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© Andriy Kalytyuk
(Chernivtsi)

INTERDEPENDENCE OF INTEGRATION AND DIFFERENTIATION IN THE FORMATION OF CONTEMPORARY PHILOSOPHY OF SCIENCE

The article analyzes the problems of different approaches to the understanding of integration and integration processes in science and philosophy, and the reasons that activate the integration processes in contemporary philosophy of science and scientific knowledge. At the same time it is noted that science alone can not combine all forms of scientific knowledge into a single, as it examines the object through the mechanism of differentiation. However if we reject differentiation in science it will cease to be a science in its classical meaning.

Keywords: integration, differentiation, science, philosophy of science, knowledge, scientific knowledge, scientific methodology.

The objective of the article is to clarify the different approaches to understanding integration in general and integration processes in science and philosophy in particular and causes that stimulate integration processes in contemporary philosophy of science and scientific knowledge as a whole. In other words, to answer the question: what is the content of integration and integration processes today? What causes its growing and deepening in the modern scientific knowledge?

First of all it is important to emphasize the strict interpretation of the term "integration", its sources and objectives. On the one hand the integration is considered as one of the defining features of scientific knowledge, which aims to build a single structured science. But on the other hand without the loss of the disciplinary structure of science, it is conserved. However, the most important in this opinion that ultimately science must necessarily be one cohesive discipline. For example, V.S. Lutay describing integrative processes and integration itself in scientific knowledge, noticed: "Integration is one of the most important tools to achieve the integrity of knowledge in all types and forms of expression: structural, meaningful, scientific, organizational, logical and epistemological ..." [2]. M.H. Chepikov gives a clearer challenge of integrating scientific knowledge through the context of the above interpretation. He stresses that "a common conceptual apparatus of science should play an important role in scientific notions" [8] that "cognitive depth of conceptual apparatus of a unified science will penetrate deeper into the essence of processes and phenomena of the material world" [8].

From another perspective, integration is interpreted by examining its relationship with the reverse process – differentiation, where the emphasis is on the process of differentiation as a leading process in the formation of scientific knowledge that most clearly depicts the contents of this knowledge. If we consider the integration in terms of similar approach, it will be seen as an artificial that is introduced from outside. That is why integration occurs only sporadically in scientific knowledge and knowledge without impacting severely on the properties of scientific knowledge. This view is supported by A.L. Nikiforov. He points out that: "Differentiation of science is a universal trend or pattern of more scientific knowledge. Instead, integration processes are temporary and local"[4, 275].

In this case it has to do with parity, namely the equality processes of differentiation and integration in scientific knowledge. That is what these two processes simultaneously represented in science; they interact and complement each other.

The process of integration that arises as a result of the integrity of scientific knowledge is interpreted as the largest development of scientific knowledge. Science is rather unusual for the development of knowledge, and in one case even as one of the processes of scientific knowledge that coexist at the same time with the process of differentiation of knowledge. The main question

here is whether there is a connection between integration and integration process of the development of scientific knowledge and science in general or whether it is a mere speculation. These questions are important because answering them negatively can be argued that the integration process does not affect the development of scientific knowledge.

A.L. Nikiforov says that the integration process is not a process by which scientific knowledge unifies, on the contrary, the originality of scientific knowledge lies in its differentiation. Minor this view can be seen in the positions of other researchers. The presence in the structure of scientific knowledge of these two processes demonstrates the impossibility of implementing its unity, because integration is designed to facilitate the unity of scientific knowledge, and differentiation by contrast, do resist such attempts.

In this case, the critical issue is how interrelated processes of integration and scientific knowledge, and what is the role of integration in the system of scientific knowledge? This question leads back to integration as a concept, as the meaning that it holds.

The term "integration" (from the Latin. intergratio – restoration, filling, from integer) "the side of the process that is generally associated with the union of heterogeneous components and parts" [6, 210]. Based on the interpretation of the term "integration", one of the most characteristic understandings is the concept of "whole" because it reflects on the state of knowledge itself, which in the end to be achieved. Integrity (integer) "expresses integrity, autonomy, self-sufficiency projects." [6, 763]. Whole predetermined specific purpose is in reaching this conclusion, and expressing in any of its final forms. Although the correlation between "integration" and "whole" is a lot of unknown, for example, their mutual dependency definitions when the term "integration" is explained through the "achievement of a" and accordingly "whole" as "integration of objects", it can be argued that understanding of integration depends on the ideas that at this point is holistic.

The process of integration also depends on the search of the whole, which can have many interpretations, hence the complex aspects in the interpretation of the integrative processes and integration in scientific knowledge. After understanding integration as a process that leads to the ultimate goal of scientific knowledge, which is reaching the integrity and understanding the process that has only a random relationship to science and no significant effect on the development of scientific knowledge, shows no such difference in understanding the content of this term as the difference in the assessment of the probability of the objectives of integration in scientific knowledge. M.H. Chepikov believes that the prospect of creating a single integrated science, A.L. Nikiforov, in contrast, believes it is impossible or says that if something similar happens and then it’s not science. "If today various sciences ever merge into one science, one language and one theory, it will not be what we now call science" [4].

Described extreme positions lead to such categorical ratings or integrations that are among the leading processes in the formation and development of scientific knowledge. Integration is a process that essentially unrelated to the development of scientific knowledge. On the one hand the integration process is characteristic of scientific knowledge, but there is a process with such a differentiation. We need to make a start with the evidence of the opinion that if there is no difference, then it must be combined. On the other hand often integration predetermines factors that are beyond science. Although we cannot fully agree with this, as in science occurrence of integration processes are possible. One has only to clarify that the purpose of the integration process within science will not achieve the integrity and unity of scientific knowledge. Perhaps it is that such processes illustrate the relationship between scientific fields. Such communication can occur through the use of generally accepted scientific methods in different disciplines or methods involving one science to another.

Just important to emphasize that the nature and purpose of integration will depend on what exactly caused this process. Thus, depending on various factors integration can move to achieve the integrity of scientific knowledge, and can only reflect the process of stopping the development of scientific knowledge. For this reason, the emphasis is on the analysis of interpretations of "integration", which shows that the integration process is a kind of filling, renewal, commitment to integrity. However, integrity may be different. On the one hand we are talking about the integrity

of scientific knowledge, and the other, the unity of different types of knowledge (scientific, philosophical, and religious), and finally, the integrity of cultures [1].

Integrity and unity are characterized as such that are outside the system, within which integrative processes is formed. Therefore claiming that the integration process is a single process wouldn't be correct. Integration process is characterized by multifaceted, multilevel, as well as renewable eventually integrate unity. This achieved integrity will reflect the unity of the system. But we must stress that it is unity, not uniqueness. Only then the integration of differentiation can coexist simultaneously, and not as the replacement of each other.

Formation of scientific knowledge and expertise in modern terms provides the same part in it processes of differentiation and integration. This equality allows combining the development and establishment of cultural science, public, government, individual, etc. interests [7, 29]. Moreover, to say that the current state of science points to the need for scientific communication demands of man and society, with such requests, which are often not related to the functioning of the internal needs of science (focus on value-neutral, object ' an objective truth). Without it, science is an autonomous, self-sufficient, unmanageable system of knowledge production, whose existence threatens the livelihoods of people and society. The threat of nuclear war, environmental hazards, etc., all this is an expression of risk elements that suggest human society the urgent need for correlation of internal structures of scientific knowledge and external to the needs of scientific community, and most importantly – to human.

In this respect, understanding integration feature, above all, a stipulation in restoring the integrity of the structure of scientific knowledge and algorithms for social and individual development. Such specificity integration process does not involve folding processes of differentiation of scientific knowledge, and directs that within the system of scientific knowledge to fully take into account the needs of the individual and society. It is necessary to relate the diversity of scientific knowledge, multiple industries with multifaceted manifestations of man and society [7, 5]. It is correct to say: focus on interdependence and connection of these systems, refer to their integrity. However, the question arises: How achieve this? How to combine scientific knowledge system with the human system? It is clear that their unity cannot be denied, but it should be realized by unity more intuitive, and viewed as an essential guide. While in practice is very difficult to implement, it is always accompanied by uncertainty. This is the main difficulty of integration processes in contemporary philosophy of science.

Integration has the character of global proportions for scientific knowledge. It makes its entry into the various systems of knowledge. It all blurs the boundaries between branches of scientific knowledge. Most new discipline context does not absorb, they continue to have their self-sufficiency. However in the new content the new features are designed to change the old boundaries of their borders. For example, the existence of such science as genomics, led to the discovery of many new features that are important outside the scope of the human genome. Accordingly, there are wider possibilities to use the results of genomics in paleontology, archeology, linguistics, ethnology, etc. Integrated knowledge of these disciplines "dissolved" categorical difference between doing these differences are more uncertain.

At the same time, this fact shows that the integration of scientific knowledge is implied, that are social in nature, which allow the application of scientific knowledge to solve social or other problems. It is also important to clarify that this type of integration processes are global because they are trying to restore the integrity of the extremely large systems of knowledge. Therefore integrity, which is the main goal of integration, has more blurred appearance.

It is a mistake to argue that science itself does not exercise integrative processes within itself that it is not needed. Integrative processes occur within the science, but their task, the unity and integrity of scientific knowledge seems inaccessible. Firstly, this is because science itself acknowledged the presence of various types of realities that are do not match together. Secondly, science has a different system of social and cultural factors that include its absorption in human life and society and, therefore, the inability to integrate any reasons within that science itself.

Because of this integration process, called local nevertheless caused social and cultural needs in the vision of scientific knowledge and the only integral to the process of differentiation.

This can be seen addressing the prerequisites differentiation of scientific knowledge. One might ask why science needs the processes of differentiation. It occurs because the object of scientific knowledge is the subject to division. Bold new object or a selection of some of the new elements of the old object gives rise to qualitatively new discipline. That is why the integration process cannot be caused by the same reasons. It is not due to the fact that science in understanding the integrity of scientific knowledge is a kind of idea that is inherent in this science from the outside, not the science generated. A.L. Nikiforov cleverly mentioned: "The unity of human knowledge at various times was provided by myths, religion or philosophy. This unity was never the unity of science "[4, 275]. That is why he rejects the view that science inherited the integration processes.

So why does the present integration processes in scientific knowledge acquire actualization? It is believed that the integration process depends on socio-cultural needs, social factors, which focus on how to use science to solve problems in every sphere of human life and society. Such type of problems lead to the formation of highly complex objects so complex that attempts of only one discipline to solve them are not enough, it is necessary to introduce a large number of sciences.

The complexity of the facility provides a structure in which there are different degrees of structural system, different types of reality, and various aspects relating to the operation of the facility. Exploring an object by reductionism means to simplify the idea of it. This can lead to the fact that the object is studied in the form in which it appeared to scientific community. Therefore, only the integration of scientific knowledge is able to allow explore complex objects, where each specific discipline, which retains its specificity, represents the knowledge of the part of the object. But this turns into complexity, the need to connect this knowledge to format a unity. It is also important to understand that science alone cannot do this because it examines the object through the mechanism of differentiation. This once again confirms the view that integration processes are caused by social and cultural factors.

Integration of scientific knowledge extends through method of learning where knowledge we gain not form the basis for systematization of different descriptions of the object, and when this knowledge structuring principle for the involvement of knowledge and knowledge of the whole. All obtained specific scientific knowledge should be regarded as knowledge in the context of something which is much more uncertain. In other words, limited problem solving within a discipline is not possible; it is necessary to think about how the solution of these problems can affect various aspects of knowledge and human society.

In other words nowadays in scientific knowledge integration provides a correlation knowledge which only promote their problematic. Integration of knowledge is a response to the collision of science and human society with extremely complex problems. Features an understanding of the extent of these problems in modern terms is what makes integration necessity [3, 62-63].

In many ways it is a question of a new form of science and scholarship, which played one of the key roles. Especially it concerns the integration function of knowledge, which rejected simply not possible to present a perspective of science.

It is extremely important for science and even from the other side, its industry (arts and science) no longer to be competing models, but to be considered only as complementary parts. Therefore we can identify three paradigms in science, which define its relationship disciplines and show the integration of knowledge in these paradigms [5]. These paradigms are scientific, philosophical, and problematic. The first guideline is a major paradigm sciences division, not union, the second paradigm of philosophy is the foundation for uniting science, and the third paradigm of scientific field accumulates the foundation of everyday problems.

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Богдана Манчул
Андрій Калитюк

Взаємозв'язок інтеграції та диференціації у формуванні сучасної філософії науки

Стаття присвячена аналізу проблеми різних підходів у розумінні інтеграції та інтеграційних процесів у науці та філософії і причин, які активізують інтеграційні процеси в сучасній філософії науки та науковому пізнанні. Водночас відзначається, що наука самостійно не може об'єднати у собі всі форми наукового знання в єдине, оскільки вона вивчає об'єкт через механізм диференціації. Водночас відмовитися від диференціації ніяк не можна, оскільки наука перестане бути наукою в класичному її розумінні.

Ключові слова: інтеграція, диференціація, наука, філософія науки, знання, наукове пізнання, загальнонаукова методологія.

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