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THE DYNAMICS OF ARGUMENTATION STANDARDS IN SCIENCE

The aim of this paper is to show the dynamics of standards of the scientific knowledge argumentation in the classical, non-classical, and post-non-classical sciences. In the paper we focus upon ethical and axiological aspects of the modern science, upon its interdisciplinary character, dialogue of scientific and humanities knowledge.

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1. Introduction

The modern logics shows a particular place taken due to the development of argumentation theory. The attempts are undertaken to substantiate the synthetic theory argumentation, different models of argumentative discourse, determination of specificity of philosophical and scientific argumentation. Individual schools of argumentation come to life. Their fruitful and efficient activities are recognized in the world known centers for the argumentation study.

Argumentation is a logical and communication process aiming at the substantiation of a certain point of view in order to understand it and/or to adopt it by an individual or collective recipient. Like any linguistic phenomenon, the process of argumentation is connected with certain logical forms. Argumentation is tightly connected to substantiation [3].

The axioms, the earlier proved theoretical theses, theses with probabilistic character (when proving a hypothesis), real data and empirical generalization in scientific argumentation that aims achieving the authentic knowledge may act as arguments (foundations). But anyway, the process of the scientific argumentation is accompanied with the transfer of characters of theses already accepted in the science into not proved yet theses,

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thus forming the latter. This is the main difference between the scientific argumentation and non-scientific one like, for instance, the reference to authority.

An important point in the scientific argumentation is the use of special linguistic means which are formed on the natural language base and detailed with particular definitions thus forming the system of a scientific terminology. The discovery of a new scientific area and the truth in the process of scientific research needs application of new linguistic methods and terms approved by the scientific community. That's why one of special features of the scientific argumentation is the orientation on describing not only the object structures which may be involved in the future activity under some other social and cultural conditions.

Together with the orientation on obtaining the true knowledge, availability of special language, support as a logical basis of the scientific argumentation, orientation on the anticipatory reflection of reality, the systematic character of argumentation is the most important its feature tightly connected to validity. Such important features of logical validation as proof, classification, interpretation, and axiomatization are the forms of the scientific knowledge systematization at the same time.

Three large stages are distinguished in the science historical development: 1) the classical science (subdivided into two sub-stages: (i) the pre-disciplinary science of the 17–18th centuries, (ii) and the disciplinary organized science from the end of the 18th to the beginning of the 19th century); 2) the non-classical science (from the 19th to the middle of the 20th century); 3) the post-non-classical science (the last third of the 20th century) [2].

2. Argumentation in Classical Science

The process of overcoming the dichotomy of the world of idealized forms together with the empirical data become the base line of the modern science and characterize the essence of the scientific revolution. This process started in the Antiquity (Aristotle).

It comes out from not only the cognitive processes taking part at that time in the science aimed at the object-reformatory activity, but from the social and cultural premises. The science becomes independent, comes out of the limits of abstract theoretical constructions, widens the possibilities of deductive argumentation, enriched with the pragmatic trends and parameters.

The revision of ideals of the scientific knowledge argumentation was accompanied with the radical turn in the science of the 20th century and signified the formation of a new world outlook paradigm supposing the science sovereignty, its deliberation from the canonic thinking of the Holy Scripture and Church records and gave grounds for the formation of new criteria of truth. The so-called "net knowledge" didn't fit the technologically advanced community. The science shows powerful axiological and purposeful transformations caused by the social orders of the community and industry. Only the sufficiently advanced capitalistic industry gives wide social possibilities and allows developing individual sciences.

Galilei considered experiments, observations, investigations of natural phenomena to be the most reliable means for finding the truth. He put forward a new value and world outlook directive of an experimental mathematical science causing the revision of ideals of the scientific knowledge. Starting from this moment, the scientific, accurate method isolates itself sharply from the speculative and scholastic method aimed for understanding and disclosing a super-natural transcendent source.

Describing the specific character of this stage in the history of science, A. Einstein noted in his Spencer lecture "On Method of Theoretical Physics": "Purely logical thinking could give as no knowledge of the empiric world. Any cognition of reality results from the experience and comes back to it. (...) Namely due to Galilei understood this fact and inspired scientists with this truth, he was the father of the modern physics and natural science in general. Isolating himself from the speculative conclusions, Galilei clearly declared that he preferred finding the truth in significant things instead of discussing great problems for a long time reaching no truth at all."

Galilean scientific argumentation is characteristic for the organic synthesis of the purposeful experiment with the mathematical treatment of experimental data. It became the standard of natural science by the end of the 16th century and by the beginning of the 17th century. From his point of view, the nature is described with the mathematical language. That's why in order to understand the nature it is required first of all to study its language and symbols: triangles, circles, spheres, cones, circumferences, and other mathematical figures.

The inner synthesis of empirical and rational things, investigation of empirically conceivable phenomena in viewing the infinity was firstly made by I. Newton in his work "Mathematical Principles of Natural Philosophy."

The correspondence to the experience is the standard of the scientific knowledge for Newton. Only after the experimental check of mathematical abstractions, the latter acquires the status of authenticity. It becomes clear that it's impossible to carry out the search for the reliable grounds of the scientific knowledge can't be successful when following the way of sharp contrasting of the empirical to the rational. Beginning from Galilei and Newton, the synthesis of the empirical and rational reliability, the synthesis of the experimentally-inductive and logical-deductive knowledge become the priority ideal in substantiating the scientific knowledge.

Using experiments and observations, Newton aims to find out the properties of the study objects and to form a theory resorting to no "hypotheses", though he himself sees shortages in the orientation on the inductive method. His protest against using hypotheses in "experimental philosophy" was most likely addressed to Cartesians which produced "illusory assumptions" without using the sufficient experimental data.

Though the gravitation was proved, and had a high level of theoretical grounding, the strict logical and mathematical argumentation, the correspondence to the astronomic observation, the theory wasn't been accepted by the scientific community for a long time. The reasons were the passivity of the world outlook convictions and the cognitive ideals of the scientific knowledge argumentation, because the strictly mathematical analysis of the observed astronomic data wasn't considered yet by the scientific community as a guarantor of a logical consideration.

The ideals of argumentation of scientific knowledge formed by the classical science determined its development up to the scientific revolution of the end of the 19th and of the beginning of the 20th century. However, the second part of the 20th century showed a necessity for revision of a number of methodological principles and aims of classical science due to the discovery of the Low of Conservation and Transformation of Energy, obtaining new data on thermodynamics and electrodynamics.

Maxwell faced the necessity of revision of methodological principles of argumentation in the classical science. Though Maxwell tried to find the "mechanical mode" for describing the studied phenomena to his dying day, he came out of the limits of classical paradigm and didn't consider Newton's mechanics to be the only right way of cognition.

In comparison with his antecedents contended that the natural sciences move along their ways resting upon the experience, Maxwell overestimates interconnection of physics with philosophy pointing out that "in our ordinary life we come to the same questions like metaphysicians do."

Hertz always emphasized that Maxwell's theory was composed of Maxwell equations. Maxwell theory of electromagnetic field was the mathematical theory. All Maxwell efforts "to dilute" the mathematical theory of electromagnetic field with the explanations based on an intuition happened to be unsuccessful.

Though the recognition, understanding, and acceptance of Maxwell theory took over 25 years, it acted as the standard of theoretical argumentation and performed "pragmatical" functions in using its results in practice.

The formation of the disciplinary natural science at the end of the 18th century and in the first half of the 19th century was accompanied with the reconstruction of a mechanical world picture, creation of new methods of argumentation in different areas of science. Later on this resulted into the integration of the above methods and into the enrichment of the science in whole. The ideals of the evolutional explanation formed in biology and geology as well as the mechanisms of chemical transformations shoving "the inner mechanics" of atoms indicated a complexity of material world that couldn't longer be explained on the basis of mathematic laws only.

While the reduction of all areas of natural and social sciences to mechanical conceptions was reasonable and required at the first stage, the first half of the 19th century showed the reverse process resulted from the formation of disciplinary science and characterized by the transfer and integration of methods of the scientific knowledge grounding worked out in a number of other areas.

Such a complex process of mutual enrichment and integration of the scientific knowledge argumentation was shown on the development example of the experimental physical chemistry later on. For the chemical conceptions to be accepted by the scientific community and introduced into culture, they must be based firstly on the dominated mechanistic world outlook. And all the explanations and definitions of the concepts used as well as the interpretation of chemical phenomena were formed within the limits of the above outlook. Only in this case the explanations and definitions were accepted by the scientific community. The classical mechanics arguments were omnipotent in this area and chemists of that time tried to modify chemistry into a section of "applied mathematics" (more clearly seen in works of A. Lavoisier, P. Laplace, K. Berthollier). Since the chemical changes are considered to be the results of the matter movement, they must be explained by mechanical laws. Chemical affinity is treated as a force similar to the attractive force.

The last thirds of the 19th century showed the formation of physical chemistry being the first "connecting" science in the chemistry history and indicating the formation of new "synthesized" ideals of science. Just as a new arising “island”, the physical chemistry is tightly connected to two “continents” – physics and chemistry.

In spite of the fact that a number of discoveries in chemistry didn’t fall in Newton paradigm and contradicted it (for instance, the discovery of the replacement phenomenon, metaleption, reduced the authority of electrochemical theory of chemical affinity), the argumentation based on the classical mechanics was very convincing and understandable both within the scientific community and outside of it.

There is no coincidence that his lecture read in the England King Institute Mendeleev entitled “An Attempt for Application of One of Principles of Newton’s Natural Philosophy to Chemistry”. Here he pointed out that Newton program of “explanation of any natural phenomenon with the use of principles of mechanics” was at the final stage.

Based firstly on the relation between the chemism and mechanicism, the Mendeleev investigation served actually as the foundation for the chemical science development and formed the methodological guidelines for creating the complex atomic structure doctrine. Namely this area showed the formation of preconditions for reviewing classical concepts of the structure of matter, methods of grounding the scientific knowledge. In this connection many scientists pointed out that the quantum atom model was greatly influenced with Mendeleev’s periodic law and with the spectral study of chemical elements. In works devoted to the development of electronic concepts (mainly within 1897–1913) the approaches of scientists were based on the synthesis of physics, chemistry, and mathematics. These approaches substantially changed numerous ideas of an atom as of a simple indivisible particle.

In his report “An Attitude of Newest Physics to the Mechanistic World Outlook” M. Planck pointed out that the mechanistic world outlook rendered certain services to physics for a long time though some scientists saw its limitation and referred skeptically at times to its attempt to explain any natural phenomenon. This skepticism at the beginning of the 20th century developed into a confidence and deep movement with the radical breaking character not only for physics, but for chemistry, astronomy and knowledge theory as well. The period of clear predictions based on the classical mechanics came to its completion and the theory dropped behind the experiment losing gradually its explanatory function.

However, when assessing the services of classical theoretical physics and classical science in the whole, Boltzmann pointed out with pride that the century worked effectively. It entrusted the future with an unexpected abundance of the positive facts and the splendid transparency and clearness of methods.

Thus, "the immense period" of classical science coming to an end with the formation of disciplinary natural science, thermodynamics, electrodynamics and with the development of chemistry, biology, geology, physical chemistry, economical statistics, and other sciences resulted into the revision of traditional priorities of methodological consciousness. First of all, the distinct departure from the undoubted necessity of classical scheme of grounding ("*if* ..., *then*...") that was important for the mechanistic processes where the initial conditions specify a strongly determined, predictable and unambiguous result.

The reasoning of the scientific cognition wasn't limited with the traditional dynamical approaches as the most reliable and "elemental" describing the behaviors of objects in the relevant system strongly definitely. This reasoning required using the statistical methods, conceptions of randomness, complexity and irreversibility more and more.

The cognitive status of the experimental data wasn't based on the data of theory that explained them (experience "was seen" through the relevant "theoretical glasses"). The interpretation of the experimental data based on the mathematized hypothetical illustrations, but not on the visual models only. Mathematics stopped to be the only description mean and became at the method for the truth grounding. The famous Newton credo "I don't contrive hypotheses" loosed its status of an absolute and strict rule while the mathematic hypothesis became to play a special significance in the development of the scientific knowledge.

In order for understanding and accepting new conceptions one had to resort to philosophic and methodological analysis of the status of different cognitive procedures and methods of the scientific and cognitive activities as well as to pragmatical, technological and "industrial" means and arguments for grounding the defended concepts. A highly developed classical science brought scientists to investigation of microworld secrets, to the revolutionary break of general concepts, notions, and methods of justification. These processes were contributed with great discoveries at the turn of the 19th and 20th century.

3. Argumentation in non-classical science

The radical changes in the science at the turn of the 19th and 20th century were accompanied with the changes in spiritual culture, philosophic bases of scientific cognition, revolutionary discoveries in different areas. All this led to a strongest break of argumentation standards of classical rationalism. The turn to the non-classical science was prepared by all its preceding development where the process of development of disciplinary natural science produced unconventional ideas of the scientific cognition including the ideas of development, irreversibility, randomness, and unpredictability.

According to Einstein, his work on justification of scientific concepts has a significant role in development of theoretical science. The philosophic and scientific analysis of grounds of classical mechanics and "high authority" of its concepts were characteristic for the Einstein approach to the formation of scientific cognition. Really, the relativity theory was born in the depths of Maxwell theory of electromagnetic field. Einstein himself said that the sources of his special relativity theory arise mainly from the Maxwell theory of electromagnetic field [2].

Lorentz, Poincaré, and Einstein were characteristic for rising the question of the theory complying with the relativity principle. But the means of the problem solution differed one from another and required the application of different arguments. Thus, the logics of the theory formation was constructed and the conditions of its understanding and adoption by the scientific community were formed. If the Lorentz concept was based on the ideas of static ether, absolute space and time, on attempts of modification and application of Newton mechanics for understanding electromagnetic phenomena, the Einstein theory doesn't include the either and privileged counting system connected with it as well as the absolute space and time.

The specific Einstein approach in forming the special relativity resulted into the synthesis of philosophical and scientific argumentation, into the search for the operational status of the scientific concepts and their philosophical substantiations, methodological and logical analysis, into the introduction of a subject (observer) into the structure of cognitive activities. It became apparent also in the process of forming general relativity.

The mechanisms of general relativity showed that the theoretical knowledge entered a high-quality new phase where the experience and the observations weren't the only source of information for the fundamental theory formation. The equivalence principle constituting the foundation of general relativity wasn't obtained from the experience and wasn't "evoked" by the latter. The incontrovertible argumentation of Einstein used in the equivalence principle grounding showed no logical way for obtaining the fundamental theory concepts from the observations.

The traditional way of formation of fundamental theories that matched the Mill model in which the interactive generalization of numerous observations and factors used for forming the logical construction appeared to be useless for the description of a new area.

The formation of the quantum theory together with the relativity was the epochal event that changed our ideas of the science, culture, means for understanding the real world. Already the first ("pre-Bohr") phase of the quantum theory development that was carried with the formation of quantum hypothesis by Planck in 1890s determined a specificity of the scientific search in this area. Planck constant required the revision of classical concepts of coordinates and pulses, displayed an insufficient influence of classical mechanics and stipulated the necessity of philosophical substantiation of an arising theory and its grounds "exposing" the problem of status of scientific concepts of classical mechanics in a new area.

The most important target of this period was searching for the physical sense of Planck constant, ensuring its empirical and semantic interpretation and experimental validation.

A number of scientists (H. Lorenz, D. D. Thompson, et al) made unsuccessful attempts to "introduce" the quantum hypothesis into the classical theory. Contradictions between the classical concepts of the radiation as of the wave process and Planck assumption of the fractional emission of energy gave a trouble and even suffering to Planck for the logical imperfection of the theory formed by him.

Namely this period of the quantum mechanics development is characteristic for the formation of new standards of the scientific knowledge argumentation. It is impossible to imagine the modern science, the reconstruction of physical picture of the world, the philosophical review of the problem of corpuscular and wave dualism standards, causality, subject-to-object relations, the formation of principle of complementarity aimed at providing the understanding and incorporation of new knowledge into the culture. The problem of grounding the quantum theory revealed and formed the interconnection mechanisms of the scientific knowledge with the culture context. The semantic and the empirical interpretation, the search for the appropriate visual example of a particle in the physical picture of the world and the development of means for relating the equations and experience were the sources for the quantum theory development.

The main aim of quantum mechanics consisting in the search for the appropriate interpretation of its equations was unrealized. This search resulted inevitably into the failure to accept classical concepts. Though Planck tried to conciliate the quantum theory with the ideas of Maxwell electrodynamics, but unlike Lorentz and Thompson he had finally to admit that it was impossible to understand a quantum with the classical concepts. The same way followed by Heisenberg determined the foundation of the so-called matrix mechanics. Schrödinger developed wave mechanics.

The search for the problem of physical interpretation of quantum mechanics stayed incomplete since the sense of the used figures and symbols, operations and interconnections among them stayed unclear. Heisenberg said that a period was required for the "clarification of formal framework".

Max Born presented the probabilistic interpretation of quantum mechanics. An electron in such an interpretation isn't "spread" like in Schrödinger wave mechanics thus giving the possibility to evaluate the probability degree of the electron presence in any given volume.

The uncertainty principle formed by Heisenberg in 1927 explained in fact the probabilistic character of quantum-mechanical calculations, showed an impossibility of requisition of the correct information of the state and speed of microobject.

N. Bohr made Heisenberg analysis of the quantum-mechanical connections more deep and correct in the sphere of Heisenberg interpretation of quantum mechanics thus resulting into the formation of principle of complementarity. N. Bohr presented this idea during the International Physical Congress in Italy in 1927.

The principle of complementarity formed by Bohr was a sui generis logical complementation of quantum mechanics interpretation though the understanding the search for its "hidden parameters" and methodological foundation, the attempts for rethinking its already traditional probabilistic interpretation is undertaken up to now.

Thus the scientific knowledge is enriched with the integrated probabilistic style of thinking, alternative, multivariativity, and flexibility. The introduction of the above parameters was caused with the development process of quantum theory at first. The intensive creation of mathematical tool of quantum mechanics followed the need of interpretation of formal mathematical notions.

The non-classical science formed such standards of the scientific knowledge argumentation which were based on incorporating a subject into the structures of social and cognitive activity, on impossibility of elimination of this activity from the main assumptions and summaries, on taking into account the means of observation of the study phenomena and objects, on operational determinability of theoretical concepts etc. They are particularly seen in the modern science in the area of understanding of complex and super-complex systems.

4. Axiological nature of argumentation in post-non-classical science

A number of concepts and approaches in the development of post-non-classical (present-day) science may be determined which allow to fix the formation means of ideals and standards of the scientific knowledge argumentation. They contribute the structure of the scientific cognition with the value reference points and humanities transcriptions thus enriching the science with the "time arrow", concepts of historicism and uniqueness of the study systems. What are these concepts, investigation spheres, and approaches?

The mechanisms transforming the ideals of the modern scientific knowledge argumentation are incorporated most intensively into the science in the second part of the 20th century with the development of the noosphere concept, ideas of nonlinearity, "highly disbalanced" thermodynamics (school of I. Prigozhin) etc. Some of these concepts are discussed below in order to determine the humanistic and value orientations and borders of the modern science.

The presence of the "human-centered" arguments is clearly observed first of all in the noosphere concept of V. I. Vernadsky based on the ideal of integrity of a human being and the Space as well as on the integrity of the modern science which shows the deletion of edges among some its areas. The specialization is mostly seen in problems but not in individual sciences.

The modern science enriches the noosphere concept with new data of astrophysics and cosmology. It makes it possible to consider Vernadsky assumptions of formation of life and intellect on the Earth as the result of the matter self-organization in the Universe or the space process in which the human intellect becomes the main factor of its development predetermining the possibility of the noosphere epoch approach.

The assumptions that the self-organization is characteristic for the alive systems only dominated in the science for the long time loosed gradually their positions under the pressure of the collected data indicating the order creation from a chaos, of new structures and self-organization in inorganic systems under some conditions. Different variants of self-organization in a wide range of disbalance physical, chemical, biological, and social systems are discussed at present: in physics (hydrodynamics, lasers, nonlinear oscillations); in electrical engineering and electronics; in chemistry (reaction of Belousov and Zhabotinsky); in biology (morphogenesis, population dynamics, evolution of new species, immune system); in the theory of computers, in economics, ecology, and sociology.

The most important features of the self-organizing systems are their nonlinearity, stochasticity (suddenness), availability of many sub-systems, openness, irreversibility (originality).

Such an approach requires revising the existing ideals of the scientific knowledge argumentation. It is connected not only to the recognition of such ideas as probability, uncertainty, pluralism, multivariability, suddenness and so on in formulating the scientific theses and arguments used for it, but to changing the forms of relations among the ideas under proving and ideas used for grounding the truth and acceptability of the substantiated thesis. That is, the notion of logical adherence itself is changed. This connection form becomes more flexible, multiversion, "relevant", excluding a strict monosemantic approach due to the origin of "possibility fan" of the system development in points of bifurcation when the system loses stability and becomes capable to develop toward the multiversion modes of functioning.

Deep reorientations of world outlook in means of description and argumentation of the scientific knowledge connected to the development of the doctrine of biological evolution in noosphere, disbalanced thermodynamics and synergetics assisted the revival of the principle of global and universal evolutionism which is used for describing the regularity of the evolution process in inorganic nature, living substance and society. The means of global evolutionism allow to make at present some integral and consistent picture of the world.

The conceptual approaches of interconnection and mutual conditionality of a human being and the Universe, the synthesis of elementary-particle physics, molecular biology and cosmology of a "young" Universe led to arising the "anthropic argumentation" and "anthropic arguments" thus showing the "parallel between the Universe and its logical structure."

The renovation of modern science, its openness, the retreat from the concept of a strict determinism and an independent subject dominating over the world as well as fixation of irreversibility, possibility, "choice of freedom" and alternative in the argumentation process enrich and transform the understanding of sciences of a human being.

The modern science grades the difference between the natural and humanity sciences with a particular care, integrates them; a human being and a human society appears as a factor of this integrity. It brings together the natural and humanities knowledge and integrates them into a united science. The ideas based physically and mathematically on the natural science are incorporated in the social and humanity knowledge; due to this fact a human being and a society can't be considered using the terms of strict determinism, the integral development model, the rejection of choice, alternative, chance, suddenness. The system of values "worked out" within the frames of philosophical and humanity knowledge becomes the concurrent scale and the reference point in the scientific search.

Such a mutual enrichment of sciences takes place through the translation of some methods, fundamental principles and conceptual means from one science into another thus resulting into the fundamental reconstruction of the science basement or into the scientific revolution. Such a change among the sciences allows improving the view on a certain science subject, developing its concepts, to form general scientific principles and conceptual means leading to integration of scientific knowledge.

The existing philosophical and methodological investigation take into account insufficiently the factors of social and cultural dynamics and global changes in the modern science, its interdisciplinary (transdisciplinary) character showing the intensification of community participation in making decisions in the area of scientific and technical politics and the necessity for explaining the content of scientific and technical projects out of the frames of the scientific community.

The denial of strict tools of the scientific knowledge substantiation, taking into account different parameters which influence the system, addressing to the concepts of casual and probabilistic processes are demonstrated at present by many medical sciences.

According to some researchers, the crisis of the Soviet clinical psychiatry is generally explained by the "predilection" for the linear principle stating that any illness (psychical) must include the integral reasons, manifestations, clinical course, clinical outcome, and anatomic changes (that is the same reason gives the same effect). The modern medicine shows that such a "strictness" in formulating the thesis (in diagnostics) has no basis since it is impossible to take part the fact that physical and spiritual characters of separate individuals as well as individual illness manifestations and clinical courses for individual patients are unique.

The denial of the single-linearity and strictness, addressing to the theory of random processes, dissipative structures will lead according to some scientists to the renovation of psychiatry since the illness concept will be probabilistic parameter and the illness origin in a number of cases unpredictable in principle. The opinion of the sane will be changed together with the society and depending on the model of medicine.

The ethical and axiological arguments "penetrate" other sciences too. Such a medical and biological science as thanatology which studies the reasons, manifestations and mechanisms of death poses a problem of "ethical argumentation" in the organ transplantation (how to avoid the ethical fault:

a donor must be "dead" prior the "alive organ" could be extracted); in life extending with apparatus (what arguments will be ethically significant in turning the apparatus off); in making conclusions on the problem of preserving the life of incurable patients (is it really ethical when the ideals of medical ethics require fighting for the life up to the "finish" while a patient prefers an "easy death") and so on.

The incorporation of the "human-centered" guiding lines and axiological parameters, the "intensification" of reflection and strengthening the thesis of the responsibility of scientists for applying the scientific results which can be used both for the mankind benefit and harm. M. Born stated that the real science and ethics showed the changes which made it impossible to preserve the old style of serving the knowledge for the knowledge itself.

The modern science must take into account the human being place and role in this world, its aims and values, cognition tools in solving cognitive problems. That is the necessity appears for widening philosophical and methodological reflection with its obvious inclusion into the sphere of human component assigning the integrity and mutual conditionality of individual elements of the areas in study. The orientation to the perception of socially significant frames of the theoretical search, its enrichment with the cultural and ethical guide lines, overcoming the estrangement of the human world appearing at the stage of abstract theoretical conclusions are the main value criterions of such a reflection.

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