature".[16] . it is clear that Bacon, on the one hand, did not deny that God is a creative force, and on the other hand, he sought to prove the existence of the material basis of the world [17] Therefore, the philosopher himself, among the ideas expressed about the creation of the world, the idea of "primary material



basis" is "probably one of the ideas ever expressed is the greatest" [18].

Logical-expressive substantiation of the existence of the initial basis has always attracted the attention of philosophers and still arouses fierce debates. If there is no such basis, the proposed idea, the concept loses its power, all thoughts remain just words. Bacon felt the need to justify the real existence of concepts, the fact that they are built on a material basis. Therefore, he tried to interpret the "primary material base" logically and expressively.

According to Bacon, it is impossible to know the "primary basis", the "primary cause", it "must be taken as it is" [19]. Some philosophers tried to give a definition and interpretation to this "primary basis". They looked for the "primary basis" in cause and action, as the impulse is the cause that sets things in motion, so the impulse that created matter must be the cause, it was called the "cause of causes." Such an interpretation is unlikely to bring the disputing parties to any satisfactory conclusion, because endless debates cannot bring any clarity to the problem. Perhaps, on the contrary, it will create new problems and disputes. This serves science, not to satisfy any practical need, but to increase speculative views. According to Bacon's interpretation, because in nature, causes have their limits, beyond this limit (he is obviously referring to matter) argument is futile. "The ignorant and heedless philosopher seeks the basis of the common..."[20]. In our opinion, this confession of the philosopher prevented him from defining matter. That is why Bacon did not define matter. In his eyes, matter and nature are identical. This was actually Bacon's natural philosophy. Here, Bacon's commitment to agnosticism is

evident. He also denies that matter has a cause, asserting that "primordial matter" cannot be known, and that it is not necessary to search for it. Questions arise: where did the "primordial matter" come from, what internal or external force created it, when and where it was created, which is not necessary to know. For science and philosophy, they are not speculative questions, but problems that the mind naturally invites to research. Bacon solves them easily and quickly. According to him, it is not necessary to look for the origin of "primordial matter", "it is necessary not even to try to find it", "whatever the matter looks like, we should consider it in such a state, we should not pass judgment on it based on some preconceived notion". Matter is natural in itself, of nature in itself; it is always a cause in itself, but never a result, that is, a product of some cause. "Cupid has no parents," Bacon says wisely, connecting matter with God. Thus, the philosopher defines the limit of reason, and as soon as this limit is crossed, futile speculations, debates, and arguments with a hard-to-find conclusion begin.

Leucippus - Apxagoras views on the atom are close to Bacon in a certain sense. Leucippus and Apxagoras believed that the material basis of the world is in the atom, but they took different approaches to revealing the inner properties of the atom. For example, Apxagoras knew that atoms have different shapes, they emit different colors and smells. Bacon supported Apxagoras in this approach. Knowing this, he denied that atoms are "stable particles" and put forward the idea that they correspond to a colorful universe[21].

From the above, it is clear that Bacon believes that the "primordial basis" is independently existing matter, the atom,



from which all other things are derived or from nature. This "primary basis" is material, matter, the world of real, existing bodies. N. Kuzansky and J. Bruno also showed that the universe is matter, and matter is equal to form, but only Bacon proved that matter is the "primary basis", primary compared to form. It should be remembered that Bacon did not mean all matter in general, but primary, "primordial matter" as primary. Simple, mere matter, according to Bacon's interpretation, tends towards chaos, chaos, and disorder[22]. Here we see that Bacon relied on Aristotle's thought. If the universe, the world, was made of simple matter, if all things were composed of matter that tends to decay and decay, then there would be no order, beauty and harmony in existence. Therefore, the world, the universe, the subject of order, beauty and harmony, was not created without Mercury, without God's word "be". Mercury, God, according to Bacon's expression, is the actus purus, that is, pure activity, the source of action, the exponent. They need an "agent" to express their will. This agent is the "starting matter". God created the world through this "agent". Bacon confirms his ideas on the example of ancient mythological images, that God exerts his forces on the initial principle that applies to all things[23].

The world, the universe is not immutable, it exists because of constant changes. And changes destroy the form, appearance, including beauty of existing things. Nothing remains. In this case, the existence and stability of the world, the universe, and the "permanent stability" of nature are questioned. Bacon seeks the answer to this complex question from the mythological interpretation, that is, the world, the

universe, arose from chaos. "Any philosophy," he writes, "understands the structure of the world in the above way, as a firm and firm philosophy rejects the idea that the world was created out of chaos, and such a philosophy is a product of lightness and mental limitation." If we conclude that chaos is not an absolute void, then the world created from this chaos must have properties that are contrary to chaos. Such features are order, beauty. Chaos did not have such characteristics, and when God was creating the universe, he meant that it was inevitable that there would be qualities contrary to chaos, which are not present in chaos.

The transformation of chaos into an ordered, harmonized existence, the world, is connected with the birth of Venus (goddess of beauty, love). Now everything, every matter, atom strives for order, mutual love, harmony. Bacon called it "schematism".

If we proceed from the above, the universe consists of the "primary base" - matter, the combination of atoms, harmony and order, chaos. In this universe, the world is composed of "a rich and powerful force from which everything grows and everything returns".[24] Because "the earth and the sky existed as forms of primary matter before the creation of the world, the universe." In his views on matter, Bacon relied not only on the ancient Greek materialists, but also on the philosophy of the "Renaissance philosopher of nature - Telezio" [25]. Analyzing Telezio's "On Things", Bacon notes that hot and cold are considered in it as "the first forms, the first active essence, and the first substances".[26] The basis of the world consists of this formless but "inactive and potential matter." Bacon



evaluates the natural philosophy of Telesio as follows: His philosophy is reminiscent of the pastoral philosophy that describes the life of shepherds who observe the world in peace and dispassion. He talks well enough about the structure of the universe, but about the starting point - he fails supremely... Any such philosophy is the product of frivolity and mental limitation. Because, in the words of V.V. Sokolov, "Verulamlik was mainly interested in the issues of the methodology of scientific knowledge, he was less interested in the doctrines of matter and nature, and issues of ontology." But this does not lead to the conclusion that Bacon was less interested in nature and real natural existence, because the philosopher does not think as a naturalist, but as an epistemologist who seeks to know and study natural existence. When he writes about matter, atom, nature, and when he analyzes the natural philosophy of Telesio, it is primarily a source of epistemological research, even in his empiricism, this approach is more noticeable. Therefore, Bacon's epistemology "serves as a critical, empirical and practical influence" for the philosophy of the new era.

Matter, form and movement are given great importance in natural philosophy. Depending on the philosopher's approach to this issue, he is called a conservative or progressist, a supporter of regression or evolution, a representative of idealism or materialism, subjectivism or objectivism. The history of philosophy shows that not a single significant philosophical movement, school, or doctrine has passed without expressing its attitude to this issue.

Philosophers up to the 16th century supported Plato's unorthodox view that "the idea is the beginning of things." The

supporters of scholasticism believed that there was a divine word before the creation of the world, and that the world moved according to the command of this word. Some supporters of idealism separated form from "primary matter", "primary base" and propagated the idea that form is "more real than matter"[27]. It was actually an attempt to create a material being, a world, from an abstract idea, of course. "The form," writes F. Bacon, "is, on the contrary, a clear manifestation." But it is based on matter... This is probably why science was dominated by all forms and ideas... abstract ideas and their exaggerated methods of evaluation. In fact, it was to reveal the error in the views of the ancient Greek philosophers. Because, according to Bacon, ancient natural philosophy saw form, and because of the invisibility of matter, it regarded it as something additional to form. The emanation of form into matter "as a view, on the one hand, led to the mutilation of form and idea (in the case of Plato), and on the other hand, under the influence of pompous expressions and eloquence (in the case of Aristotle), abstract ideas and their exaggeration" [28]. This resulted in the interpretation of form as an independent substance without matter, a misconception that even some philosophers who "viewed matter as the basis of things" espoused. True, Bacon expresses the form in the Aristotelian interpretation, but he understands the form as "pure action". It is on this point that he differs from Aristotle[29].

Matter gives form to matter. The form changes, but the "original amount" of matter does not change. "Nothing disappears in existence, the total number of matter remains the same." Therefore,



according to the philosopher, "the sum of matter is eternal, it does not increase or decrease", thus it is preserved forever. But the sum of the matter is proportional to the size and structure of the form. With the change of form, the amount of matter related to this form also changes, that is, it either increases or decreases. However, the number and sum of matter in the universe is eternal. Therefore, all things in nature change their form, a small form becomes a large one, a large form becomes a small one, it can even be "absent" in a certain space and time. But in the broadest sense of nature, the whole amount or sum of matter in existence is unchanging. It does not decrease or change[30]. It seems that this is close to I. Newton's law of conservation of the whole universe, even it is itself. True, this idea was advocated by Empedocles in antiquity, but Bacon revived this materialist view as the main concept of New Age natural philosophy and gave it scientific and theoretical importance. In particular, his ideas about the preservation of the movement of matter with the change of form, that is, the fact that the movement of matter does not stop with the change of form, and now it continues to move in the changed form, turned Bacon's natural philosophy into a doctrine different from the natural philosophy of antiquity. We first find the idea of conservation of matter and motion in Beruni. He writes that the speed and slowness of the movement of "falak" does not increase, but remains the same. Also, both Beruni and Bacon note that bodies and actions occur in a round shape, in a circle. In our opinion, this commonality, closeness is due to the empirical approach to understanding the nature of the research object. Both thinkers

tried to rationalize changes and actions in the world, relying on the intellect.

Ibn Sina also noted the dialectical relationship between matter and form. He writes that "what matter takes is called form"[31]. Bacon also repeats this idea.

Empedocles was right about the conservation of matter, but he was limited to this idea, and Bacon continued it and put forward the idea that not only matter itself, but also its motion is conserved. It was possible to easily apply this idea not only to natural science, but also to social science, and social thoughts of the XIX-XX centuries made good use of it. The principle of the eternal conservation and motion of matter and its constituent parts, the atom, is Bacon's great contribution to natural philosophy and social science.

At the same time, Bacon did not limit himself to note the existence of matter, atoms and the eternity of movement, he considered them as a phenomenon characteristic of all Nature, including the Universe, Stars[32]. The "primary basis" of nature, consisting of matter, makes movement a phenomenon characteristic of all forms and parts of nature. In this way, movement was interpreted as a universal reality characteristic of all parts and fragments of existence, being, and Nature. Bacon believed that the processes of sensation, excitement, cognition are also the result of the movement of matter. This idea was later supported and developed by philosophers such as Hobbes, Gartley, Lametrie, Diderot, Holbach, Feuerbach. True, Bacon tried to apply the movement of matter even to language and other social realities[33], but his specific view of nature and society prevented him from realizing that socio-historical reality has its own laws.



The universal, colorful nature of movement ensures that matter, atoms come in different forms and appearances. And this means to move from diversity to the general, to the whole, to join the common, to the whole. According to Bacon, "all existing things, like the waves and currents of the sea, pass from diversity to generality and from unity to diversity" [34]. This interpretation can be called the dialectic of Bacon's natural philosophy. The fact that motion determines the form of matter, gives it order, organization, or causes it to divide gives some sense to dialectically related processes. As a result, we come to the idea that movement is the "spirit", "heart", "mind" of matter that gives consciousness, which differs from the mechanistic understanding of matter. We see this when Bacon sees matter as having various qualities: heavy and light, dense and sparse, hot and cold, simple and complex, fast and slow, changing and fixed, perceptible and imperceptible, conscious and unconscious[35]. The philosopher did not simply enumerate these forms of motion, he applied them to the universe, planets, gravitational and magnetic attraction, bodies prone to compression and expansion, heat and light. In this way, he turned the entire cosmos, the universe, and the bodies in them into objects of movement. The forms of motion in nature are not mere mechanistic transitions of the complex to the simple or the simple to the complex, but that both the complex and the simple are in constant motion; it is movement that gives them wholeness, wholeness. As long as the object or thing exists, the matter is also in motion. When the object or thing disintegrates, changes from one form to another or dies, the direction and appearance of the movement

also changes. This is how quality changes. Experiments and discoveries in natural sciences in the 19th and 20th centuries confirmed that Bacon's desire to synthesize qualitative change and quantitative change is a widely occurring phenomenon in nature.

It is true that Bacon knew that motion, the dependence of motion on mass or the lack of influence of mass on motion in space (Galileo), the properties of a magnet (Gilbert), and that motion is the main subject of physics (Aristotle). They were examples and guesses, and Bacon wanted to create a theory of action. It was envisaged that "matter is related to form, thinking is related to practice"[36]. By doing this, Bacon, first of all, rejected Aristotle's view that "natural position" is a necessary force for the movement of matter. According to Bacon, Aristotle's "place" has neither real force nor real action. He did not completely reject Aristotle, he included in his theory three of the types of motion related to quality, number, increase, decrease, presence, and places, that is, the types of motion related to the desire to interact, to prevent the occurrence of a void, and to join the natural mass.[37] . Second, Bacon recognized the existence of motion and force, and included in his theory the influence of force on motion at a distance (magnetic forces). Thirdly, Bacon saw stillness as a manifestation of motion. For example, heavenly bodies, Earth, oceans "move quietly"[38]. It is not absolute stillness, but stillness in a kind of movement. So, it can be seen that through the theory of motion, Bacon made a great contribution not only to natural philosophy, but also to the development of physical science.



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