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GENERALLY RECOGNIZED SCIENTIFIC CATEGORIES AS A THEORETICAL AND METHODOLOGICAL BASIS FOR SCIENTIFIC RESEARCH. PART II

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Abstract
Aim. Based on philosophical methodology, consider in detail the content of some general scientific (philosophical) categories "content", "essence", "organization", "structure", "integer", "quantity", "quality", "measure", 'leap", "system" and give them a definition in the modern edition.
Methodology. The work was carried out based on a systematic approach using methods of classification and comparative analysis.
Results. Reasoning about the system of philosophical categories because of intellectual activity, which is the systematization of information about a phenomenon and the naming of this phenomenon, is still relevant today. The categories reflect the features of the phenomena of a certain class, the essential properties of the phenomena and the connections between them are recorded. Moreover, based on the content of general scientific categories, methods of cognition are formed. They also have a general scientific character; they participate in all scientific research without exception. This fact attaches particular importance to understanding the essence of general scientific (philosophical) categories, which, working to solve the problems of scientific research, are transformed into methods of scientific research. This circumstance determines the need for a detailed presentation of the content of general scientific (philosophical) categories in their modern version.
Research implications. The results of the study can be used to improve the methodological competencies of both teachers of philosophical disciplines and students.

***Keywords*:** content, essence, organization, structure, integer, quantity, quality, measure, leap, system

ОБЩЕПРИЗНАННЫЕ НАУЧНЫЕ КАТЕГОРИИ КАК ТЕОРЕТИКО-МЕТОДОЛОГИЧЕСКИЙ БАЗИС НАУЧНЫХ ИССЛЕДОВАНИЙ. ЧАСТЬ II

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Аннотация
Цель. На основе философской методологии детально рассмотреть содержание некоторых общенаучных (философских) категорий «содержание», «сущность», «организация», «структура», «целое», «количество», «качество», «мера», «скачок», «система» и дать им определение в современной редакции.
Процедура и методы. Работа выполнена на основе системного подхода с использованием методов классификации и сравнительного анализа.

Результаты. Рассуждения о системе философских категорий как результате интеллектуальной деятельности, представляющей собой систематизацию сведений о каком-либо явлении и назывании этого явления, сегодня по-прежнему актуальны. В категориях отражаются признаки явлений определённого класса, фиксируются существенные свойства явлений и связи между ними. Более того, на основе содержания общенаучных категорий формируются приёмы познания. Они также имеют общенаучный применяются, участвуют во всех без исключения научных исследованиях. Этот факт придаёт особое значение пониманию сути общенаучных (философских) категорий, которые, работая на решение задач научных исследований, трансформируются в приёмы научного исследования. Данное обстоятельство детерминирует необходимость детального представления содержания общенаучных (философских) категорий в их современной редакции.

Теоретическая и/или практическая значимость. Результаты исследования могут быть использованы в совершенствовании методологических компетенций как у преподавателей философских дисциплин, так и у обучающихся.

Ключевые слова: содержание, сущность, организация, структура, целое, количество, качество, мера, скачок, система

Introduction

Taking as a fundamental thesis about categories formed on the basis of techniques, we should continue the reasoning begun in previous issues of the journal. The subject of this study was the categories "content", "essence", "organization", "structure", "integer", "quantity", "quality", "measure", "leap", "system". It is reasonable to assume that interacting elements give rise to new qualitative characteristics of phenomena. What exactly?

Category "content"

First of all, it should be noted: the interactions of elements give rise to the content of phenomena. There are many reflections on this subject in the scientific literature. The most widely represented position is that the content is synonymous with the phenomenon[1]. The above conclusion is developed in the statement that the content is a set of elements, sides, properties, connections, and trends that make up a specific object, process, phenomenon. We can agree that the content is, indeed, a collection of elements. At the same time, it is difficult to recognize as true the assertion that the content is also a set of properties, connections and trends. It is difficult for the reason that in such a wording the content is identified with the form. Of course, they are inseparable, but science involves an accentuated approach to understanding both content and form.

It is difficult to question the conclusion that the content creates the form of phenomena, fills it with a certain meaning. Having considered the above conclusions, we note that strict adherence to the object of knowledge allows us to interpret the category of "content" as a form of philosophical knowledge, reflecting the totality of interacting elements that form it.

Having decided on the content of phenomena, it is logical to ask the question of what is their essence.

The category "essence"

The category "essence", like other categories, in philosophical science is defined in a wide range. Let's analyze the proposed positions.

First, it is important to pay attention to the conclusion that the essence, as a rule, is not revealed at the ordinary, sensual level. It is the subject of special attention of science[2]. As an argument, we cite the following conclusion: the essence is the inner content of the object,

[1] Моисеева Н. А., Сороковикова В. А. Философия: краткий курс: учебное пособие. СПб.: Питер, 2010. 320 с.

[2] Там же.

inaccessible to the senses, its meaning. This premise is interesting in two contexts. On the one hand, an indication of the dialectical unity of essence and phenomenon. On the other hand, the orientation to the fact that the essence is very rarely revealed at the sensory level of cognition of phenomena, since it is a product of scientific cognition.

Secondly, it is traditionally productive to consider the essence as the main thing in the content. We should agree with this. This point of view is defended by many authors in different editions. In the scientific literature there are many conclusions about the connection between essence and the nature of phenomena. On this occasion, we read: "... to know the essence of an object means to understand its cause and the law of life"[1]. It seems fair to us to point out that the essence is organically connected with the laws of the existence of phenomena. A lot has been said about this. In particular: "Essence is a set of deep, internal relationships, laws that determine the main features and directions of development of things, processes, phenomena"[2].

The main, in our opinion, in the nature of the content of the philosophical category "essence" is the understanding that it reflects the totality of the parts of the phenomenon, without which it cannot arise, exist and develop. Moving beyond the objects of analysis, we have the right to state that the philosophical category "essence" reflects the totality of interacting parts of phenomena, without which they cannot exist.

Categories "organization" and "structure"

It is well known that all the phenomena of reality without exception are organized and structured in one way or another. This circumstance is the basis for qualifying the categories "organization" and "structure" as philosophical. At the same time, it is very important to determine their essence, to see their unity and differences. In the interest of solving this problem, let us analyze scientific sources, primarily encyclopedic ones, in which attention is drawn to the essential features of such phenomena as the organization and structure of phenomena. The results of the analysis show that in most cases the organization is considered as the antipode of chaos, while experts in the field of synergetic rightly note that in certain cases chaos gives rise to fundamentally new organizations, but these facts do not cancel the opposites of organization and chaos. In fact, in all encyclopedic sources it is indicated that the organization of phenomena is their structure, device. Despite the actual unanimity in the understanding of organization as the antipode of chaos and a phenomenon that provides the structure, arrangement of phenomena, the authors often differ in detail, which, in our opinion, carry an important semantic load in understanding other essential features of such phenomena as the organization and structure of phenomena.

Not only with systems, but also with all phenomena, the authors of the source associate the organization, in which it is stated that the organization is the structure, the device of something. With this approach, it is obvious that all phenomena have an organization. And this is fair. At the same time, there is also a debatable component in their opinion. In particular, when they state that organization is, among other things, also a structure of phenomena. Further we will show that the identification of organizations and structures is erroneous.

In the literature, the concept of organization as a degree of internal order, consistency of parts of the whole has been established – a certain structure, structure, type of connections as a way of connecting elements into a system. In this conclusion, the organization is considered as an internal order of parts that form a whole, as a structure, structure, type of connections, as a way of connecting elements into a system. Once again, we note that it is difficult to find a sufficient basis for considering only systems organized without seeing at the same time the difference between the organizations of

[1] Тарасов Ю. Н. Философия: учебное пособие. М.: МПСИ: МОДЭК, 2006. С. 462.

[2] Бучило А. Ф., Исаев И. А. История и философия науки: учебное пособие. М.: Проспект, 2021. С. 109.

phenomena and their structures. But the remark that the organization ensures the integrity of phenomena seems to us important and essential.

In this regard, the authors of those sources that directly indicate the connection between the organization of phenomena and their integrity are right. It seems to us that the organization of the phenomenon is formed by their elements, which are in a state of all-connectedness. Behind the "board" of the organizations of the phenomenon are their elements that did not fall into the mechanism of all-connectedness.

Thus, an organization is: a) a set of elements and parts of phenomena that are in a state of all-connectedness; b) providing their structure, device; c) whose interactions determine the integrity of phenomena. The philosophical category "organization" is precisely intended to reflect at the scientific level the named signs of the phenomenon of being of the same name. Phenomena that lack structure cannot have organization. As well as vice versa. In other words, organization is always structured and structure is always organized.

Before expressing our opinion on the content of the philosophical category "structure", let's analyze the points of view on it presented in the scientific literature. Let's represent them positionally. Position one: structure is the interactions between elements. Position two: structure is the structure, arrangement and connection of the constituent parts of something. The second position differs from the previous one in that it speaks not just about the interaction of elements, but about connections as the most stable interactions of phenomena. In addition, it contains a clarification that the structure of phenomena is formed not by connections between the elements of certain phenomena, but by connections between their parts, that is, the most important, significant elements. Position three: structure is a diverse hierarchical relationship between phenomena. Hierarchical relationships, as it is known, differ from arbitrary, disordered relationships in that they are correlated, coordinated, and subordinated. The indication that structure is a way of regular connections between parts and only parts is interesting, but not indisputable. The fourth position: the structure should be considered in unity with the sign of the integrity of the phenomena of being. At the same time, the conclusions of supporters of this position may differ. Some believe: "Structure is a set of stable connections of an object that ensure its integrity"[1]. The same point of view is presented in a literal version in other works. As you can see, in them the structure is considered as a certain determinant of the integrity of phenomena.

There are many works in which the connection between the structure of phenomena and their quality is noted. For example: "Structure is the interconnection and interdependence of the elements of an object, ensuring its qualitative specificity and preservation of properties during various changes"[2]. In this study, not all points of view on the essence of such a phenomenon as "structure" are given. Starting from the ontological basis of the knowledge of phenomena, let us name the main essential features of the structures of phenomena.

1. Structures are interactions of elements of phenomena.

2. Structures are interactions of phenomena coordinated in a certain way.

3. Structures are all connections of both elements and parts of phenomena.

4. Structures are invariant, stable interactions of elements and parts of phenomena. Of course, the invariance of these interactions cannot be absolute. You should see their relative stability.

5. The structure of phenomena ensures their integrity, works to preserve it.

Thus, the philosophical category "structure" is a reflection of the invariant (relatively stable) mechanism of the all-connectedness of elements and parts of phenomena, which forms their integrity. The problem of the integrity of phenomena is important, but it is interpreted in the scientific literature very ambiguously.

[1] Структура // Философский энциклопедический словарь / ред.-сост. Е. Ф. Губский. М.: ИНФРА-М, 2009. С. 439.

[2] Тарасов Ю. Н. Философия: учебное пособие. М.: МПСИ: МОДЭК, 2006. С. 460.

Category "integer"

Let's try to systematize the views of scientists on the essence of the philosophical, general scientific category "integer", presenting their totality of certain conclusions.

– the category "integer" is philosophical. This is true, since the integrity of phenomena is a universal characteristic of the phenomena of nature, society and consciousness. Recognizing the philosophical status of the category "integer", many authors associate the integrity of phenomena with their parts.

– the above conclusions guide us to understanding the connection of the integer with the structure of phenomena.

– far from all researchers consider the integer as a unity of only parts of phenomena. Often the whole is interpreted as the unity of both parts and elements, which seems important. In particular, in the same source one can find confirmation of what has been said: "The integer is a set of interrelated parts, as a result of the interaction of which new integral properties, patterns that are not characteristic of separate components arise"[1]. In this statement, the whole is presented as a collection of interrelated parts. Literally on the next page of the same work, we find: "... the categories "integer" and "system" are distinguished, because in the concept of "integer' the emphasis is on new integral properties of interconnected elements, which cannot be said about summative systems"[2]. In this context, the whole is presented as the interconnection of not parts, but elements of phenomena.

– any integer – something complete, complete, integral, in which there is everything necessary. In this regard, one of the encyclopedic remarks is interesting: "Integrity is completeness, totality, integrity and its own regularity"[3]. At the same time, it must be remembered that the state of integrity is conditionally relative, changeable, not absolute.

If we integrate the above conclusions and connect them with the ontological basis of the category "integer", then we can propose the following definition of the category "integer". The whole is a philosophical category that reflects the facts of the existence of real phenomena that have all the necessary elements and parts, and their connections determine the emergence of integral properties in integral phenomena[4].

Categories "quality" and "quantity"

All internal parameters of phenomena have both quantitative and qualitative certainty. Let us first consider the quantitative parameters of the phenomena. To do this, it is necessary to strictly define the content of the category "quantity". In accordance with the approach to determining the essence of philosophical categories established in this work, let us consider the ideas presented in modern scientific literature regarding the category "quantity": it is interpreted through the parameters of phenomena – number, size, volume, weight, shape, size, numerical certainty; it is interpreted as a certain phenomenon, unrelated to the qualities of certain phenomena. In particular: "Quantity is the common thing in things, which is indifferent to the specific content and qualitative certainty of the object"[5]. Indeed, one should recognize a certain indifference of quantity to the quality of phenomena. At the same time, it cannot be absolutized, since this leads to ignoring the operation of the universal law of the mutual transition of quantitative changes into qualitative ones and vice versa.

There are also such opinions, according to which the quantity is directly related to the degree of expression, intensity of the properties of objects. The quantity, indeed, one way or another reflects the intensity

1 Философия: учебное пособие / отв. ред. Е. Г. Кривых. М.: МГСУ, 2014. С. 87.

2 Там же. С. 88.

3 Целостность // Философский энциклопедический словарь / ред.-сост. Е. Ф. Губский. М.: ИНФРА-М, 2009. С. 507.

4 Кокорин А. А. Методология научных исследований: учебное пособие. М.: Московский государственный областной университет, 2015. С. 174.

5 Количество // Философский энциклопедический словарь / ред.-сост. Е. Ф. Губский. М.: ИНФРА-М, 2009. С. 406.

of changes in the qualities of phenomena, however, the question of indicators of the intensity of changes in the qualities of phenomena remains open. In addition, the observation that quantity is the intensity of change in the properties of phenomena is contradictory. If we consider properties as external stable manifestations of the qualities of phenomena, then it should be recognized that the quantity is organically related to the quality of the analyzed phenomena, and therefore, to the intensity of changes in the qualities of phenomena. Quite often, quantity is integrated not only with quality, but also with the essence of phenomena. In particular: "... quantity is a set of such changes in a certain system, which, characterizing the homogeneity, similarity of elements, systems, subsystems, are not identical to a change in their essence" [1]. The idea is productive and interesting, but not strictly defined. There are doubts about the accuracy of the definition of the concepts "quantity", "quality", "essence". If they were strictly defined in dialectical interaction and dialectical relations, then there would be less doubt.

Following the universal features of phenomena, we propose the following definition of the philosophical category "quantity", linking its essence with two important features – the number and rate of changes in the qualities of phenomena. So, quantity is a philosophical category that reflects the number of elements that make up cognizable phenomena, the duration and pace (intensity) of changing their qualities. Following the quantity, we will consider the positions presented in the scientific literature regarding the content of the category "quality": "quality is a philosophical category that expresses the essential certainty of an object, due to which it is precisely this and not another"[2]. The essence of this common view is rooted in Hegel's conclusion that quality is what makes a thing that thing. Quality in one way or another is associated with the internal features of phenomena by elements, structures, organizations, forms of organization of elements, the architectonics of their connections. "Quality is nothing but the unity of all properties of a given object"[3]. This conclusion acquires a certain development in the following interpretation: "... quality is such a certainty of an object that reveals itself as an integral characteristic of mutually exclusive properties that determine its existence, in contrast to the existence of other objects"[4]. Here quality is presented as an integration of the properties of a particular phenomenon, and not just their unity. This translates the understanding of the essence of quality into a somewhat different plane. The presentation of quality as a system is interesting. At the same time, the disadvantage of such a position is that we are talking about a system of properties of phenomena, and not about elements, parts. It is well known that properties are an external manifestation of the qualities of phenomena. In addition, some authors associate quality only with the internal features of phenomena, their certainty, while others believe that it organically connects both their internal and external certainty. This creates a certain contradiction. Summing up, we note that quality is such a certainty of phenomena that makes them integral and stable; it integrates both the internal and external certainty of objects, being the basis for identifying their differences and similarities, which make it possible to classify the phenomena of being.

Perhaps, of all the above conclusions, only the assertion that the category "quality" is a combination or system of properties of phenomena is doubtful. This doubt is not unfounded, since traditionally in the scientific literature properties are interpreted as external, stable manifestations of the qualities of phenomena in the environment. Thus, paying tribute to the researchers of the philosophical category "quality", it should be noted that quality is a certainty that makes a particular thing this thing. Without doubting

[1] Количество // Философский энциклопедический словарь / ред.-сост. Е. Ф. Губский. М.: ИНФРА-М, 2009. С. 406.

[2] Качество // Новый энциклопедический словарь / отв. ред. А. П. Горкин. М.: Большая Российская энциклопедия: Рипол Классик. 2007. С. 495.

[3] Там же. С. 495.

[4] Там же.

this approach in the main thing, nevertheless, we note that it does not give an answer to an important question – what generates the named certainty of the phenomenon? The answer to the question is there.

The category "quality" reflects the essence of the unique, sustainable ways of connecting elements into a whole. These ways (certain sequences of links between elements) ultimately make each specific thing exactly that thing.

Categories "measure", "leap", "system"

Understanding the essence of quantity and quality concretizes the category of "measure", expressing their dialectical relationship. The overwhelming majority of researchers are unanimous in their understanding of the category "measure". First, it expresses the dialectical unity of the quantitative and qualitative characteristics of an object; secondly, it reflects the boundaries, intervals, zones within which the qualities of phenomena are modified. This summary hardly needs any additions. The named category is organically connected with the philosophical category "leap". In the scientific literature, its essence is interpreted without any particular contradictions, but with certain nuances. They are easy to understand by paying attention to the following conclusions: "A leap is a philosophical category that expresses the nature of the transition of a thing from quantitative to qualitative changes, from one qualitative state to another, a decisive turn, a radical change in the development process"[1]. There is hardly any need to comment and detail the above definition. In our opinion, it expresses all the main ontological features of the phenomenon, the essence of which reflects the category under consideration. Reflecting on the essence of categories that reflect the internal features of phenomena (content, essence, organization, structure, whole, quantity, quality, measure, leap), one cannot ignore the category "system".

There are several reasons. Thus, in the scientific literature there is a struggle between those who consider the category "system" to be general scientific, and those who qualify it as a philosophical category. We are deeply convinced that the category "system" is philosophical, and therefore general scientific. This conclusion can be substantiated by the following theses: the systemic quality of phenomena should be qualified as their most perfect organizational and structural state; all phenomena tend to be systems, but not all become systems; in every unsystematic phenomenon there are elements that are systems; in each system there are elements that are not systems, but they do not determine the main trends in the development of phenomena-systems; phenomenon-system under the influence of conditions, causes and grounds may lose its systemic quality; systemic and unsystematic states of phenomena can replace each other. The systemic state of phenomena is always higher in quality than their unsystematic state.

The system is a complex of interacting elements. Its author is the Austrian biologist L. Bertalanffy, who is considered to be the founder of systems theory. Without belittling the role of the named researcher, we note that long before him, the concept of a system was widely used in the works of many scientists, including philosophers: Aristotle, Hegel, Fichte, Scheling, Marx, etc.

From the standpoint of modern science, the accuracy of the definition proposed by L. Bertalanffy is questionable. Indeed, all systems are complexes of interacting elements. At the same time, all phenomena are also complexes. It follows from this that the named sign cannot be the basis for distinguishing between phenomena-systems and non-systemic phenomena. In addition, the acceptance of the interaction of elements as the main feature of systems means that all phenomena of being should be considered as systems. However, practice daily convinces us of the opposite: both systemic and unsystematic phenomena of the world around us really exist. There are researchers who, in our opinion, mistakenly believe that all

[1] Современная мировая философия: учебное пособие / под ред. А. С. Колесникова. М.: Академический Проект: Альма Матер, 2013. С. 79.

"objects of the material world, as well as the spiritual one, can be considered as systems" [1; 2].

Paying tribute to L. Bertalanffy as the creator of systems theory, we note that modern science and its methods of cognition allow us to see many essential features of phenomena-systems. Although even today many researchers adhere to the traditional approach to the essence of systems, presenting it variably [3; 4; 5; 6]. In particular, there is a statement that the system is a set of elements that are in an ordered interaction. Often the essence of systems is interpreted as a set of elements and their connections, not interactions, but just connections of elements. The system is a kind of integral formation. It is defended by a large group of researchers who believe that all systems, without exception, are a complex of elements that form phenomena.

The system is the unity of the composition (components) of phenomena and their structure. They represent the latter as an order, organization of elements, relations of their subordination and coordination, hierarchy. Undoubtedly, systems, like virtually all phenomena of being, have a characteristic of structure. This fact does not allow us to consider it only as an essential feature of the system. Systems have the ability to self-organize [7; 8].

Very often this sign is qualified only as a sign of material systems. In our opinion, it is inherent in all systems. Highlighting the main features of systems, it should be noted that any system tries to maintain integrity, that is, the internal energy of this system plus the kinetic energy of its particles must be greater than the energy of external influences; each system is built on the principle of optimality; in a system the law of the part is not equal to the law of the whole; the system is hierarchical, it has main and secondary parts, elements; the system is adaptive, changes its behavior under the influence of external influences; it changes either in the direction of lowering or in the direction of increasing the organization; in an ordered system there are elements of chaos; each system has its own dynamic rhythm;

– there is an increase in the rate of development in the system; processes of differentiation and integration of connections and elements are going on in them; the system has a goal, the process of self-management is directed not to any, but to a certain result; in the system there is an increase or decrease in its information capacity; it stores information about its past dynamic state [9; 10].

Analyzing the proposed version of the features of systems, we note the following. First, all these features are present in different systems. Their set can be qualified as a meaningful, rather than an essential characteristic. Secondly, only some of the above signs can rightfully be called essential and universal. Thirdly, there are certain repetitions in approaches to the features of systems.

Conclusion

It becomes obvious that the reasoning about the system of philosophical categories as a result of intellectual activity, which is the systematization of information about a phenomenon and the naming of this phenomenon, is still relevant today. The categories reflect the features of the phenomena of a certain class, the essential properties of the phenomena and the connections between them are recorded. Moreover, on the basis of the content of general scientific categories, methods of cognition are formed. They also have a general scientific character, they participate in all scientific research without exception. This fact attaches particular importance to understanding the essence of general scientific (philosophical) categories, which, working to solve the problems of scientific research, are transformed into methods of scientific research. This circumstance determines the need for a detailed presentation of the content of general scientific (philosophical) categories in their modern version.

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