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Science and Parascience: Review of Literature on the Problem (Late XX – Early XXI Centuries)

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The article presents a review of predominantly Russian literature dedicated to the problem of relations between science and parascience, states various points of view on the structure of extra-scientific knowledge and the place parascience occupies in it. Recourse to the current problem is caused by its openness, absence of clear classifications and definitions of parascientific knowledge as such, which leads to the necessity of the present explication. The article summarizes the experience of teaching "Science and Parascience" topic in the lecture course for post-graduates and external PhD students "Philosophy of Science".

Keywords: science, scientific knowledge, demarcation of scientific and non-scientific knowledge, abnormal knowledge, parascience, pseudoscience, protoscience, anti-science, quasi-science, deviant science.

Introduction

The question "Science and Parascience" is included into Topic No.7 "*Peculiarities of modern science development. Prospective of progress in science and technology"* of the self-preparation Program for Post-Graduate History and Philosophy of Science Qualification Exam for post-graduates and external PhD students. The evident theoretical and practical significance of the issue on one hand and the inconsistency of its treatment in literature on the other substantiate the need for a special study. The purpose of the present publication is the review of late 20th – early 19th century's literature on the problem of meaning and composition of parascientific knowledge.

Modern literature reflexively admits the fact of disagreement in the use of the term *extra-scientific knowledge,* absence of clear semantic certainty and distinctive boundaries of the notion, terminological inconsistency of definitions and classifications of extra-scientific knowledge. It offers various solutions for the problem of terminological inconsistency. Thus, N.I. Martishina considers it rational to draw a boundary between the common term of *extra-scientific knowledge* and its use for defining a particular sphere of knowledge, disclaiming any scientific status (*trivial, religious, artistic, philosophic, mythological knowledge* etc.), while defining the multitude of non-scientific knowledge forms inclined to the status of science

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(popular science, parascience, pseudoscience, antiscience etc.), with the term *would-be scientific knowledge* (Martishina, 1996). The opinion of V.A. Lektorskiy is similar: he connects the process of *science* institutionalization with its essential separation from *extra-scientific knowledge* (*trivial knowledge, art* etc.) which does not claim to be scientific, and with opposition to *pseudoscience* which claims to be science (Lektorskiy, 1996). It thereby establishes a certain primary classification of knowledge types that stretch beyond the boundaries of science. It is necessary to admit, that various options of defining the *extra-scientific knowledge* term itself are extremely efficient for solving the problem of demarcation between *science* and *non-science.*

According to one of the reputable non-scientific cognition researchers I.T. Kasavin, development of cultural pluralism idea is unthinkable within the strict opposition of science to another form of cognitive activity. Kasavin is convinced, that in the situation of tolerance in modern sociocultural reflection, the dominating philosophical paradigm in the cognition theory shall be: admittance of historical variability of scientific criteria and legitimate status of diverse *extra-scientific* knowledge, unacceptability of knowledge property evaluation from the positions of scientized dogmatic rationality principles. This is the philosophy which intends to substantiate the status of *normal knowledge* in the enormous valuable mass of non-scientific experience (Kasavin, 1990).

It is essential to remark, that, though the theoretic *parascience* analysis is carried out in the context of general ratio of *science* to *extra-scientific knowledge,* the term *parascience* is interpreted in a narrower sense than *extra-scientific knowledge,* and, therefore, the insight is limited to *parascience*-related. It eliminates from our sight a whole range of such *extra-science* phenomena as trivial cognition, esoterism, religion, magic etc., each of which is an exciting object for an independent research. In the present case we join the opinion formulated in "Cognitive Foundation of Parascience": in a general sense, *extra-scientific knowledge* encompasses all types of cognition found beyond the boundaries of science (religious, artistic, mythological, trivial etc.); the term *parascience* is applied to a narrower group of *would-be science* forms of cognition modeling only few of the properties typical of science (Martishina, 1996).

1. Science and Parascience: Border Conflict Reflection

If the self-sufficiency of the main *extra-scientific* forms of knowledge, such as philosophy, religion, or art, allows them to avoid identifying themselves with science to increase their own authenticity (or, at least, not to claim for it), then the sphere of knowledge conventionally referred to as *parascience*, on the opposite, is fighting for recognition and admittance of its evidence as legitimate through obtaining the scientific status.

In the name *parascience,* the denotation and the concept conflict with each other due to its negatively-attitudinal valence and correlation with the term *science.* A derivative, secondary origin of *parascience* term created by affixing the root *science* with the noun functor, prefix *para-* (*anti-, quasi-, pseudo-* etc.) demonstrates the principal "attitudinalness", derivativeness of the term, the actual absence of an adequate term to generalize the phenomena referred to as *parascientific phenomena.*

Scientized world outlook prefers denying the "believe-it-or-not" evidence which cannot be yet assimilated at the modern level of science development. Denial is another way of psychological defense, the use of which is caused by the habit of scientist culture to cut itself off the so-called *parascientific* with the shield walls of logocentrism.

All publications on the problem of any *non-scientific (antiscientific, pseudoscientific, mock-scientific, quasi-scientific, alternative* etc.) *knowledge* admit the impossibility of clear distinction and differentiation between these terms. A serious challenge for clarifying the epistemological nature of *parascience* phenomenon is the absence of universality and certainty in understanding the meaning of the term, and the absence of serious systematization and classification of such notions, as *parascientific, pseudoscientific, alternative, quasi-scientific, mock-scientific, anti-scientific* etc. *knowledge.* For this reason it is necessary to describe some (more or less successful) attempts made in clarifying the meaning and classification of these notions. It goes without saying that the selection between the listed opinions is always judgmental and restricted due to the immensity of researches dedicated to the problem, while the statement of the opinions themselves is usually brief.

It is universally admitted, that terminological distinction between certain types of *would-be-science knowledge* (according to the classification offered by N.I. Martishina), particularly *popular science, protoscience, parascience, pseudoscience, mock-science* etc. is not adequately substantiated. These terms are used by multiple authors, and each author uses them in a different meaning. Moreover, many authors introduce their own, added value categories, such as *deviant science, pathologic science, marginal knowledge, deviating knowledge, abnormal knowledge* etc. A brief insight into the existing attempts to bring such cognitive phenomena into order is presented in "Cognitive Foundation of Parascience" research, the author of which complements the system with some positions adopted from the most original classifications, which frequently contradict each other (Martishina, 1996).

Thus, G. Holton operates the term *antiscience* as a collective reference to the knowledge, alternative not even to the science itself, but to Enlightenment as such, outlining such types of *antiscience* as *pathological science* (concepts borne by knowingly ideas and suggestions), *pseudoscience* (concepts obviously contradicting the fundamental scientific facts) and *scientism* (superoptimism in evaluating the power of science). V.P. Filatov subdivides *would-be science* into unspecialized (everyday experience, popular science etc.) and specialized knowledge, which, in its turn, is structured into *paranormal science* (theories of secret powers of nature underlying ordinary natural phenomena); *pseudoscience* (concepts claiming to be scientific, but unfulfilling the cognitive scientific criteria); *deviant science* (researches by marginal scientists based on alternative programs). V.V. Ilyin outlines the following components of would-be science sphere: *non-scientific forms of cognitive activity* (practical-routine, artistic etc.); *prescience (protoknowledge); mock-science* (prejudice camouflaged into science); *parascience* (knowledge unfulfilling scientific criteria in its epistemological status); *anti-science* (intentional distortion of the scientific world view). M.R. Zhbankov subdivides would-be scientific knowledge into: *protoscience* (attempts to create an integrative scientific outlook under the conditions of information deficit); *pseudoscience* (characterized with subjectivism, esoterism, authoritarianism); *pathological science,* partially intersecting with *pseudoscience* (voluntary definitions formulated under scientist orientation and judgmental conviction in compliance to the scientific research criteria)

From the point of view expressed by the authors of encyclopedic *Parascience* article published in Wikipedia, one of the most popular information sources among modern Russian Internet users, the closeness of notions *quasi-science* and *parascience* allows using them as synonyms: *'Parascience* (or *quasi-science*) is

a group of concepts and theories of ideological, hypothetical, theoretical and pseudotheoretical character, striving to apply scientific methodology to *non-scientific* and *extra-scientific* objects (including so-called *paranormal activity*). *Parascientific knowledge* emerges as an alternative, an addition to the existing forms of *scientific knowledge,* but does not meet the criteria of structuring and substantiating scientific theories, and, thereby, is not capable of providing a rational definition to the studied facts.

At the same time, the authors of the current article principally distinguish between the terms *parascience* and *pseudoscience,* which is used to generalize non-scientific concepts and theories, positioned or perceived as scientific.

Similarly, Martin Mahner suggests that *parascience* refers to all types of *non-scientific* activities, not classifiable as *pseudoscientific* (Mahner, 2007).

The corresponding Wikipedia article on *Pseudoscience* presents *pseudoscience* and *mock-science* as synonyms, explaining that the details of its semantics are not reflected in English: both of them have one and the same English equivalent, *pseudoscience*. Among close terms, it lists: *parascience* (which contradicts the opinion on principal difference between *parascience* and *pseudoscience,* as determined in the mentioned *Parascience* article), *quasi-science, alternative science, non-academic science*. It is also remarked that some researches refer to the complex of *pseudoscience, parascience, mock-science, quasi-science,* intended to distort the authentic science, with the term *deviant science*.

Therefore, it becomes evident that the invariant term set is interpreted by various scientists in fundamentally different ways. V.P. Filatov uses the term *pseudoscience* to what V.V. Ilyin refers to as *parascience,* and to what M.R. Zhbankov names *pathological science*. *Pathological science* category of G. Holton encompasses phenomena from the spheres of *mock-science, parascience,* and, probably, *anti-science* in the understanding of V.V. Ilyin and *deviant science* of V.P. Filatov; at the same time, Holton's interpretation of *pseudoscience* is close to the definition of *paranormal science* by V.P. Filatov, who also operates the term *pseudoscience,* however, in a different sense.

According to the author of the same research "Cognitive Foundations of Parascience", the complex of *would-be science* includes *popular science, extra-science, parascience and mock-science*. By *mock-science (=pseudoscience)* the author understands the concepts based on principally false grounds, claiming to be self-sufficient in the current field of knowledge, based on empiric material obtained from the normal scientific research procedures, and on the similar theoretic assumptions, but with significant deviations. The term *extra-science* stands for mystical theories, studying the objects lying beyond the boundaries of actual being, presenting the space beyond reality; the methods of *extra-science* are irrational and are opposed to those of regular science as less subtle or developed. *Parascience* denotes an aggregation of concepts based on non-normative interpretation of rational initial assumptions, reproducing specific properties of scientific knowledge, though replacing some of its criteria with the opposite ones. At the same time, *deviant science,* meaning marginal research deviant from the standards of its time and presenting an aggregation of original, though scientific concepts, and *protoscience,* the term which characterizes the level, not the form of conceptual development, are put beyond the sphere of *would-be science* (Martishina, 1996).

The question on classification of a certain concept as belonging to this or that variety of would-be science is answered depending on the

ideas outlined as its basis. For example, astrology may be regarded as both *pseudoscience* and *parascience,* depending on what is considered to be its basic idea: the thesis on predetermination of human fate by zodiacal constellations or the idea on the influence made by cosmic bodies and cosmos as a whole on the human activities.

Generally, any theory is built around a central, generic term, uniting close phenomena into a conceptual whole. Thus, E.B. Tylor centralizes early religious phenomena around the term *animism*. V.I. Kopalov considers *fetishist conscience* to be a generic term for a whole range of conscious forms (such as, mythological); I.R. Kasavin brings all the aggregation of paranormal phenomena together under the central term of *magic:* "clairvoyance, telepathy, ability to see spirits and to levitate, biolocation, telekinesis, poltergeist are all phenomena necessarily included into the magic cosmos". I.T. Kasavin agrees with D. O'Keeffe, who argues against understanding paranormal activity as epiphenomenon of science. The fact that some psychic phenomena may be understood as caused by electrostatic charging (telekinesis), statistic coincidence (prediction), hallucinogen effect (clairvoyance) or placebo effect (paranormal healing) does not play any role. On the opposite, it is important to study the cases unexplainable by physics, biology or psychology. According to D. O'Keeffe, the relevant factor is to understand, why the humankind keeps forming minor groups, producing and confirming paranormal experience; maybe, the question on the objectivity in this experience is not as important as the question of functioning of the whole system, or institution of magic. This is the approach I.T. Kasavin finds most appropriate for the philosophic analysis of the paranormal (Kasavin, 1994).

Multiple researchers remark, that *parascientific* inquiries have always claimed to be true, to assist the cognition of reality. For this reason they have always upheld their existence either by the side of what is accepted as real science, being a sort of *alternative science,* or even as a deeper type of knowledge, substituting all other candidates to be recognized as science. It means, that besides scientific knowledge, there are various forms of *non-scientific knowledge* that position themselves as scientifically and empirically substantiated, argumentative. Following the ideals of science, *parascientific knowledge* is striving to adjust itself to the paradigm. As the attendees of round table "Pseudoscientific Knowledge in Modern Culture" remarked, *parascience* representatives are consistently inclined to using the forms (principally, linguistic) that outwardly resemble those of professional scientific texts. Magicians and wizards frequently use various forms of academic communities and position themselves as Masters and Doctors of white (black) magic and or members of various research academies. It happens due to the stable momentum of science prestige that exists in the public opinion. In the tradition of public opinion, argumentative, positive knowledge is associated with the authority and prestige of science as a social institution.

Comparing *scientific* and *extra science forms of thinking,* A.V. Kezin in his article "Ideal of the Scientific and Parascience" develops a thesis that in the argument between *science* and *parascience* the choice is based not on any criteria, but on the worldview, and that there is a similarity between *parascientific* knowledge and a new ideal of science under development, marked with *antifundamentalism, pluralism, externalization*. In the view of Kezin, understanding *parascience* as having a serious social and humanitarian potential is heuristic. Remarking high social and practical orientation as the main feature of the new developing ideal of scientific, Kezin mentions that the majority

of *paradisciplines* (paraphysics – dowsing; levitation, eternal engine etc.; parapsychology – clairvoyance, telepathy, psychokinesis etc.; alchemy, astrology etc.) meets the ideal surprisingly well (Kezin, 1996).

Analyzing the problem of demarcation between science and non-science in his work "Alternative for Parascience", Yu.M. Serdiukov arrives at a conclusion, that the difference between them is not in the degree, but in the core of it. He joins A.V. Kezin, who assumes that *science* and *parascience* are antipodes in their worldview. The main thing that separates them is the belief in miracles. *Science* is radical in denying the very opportunity of breaking the course of nature, while *parascience* originates from the idea of trivial miracle. "The principal difference of scientific knowledge from all other types of human cognitive activity is in unacceptability of explaining reasons and characters of the studied phenomena by postulating hypothetical transcendent ideas beyond the limits of human experience" (Serdiukov, 2005).

In his turn, V.A. Lektorskiy, pointing at the evident similarity of *parascientific* assumptions and synergetic paradigm ideas (new, open form of rationality based on the dynamic chaos idea etc.), remarks, that in the context of this new approach many ideas accepted as *antiscientific* by science may be rehabilitated in a certain way (Lektorskiy, 1996). At the same time, he emphasizes that the subject matter is not elimination of a boundary between *scientific* and *extra science* thinking. This boundary exists at every moment of time. But it is mobile, historically variable. The opposite to science in a certain period of history may turn to be close to it: admitting the necessity to complement itself with some other, *extra-scientific* methods of understanding reality, science may correlate with the *extra-scientific* cognitive tradition, making its own boundaries more universal.

2. Example

2.1. «Parascience» as the Context of Scientific Knowledge

Let us have a deeper insight into the ways of systematizing various forms of non-scientific (*would-be science*) knowledge according to researches dedicated to the issue.

Parascientific knowledge (from Greek "para" – near, close) is usually defined as a form of cognitive activity, emerging as an alternative or an addition to the existing forms of scientific cognition. The term *parascientific* also refers to ideas and concepts, not firmly agreed on by the members of academic community to recognize it as fully legitimate elements of the scientific cognition system. *Parascientific knowledge* is regarded as non-complying with the common criteria of building and proving scientific theories, incompatible with the existing epistemological standards, such as including some assumption of the phenomena not yet argumentatively explained from the scientific rationality point of view (such as, mysticism, spiritualism, extrasensory perception – clairvoyance, telepathy etc.).

As authors of *Parascience* Wikipedia article remark, in modern practice the term *parascience* is applied in various contexts:

- In relation to new theories that have not yet gained their authority, non-complying to the dominating theoretical paradigm. Examples of such theories, like Tsiolkovsky's cosmonautics or Weneger's theory of continental drift, witness that some *parasciences* have a chance of entering the sphere of *"normal science"* with the course of time.
- The fact that the complex of practical cognition, which does not require any scientific rationality ideal, or does not contain any ideal object systems, is the reason why scientific substantiation procedures or prediction, do not rise over

systemized and didactically formulated experience (i.e., *popular sciences:* folk medicine, folk meteorology etc.)

- In relation to concepts and theories exaggerating the role of certain natural processes, and postulating the existing of supernatural bodies, phenomena or powers, unknown to traditional science (i.e., parapsychology, ufology, "occult sciences": alchemy, astrology, phrenology, geomancy, chiromancy, physiognomy, dream interpretation etc.).

It is remarkable that, as a rule, the subdisciplines, the names of which include the *para-* prefix, are not related to *parascience* as such. It denotes the methods, means and practices beyond the main field of the science or practice. For example, paralinguistics is a subdiscipline of linguistics studying non-verbal means within the composition of spoken message; paramedicine is a subdiscipline of medicine that studies first aid methods.

In her specialized research for "Cognitive Foundations of Parascience" N.I. Martishina, regarding *parascience* as a dialectic opposite of science, as a "peculiar alternative" of science, emphasizes that the tendency of *parascience* to co-exist with science in different historic periods is determined by the extent to which *parascience* meets the cognitive and sociocultural needs. *Parascientific knowledge* exists as a type of knowledge that strives to satisfy the social necessity for *perfect science*. *Parascience* does not oppose itself to *science;* on the contrary, it emphasizes the "scientific" character of its basic ideas and methods.

According to the definition by N.I. Martishina, *parascientific moods* are characterized by specific techniques of operating empiric data, such as: equality of assumption (a "natural" explanation is regarded as equally possible with the "maximum allowed"); conjunctive verification (if certain elements are authentic, the whole message is admitted as authentic); equalizing of possible with authentic; quasi-documentation. The general criteria of *parascience* are: maximization of initial assumption; shifting modality of reaches conclusions; cure-all effect; non-falsifiability and axiological type of substantiation (Martishina, 1996).

In his article "Parascientific Knowledge" M.R. Zhbankov claims, that *paranormal knowledge* exists as a constant context of a developing scientific knowledge as *protoscience, deviant science* and *pseudoscientific (non-scientific) knowledge* (Zhbankov, 2001). *Protoscience* presents the primary forms of reality contemplation which occur in the process of development of a certain historical scientific knowledge type at the absence of required empirical material, in the situation of crudity of research methods or theory-building regulations. Relying on the existing authentic data and subjective assumption of the researcher (inevitably influenced by the epoch atmosphere), *protoscience* serves as the basis for building more authentic theoretical models, the pre-fundament for a scientific theory.

Deviant science is an independent field of theoretical knowledge, which, according to academic community, does not comply with the existing criteria of science. The reasons for such determination may be: world outlook, conceptual or political arguments between the natives of such *deviant knowledge* and the orthodox majority. Therefore, the status of *deviant science* may be ascribed both to esoteric, parapsychologic and similar concepts, or actual scientific theories, which contradict the current world outlook (e.g. helio-biology of Chizhevsky, theory of "passionarity" by Gumilev etc.). In a totalitarian society *deviant* (from the ruling ideology point of view) *science* gets prohibited, and its followers are subjected to persecution and repression (for

example, let us remember "The White Robes" by D. Granin).

Pseudo-scientific knowledge is an attempt to expand the sphere of scientific search by building a theory based on non-scientific grounds. Pseudoscientific knowledge is often understood as intellectual activity speculating on popular theories (for example, the treasure of the Nibelungs, the submerged Atlantis, ancient astronauts etc.).

Among the radical violations of scientific regulations by *pseudoscience* are: supernaturalism; neglect of methodological principles of economy and fallibilism; recognition of truth characteristics in such subjective elements as belief, sense, mystical vision and other paranatural types of experience; use of non-falsifiable hypotheses.

The authors of *Pseudo-science* Wikipedia article remark, that at any attempts to classify the forms of *pseudoscientific knowledge*, the ascription of certain fields of human activities to *pseudoscience* is gradual, depending on the development of the humankind and the obsolescence of its previous worldview. Thus, the first group includes some empirical theories of the past: alchemy, which served as fundament to modern chemistry and may be regarded as a historical period of its development; astrology, which boosted the development of astronomy; numerology that appeared at the moment of exuberant bloom of philosophy, mathematics and astrology, and gave a push to certain ideas of the theory of numbers. *Pseudoscience* today includes the attempts to use similar theories as adequate replacement of modern science, ignoring the current scientific facts, to use their old age as an argument in favor of their authenticity and scientific character.

The second group encompasses the "sciences" and "theories" which appeared as improper attempts to found a new, *alternative science* or a theory, for example: supercritical historiography, particularly, "new chronology"; wave genetics; torsion fields etc.

The third group includes the argued attempts to connect modern scientific theories with religious or mystical ones, such as: scientific creationism; parapsychology (telepathy, telekinesis etc., psychotronic weapon); telegony etc.

Into the fourth group we include various "marginal" theories ("healing systems", psychological, occult, religious etc. theories and movements), particularly: graphology, health care science, dianetics; socionics; phrenology; homeopathy etc.

The arguable presence of various *pseudoscientific knowledge* forms in encyclopedic articles indicate the crudity of clear definitions and criteria for *science* and *pseudoscience,* disinformation of certain encyclopedic sources, where unsystematic and mutually exclusive positions are presented as trustworthy "scientific" information.

In the proceedings of the Round Table "Pseudo-Scientific Knowledge in Modern Culture" B.I. Pruzhinin states, the problem of *pseudoknowledge* is actualized in those areas where identification of scientific knowledge is complicated, where the mechanisms of differentiation between *science* and *pseudoscience* do not work out. Not claiming to follow a strict classification, researchers interpret such pseudoscientific knowledge as *mock-scientific* and *quasi-scientific* knowledge as well.

2.2. "Mock-Science" and "Quasi-science"

The *"mock-science"* (the term itself has some negative axiological connotation: "mock" as intentionally harmful and false, though the literary meaning of the Russian term is "non-true") is sometimes interpreted as intentional use of prejudice, often associated with the behavior of a pathological psyche, inadequate,

pretentious person intolerant of criticism striving for sensation. Usually this sort of knowledge is not systematic, paradigmatic and often manifests and develops itself by means of quasi-scientific knowledge. *Quasi-scientific knowledge* exists and develops under the cover of the ruling ideology, which provides it with the support of the authorities and makes it critic-proof.

An attempt to differentiate between the terms *quasi-science* and *mock-science* was performed by V.A. Legler in his work "Science, Quasi-Science, Mock-Science" (Legler, 1993). In his opinion, the term *quasiscience* stands for the form taken by science under the conditions of hierarchically organized society; it is a merely social, collective phenomenon. While *mock-science* is an individual matter. It is a theory in the relations of mutual denial with the similar world science. It is related to science as, after V.A. Legler, a mental disorder is related to normal conscience. *Mock-science* is a mistake of a certain individual caused by their fanaticism, low education, intellect or mental illness. According to the definition given by M.V. Volkenshtein, author of "Mock-Science Tract", there are several types of mock-scientists. In the most primitive and the most pitiful case they are mentally challenged people obsessed with the desire to invent. Another type of mock-scientists is ordinary charlatans, swindlers, scam artists. The greatest group of the three is ignoramus and laymen (Volkenshtein, 1975).

In the opinion of V.A. Legler, in the academic community mock-scientists may be compared to noise which blocks the useful signal. They obstruct the academic community, decreasing its total capacity. The real hazard for the science is organized *mock-science,* organized in the form of *quasi-science*. The paradox of the *quasi-science* world is that often it may be headed by famous and authoritative scientists.

Quasi-science is an ideological phenomenon which forces scientists to come together. And while highly professional *quasi-science* is limited to "mild" forms of violence, confident that it may protect itself by its own means, the lower professional *quasi-sciences,* on the opposite, tend to stricter ideological methods of dissidence security: dismissals, repressions, arrests etc. Highly professional *quasi-sciences* are harder to overcome than less professional ones, as their delusions are not so obvious for non-experts. In this sense less professional *quasi-sciences* are more vulnerable, and, consequently, less harmful. But when science turns into *quasi-science,* it makes no difference whether it is presented by scientists or mock-scientists, as, according to V.A. Legler, it is not regarded as science any more. In such a situation a scientist is of more hazard, as he may protect the *quasi-science* more efficiently (Legler, 1993).

2.3. "Abnormal Knowledge"

Authors of the article "Extra-Scientific Knowledge and Modern Crisis of Scientific Worldview" study the problem of *abnormal knowledge,* which they understand as the part of knowledge that does not conform to a certain common paradigm with its aggregation of regulations and ideals (Dynich, El'iashevich, Tolkachev, Tomil'chik, 1994). The *abnormal knowledge* term itself bears no negative emotional or semantic meaning and denotes nothing but the fact that the knowledge itself, or the method of obtaining such, does not conform to the norms accepted as common in the modern science of the current historical period.

Authors divide *abnormal knowledge* into three types:

- *Abnormal knowledge* which appears as a result of the unacceptable, for a certain individual, divergence between "common

sense" regulatives and the norms and methods of a certain science or science in general, "AK-1";

- *Abnormal knowledge* born inside a science and revealing itself in the divergence of paradigms – "AK-2";
- *Abnormal knowledge* that occurs at the attempt to unite norms and ideals form principally different (rational or irrational) forms of knowledge and activity – "AK-3".

As the first type, "AK-1", lies beyond science and is absolutely evident, the authors are more interested in the second and third types, "AK-2" and "AK-3". The second type of *abnormal knowledge,* or "AK-2", includes the science frauds hardest to recognize, and the third type of *abnormal knowledge,* "AK-3", may also be socially dangerous, as it is directly projected on the common conscience and this influence is multiply enhanced during the periods of social or spiritual instability.

Speaking about the second type of *abnormal knowledge,* "AK-2", the authors remark that emergence of any radically new idea is a generation of knowledge, *abnormal* ("*deviant*") in relation to the traditional science. It is explicitly demonstrated by examples of reaction of the academic community to the first versions of some fundamental physical theories, such as, Maxwell's electrodynamics, quantum theory, special relativity theory etc. However, the community's negative reaction towards any novation as such may be only regarded as a proof of abnormality of the suggested idea, not the feature which drives it beyond the boundaries of science. As we see in the history of great scientific discoveries, the principally new concepts that radically change the face of science are usually obtained as "abnormal" results of "normal" researches, targeted at "normal" aims (such as discoveries of A. Einstein, M. Planck, N. Bohr etc.). Another essential criterion which helps an abnormal novation to find its place within the system of scientific knowledge, is its capacity to be expressed through the terminological apparatus, traditional for this field of study, notwithstanding its extraordinariness or paradox.

Consequently, as suggested by V.I. Dynich and his co-authors, the elements of *abnormal knowledge,* born within the framework of science and rejected by it, find themselves as incapable of being non-contradictorily expressed in the categories of science terminology, as having aims and methods, alternative in relation to modern scientific knowledge. Driven out of science, such ideas continue their existence beyond its limits, transforming into *abnormal knowledge* of "AK-3" type, and begin to attract authenticity criteria from other fields of spiritual and cognitive activities (religion, trivial cognition etc.). This is the process of evolution of *abnormal knowledge* from science into the mass culture, inappropriate expansion of scientific paradigm at the expense of ultimate philosophic concepts, introduction of such terms, as "faith", "good", "evil" etc. into scientific structures. The sympathy and support for such studies is usually shown due to their explanation with the "general human values" terms.

Based on their own classification of *abnormal knowledge* types, the authors of "Extra Science Knowledge and Modern Scientific Worldview Crisis" make an attempt to oppose their typology to other approaches to extra-scientific sphere. As an example, critical analysis of V.P. Filatov's view is presented, which outlines *paranormal knowledge, pseudoscience* and *deviant science* in the would-be science sphere (Filatov, 1990). As, after V.I. Dynich and his co-authors, V.P. Filatov claims that science "undermines humanistic values, substitutes traditional forms of culture and life, splits the previously unified culture into two opposite spheres, scientific-technical and humanitarian", as the question of alternative

culture under the modern context is, first of all, is the "question on compensating the known limitedness of modern science" and "getting over the alienation of science from the everyday life world of people, its compatibility with humanistic ideals and values" (Dynich, El'iashevich, Tolkachev, Tomil'chik, 1994) (in the attempt to find the "third way", the synthesis, the recovery of the cultural sphere split into expressively irrational and scientifically theoretic conscience, the authors of the mentioned work extract an unsubstantiated extrapolation of values and norms of humanitarian conscience on the sphere of rational scientific conclusions, which is the third type of *abnormal knowledge "AK-3").*

2.4. «Antiscience»

Having explained their unconsent with V.P. Filatov's point of view, the authors of "Extra Science Knowledge and Modern Scientific Worldview Crisis" express their solidarity with the opinion of G. Holton, which is also worth mentioning. In his article "What is Antiscience?" G. Holton states, that the *antiscience* term consists of a great number of meanings, comparable with the notions *true science, pathological science* (which stands for the activities of people, convinced that what they are creating is true science, but in fact trapped in their unhealthy fantasies and illusions), *pseudoscience* ("science" of paranormal activity), *scientism* (excessive enthusiastic belief in the power of science, expressed in imposing "scientific" models to extra science cultural spheres; extravagant ambitions of technocrats, blindly trusting the all-mighty power of science). A special interest of G. Holton is drawn by such phenomenon of *antiscience* as *pseudoscience,* which claims to be *alternative science* (Holton, 1992).

Regarding the conceptual structure of the world outlook, G. Holton remarks that there is no world outlook which is *antiscientific* in the authentic meaning of the world, as it always includes the basic component of a working prototheory on the nature of physical and biological reality, which forms the fundament for the *protoscientific* type of worldview. The world outlook which lacks the typical traits of a standard one, is, as a rule, perceived as an alternative from the point of the outlook which has such traits. G. Holton concludes, that instead of *antiscience* (inappropriateness of the term *antiscientific knowledge* is connected to its judgmental character), it is better to speak of *alternative science,* but as the word "alternative" creates the illusion of equality of such concepts in the ontological and pragmatic sense, and possess (to the equal extent) the status of *real science;* for this reason, after G. Holton, it is even more accurate to name such concepts *parascience.*

In general, *counter-scientific* assumptions (*parascientific, alternative outlook)* are negatively evaluated by G. Holton as destructive (Holton, 1992).

2.5. «Parascience» and «Myth»

The isomorphic relations between *parascience* and *myth* are caused, particularly, by the fact that the "supernatural", "miraculous" phenomena themselves are absolutely natural and expected both for *parascience* and *myth.*

K. Hübner presents an original vision of the normalization of the theoretic discourse development problem as an opposition to the expressive and mythological, to the problem of the choice between *science* and *myth,* yet in a different relation to *miracle* phenomenon. Demonstrating the relative character of *de-* and *re-mythologization,* Hübner remarks, that the attempt to explain the fact of "transition" from the totality of mythological world perception to theoretic and discoursive understanding of the world makes us face the normative conditions of such a transition. And while there is no explanation

for the transition from mythological to scientific world outlook, either natural or historical, in the scientific meaning this process may be regarded as a mere coincidence. But the things interpreted by *science* as a coincidence, is explained as a numinous interference by *myth*. – Therefore, Hübner suggests that the replacement of myth by science may be equally explained scientifically, as a coincidental event, and mythically, as a numinous interference. Correspondingly, both return of the myth, or re-mythologization, is a coincidence from scientific point of view (a "needless tragedy", as total de-mythologization is the objective and the ideal of scientism), and fate from the mythological one (Hübner, 1996).

Expansion and popularity of *parascientific knowledge* in the modern age is mostly associated with the phenomenon of culture *re-mythologization*. Regarding various correlations of *parascience* with other forms of *extra-scientific* knowledge (philosophy, religion, art etc.), N.I. Martishina, for instance, is inclined to interpret *parascience* as *modern mythology,* and to connect the actualization of *parascientific* research with the modern culture *re-mythologization* processes (Martishina, 1996).

An original interpretation of re-mythologication in modern culture and adherence to *parascientific knowledge* is presented in "Anthropology of Myth" by A.M. Lobok, who emphasizes, that even though throughout many centuries the strategic objective of European civilization was the idea of total de-mythologization of the public conscience, the whole 20th century lives under the sign of myth. Despite the gist of European science and European Enlightenment determined with the dominant of "rationalism", claiming that rational thinking means analytical thinking, that separates possible from impossible and sticks exclusively to the "possible" space, the 20th century experiences a powerful mythologism flow into the educated public conscience, manifesting itself as the cultural *re-mythologization* phenomenon.

According to definition by A.M. Lobok, the conscience of an educated 20th century person has actualized the level of *myth,* which is typical for a prehistoric human or a pre-schooler: *"allow-all",* or *"unlimited myth"*. Today we observe an incredible phenomenon: a person brought up with the rationalist thinking, forming the fundament for the European education ideals, gets more and more persistent in turning not to irrational, but "all-allowing" type of thinking. For him, the world is populated with energy vampires and werewolves, demonic forces, karmic incarnations, otherworld creatures, and, as A.M. Lobok enhances, simultaneously! Strangely, the minds of our contemporaries create an amazing mix of different, yet at the same time, opposite *mythologies.* A modern person may pray at an Orthodox church, celebrate Catholic Christmas, break hex and evil eye spells with the help of healers and magicians, determine the astrological scenario of his life using the Chinese Calendar, believe in multiple incarnation of his life, and, at the same time, in the achievements of scientific and technical progress. Jesus Christ and Albert Einstein are equally real for him. The dominating idea of the mass public conscience in the 20th century is the *common belief in everything* and strong conviction that *everything is possible.* While this conviction is the key characteristic of *mythological conscience* in its most naïve, childish and prehistorically archaic forms.

Everything is possible: it means, that clairvoyance, vampirism, turning into a werewolf, afterlife, multiple reincarnation, naturalized demons and witches are all possible. The educated humankind of the 20th century is absolutely tolerant to any cultural difference in the form of the *all-allowing myth, unlimited myth*.

At the same time, the dearest, the most meaningful thing in the existence of an educated

person, *the myth,* is also put on the railway of his rational and cultural thinking. This is how an absolutely different myth is created: the myth for building a reflexive dialogue. While the *unlimited myth* of a child or a prehistoric human accepts everything, the *intelligent myth* does not only *believe* in a certain major mythological force, but is also strong in cutting off everything which may contradict the authenticity of the *myth*. It applies all power of rational argumentation to protect his *mythological truths* (Lobok, 1997). – This rational argumentation is the one to cause the cognitive consonance of the myth in the conscience of a modern person, the mosaic of his world outlook, the adherence to supernatural, paranormal, and, at the same time, "protects", "prevents" him from realizing the contradiction of his own world outlook, as *myth* is not sensitive to contradiction. This is why the limit between the *scientific* and *parascientific knowledge* finds its mythological shape.

Resume

The above arguments make it evident that the invariant classification for non-scientific knowledge form has not been built yet in the modern philosophy of science. The process of post-neo-classic science formation requires understanding both the features of *scientific knowledge* as such, and the characteristics of *alternative knowledge forms*. This is why the problem of the *boundary, demarcation of scientific* and *extra-scientific knowledge* gets so topical in the modern philosophy of science. The flexible boundary idea is one of the basic ones among the conclusions of researches, results of which are presented in "Critical Analysis of Extra-Scientific Knowledge" (1989); "Deluded Mind?: Diversity of Extra-Scientific Knowledge" (1990); "Magic Crystal: Magic Through the Eyes of Scientists and Magicians" (1992) edited by I.T. Kasavin, conclusions of symposium "Scientific and Non-Scientific Forms of Thinking" (1995), which underline that *scientific thinking* is just one of the ways of reality cognition, existing along with the others, principally incapable of replacing them. But different forms of thinking do not only exist; they interact with each other in a continuous dialogue. This is why the boundary between *scientific* and *extra-scientific* forms of thinking is flexible, vague, historically fluctuating. The so-called *criteria of science* is of less demarcating than regulating or orienting character. Therefore, the fundament of this "argument" between *science* and *non-science* is formed not by rational assumptions, but by world outlook preferences. The thinking called *scientific world outlook,* is, basically, a *naturalistic world outlook,* which does not admit any *miracle* (Kezin, 1996). On the contrary, the basis of *parascience* is the belief in various *miraculous* phenomena.

In summary, it is important to remark, that all the theoretic positions demonstrated in the present literature review and in the list of references, are representative enough, though, naturally, do not cover all the points of view on the problem expressed in literature. The study of the ratio between *science* and *parascience* within the framework of "History and Philosophy of Science" course assumes, as a minimum, introduction into the main definitions of *parascientific knowledge* and its structure. At the same time, the analysis of the studied *parascience* phenomenon shall not be a priori built on the unequivocal critical assessment; it is still essential to study all the patterns, underlying its emergence and functioning.

There is no doubt, that the most heuristic initial position in studying the *parascience* phenomenon is studying it in the context of interpreting *science* and *extra-scientific* knowledge as correlating, complementary, synergically cumulative ways of describing the world.

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Наука и паранаука: обзор литературы по проблеме (конец XX – начало XXI века)

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В статье проводится обзор литературы, преимущественно отечественной, по проблеме отношения науки и паранауки, фиксируются различные точки зрения относительно структуры вне-научного знания и места в нем паранауки. Обращение к данной проблематике обусловлено ее открытостью, отсутствием четких классификаций и дефиниций паранаучного знания, что делает необходимым его экспликацию. Статья обобщает опыт преподавания темы «Наука и паранаука» в лекционном курсе для аспирантов и соискателей по дисциплине «Философия науки».

Ключевые термины: наука, научное знание, граница между научным и вненаучным знанием, анормальное знание, паранаука, псевдонаука, протонаука, антинаука, квазинаука, девиантная наука.