

## Epistemological Layers: Analysis of Changes in Cultural Paradigms on the Example of the Mid-18th Century European Culture

*Epistemolojik Katmanlar: 18. Yüzyıl Ortası Avrupa Kültürü Örneği Üzerine Kültürel Paradigmalarındaki Değişimlerin Analizi*

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**Abstract:** Before this study, the author was tasked with identifying general tendencies of changes in values and dominant ideas in all spheres of cognition. During the study different branches of knowledge of one period and one civilization area are compared. The author analyzes the tendencies developed in them. He chooses the example of the mid-18th century European culture. The article considers changes in scientific paradigms of philosophy, economics, linguistics, and natural sciences. Thus, in all areas of scientific knowledge, there is a tendency of interest in nature. In particular, in the philosophy, the idea of the value of the man's natural state advocated Rousseau in his "ode to human nature," in the economics of this period, a significant contribution belongs to Quesnay and Turgot, the founders of the physiocratic school, who changed the concept of capital and showed the value of nature. Linguists Dumarsais, de Condillac and de Gebelin made a significant breakthrough in language learning, namely by the interest in natural languages. In the natural sciences, scientists also actively studied nature; in particular, it refers to the discovery of the Lavoisier's theory of combustion, and the redefinition of the Linnaeus's classification of animals and plants.

**Keywords:** Cognition, epistemological layers, paradigm, scientific revolution, nature.



## Introduction

The task of cognition is to answer questions that arise in the human mind. The ideal form of response is the definition, the construction of which requires the availability of all necessary elements of definiens. Their presence allows to form scientific, i.e., clear answers to questions of inquisitive mind. However, there are such concepts for which it is impossible to formulate the definition, since they are the most general and do not have more general concepts about them which could become generic for them. Since such concepts go beyond the limits of defining, they will always remain the realm of metaphysics, i.e., transcendental concepts in the sense in which they were understood by Thomas Aquinas, i.e., “anything, in comparison with what nothing else can be thought of” (2000: 80), or Kant, for whom transcendental is something beyond the scope of experiential learning (1787: 19). Since these concepts will never become defined, they constitute a static metaphysical structure. Their particular importance lies in the fact that they not only cannot be defined themselves but since they are the most general, they are generic concepts for the definition of all other concepts of the lower level of generality. The curiosity of the human mind makes us find some explanation for the static metaphysical structures. Those explanations in their turn are generic for further definitions. It follows that the explanation they receive determines the whole further course of cognition.

If concepts are not static metaphysical structures and can get clear definition, they pass into the realm of science, where they form its theoretical basis. The entire development of science is a constant creation of hypotheses, which later seek their own empirical evidence. In science, theory is always ahead and determines the course of empirical research, the theory puts on the researcher certain glasses, through which he can see reality. Without these glasses, he will not see it, but in them he will always see it only in the light in which the glasses will allow it. There is no linguist who would not base his views of the language on one of the language theories: whether on Wilhelm Freiherr von Humboldt’s theory, or Ferdinand de Saussure’s, or Benjamin Lee Whorf’s, or any other of the hundreds, worked out in the history of philosophy and the theory of language. There is no economist who would not base his work on the theo-



retical doctrine of either Adam Smith, or John Maynard Keynes, or Karl Marx, or others. In any field of knowledge - both in the humanities and in the natural sciences - the theoretical basis is not only an explanation of what has been seen, but also an impetus for further empirical research, which is necessary only in order to strengthen the probabilistic significance of the theory. The essence of science is its theoretical foundations. The whole history of science is a constant struggle of theories. Not experiments and observations are mutually controverted, but theories. Scientific revolution is a change of theories.

Speaking of any science, any manifestation of the human spirit, we always see that in all of them, within the same civilization range, the same tendencies are realized that follow from general philosophical settings, the roots of which lie in the interpretation of the static metaphysical structures. The worldview changes when the interpretation of at least one of the three static metaphysical structures changes. Since all forms of cognition are based on the general worldview, i.e., on the interpretation of the static metaphysical structures, changes in this interpretation are reflected in all realms of knowledge. During university studies, students study not only the applied aspects of their discipline, but also get acquainted with their theoretical segment. This is especially noticeable in the humanities and social sciences. An economist must study economic theory, a linguist - linguistic, a lawyer - a theory of law, a sociologist - a theory of society, etc. In some countries of the world, including Ukraine, there is a tradition of studying these disciplines in a historical perspective. It is difficult not to agree with Edmund Runggaldier (2014: 4), who is convinced that the tendency to cover theoretical changes in philosophy and science from the historical point of view was formed under the influence of Hegel: if the Absolute Spirit unfolds in history, then all its manifestations can be traced only in history. Often historical reviews of theoretical background of various disciplines are considered separately. This does not allow to see their common features. However, if you compare different branches of knowledge of one period of time and one civilization area, then the trends that develop in them, are strikingly similar. This means that the changes we call scientific revolutions occur not in separate sciences, but in the whole worldview. It is impossible to imagine



a situation in which serious changes take place in philosophy, and at the same time there are no changes in economics, physics, sociology, linguistics, etc. On this basis, it is groundless to speak of changes in certain areas, but it is necessary to talk about large-scale worldview changes. Changed whole cognitive planes, or epistemological layers are changing.

### **Jean-Jacques Rousseau and the Idea of Nature in Philosophy**

Let us look, for example, at one of the periods of European culture. Since we have previously devoted a lot of attention to the Renaissance, we will choose some other era - for example, the 18<sup>th</sup> century. What was happening at that time in philosophy? The most vivid philosophical thought in the middle of this century, the beginning of which is associated with the figure of Louis XIV, the middle - with Maria Theresa, and the tragic ending - with Maximilien de Robespierre, was expressed by Jean-Jacques Rousseau who was born in Switzerland and worked in France. The peak of his activity dates back to the middle of the century: in 1750 his work "Discours qui a remporté le prix a l'academie de Dijon" appeared, which was written for the competition announced by L'academie de Dijon, and in 1762 - "Du Contrat Social ou Principes du droit politique". The main idea of the philosophy of Rousseau was the ode to human nature. The philosopher believed that the ideal state of human existence were natural circumstances. The refusal of the natural state and the beginning of the civilization construction generates evil human propensities. Rousseau, responding to the competition question of L'Academie de Dijon, "Did the emergence of sciences and arts contribute to the development of morality?" believed that sciences and arts not only did not contribute to the development of moral practices, but also gave the person the opportunity to exacerbate their bad features. Within the limits of civilization, a person developed mathematics for his own greed, rhetoric - for the sake of pride, etc. In his cultural criticism, Rousseau is somewhat similar to Gilgamesh. However, unlike the Sumerian king, the Swiss-French philosopher did not call for a return to the natural state and the abandonment of civilization, since this is not possible. He promoted the development of natural features in contrast to those generated by culture. Consequently, the leading idea of Rousseau's philosophy is the value of nature. The view that the epistemological layer should spread in



a wide variety of branches of knowledge requires that ideas similar to those of Rousseau's philosophy be available in other sciences. Therefore, let us consider different sciences. At that time, the economic theory, especially in France, was marked by the work of the court physician of Louis XV, François Quesnay who, besides medicine, was also interested in economics. Quesnay's views laid the foundation for the physiocratic school, which became the leading in the economic theory of the second half of the 18<sup>th</sup> century. It is important to note that Quesnay's main economic work "Tableau économique" appeared in 1758, that is, eight years after Rousseau's "Discours qui a remporté le prix a l'academie de Dijon" and four years before his "Du Contrat Social". At that time, there was another co-founder of the physiocratic school, Anne Robert Jacques Turgot, whose main economic work, "Reflections on the Creation and Distribution of Wealth", was published in 1766. The economic theory of that time, especially in France, experienced a wave of intensive development. After the measures introduced by Cardinal Armand-Jean du Plessis duc de Richelieu a century before the physiocrats, the French economy grew sharply. During the century after de Richelieu's death, the wealth of France continued to grow. The development of national wealth attracted the attention of educated Frenchmen to economic processes. As the economy became the subject of intensive studies, the scientific discussion on the economic topic became more active too. In the new conditions the ideas that created the competition to the theory of mercantilism, which dominated the economy of France under the rule of Louis XIV, were created. If the mercantilists considered money to be the basis of capital (at that time, gold and silver), and foreign trade to be the source of wealth (Loschyna, 2009: 56), then the physiocrats changed their perceptions of capital. Their doctrine was based on several basic principles: 1) the source of wealth is agriculture, that is, the multiplication of what nature gives, not artificial goods (Stepanenko, 2010: 190); 2) the economy must develop in accordance with its own natural order, that is, according to its own universal laws; 3) economy should be free, and property - inviolable. Our goal is not a detailed analysis of the theory of the physiocrats. The above is enough to see that the basis of this theory is the value of nature.



## The Idea of Natural Language

The situation in linguistics looks similar, but it has certain peculiarities. Linguists are interested in the natural language much earlier, since the Renaissance. The rejection of medieval traditions leads to the desire to renounce Latin, which at that time was official in all spheres of being. Interest in national languages is developing. Already at the beginning of the 14<sup>th</sup> century a treatise by Dante Alighieri "De vulgari eloquentia" appears, though written in Latin. In the 15<sup>th</sup> – 18<sup>th</sup> centuries a number of works on grammar, phonetics and vocabulary of European languages are published. Among them there are Ukrainian scholars, e.g., Lavrentii Zyzanii, who in 1596 published the first Slavic grammar in Vilnius (Zyzanii, 1980: 92) and Meletii Smotrytskyi, who published his grammar in 1619. In 1660 French monks Antoine Arnauld and Claude Lancelot prepared "Grammaire générale et raisonnée de Port-Royal". French linguists attempted to distinguish grammatical forms common to all languages and based on laws of thinking. They were convinced that the language implements universal language principles that are inherent in all people. Accordingly, in any language the same language laws are implemented. Arnauld and Lancelot noticed these principles in grammar. Their work is comparing grammars of different languages with the purpose of distinguishing those grammatical principles, which are based on universal laws of thinking, and therefore appears in all languages. Of course, the theory underlying the "Grammaire de Port-Royal" collapsed as European scientists found out about the languages of remote continents. Arnauld and Lancelot worked only with West European languages, the similarities between which are obvious. There appeared a lot of similar general comparative grammars in Europe. Latin became the basis for them. But, as soon as European missionaries and travelers brought to Europe information about the languages of the Far East, Africa, America, the idea of universal grammar turned to the margin of linguistic science. Still, the idea of "Grammaire de Port-Royal" is not without merit. This is evidenced by the study of Avram Noam Khomsky who revived the idea of universal grammar, but on a new, deeper basis. In comparative grammars, the desire to insert a language into a rational system is obvious. Here the dominant and priority value, however, is the system, not the language



itself. Therefore, the interest in living language, which extends from the Renaissance, cannot yet be considered its worthy appreciation. A new turn in the development of linguistics unfolds when languages of other civilizational areas become known Europeans. As a result, all existing systems are broken in the views of linguists. Now it becomes apparent that neither Latin grammar is the basis of any language, nor Hebrew is the oldest ancestor. The researchers have only one possibility - to leave the systems and turn to the study of the language itself. At this moment natural language becomes in the centre of the researchers' attention. The comparative method and comparative grammar, however, do not fade into oblivion. There are attempts to compare all language research material which is known to European scientists. Researchers noticed that some languages are very similar to each other. This gave reason to talk about language groups. In place of the universal grammars, the era of comparative analysis of natural languages has come. New ideas developed primarily in France. Among the scholars of particular interest in our discourse we should mention: César Chesneau Dumarsais, whose linguistic research "Logique et principes de grammaire" was published after the death of the author in; in 1775 Étienne Bonnot de Condillac published a thirteen-volume "Course of Study for the Instruction of the Prince of Parma" the first volume of which was devoted to grammar; in 1776 Antoine Court de Gébelin published his work "Histoire naturelle de la Parole, the grammar of the universe for use in jeunes gens" and others. A review of these works makes it possible to see in them the tendency to value the natural language.

### **The Idea of the Value of Nature in Natural Science**

In the mid seventeenth century natural sciences, the situation seems to be rather calm. Newton is recognized as an indisputable authority, and his theory not only raises no doubt, but receives more empirical evidence. What remains to be done by scientists if Newton has already answered all the questions? The only way out for them was to work on applying his theory to reality, that is, to nature. Scientists had everything they needed – a universal scientific method that was undeniable. Now they only had to direct it to nature. As a result of scientists' work numerous discoveries were made. We have previously mentioned the history of the discovery



of the planet Uranus, the theoretical prediction of which was formed by Kant in 1755, and which was firstly recorded by Herschel in 1781. This was not the only discovery that came about because scientists, armed with Newton's legacy, turned their gaze to real nature. The contribution of Benjamin Franklin to the development of knowledge of electricity, or the discovery of oxygen by British priest Joseph Priestley in 1774, cannot be overlooked here. The latter case is particularly interesting. The discovery of oxygen not only expanded the knowledge of nature, but also liberated natural science from the mirage of "substance of fire". When scientists were asked to explain the nature of fire and the processes of combustion, in 1703 Johann Joachim Becher and Georg Ernst Stahl suggested that combustion occurs due to the presence of certain substance that provides combustion. This substance was called phlogiston. The introduction of this concept meant that scientists sought to explain the phenomenon of fire, and they couldn't come up with anything better because of the knowledge of the time. Phlogiston theory has been dominant in science for half a century simply because there was no worthy substitute. The alternative came only when Priestley discovered oxygen. It was this discovery that made it possible to formulate an oxygen theory of combustion that quickly supplanted phlogiston theory. The new theory was formulated by the French scientist Antoine-Laurent de Lavoisier, who was executed on a guillotine by the revolutionary government in 1794. The discovery of oxygen theory gives reason to call de Lavoisier the founder of modern chemistry, another method of nature study that could emerge only on the basis of a particular interest in it. Interest in nature also covered organics. The greatest scientific revolution in biology took place in 1735, when the first president of the Swedish Academy of Sciences, Carl Linné, published the work "Systema Naturae". Before Linné in biology there was only one classification of living organisms, proposed by Aristotle. The Greek scientist had a tremendous opportunity to get acquainted with the diversity of the living world thanks to Alexander the Great, who from all the countries to which he went to war, sent to his teacher in Athens samples of plants and animals. But even the efforts of the king, who seized territory from the Balkans to the Indus, did not give the materials that were collected by inquisitive scholars after the great



geographical discoveries. Aristotle collected and classified 454 species of animals. In the middle of the 18<sup>th</sup> century 4200 species of animals have already been known. Aristotle's classification could not cope with this number. The new classification was proposed by Linné, dividing the animals into six classes: insects, worms, fishes, birds, amphibians and mammals, and plants into 24 classes. In modern classification, new species appeared that were not in Aristotle's, and some animals have changed their belonging to the species. Thus, Aristotle distinguished whales as a separate genus of animals which have blood. He divided the animals into two types: those with blood, and those without blood. Among the blooded animals he identified five genera: 1) viviparous quadrupeds (mammals), 2) oviparous quadrupeds (reptiles and amphibians), 3) feathered bipeds (birds), 4) footless, living in the water and breathing through lungs (whales), 5) footless living in the water and breathing through gills (fishes). In the new classification, whales became fish. Probably the whales did not notice that their status had changed dramatically and that they were now mammals. The new classification gave impetus to the theory of evolution, the first version of which was created by Jean-Baptiste de Lamarck and described in the work "Philosophie zoologique" in 1809. De Lamarck also pioneered the use of the term "biology" to refer to the science of living organisms.

The achievements of science, based on the interests in nature, have developed a belief in scientific progress (Baczko, 1970: 138). Mind began to be perceived as a means of nature cognition. There were slogans about the conquest of nature. This was reflected even in religiosity. Fascination with the mind even led to such civilizational perversions, when in 1793 the French revolutionaries established the official cult of reason and crowned Thérèse-Angélique Aubry the "goddess of reason", and in 1794, the Convention after the overthrow of the Jacobin dictatorship, led by Maximilien Robespierre, proclaimed the cult of supreme truth a civil religion of the French. Yet this is a terrible extreme. Apart from it, ideas of deism were spread in the minds of European and American intellectuals. Among the followers were Jean-Jacques Rousseau, François Marie Arouet Voltaire, Thomas Paine, Benjamin Franklin, Jean-Baptiste de Lamarck, and John Toland. The Deists believed that God created the



world, but is not interested in it after creation. This philosophical and religious position was appropriate for those who saw value in nature itself, and not in the Creator, who shows his creative grace through it.

## Conclusion

Summarizing the review of the epistemological stratum that dominated in the mid-eighteenth century, it should be noted that material nature was of the greatest interest both in Rousseau's philosophy and in the economics of physiocrats, in linguistics and physics, in astronomy and chemistry. It became an axis of the epistemological layer of that time and space. Unfortunately, in each epistemological layer it is possible to distinguish only its core, while time and space frames remain unnoticed. We can say that the epistemological layer described above reached its peak in the middle of the eighteenth century, but we cannot determine its beginning or end. We can say that this layer was concentrated in Western Europe, in particular France, but we notice its manifestations both in America and the East of Europe. It is also unacceptable to speak of a clear change in layers. When one of them still exists, the other is already born, and when the first falls, the second already conquers minds. When physiocrats flourished in France, Adam Smith was already active in Scotland and laid the foundations for the classical economic theory of liberal capitalism. When Rousseau was acting in France, Kant was already forming his philosophical views in Germany. It would also be wrong to claim that similar ideas are implemented simultaneously in all fields of knowledge. Sometimes it happens that in one realm, ideas are ahead of the same in other realms by several decades.

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**Öz:** Bu çalışmadan önce yazar, tüm biliş alanlarında değerlerdeki genel değişim eğilimlerini ve baskın fikirleri tanımlamakla görevlendirildi. Çalışma sırasında bir dönem ve bir uygarlık alanının farklı bilgi dalları karşılaştırılmıştır. Yazar, içlerindeki gelişmiş eğilimleri analiz etmektedir. O, 18. yüzyıl ortalarında Avrupa kültürü örneğini seçmektedir. Makale, felsefe, ekonomi, dilbilim ve doğa bilim-



lerinin bilimsel paradigmalardaki deęişiklikleri ele almaktadır. Dolayısıyla, bilimsel bilginin tüm alanlarında, doğaya ilgi eğilimi vardır. Özellikle felsefede, insanın doğal durumunun değeri Rousseau'yu "insan doğasına önder" olarak savundu, bu dönemin ekonomisinde, fizyokrat okulun kurucuları Quesnay ve Turgot'a önemli bir katkı var. Sermaye kavramını deęiştiren ve doğanın değerini gösteren dilbilimciler Dumarsais, de Condillac ve Gebelin, dil öğreniminde yani doğal dillere olan ilgiyle önemli bir atılım gerçekleştirdi. Doęa bilimlerinde, bilim adamları ayrıca doğayı aktif olarak inceledi; özellikle, Lavoisier'in yanma teorisinin keşfine ve Linnaeus'un hayvan ve bitki sınıflandırmasının yeniden tanımlanmasına atıfta bulunmaktadır.

**Anahtar Kelimeler:** Biliş, epistemolojik katman, paradigma, bilimsel devrim, doğa.

