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# THE SCIENTIFIC WORLD PICTURE: INTERACTION AND INTERRELATION TENDENCIES

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# НАУКОВА КАРТИНА СВІТУ: ТЕНДЕНЦІЇ ВЗАЄМОДІЇ І ВЗАЄМОЗВ'ЯЗКУ

***Purpose.*** *To investigate the historical development of the scientific world picture formation, to analyses the relationship between philosophy and science, to define the role of philosophy in the formation process of the scientific world picture.*

***Methodology.*** *The features of the scientific world picture formation at every stage of history are explored. The sciences evolution process is analyzed and the predicted future unified science is revealed.*

***Findings.*** *The formal organizational science development is found out and the philosophy as foundation of all sciences is determined. The connection between integration processes and scientific knowledge differentiation is described. It is revealed that the equivalence relation which established between the philosophical assumptions and scientific considerations is not only makes explicit the inner character premised relations, but also the logical aspect of the mechanism of the relationship between philosophy and science.*

***Originality.*** *It is found out that the basis of scientific knowledge in the scientific world picture become philosophical categories and fundamental scientific concepts through which reveal the most important properties and laws of the material world.*

***Practical value.*** *The identification of the relationship between philosophy and the scientific world picture is the practical significance of the article.*

***Key words:*** *the scientific world picture, integration and differentiation of scientific knowledge, philosophical premises.*

**Problem statement.** Man's consciousness of reality is based on the scientific world picture that allows us to objectively perceive information and more balanced decisions in the course of interaction with reality. In turn, the scientific world picture of society is based on integration and differentiation existing in a certain historical period of scientific knowledge, where philosophy serves as foundation and methodological foundation.

In modern conditions, the widespread introduction in all aspects of scientific and technical progress of the integration of science plays a particularly important role in its development, and that determines the relevance of the theme.

**Analysis of researches and publications.** The general theoretical aspects investigation of the scientific world picture formation process on its relation to philosophy, science and the analysis of its historical evolution stages is presented in the scientific works of many scholars, among them Kozubtsov I.M., Kumeda T.A., Marakhovskyi L.F., Rosul T.I., Sushchenko L.O. Uiomov A.I.

**Purpose of the article.** To investigate the historical development of the scientific world picture formation, to analyses the relationship between philosophy and science, to define the role of philosophy in the formation process of the scientific world picture.

**Exposition of basic material.** The concept of "the scientific world picture" came into science in the middle of the XX century. However, its content is still insufficiently defined. In Ukraine, it was first formulated in the "Philosophical Dictionary", where defined it as a special form of theoretical knowledge, which represents science study subject according to its historical development stage, by which specific knowledge is integrated and systematized and gained in various fields of scientific research [1, p. 324].

Overall, the world picture is considered by scholars as a necessary and indispensable condition of scientific reality existence, because structured knowledge forms a discourse that defines the movement and scientific thought development. However, the scientific reality is not limited to the scientific world construction, as it is a system of rules that determines the activity of the subject, and the scientific world picture that defines the boundaries of the actual research and its results. During the period of the scientific world picture changing, when new knowledge is expanding scientific discourses, the worldview theoretical core (constants common to all theories) and the fundamental principles remain the same, they modifying to a certain extent. Building the scientific world picture takes place directly in the scientific theorizing world, but it sets the parameters for the development of other human life spheres [2, p. 297].

The classical world picture is based on the Galileo and Newton achievements, is inherent linear development with a clear phenomenon and processes determination and the absolute empirical knowledge dominance. Therefore, the scientific world picture has become an object of scientific interest especially prominent physicists. In particular, Hertz under this concept implies a set of internal images of external objects, from which information about the behavior of these objects can be obtained in a logical way. P. Dyshleviy believes that the scientific world picture – is a synthetic, systematic and holistic nature view at this scientific knowledge stage [2, p. 298]. The main drawback of these approaches is in attempts to explain the scientific world picture phenomenon on the abstract and out of subject basis, which ignoring the personal and socio-cultural settings learning process regulative.

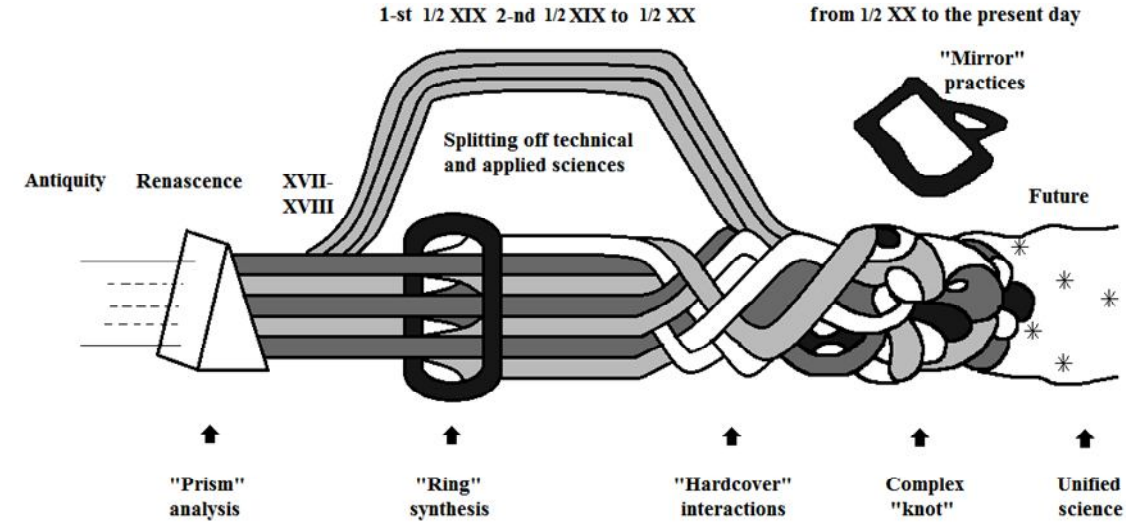
The transition to the non-classical world picture occurs under the influence by the relativity and thermodynamics theories, which questioned the classical mechanics laws. The flexible system of determination appears in the non-classical world picture. They take into account the randomness factor and personal position [2, p. 297].

The current scientific world picture stage of development associated with the formation of post-non classical science, which is characterized by increased synthesis processes of disciplinary knowledge. This synthesis is strengthened based on the principles of global evolutionism. Feature of the current world picture is not the desire to standardize all areas of knowledge and the unity and disciplinary ontology diversity. Each of them becomes part of the whole complicated, specifying within themselves the global evolutionism principles [3, p. 319]

Strengthening the sciences linkages is the main modern development tendency, the analysis of which is shown in Figure 1.

The science evolution can be summarized as follows. In ancient times, there was a single indivisibility (diffuse) science that studies the world as a whole, it reflected in a diffuse state. Later comes the sciences differentiation stage because of their separation: each individual (private) science had only one ($k$ times) its own thing and a single-valued relationship existed for all $n$ sciences, therefore, $k$ times. So the separateness and functionality principle was done. Then the time sciences integration through their differentiation comes. It implemented the comprehensiveness and substrate principle: firstly, one object is studied by $n$ sciences, secondly, one and the same sciences study $m$ different objects, and this situation is repeated countless times as the number of objects to be studied is virtually unlimited. Finally, it

is predicted that the future science will study (globally) the whole world, in all its manifestations, wherein the private and complex sciences will save subordinate, but relatively independent position, depicted in the form of dots inside the white band [4, p. 15].




| Diffuse undifferentiated science stage | Sciences stage differentiation through their disunion | Sciences integration stage through their differentiation | | | The principle of the substrate with the subordinate feature functionality | |
|---|---|---|---|---|---|---|
| | | Through the "bridges" formation between the sciences | Through the sciences interplay | Through close association sciences | | |
| | Basic sciences appearance | | | | | |
| | | Sciences transient appearance | The emergence of core science and interdisciplinary areas | The emergence of integrated science | Global science (with internal departments) | Global object (the world) |

Figure 1 – Scheme of the science evolution [4, p. 16]

The formal organizational science developed as follows. It appeared together with the philosophy in ancient Greece called “physics” (science of nature): physics is the first historical form of ancient Greek philosophy. All of the first Greek philosophers before Socrates (pre-Socratics) were physicists. Socrates first in philosophy introduced “Ethics” (in the modern sense, is equivalent to the social sciences) and “Logic” (corresponding to the sciences of cognition and thinking), and physics began to take third position. Later “Metaphysics” created by Plato and Aristotle (speculative science about the basics of life) was “first philosophy”, and physics – “The second philosophy”. At the same ethics and logic does not correlate linearly with the physics and metaphysics. Logic – it is not a branch of philosophy, and the cannon of all scientific knowledge, including metaphysics, physics and other sciences. Ethics refers to the practical sciences, and metaphysics and physics – to the theoretical. Next, next to the “physics” occurs and used her Latin counterpart – “natural philosophy” (philosophy of nature). Therefore, the public, the majority of humanities, natural sciences are integral parts of philosophy [5, p. 345].

Thus, historically, the philosophy is science, and all sciences are “a certain philosophy”: the bases of all the sciences are in philosophy.

Based on this approval, scientists L.F. Marakhovskyi and I.M. Kozubtsov compared the decomposition process of philosophy on research areas with allegorical analogue physical prism action principle.

This prism decomposes complex monochrome light (philosophy) on the spectra (aspects, research areas).

Prototype and intuitive explanation of this process is presented in Figure 2.

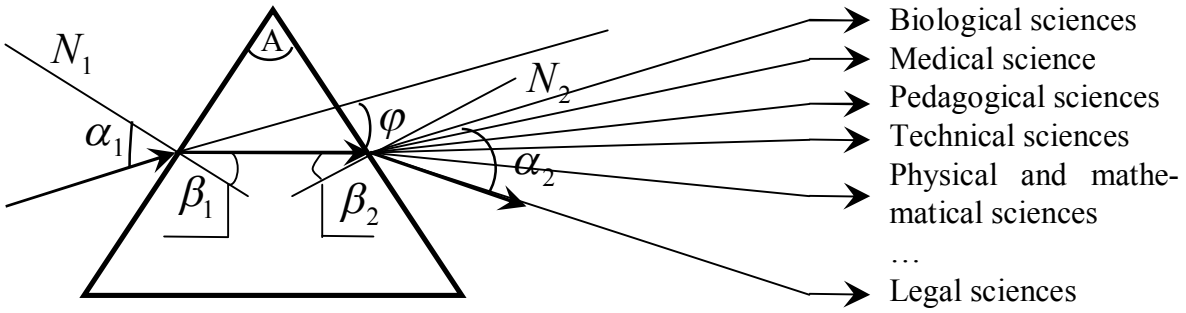



Figure 2 – Explanation of the interdisciplinary prism principle [6, p. 654]

The philosophy has a universal categorical apparatus and penetrate total intellectual field of all modern basic sciences. On the one hand, it generalizes integrative tendencies in individual sciences, and on the other – performs methodological knowledge functions, provides knowledge synthesis in specific disciplines, and "external" synthesis between disciplines and their main offices.

Communications between integration and differentiation processes of scientific knowledge can be investigated by invoking the dual system modeling idea proposed by A. Uiomov [7, p. 18].

The philosophy, which is the core of integrative general scientific knowledge forms, as a methodology, philosophy, the scientific world picture, has a great influence on the convergence of science directly through them [8, p. 166-167].

In the attributive structure categories A. Uiomov explores premise ratio, or the ratio assumption between philosophy and science, as regards this relationship in terms of truth and truth result premise provisions obtained in the concluding process that category prerequisites associated with obtaining this result, transition from $A$ to $B$. The premise, which we denote as $C$, is what causes the legality of $A \to B$. In other words, from $C$ does not appear to neither $A$ or $B$. However, the truth is the truth with, legitimacy $A \to B$. The contrary, with the falsity $C$ means that the result does not follow from $A$, that is, that we have no reason to make such a conclusion justified.

If we approach this issue from the viewpoint of the relationship between truths $C$ and, on the one hand, and $A \to B$, on the other – we can see that this ratio is expressed by the addition of logical connection, which in symbolic logic is called equivalence. Thus, we obtain a formula that expresses the ratio of the prerequisites: $C$ *eq.* $(A \to B)$.

The equivalence relation specificity between the philosophical premise $C$ and scientific output $(A \to B)$ is expressed in the fact that the philosophical position is not always adequately represented two cases are examined by A. Uiomov. In the first case, the premise is used deliberately, then the circuit shown above, expresses the real use of the premises as a method of obtaining a new result. In the second case, assumption is used unconsciously. This means that, conclusions of $A \to B$, a prerequisite for $C$ do not think. But the conclusion $A \to B$ will be legitimate only when it is true $C$. It can be detected by special theoretical analysis [9, p. 17].

In both cases, the equivalence relation is established between the philosophical assumptions and scientific reasons, not only makes explicit the inner nature of the contingent relations, but also the logical aspect of the philosophy and science relationship mechanism.

**Conclusions.** Thus, analyzing the historical development of the scientific world picture concept, we can conclude that it is the product of the theoretical and practical activity in various areas and is characterized by unity and versatility of its manifestation. Examining the organizational science development and its evolution has been found that core philosophy advocates the scientific world picture and has a great influence on the science convergence. Therefore a main scientific knowledge basis in the scientific world picture become philosophical categories and fundamental scientific concepts through which reveal the most important properties and laws of the material world.

**Список літератури / References:**


1. Філософський словник / За ред. В.І. Шинкарука. – К.: Головна редакція УРЕ, 1973. – 599 с.
   Shynkaruk,V.I. (1973), *Filosofskyi slovnyk* [The philosophical dictionary], Holovna redaktsiia URE, Kiev, Ukraine.
2. Росул Т.І. Наукова і художня картини світу: тенденції взаємодії / Т.І. Росул // Гілея: наук. вісник. – 2012. – Вип. 58. – С. 295-298.
   Rosul, T.I. (2012), "Scientific and artistic pictures of the world: tendencies of interaction", *Hileia: nauk. visnyk*, Issue 58, pp. 295-298.
3. Кумеда Т.А. Концепт «картина світу» як об'єкт гуманітарних досліджень / Т.А. Кумеда // Гілея: наук. вісник. – 2012. – Вип. 65. – С. 318-322.
   Kumeda, T.A. (2012), "The concept "world view" as the object of humanitarian research", *Hileia: nauk. visnyk*, Issue 65, pp. 318-322.
4. Сосновский Л.А. Об уровнях междисциплинарных исследований в механике / Л.А. Сосновский, П.А. Витязь, М.С. Высоцкий, М.А. Журавков, С.С. Щербаков // Теоретическая и прикладная механика. – Вып. 27. – 2012. – С. 15-30.
   Sosnovskiy, L.A., Vitiaz, P.A., Vysotskiy, M.S., Zhuravkov, M.A. and Shcherbakov, S.S. (2012), "About Levels of interdisciplinary research in mechanics", *Teoreticheskaya i prikladnaya mekhanika*, Issue 27, pp. 15-30.
5. Гуревич П.С. Мир философии: книга для чтения: в 2-х ч. / П.С. Гуревич, В.И. Столяров. – М.: Политиздат, 1991. – Ч. 1. Исходные философские проблемы, понятия и принципы. – 672 с.
   Gurevich, P.S. and Stoliarov, V.I. (1991), *Mir filosofii: kniga dlia chteniya* [The world of philosophy: the book to read], Part 1. The original philosophical problems, concepts and principles, Politizdat, Moscow, Russia.
6. Мараховський Л.Ф. Міждисциплінарна призма на основі експертної системи / Л.Ф. Мараховський, І.М. Козубцов // Современные достижения в науке и образовании: VII Междунар. науч. конф. – 2012. – С. 654-658.
   Marakhovskiy, L.F. and Kozubtsov, I.M. (2012), "Interdisciplinary Prism based on expert system", VII Int. Sci. Conf. "Modern achievements in science and education", pp. 654-658.
7. Терентьєва Л. Передумовне відношення між філософією і наукою: логіко-системний аспект / Л. Терентьєва // Вісник Національного університету «Львівська політехніка». – 2009. – № 636. – С. 14-19.
   Terentieva, L. (2009), "*Major relationship between philosophy and science: logical-systematic aspect*", *Visnyk Natsionalnoho universytetu "Lvivska politekhnika"*, Vol. 636, pp. 14-19.
8. Сущенко Л.О. Теорія розвитку й тенденції сучасної науки в Україні / Л.О. Сущенко // Педагогіка формування творчої особистості у вищій і загальноосвітній школах: збірник наук. праць. – 2011. – Вип. 21. – С. 165-172.

Sushchenko, L.O. (2011), "Theory of development and trends of modern science in Ukraine", *Pedahohika formuvannia tvorchoi osobystosti u vyshchii i zahalnoosvitnii shkolakh*, Issue 21, pp. 165-172.

9. Уйомов А.І. До питання про взаємовідношення предмета філософії та спеціальних наук / А.І. Уйомов // Філософські проблеми сучасного природознавства: наук. збірник. – 1967. – Вип. 7. – С. 13-22.
   Uiomov, A.I. (1967), "To the question of the relationship of the subject matter of philosophy and special Sciences", *Filosofski problemy suchasnoho pryrodoznavstva*, Issue 7, pp. 13-22.

***Мета.*** *Дослідження історичного розвитку становлення поняття наукової картини світу, аналіз зв'язку між філософією і наукою та визначення ролі філософії у процесі становлення наукової картини світу.*

***Методика.*** *Проведено дослідження особливостей становлення наукової картини світу на кожному її історичному етапі. Проаналізовано процес еволюції наук та виявлено прогнозовану єдину науку майбутнього.*

***Результати.*** *З'ясовано формально-організаційний розвиток науки та визначено, що підстави всіх наук знаходяться у філософії. Описано зв'язок між процесами інтеграції та диференціації наукового знання. Виявлено, що відношення еквівалентності, встановлене між філософськими передумовами і науковим міркуванням, експлікує не тільки внутрішній характер передумовного відношення, але й логічний аспект механізму взаємозв'язку філософії і науки.*

***Наукова новизна.*** *Встановлено, що основою наукового знання у науковій картині світу стають філософські категорії та фундаментальні природничо-наукові поняття за допомогою яких відображаються найважливіші властивості й закономірності матеріального світу.*

***Практична значущість.*** *Практична значущість статті полягає у виявленні взаємозв'язку філософії і наукової картини світу.*

***Ключові слова:*** *наукова картина світу, інтеграція і диференціація наукового знання, філософські передумови.*

***Цель.*** *Исследование исторического развития становления понятия научной картины мира, анализ связи между философией и наукой и определение роли философии в процессе становления научной картины мира.*

***Методика.*** *Проведено исследование особенностей становления научной картины мира на каждом ее историческом этапе. Проанализирован процесс эволюции наук и выявлено прогнозируемую единую науку будущего.*

***Результаты.*** *Выяснено формально-организационное развитие науки и определено, что основания всех наук находятся в философии. Описано связь между процессами интеграции и дифференциации научного знания. Выявлено, что отношение эквивалентности, установленное между философскими предпосылками и научным соображением, эксплицирует не только внутренний характер предпосылочного отношения, но и логический аспект механизма взаимосвязи философии и науки.*

***Научная новизна.*** *Установлено, что основой научного знания в научной картине мира становятся философские категории и фундаментальные естественнонаучные понятия, посредством которых отражаются важнейшие свойства и закономерности материального мира.*

***Практическая значимость.*** *Практическая значимость статьи заключается в выявлении взаимосвязи философии и научной картины мира.*

***Ключевые слова:*** *научная картина мира, интеграция и дифференциация научного знания, философские предпосылки.*

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